VOLUME 4

HANDBOOK FOR THE BACHELOR'S DEGREE
COURSE DESCRIPTIONS FOR PROGRAMMES IN THE
HEALTH SCIENCES

September, 2014
NOTE TO THE UNDERGRADUATE HANDBOOKS
Undergraduate Handbooks of the University of Ghana are published in four volumes as follows:

VOLUME 1: REGULATIONS GOVERNING UNDERGRADUATE STUDY AND UNIVERSITY EXAMINATIONS
VOLUME 2: COURSE DESCRIPTIONS OF PROGRAMMES IN THE HUMANITIES
VOLUME 3: COURSE DESCRIPTIONS OF PROGRAMMES IN THE SCIENCES
VOLUME 4: COURSE DESCRIPTIONS AND REGULATIONS FOR PROGRAMMES IN THE HEALTH SCIENCES

Undergraduate students should therefore have Volume 1 and either Volume 2, 3 or 4 of the Handbooks, depending on the programme they have been offered.
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UNIVERSITY REQUIRED COURSES

The University has, beginning from the 2010/2011 academic year, introduced a unique general education programme which is intended to provide a rewarding experience for all students who undertake undergraduate studies in the University. The interdisciplinary courses in the programme, which are intended to foster broad student familiarity with key advances in the humanities, science and technology, are the following:

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* See write up below on structure for Understanding Human Societies
** See write up below on structure for Science and Technology in our Lives
*** See write up below on structure for Introduction to African Studies

It is expected that these compulsory courses will, in combination with students’ main areas of study, produce students who are equipped to meet the development needs of Ghana and Africa, and equip graduates of the University of Ghana to be confident, rounded scholars, capable of holding their own with graduates from any part of the world.

NOTE: Details of the semesters in which students of various Schools are expected to take University Required Courses may be found in the programme structure for each Department/School.

UGRC 110: Academic Writing I
The main objective of Academic Writing I is to equip students with the language skills that will enable them to read and write effectively. Students will be taken initially through fundamental issues in grammar and composition in order to consolidate their language skills in these areas. Subsequently, reading and writing skills relevant to university work will be introduced. These will include the structure of the essay, unity, completeness and coherence in essay writing; summarizing as a skill basic to exposition, writing from sources, referencing skills and avoiding plagiarism. The course will be taught in small groups and class activities are characterised by group work, oral presentations and extensive practical assignments.

UGRC 120: Numeracy Skills
This course is designed for students to acquire basic numeracy skills needed for solving real life problems. It involves the following: review of basic algebraic skills; rates (fractions, proportions and percentages); approximating numbers (rounding up of numbers and significant numbers); mathematical reasoning, (deductive and inductive reasoning); statements; truth tables; necessary and sufficient conditions; basic set theory; nature and uses of statistics; sources of data; data types and measurement scales; methods of data manipulation (aggregation and
interpretation); basic probability with illustrations from various disciplines; establishing relationships between variables, and the use of basic computer packages such as Excel in analyzing data.

UGRC 131-136 Understanding Human Societies
These courses are designed for students pursuing science-related programmes at the undergraduate level. The aim of the courses is to introduce students to the broad array of issues that shape human societies. Students are expected to select only one out of the six modules provided: the economy and business; culture and development; governance in the information society; human behaviour and the social environment; religion and societies; and language in society.

Descriptions of Modules:

UGRC 131: Understanding Human Societies/Culture and Development
This module introduces students to culture-development linkages. It delineates the basic concepts of culture, resources and development and how these concepts holistically constitute the basis of human society. Approaches to understanding human society, both past and present, form the foundation for understanding cultural formations and the diverse resource usages.

UGRC 132: Understanding Human Societies/Religion and Societies
This module aims at introducing students to the on-going debate on the role of religion in human societies. It focuses on religious perspectives on social issues and discusses the way religion impacts social and political structures such as leadership and the family, as well as the environment. Students will in the end appreciate the synergy between science and religion in providing the wellbeing of all creation. Topics to be treated will include origins of religion, science and religion, religion in the modern world, religion and health, religion and the environment, gender, religion and cultural values.

UGRC 133: Understanding Human Societies/Economy and Business
This module is designed to offer students the opportunity of understanding the environment within which business operates in Ghana. The module places emphasis on the extent to which geographical, political, socio-cultural, economic and international forces have shaped the growth and practice of business and management in Ghana over time. It is also designed to help students to understand some macroeconomic issues with particular reference to the Ghanaian economy. More specifically, macroeconomic issues such as inflation, unemployment, poverty, exchange rate and economic growth will be discussed.

UGRC 134: Understanding Human Societies/Language in Society
This module is aimed at giving students a basic understanding of what language is and how it works in every human society. The course will help students to appreciate how language is used as a tool for doing things in the world. It shows how the study of language is at the intersection of the humanities and the social and natural sciences and how linguists conduct the business of studying language. Some of the topics to be covered are: the nature and functions of language, the language situation in Ghana, language, power and gender, as well as levels of linguistic analysis.

UGRC 135: Understanding Human Societies/Human Behaviour and the Social Environment
This module is designed to introduce students to human behaviour and the social environment. There are various dimensions to social issues and it is useful for students to get to know a wide range of these issues that concern them and the people around them. It also adds to their existing stock of knowledge.

UGRC 136: Understanding Human Societies/Governance in the Information society
This exposes students to the concepts of good governance and the information society, and the relationship between information and the key elements of good governance such as the rule of law, transparency and accountability. The module further examines the nature, scope and importance of governance and the relationship between the various institutions of governance in a modern society. The way public services ethics promotes good governance is also explored. Finally, the module takes a look at information literacy and sources of official information.

UGRC 141-146: Science and Technology in our Lives
These courses deal with the application of science to everyday life. The courses will, therefore, include material to assist students to appreciate the foundations of scientific thought, the application of science and technology and demands of changing societies for scientific and technological advancement. The courses are expected to foster
broad familiarity with key advances in science and technology. The courses will be delivered through lectures, tutorials, class exercises, homework assignments, and examinations.

There are six modules/areas including: Earth Resources, Geohazards, Chemistry and Life, Food and Nutrition in everyday life, Everyday Physics, and Animals as Friends of Humans. Students are expected to select only one out of the six modules provided.

**UGRC 141: Science and Technology in our Lives/Everyday Physics**
The course presents some of the basic principles of physics that are useful for understanding and explaining everyday physical phenomena. Participants will learn about the laws of motion and how principles of mechanics are applied in everyday objects such as seat belts and airbags. The properties of semiconductors and their application to microelectronics will also be discussed. In addition, concepts in energy, both renewable and non-renewable, electricity, and electrical safety measures will be discussed.

**UGRC 142: Animals as Friends of Humans**
The course is a general introduction to animal species and groups commonly found in our environments - understanding their lifestyles, their interactions with humans, roles and contributions to the environment, and how to manage and conserve them. These include vertebrates, invertebrates like insects, and pathogenic organisms that cause diseases.

**UGRC 143: Science and Technology in our Lives/Earth Resources**
The earth is endowed with rich resources, many of which are indispensable to mankind. Many of these resources are covered by the earth and need to be uncovered for easy access and for our benefit. This course is aimed at providing students with the basic understanding of what resources are in general; with specific emphasis on earth resources. The course will assist students appreciate the fundamentals of scientific thought and the application of science and technology in gaining access to many of the resources that are hidden deep beneath the earth. Some of the topics to be covered include: our earth resources, alternative energy sources, groundwater resources, mineral deposits and fossil fuels.

**UGRC 144: Science and Technology in our Lives/Geohazards**
The course introduces students to various geological hazards, with an emphasis on an understanding of the natural processes that operate on our planet Earth, both at the surface and deep within the interior. The course also examines the causes and effects of these hazards and the appropriate preventive measures. Processes examined include:

- Earthquakes and associated hazards
- Volcanic activities and hazards related to volcanoes
- Mass wasting and their impact on the environment
- Waste disposal and management problems, and the potential impact of wastes on the environment
- Medical geology which looks at the processes responsible for the release of chemicals and naturally occurring dangerous geologic elements onto the environment, the mechanisms through these elements enter our body and the accompanying health effects on humans, animals and plants living in that environment
- Greenhouse effect and climate change
- Flooding

**UGRC 145: Science and Technology in our lives/Food and Nutrition in Everyday life**
This course is designed to offer students the opportunity to understand, know and apply the principles of the science of food and nutrition to promote health. The course will give an overview of the differences between nutrition and food science as well as transitions in the food industry and nutrition. The nutrients in food, food types, food habits and effects, food security, water as a nutrient, food safety and nutrition will be covered. The significance of breastfeeding in infant nutrition, health and national development will also be discussed.
UGRC 146: **Science and Technology in our lives/Chemistry and Life**
This course is aimed at giving students a basic understanding of the application of chemistry to our lives. The course will expose students to the importance of the atmosphere and the chemistry involved in how various pollutants arise as well as how the atmosphere can be protected. Global warming, the water we drink as well as sources of energy will also be examined. This will enable students to make informed decisions in these areas on the choices they will make in the near future.

UGRC 150: **Critical Thinking and Practical Reasoning**
An essential element in the training of social studies and humanities students is providing a corrective and diagnostic skill set that enables students to discriminate logically between: rhetorical ploys that give motives vs. arguments providing good logical reasons for believing an assertion. Students need to recognize the contrast between inductive and deductive reasoning and the different types of support yielded by each, to evaluate the quality of evidence confirming an empirical hypothesis about human conduct, to maintain individual professional and scholarly discretion in the face of peer pressure and mob mentality. Those enrolled in this course will be provided the vocabulary and techniques to employ critical thought and practice within the academic arena and beyond.

UGRC 160: **Introduction to Literature**
This course will engage students in careful reading and analysis of a challenging selection of literary works from a range of genres including the novel, the short story, poetry and drama. The focus will be on intensive reading and discussion of the literature to inculcate in students the skill of interpretation. Students are expected to be active readers as they analyze and interpret textual detail, establish connections among their observations and draw logical inferences leading toward an interpretive conclusion. They will be introduced to formal features of the selected texts, including plot, character and language, as well as to the links between literature and life, to make them better readers of their world. The course will include a writing component that focuses on expository, analytical and argumentative writing about the literature. In short, students will read, discuss and write about texts while developing skills such as the sophisticated use of literary elements and terminology, close readings of various texts, creating, drafting and editing analytical essays.

At the completion of this course, the students will be able to:

- Make warranted and reasonable assertions about an author’s arguments
- Recognize and use literary terms
- Apply literary terminology to fiction, drama, and poetry
- Analyze different genres of literature, particularly short stories, novels, drama and poetry
- Read literary texts closely
- Read, understand and write analytical literary essays
- Recognize and assess the elements of different literary genres

UGRC 210: **Academic Writing II**
Academic Writing II is a follow-up to Academic Writing I and builds upon the skills acquired in the first year. Students will be required to read and critique a variety of academic essays in their areas of study. Writing activities will derive from these reading tasks and students will be guided to develop their writing through process writing which involves: pre-drafting, drafting, re-writing and revising. In this broad context, students will revise and consolidate their grammar through proof reading and editing activities. The course will also involve training students to write from multiple sources as a preparation for doing research-based writing. Activities will be geared towards getting students to develop the skills of extracting and sorting information from multiple sources and synthesizing them into coherent arguments in an essay. Students will be required to write such a synthesis essay for assessment. Subsequently, students will be introduced to academic presentation skills.

The Language Centre will teach the Academic Writing II course in all programmes in Level 200, except the following:
- The School of Engineering which has opted to offer Technical Report Writing (FAEN 206) in lieu of Academic Writing II.
The School of Agriculture and some departments in the Schools of Physical and Biological Sciences have opted to provide their own courses in the second six weeks of the first semester of Level 200 (Academic Writing II). Programme-specific lectures in Academic Writing in the second half of the first semester will be run.

UGRC 220-238: Introduction to African Studies
This course introduces students to the field of African Studies including Africa’s histories, peoples and cultures. It begins with a general introduction to the discipline, its history and values; continues with an introduction to Gender Studies in Africa; and thereafter students select from an extensive and diverse menu of ‘electives’. While all students take the general introduction and the introduction to gender, students are registered into the electives that they will take in the second half of the semester.
The general introduction serves as the springboard from which to launch the entire course.

Objectives of the course:
- To help students appreciate the contemporary value of African Studies as an area of enquiry.
- To help students engage with discourses on African realities.
- To encourage students to appreciate the African Identity.
- To help students develop a sense of Self Determination in the global world.
- To make students aware of the negative stereotypes about Africa and to encourage them to challenge these stereotypes.
- To help students develop appropriate methodologies and frameworks for examining Africa and its past through multi-disciplinary approaches.
- To highlight some of Africa’s contributions to world civilizations and knowledge generation.
- To enhance students’ knowledge in specific areas of African Humanities and Social Sciences

The overall introduction covers three weeks, including two hours of lectures, and one hour of tutorials per week.

Introduction to Gender
The main objective of this two week introduction (four hour), is to help students appreciate the gendered nature of African societies, how this impacts development, and state as well as civil society responses to gender inequalities. This component explains key concepts in African gender studies and explains why and how we address gender issues in African studies. This component of the course also makes a case for transforming gender relations on the basis of three justifications: (1) citizenship rights and the constitution, (2) development imperatives, and (3) the promotion of gender equitable cultures. The role of individual and group agency and leadership in changing gender relations will be highlighted.

The introduction to gender covers three weeks, including two hours of lectures, and one hour of tutorials per week. Also included is a practical activity, typically a film show.

At the end of the first 6 weeks students take part in a continuous assessment exercise.

Elective Component:
In the second half of the semester students join one of 19 pre-selected “elective” classes, each of which is described below. An examination for each of these is carried out at the end of the semester.

UGRC 220: Introduction to African Studies/ Appropriate Technology for Development in Africa
Course Description
The course is introduced by defining important concepts and theories of Appropriate Technology, emphasizing that it is technology that is appropriate, most suitable, practicable, and result oriented. It reviews the most dominant, but simple technologies used at local community levels. These include patterns of industrial and trade regimes in Africa, technologies used in rural energy production and consumption, water resource management technologies, and inter-agency collaboration in rural development activities, using these appropriate technologies. The course concludes by examining the gender dynamics and rural governance systems as critical thresholds for the understanding of appropriate technology use, and development prospects in Africa.
Course Objectives:
The objectives of the course are as follows:
- Equip students with knowledge and appreciation of basic definitions and debates around rural development and appropriate technology practice in Africa
- Assist students appreciate appropriate technologies which are used in rural development,
- Deepen students’ understanding of the prospects and challenges of rural development using specific technologies within specific contexts
- Develop the capacity of students to appreciate the intricate relations among appropriate technologies, rural development and development prospects in Africa.

UGRC 221: Introduction to African Studies/African Art, its Philosophy and Criticism

Course Description
This course is designed to introduce students to an understanding of African art and its conceptual framework as evidence of material culture, actively involved in the historical process and life of the African. As a cultural practice, it forms the bedrock of African aesthetic expression. The course argues that the environment, availability of materials for producing art, different histories and external influences, have affected African art and its development. The course proposes that African art is reflective and representative of African belief, philosophy, values and taste, and is used in several social, political and religious functions. As a fairly new field of discipline, the course introduces students to forms of art, historical and theoretical enquiries and approaches to the subject, such as art as history, history as an art, aesthetics, style, subject and subject matter interpretations and meanings, visual narratives, gender perceptions, roles and representations, art criticism and contemporary discourses on the practice of art on the continent.

Course Objectives:
The aim of this course is
- to develop in the second year university students within a six week period, an understanding of what African art is
- to establish a rational basis for African art appreciation, criticism, and discourse,
- to develop criteria for judgment in African art.

UGRC 222: Introduction to African Studies/ Africa in the Contemporary World

Course Description
This course provides a general overview of how Africa's past has shaped its present, political and economic conditions. It conducts systematic analysis of the role of leadership, gender and other major factors that influence African nations as they prepare for the challenges of the 21st century. It also discusses some of the major development challenges confronting Africa today, as well as key initiatives proposed by African leaders, policy makers and scholars to address underdevelopment on the continent. The course will focus on colonial rule, African nationalism, one party rule, military intervention, democracy and good governance, and the New Partnership for Africa's Development (NEPAD). In general, the course is designed to meet the needs of those who have never studied and perhaps will never be able to undertake any planned study of politics and economic development in Africa.

Course Objectives:
The course will enable students to:
- Appreciate how Africa’s past has shaped its post-colonial social, economic and political conditions and gender relations.
- Obtain an enhanced understanding of the challenges facing contemporary African states and propose initiatives to address them.
- Appreciate the impact of colonial rule on Africa’s development and gender relations.
- Understand the role of leadership and strategies implemented for Africa’s development and their impact on gender relations.

UGRC 223: Introduction to African Studies/ Africa and the Diaspora

Course Description
This course is designed to provide a general overview of the voluntary and involuntary journeys, life experiences, as well as the general culture of Africans in the Diaspora. It will also discuss some of the surviving African cultural
elements in the Americas, and analyze certain cultural and political coping/resistance strategies. The course hopes to demonstrate the resilience of African culture as expressed in music, literature, language, religious beliefs, festivals and art. It will critique some of the ideological bases for the various slave-trading epochs, and suggest ways of enhancing the African image within the global community. Furthermore, it will and discuss some notable contributions of the African Diaspora to the body of world civilization.

Course Objectives
The course aims to enable students to:

- recall Africans’ movements and contacts with other continents and countries.
- discuss the slave trades and analyse the reasons why Africans, more than any other race, have been enslaved by people of other continents
- analyse some of the cultural and political coping/resistance strategies including maroonage, the civil rights movements, Negritude, Pan-Africanism
- discuss the retention and creolization of some of the surviving African cultural elements in the Americas
- analyse contemporary migrations and discuss ways of enhancing the African image within the global community.

UGRC 224: Introduction to African Studies/African Popular Culture: Traditional Festivals and Funeral Ceremonies
Course Description
This course is a general survey of African festivals and funeral ceremonies. It is intended to make the undergraduate students conscious of the two events in their own communities, and also to help them identify, classify, perceive and understand the relative importance of these popular events. Assuming anthropological, sociological and folkloristic perspective, this course will examine ‘Traditional Festivals’ and ‘Funeral Ceremonies’ as two components of ‘African Popular Culture’. The course will pay particular attention to conflicts in these social phenomena and their respective roles in African societies.

Course Objectives:
The objectives of the course are as follows:

- To demonstrate to students the ritualistic and ceremonial functions in the festival and funeral ceremonies which bring together members of African communities for a common purpose.
- To help students understand the different categories of the two events, their definitions, morphologies which in the future may help them in their own community endeavours.
- To enable students understand how the drama of the festival and funeral ceremonies bring to light happiness, hope, despair, anxieties, contradictions and conflict between the forces of continuity and change in the African world.

UGRC 225: Introduction to African Studies/African Dance
Course Description
- The course is to introduce level 200 students to Traditional African Dance. This introductory course will give students the opportunity to understand the role of dance in the Ghanaian Society since dance is part and parcel of our life cycle. Further explanation of the principles of African Dance movements, and the historic and cultural contexts in which the dances are presented will also be explained. This introductory course has theory and practical components. Students must be and physically fit to register for this course.

Course Objectives:
The course aims to equip students to:

- develop the expressive qualities of the body through dance
- develop strength, flexibility, and endurance
- acquire a broader basis for personal creativity
- understand the history and cultural context for a given dance form
- analyze the form of a given dance
- appreciate the significance of dance in the socio-cultural development of the African
- understand the value and cultural importance of dance movements and symbolic gestures.
UGRC 226: Introduction to African Studies/African Drama
Course Description
Drama is a universal phenomenon deriving from play and manifesting in important aspects of human spirituality. The rich ritual and ceremonial life which characterizes the social, political and religious institutions of Africa has deep roots in indigenous dramatic traditions of Africa. Selected ceremonies, festivals and rituals will be analyzed to reveal their representation of and interface with institutions of leadership on the one hand and gender on the other. The course will also look at drama as an art form and briefly trace its evolution. It is intended to undertake a systematic survey of contemporary forms of drama and theatre and to provide students with the critical tools to both evaluate and appreciate this important art form. The course will provide students with the opportunity to observe and participate in theatrical manifestations such as plays and festivals. Given the wide range of dramatic works produced in Africa, works studied in this course will be changed from time to time.

Course Objectives:
At the end of this course, students will be able to
- Identify forms of drama in African society
- Competently discuss the representation of gender issues and relationships through drama
- Competently analyze the interface between drama and leadership
- Demonstrate familiarity with the art of stagecraft
- Show familiarity with key playwrights and their works

UGRC 227: Introduction to African Studies/African Music
Course Description
The course is in two parts: theory and practicals. The theory part is designed to broadly introduce students to some concepts of traditional African music. Students will then be taken through the general uses and functions of music in traditional African societies, with reference to events in the life cycle. Topics to be discussed include:
- Music in community life
- Performing groups and their music
- Recruitment and training of traditional musicians
- Instrumental resources of traditional African societies and,
- Traditional and contemporary musical types.
The contributions of some African composers (both males and females) to the development of traditional and contemporary Pop music in Africa will also be discussed.
The practical part of the course aims at introducing students to at least one traditional African instrument and some traditional and contemporary songs. At the end of the course, students who choose to learn a melodic instrument such as the atántábân are expected to be able to use the instrument to play some selected local and traditional tunes, hymn tunes and gospel songs among others. Those who choose to sing will be required to sing and accompany themselves using a percussive instrument, such as the single or the double bell, slit bell, castanet or the maracas, depending on the rhythmic pattern selected for the year.

Course Objectives:
- The course will enable students to:
  - Understand the musical traditions of Africa with respect to their historical, social and cultural backgrounds,
  - Appreciate the traditional as well as the contemporary approaches to musical organization and practice.
  - Understand how social control is applied with regard to ownership, and use of music and musical instruments in both traditional and contemporary societies.
  - Appreciate gender roles in the development and practice of music in African societies.

UGRC228: Introduction to African Studies/Chieftaincy and Development
Course Description
The course is a general introduction to the institution of chieftaincy in contemporary African society and the role it plays in development. The course will discuss the position of the chief in the African society, and address how can chieftaincy fulfills the aspiration of the people.

Course Objectives:
The course aims to:

- Introduce students to the chieftaincy institution.
- Understand the position of the chief as a traditional office
- Appreciate the challenges that chiefs face today.

UGRC 229: Introduction to African Studies/ Culture and Development
Course Description
This is a semester long course scheduled in the first semester and repeated in the second Semester. The course discusses the cultural issues that underpin the quest for socio-political, economic, religious and technological advancement, and the need to preserve, reshape or jettison certain endogenous values, beliefs, behaviours, attitudes, and to exploit their beneficial aspects while at the same time discussing potential strategies for coming to terms with the unsavoury aspects of some indigenous norms and practices.

Course Objectives:
The course aims among other things to:

- Providing basic information on African developmental and cultural issues, such as languages, peoples, institutions, belief systems and practices;
- Giving students a conceptual appreciation of African, particularly Ghanaian, culture/cultures;
- Enhancing students’ ability to identify and evaluate important contemporary cultural debates and issues in relation to current modalities and determinants of human development.

The approach centres on lectures, discussions and tutorials. Power Point presentation is an essential tool for teaching this course. The lecturer also communicates with students through a course website accessible through the KEWL e-learning tool lodged on the University of Ghana website. Lecture notes and copies of e-journal reading materials are posted there for students’ benefit.

UGRC 230: Introduction to African Studies/ Gender and Culture in Africa
Course Description
This course examines how culture shapes the positions of women and men in African societies, analyses cultures and cultural practices as dynamic, contested and rooted in socio-economic conditions and power relations. Key concepts in gender studies are analyzed in relation to debates about accepted notions of culture. Students will be encouraged to reflect on their own experiences of gender, and their role in reinforcing and transforming the nature of gender relations in society.

Course Objectives:
The objectives of the course are as follows:

- Critically examine existing assumptions about gender and culture
- Gain an understanding about how gender relations are shaped by power relations and cultural practices in different socio-economic contexts
- Examine how cultural forms manifest unequal power relations within society.

UGRC 231: Introduction to African Studies/Gender and Development
Course Description
This course will introduce students to key concepts and issues in gender and development with a focus on Africa. It argues that development is not a neutral process, but impacts on men and women differently. Key topics will include men and women’s access to resources in Africa such as land, labour, credit, time and social capital, production and reproduction. The course will also examine the gendered implications of natural resource management and sustainable development as well as decision making. It will further examine state and civil society responses to gender issues in Africa. The main objectives of this foundation course is to sensitize students to gender issues and enable students recognize and understand the relevance of gender as a development issue and how gender inequalities impact negatively on development.

Course Objectives:
The objectives of the course are as follows:

- understand the key concepts in gender and development
- apply gender analysis to development issues
- recognize the relevance of gender in structuring access, citizenship and rights to resources in Africa,
appreciate and understand how development policies and processes work to have differential impacts on men and women

Understand state and civil society responses to gender inequalities.

Course Description
This course introduces students to the key debates around issues in Africa’s population. Africa’s population is distinct in many respects. Students will receive an overview of significant aspects of demographic concepts and population - its composition, growth etc. - and related issues such as human resource development, socio-economic development, environmental sanitation and preservation, and migration. Challenges associated with some of these issues will be addressed at various levels, with special attention paid to the population of Ghana. The so-called impact of the rapid population growth rate on development in the sub-region has been an important issue of debate so far as the population of Africa and development is concerned. Though there are no definite conclusions, there has been growing consensus among many governments, policy-makers, and researchers that population variables influence development in Africa. The need to understand the relationship among Africa’s population and related issues is urgent, not only for policy-makers of today but also for students who are future leaders and/or policy-makers. The challenges of other population issues such as environmental change, HIV/AIDS and gender are also of equal importance.

Course Objectives:
The course aims to teach students the following:
- The features that distinguish sub-Saharan populations from those of the major regions of the world.
- The status and condition of Africa’s population, as well as transitions in its populations.
- The linkages between population processes and political, socio-cultural and environmental variables.

UGRC 233: Introduction to African Studies/Our African Heritage through Literature
Course Description:
Africa as a cultural space reflects an intriguing unity in diversity. Wordsmithery is a vital element of the cultural life of the region. Literature as a performance art takes a central role in a range of contexts formal, sacred, popular and profane and therefore permeates the rich ceremonial life of African peoples. A functional analysis of the literature will demonstrate the extent to which it reveals notions of gender and leadership in African society. This course also intends to explore the creative ways in which primary values have been, and continue to be expressed, explored and contested in African societies.
The course seeks to introduce students to the notion of a living literary culture in Africa, discussing issues such as values and worldviews, writing, performance, context and keys to informed literary analysis. Case studies will mainly be drawn from performance and writing traditions of societies in West, East and Southern Africa. In addition, the more recent domination of Africans by Arabs and Europeans has occasioned the evolution of a significant body of written literature with powerful artistic and political significance. The course will also discuss the thematic concerns of literary artists putting works into social and political perspective from a local and global point of view.

Course Objectives:
At the end of this course students will be enabled to:
- apply literary tools relevant to the study of African literature in its various forms
- engage in an enlightened discussion about selected works and artistes in the field of African literature,
- Comprehend the role of literature in society, particularly as a vehicle of notions of gender and leadership.

UGRC 234: Introduction to African Studies/Philosophy in African Cultures
Course Description
This course intends to introduce students to philosophical thought in African cultures, emphasizing its relation and relevance to contemporary African cultures and development. Topics will include the African cosmologies, concepts of God, the deities, ancestors; African communal and individualist values, concept of the human being, destiny, evil and ethics/morality, gender and race.
Course Objectives
At the end of the course students will be enabled to:
- Know what constitutes philosophy and the various trends in African Philosophy
- Understand and engage meaningfully in the contemporary discourse on the status of African philosophy
- Appreciate the philosophical underpinnings of traditional African thoughts
- Evaluate the relevance of African philosophy to African development.

UGRC 235: Introduction to African Studies/Dagbani
Course Description
This is a beginner’s course for non-native speakers of a Ghanaian language-Dagbani. The course is designed to introduce second year students who cannot speak, understand or read Dagbani to the language. It is a semester-long course to be taken in either the first or second semester of every academic year at the discretion of the student. It is a three credit course, and two contact hours will be used every week for teaching and an additional hour for tutorials. The main components of the course are:
- Issues in African languages
- Reading, comprehension and vocabulary development
- Grammar
- Writing
- Listening and Speaking
- The culture of the language community

Course Objectives:
By the end of the course, students will be enabled to:
- Understand common issues that pertain to African Languages.
- Acquire the skill of learning a Ghanaian language through listening, speaking, writing and translation in order to function in the language effectively in formal and informal conversations.
- Know the basic grammatical structures of the language so that they can use them effectively in both oral and written communication.
- Obtain an insight into the culture of the community whose language they have studied.

UGRC 236: INTRODUCTION TO AFRICAN STUDIES/EWE
Course Description
This is a beginner’s course for non-native speakers of a Ghanaian language-Ewe. The course is designed to introduce second year students who cannot speak, understand and read Ewe to the language. It is a semester-long course to be taken in either the first or second semester of every academic year at the discretion of the student. It is a three credit course. Two contact hours will be used every week for teaching and an additional hour for tutorials. The main components of the course are:
- Issues in African languages
- Reading, comprehension and vocabulary development
- Grammar
- Writing
- Listening and Speaking
- The culture of the language community

Course Objectives:
By the end of the course, students will be enabled to:
- Understand common issues that pertain to African Languages.
- Acquire the skill of learning a Ghanaian language through listening, speaking, writing and translation in order to function in the language effectively in formal and informal conversations.
- Know the basic grammatical structures of the language so that they can use them effectively in both oral and written communication.
- Obtain an insight into the culture of the community whose language they have studied.

UGRC 237: INTRODUCTION TO AFRICAN STUDIES/GA
Course Description
This is a beginner’s course for non-native speakers of a Ghanaian language-Ewe. The course is designed to
introduce second year students who cannot speak, understand and read Ewe to the language. It is a semester-long course to be taken in either the first or second semester of every academic year at the discretion of the student. It is a three credit course. Two contact hours will be used every week for teaching and an additional hour for tutorials. The main components of the course are:

- Issues in African languages
- Reading, comprehension and vocabulary development
- Grammar
- Writing
- Listening and Speaking
- The culture of the language community

Course Objectives:
By the end of the course, students will be enabled to:

- Understand common issues that pertain to African Languages.
- Acquire the skill of learning a Ghanaian language through listening, speaking, writing and translation in order to function in the language effectively in formal and informal conversations.
- Know the basic grammatical structures of the language so that they can use them effectively in both oral and written communication.
- Obtain an insight into the culture of the community whose language they have studied.

UGRC 238: INTRODUCTION TO AFRICAN STUDIES/ASANTE TWI

Course Description
This is a beginner’s course for non-native speakers of a Ghanaian language-Ewe. The course is designed to introduce second year students who cannot speak, understand and read Ewe to the language. It is a semester-long course to be taken in either the first or second semester of every academic year at the discretion of the student. It is a three credit course. Two contact hours will be used every week for teaching and an additional hour for tutorials. The main components of the course are:

- Issues in African languages
- Reading, comprehension and vocabulary development
- Grammar
- Writing
- Listening and Speaking
- The culture of the language community

Course Objectives:
By the end of the course, students will be enabled to:

- Understand common issues that pertain to African Languages.
- Acquire the skill of learning a Ghanaian language through listening, speaking, writing and translation in order to function in the language effectively in formal and informal conversations.
- Know the basic grammatical structures of the language so that they can use them effectively in both oral and written communication.
- Obtain an insight into the culture of the community whose language they have studied.
SPORTS FOR ACADEMIC CREDIT
The University has, beginning from the 2011/2012 academic year, introduced a sports for academic credit programme. The introduction of the programme is based on the recognition that there is the need to integrate sports into the academic programme of the University, which would enable students earn credits for sports and sport-related courses, which would count towards their total credits earned. The reason for awarding credits for sports participation is to encourage and reward students who spend their time, energy and resources to train and compete for honours to the University and the nation.

Students can be considered for sports credit from their second year based on their previous sports performance in the University. Enrollment is on the basis of application to and recommendation from the Sports Directorate and approved by the appropriate Dean. Sports performers can earn a maximum of three credits per year on the programme, with a maximum of six credits during their course of study in the University. Courses under the programme will be graded in accordance with the University of Ghana grading system. Practical and theory sections will take 50% each of the final grade.

COURSE OUTLINES (THEORY)

SPAC 210 BASIC ANATOMY 2 credits
The course introduces students to the study of the human body in stand and in motion.
Course Objectives
• To define the anatomic parts in 3-dimensional space.
• To describe the human body and how it works in motion and in stand.
Course Content

SPAC 220 SOCIOLOGY OF SPORTS 2 credits
The course analyzes human interaction and studies the application of scientific methods in the observation and analysis of social phenomenon in sports.
Course Objectives
• To provide candidates with opportunities to learn the basic elements of sociology as an analytical behavioral science. It also assists students in developing an awareness of the processes involved in human interaction.
• To define the basic knowledge of sociology and theories of social life.
Course Content

SPAC 230 SPORTS THEORY 2 credits
This course focuses on the theory behind the practice of sports such as skill analysis and coaching philosophies.
Course Objectives
To familiarize students with the knowledge of the theories in sports coaching, organization and management.
Course Content

SPAC 240 SPORTS PHYSIOLOGY 2 credits
This course provides basic principles of physiology of exercise, and the physiological effects on the human organism under different intensities, duration and environment.
Course Objectives
• To acquaint students with the knowledge of how the body systems function in athletes during both wellness and illness/injury. Students will then apply their knowledge in understanding and recognizing injury and illness in athletes in order to assist in the prevention and care of athletic injuries and illnesses.

• To familiarize students with the knowledge of the organ systems and how each functions in the physically active individual.

Course Content

SPAC 250 HISTORY AND PHILOSOPHY OF SPORTS 2 credits
The course covers the history of contemporary sports and physical activity. The subject provides students with reasoning mechanisms, the evolution of sports and the analysis of present realities.

Course Objectives
Students should be able:
• To define the general streams in the history of sports and physical activity, to understand the current realities of sports and its social and cultural dynamics.
• To appreciate the main actors of modern sport and physical activity, in their social and cultural context.
• To evaluate and analyze behaviours, habits and values of sport and physical activity in different social contexts.

Course Content

SPAC 260 ELEMENTS OF SPORTS FITNESS 2 credits
This course introduces students to the concept of fitness and wellness and how they relate to quality of life.

Course Objectives
To familiarize students with basic knowledge of diet, exercise, stress management, health and other areas of total wellness and their impact on maintaining healthy lifestyle.

Course Content

SPAC 310 SPORTS INJURIES 2 credits
This course introduces students to the basic injuries associated with the physical activities and the methods to prevent them and manage them if they should occur.

Course Objectives
• This course is intended to provide students with the basic injuries in sports participation; how to assess them, prevent them and manage them.
• To identify the causes of sports injuries and how they can be avoided.
• To define knowledge about the general principles of initial treatment of injuries.

Course Content

SPAC 320 SPORTS PSYCHOLOGY 2 credits
This course leads students to understand how personality, self conceit, self-esteem, self efficacy and other psychological characteristics relate to participation and performance in sport and physical activity. It also helps
students analyze and understand motivational bases for sports as well as barriers to participation and special motivational issues in competitive sports.

**Course Objectives**
- To explore core issues and related intervention strategies in working with athletes and recreational exercisers to enhance performance and participation.
- To define motivational bases for sports as well as barriers to participation and special motivational issues in competitive sports.

**Course Content**

**SPAC 330 ECONOMICS OF SPORTS** 2 credits
Investigates what economics has to say about sports as an economic activity: what tools of economic analysis apply to sports. Economics of sports focuses on professional and college sports.

**Course Objective**
- To give students the theoretical knowledge of the emergence and growth of commercial sports and the general characteristics of commercial sports.

**Course Content**
Economic motives and the globalization of commercial sports. Media coverage and spectator interest. The use of sports for global expansion. Owners, sponsors and promoters in commercial sports.

**SPAC 340 SPORTS: LAW AND PRACTICE** 2 credits
This course examines some of the most common legal problems encountered both on and off the playing field. It will concentrate on practical issues and will be presented by legal practitioners, academics and professionals with rich experience in sports management and administration.

**Course Objective**
- This course is intended to familiarize students with the important areas that provide the foundational principles that drive the outcome of most legal disputes arising in the sports industry.

**Course Content**

**SPAC 350 SPORTS NUTRITION** 2 credits
An introduction to nutrients and sources, digestive and metabolic processes and the health impact of nutrient deficiencies and excesses.

**Course Objectives**
- To familiarize students with the fundamentals of sports nutrition as it relates to the physically active. Students will gain an understanding of the importance of sustaining the body with adequate nutrition through food and dietary supplements.
- Students will also discover the sports nutrition products available to fulfill the requirements of the physically active, ranging from the everyday exercise enthusiast to the serious athlete.

**Course Content**
An Introduction to sports nutrition. Basic nutrition essentials for sportsmen/sportswomen. Preparing the body nutritionally for exercise. Injury and recovery – what happens to the body during exercise and how to feed it for recovery. Strength and Speed - Nutrition for top athletes.

**SPAC 360 PRINCIPLES OF SPORTS PERFORMANCE** 2 credits
This course is designed to study issues relating to causes of human performance and motor behavior over the lifespan.
Course Objectives
- To familiarize students with the principles underpinning human performances at the same time as improving their own performances in all spheres of life
- To acquaint students with lifestyle management issues and their impact on performance.

Course Contents

SPAC 370  SPORTS MANAGEMENT  2 credits
This course is designed to provide students with an overview of the basic organizational, and business principles and structure of sport, fitness and leisure industries.

Course Objective
- Students will acquire knowledge necessary to successfully manage any governmental/non-governmental sports institution.

Course Content

SPAC 380  SPORTS COMMUNICATION  2 credits
This course introduces students to communication skills necessary for adjustment and success in sports. The course provides an opportunity for students to learning principles of effective behavior in sports to reinforce these skills to develop confidence in both spoken and written communications.

Course Objectives
- Define communication and identify the elements of a communication system
- List the various communication media
- Identify barriers to effective communication in sports
- Explain basic technical jargons in sports
- Describe the various communication contexts in sports
- Communicate nonverbally in sports
- Explain the ethics of sports communication.

Course Content
The concept of communication & communication theory. Communication media. Barriers to effective communication in sports. Basic communication skills in sports. (Communication and the Self, Interpersonal communication (two-persons), Group communication (speaking & leading discussions), Fundamentals of public speaking, Intercultural communication). Nonverbal communication in sports. Communications ethic in sports.

SPAC 281 - 295  SPORTS SPECIFIC EVENTS/DISCIPLINES (PRACTICALS)
Students will receive instructions in the basic skills, tactics and techniques of the sport.

Course Objectives
Students will acquire skills and knowledge necessary for participation as a competitive, fitness or leisure time activity.

Course Content
History and development of the game. Basic rules and regulations. Basic Skills. Governing bodies at local, regional, national and international levels. Organizing sport events.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Sport</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAC 281</td>
<td>Athletics</td>
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</tr>
<tr>
<td>SPAC 282</td>
<td>Badminton</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 283</td>
<td>Basketball</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 284</td>
<td>Boxing</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 285</td>
<td>Cricket</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 286</td>
<td>Goalball</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 287</td>
<td>Handball</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 288</td>
<td>Hockey</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 289</td>
<td>Martial Arts</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 291</td>
<td>Soccer</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 292</td>
<td>Swimming</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 293</td>
<td>Table Tennis</td>
<td>1</td>
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<tr>
<td>SPAC 294</td>
<td>Tennis</td>
<td>1</td>
</tr>
<tr>
<td>SPAC 295</td>
<td>Volleyball</td>
<td>1</td>
</tr>
</tbody>
</table>
Medical Sciences became part of the University of Ghana’s educational programmes in 1962 when the first batch students was admitted to pursue courses for a degree in medicine. The plan then was to have American government funding for buildings for the Medical School. The proposed medical school was also to be staffed mainly by expatriates. For political and other reasons, this plan was aborted in 1964. The government of Ghana with Dr. Kwame Nkrumah as President, rather decided to have a Medical School fully owned by Ghana and with Ghanaian management and teaching staff. In 1964, Professor C.O. Easmon was appointed first Dean of the Ghana Medical School. The Basic Sciences were located in temporary buildings at the Korle Bu Hospital, which was made a teaching hospital to provide clinical training for medical students. The first batch of 39 doctors graduated from the School in 1969. Their performance, academically and soon thereafter in practice, attracted early recognition of the School by the General Medical Council of Great Britain in 1970.

In 1974, the UGMS initiated the development of a Dental School. The Basic Dental Science courses were offered at the Medical School; the dentistry students pursued clinical programmes at the University of Lagos, Nigeria, the University of Manchester and the University of London, UK. In 1992, the clinical courses became fully localized. The University therefore granted dentistry a faculty status. The first batch of locally produced dental surgeons graduated in 1997.

In 1979, the Noguchi Memorial Institute for Medical Research (NMIMR) was established with sponsor-ship from the Japan government through the Ministry of Finance and Economic Planning. This Research Institute was sited on the plot of the University of Ghana earmarked for the permanent medical school. To date, NMIMR is the permanent structure of the medical complex to have been developed at this site.

In 1994, the University of Ghana, in collaboration with the Ministry of Health, brought into being the School of Public Health for graduate courses leading to the award of MPH, MPhil and PhD degrees. This School is currently located in rooms of the Institute of Statistical, Social and Economic Research and in the Department of Statistics. Permanent building for the School have started with the construction of the Bill Gates Centre for Malaria Research and Control at the site for the medical complex at the main University. The School has six departments and these offer various courses at the postgraduate level.

The Ministry of Health, in 1998, initiated the establishment of a School of Allied Health Sciences to produce medical and dental technical graduates through the Medical School. Programmes for this school included physiotherapy, medical laboratory science, radiography and therapy radiography. Academic Board and the University Council approved this proposal in 1999. In the year 2001, this School came into being. An earlier Diploma in Medical Laboratory Technology also sponsored by the Ministry of Health in 1994 was phased out, with the birth of the School of Allied Health Sciences.

On December 13, 1997, the Academic Board recommended to Council for its approval, the establishment of a College of Health Sciences in the University, to serve as an umbrella organization for all the Schools/Institutes classified under the healing arts of the University. The objectives of the College were clearly stated, as follows:

- to provide a central administration for the constituent schools/institutes;
- to harmonize academic work of the constituent schools/institutes;
- to foster active interaction of Faculty, Administration and other Staff of the constituent school/institutes;
- to facilitate and promote maximum utilization of human and other resource;
- to assist constituent schools/institutes achieve academic excellence in health education by actively supporting the development of their teaching and research programmes leading to the award of higher degree;
- to ensure the development of sustainable health education and programmes.

The College has the following as foundation Schools and Institutions:

- The University of Ghana Medical School
- The University of Ghana Dental School
- The School of Public Health
- The School of Allied Health Sciences
- The School of Nursing
- The Noguchi Memorial Institute for Medical Research
- The School of Pharmacy
The College is headed by a Provost who is appointed by the University Council on the recommendation of the Appointments Board. Each School/Institute is headed by a Dean or Director who is appointed on the recommendation of the Appointments Board.

SCHOOL OF BIOMEDICAL AND ALLIED HEALTH SCIENCES

INSTITUTIONAL GOALS
The primary goal of the School of Biomedical And Allied Health Sciences is to train and meet the nation’s demand for Allied Health Professionals through the provision of both academic and professional knowledge. The secondary goal is to support the mission of the University and College of Health Sciences by producing highly qualified and competent allied health professionals who will provide preventive, promotive, curative and rehabilitative services to meet the health needs of the nation and the global community.

To achieve this, the School aims at:

i. providing an environment in which students develop and attain clinical competence and skills, and develop integrity, ethical relationships and empathic attitudes that contribute to the welfare and well-being of patients;
ii. helping students to develop a set of information and attitudes that promote intra- and inter-professional understanding and cooperation;
iii. encouraging students to develop the habit of self-education that will foster a life-long practice of continuing self-professional development and growth;
iv. engendering and nurturing in each student respect for his/her chosen profession and the desire to serve as needed in hospitals according to professional standards; and
v. promoting the allied health professions and fostering close collaboration with allied health professional associations.

INSTITUTIONAL OBJECTIVES
The objectives of the School are to produce allied health professionals who will be able to:

a) Demonstrate a high level of competence in the practice of their specialty.

b) Identify the needs of the individual patient through assessment procedure and then determine the objectives of patient management.

c) Critically evaluate their own role and performance within an inter-disciplinary team.

d) Demonstrate an appreciation of management strategies within health care.

e) Discuss and evaluate the role of their specialty within the field of preventive health care.

f) Demonstrate an awareness of the economic, psychological, cultural and sociological factors, which may influence the context of contemporary therapeutic practice.

g) Commit to life-long learning and continued personal and professional development, undertake research and read and interpret research papers.

h) Analyze and respond appropriately to the changing field of health care.

ADMISSION REQUIREMENTS AND REGULATIONS FOR THE BSC. PROGRAMMES IN:

(i) MEDICAL LABORATORY SCIENCES

(ii) DIAGNOSTIC RADIOGRAPHY

(iii) THERAPY RADIOGRAPHY

(iv) PHYSIOTHERAPY

(v) OCCUPATIONAL THERAPY

(vi) DIETETICS

GENERAL REGULATIONS
The University runs a modular course structure. Under this structure, the University’s academic programme has been organized into a semester system, and instruction takes the form of courses evaluated in terms of credits. Units of courses are examinable at the end of very semester and, if passed, a student shall earn credit(s) for the Units. The
courses are coded and arranged in progressive order of difficulty, or in levels of academic progression.

Each Faculty shall provide detailed information about the structure of courses leading to the award of Bachelors’ Degrees.

It is the responsibility of each student registered at the University of Ghana to be familiar with specific requirements of the bachelor’s degree, which he/she plans to pursue, as well as the rules, regulations and policies of the University and of the Faculties or Departments or Schools concerned.

Each student is responsible for ensuring that the courses in which registration is effected satisfy the programme requirement of the bachelor’s degree sought: advice and/or counselling for all who need assistance is freely available.

It is also understood that every student, by the act of registering, agrees to abide by all rules, regulations and policies of the University of Ghana and of the Faculties or Departments or Schools in which that student is registered.

Each student is expected to be familiar with the General Information outlined in this Handbook as well as the information pertaining to the Faculty or Department or School in which he/she is enrolled. Students shall therefore, be held liable for any lapses. When in doubt, students may consult their Heads of Departments in writing with a copy to the Executive Secretary of School of Allied Health Sciences, asking that advice be given in writing.

Exemption from any of these General Regulations may be granted only by the express permission of the Academic Board on the recommendation of the appropriate Faculty Board.

The University reserves the right to change rules, regulations and policies, as well as programme and course requirements given in this Handbook without prior notice.

- COURSES/SUBJECTS FOR LEVELS 100 TO 400

Level 100 Courses (Semesters 1 & 2) shall be used to upgrade the level of Science of students to lay a foundation for higher levels of the undergraduate programmes.

Levels 200, 300 and 400 Courses shall be taken in Semesters 3 & 4, 5 & 6 and 7 & 8 respectively.

BSC IN RADIOGRAPHY
DIAGNOSTIC AND THERAPY RADIOGRAPHY

DEPARTMENTAL OBJECTIVES

Diagnostic Radiography
At the end of training, the diagnostic radiography student should be able to:

1. Accurately demonstrate anatomical structures on a radiograph or other image receptor
2. Determine exposure factors to achieve optimum radiographic techniques with minimum radiation exposure to the patient, self and others
3. Evaluate radiographic images for appropriate positioning and image quality
4. Recognise emergency patient conditions and initiate life-saving first aid and basic life support procedures
5. Exercise independent judgement and discretion in the technical performance of medical imaging procedures
6. Employ quality assurance and quality control procedures in the performance of duty
7. Provide patient care and comfort, show respect for patients’ rights and dignity and act in acceptable professional manner at all times
8. Educate patients and the general public on radiographic procedures and radiation protection/safety
9. Participate in continued professional development programmes
10. Manage a radiography department in at least a district hospital and advise hospital management on radiography issues
Therapy Radiography
At the end of training, the diagnostic radiography student should be able to:

1. Assist the radiation oncologist in localizing tumours
2. Simulate treatment parameters
3. Verify and implement computer-generated treatment plans
4. Perform quality assurance procedures
5. Deliver radiation treatment as prescribed by the physician and monitor patient’s physical condition and response to treatment
6. Provide patient care and comfort, show respect for patients’ rights and dignity and act in acceptable professional manner at all times
7. Educate patients and the general public on radiotherapy procedures and radiation protection/safety
8. Participate in continued professional development programmes
9. Work with colleagues and other health professionals as a member of the health care team
10. Advise hospital management on radiotherapy issues

LEVEL 100
All the courses at level 100 are Compulsory

SEMESTER 1

<table>
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<tr>
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<tr>
<td>SAHS 101</td>
<td>Introductory Statistics</td>
<td>2</td>
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<tr>
<td>SAHS 103</td>
<td>Physical and Inorganic Chemistry</td>
<td>2</td>
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<tr>
<td>SAHS 105</td>
<td>Organic Chemistry</td>
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<td>SAHS 107</td>
<td>Chemistry Practical</td>
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<tr>
<td>SAHS 109</td>
<td>General Physics</td>
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<tr>
<td>SAHS 111</td>
<td>Biology</td>
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<tr>
<td>SAHS 113</td>
<td>Introduction to Computer Studies</td>
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<tr>
<td>SAHS 115</td>
<td>Clinical Reasoning in Health Sciences</td>
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<tr>
<td>UGRC110</td>
<td>Academic Writing I</td>
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**Total: 18 Credits**

SEMESTER 2

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<tr>
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<td>General Anatomy</td>
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<tr>
<td>SAHS 104</td>
<td>General Anatomy Practical</td>
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<tr>
<td>SAHS 106</td>
<td>General Physiology</td>
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<tr>
<td>SAHS 108</td>
<td>General Physiology Practical</td>
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<tr>
<td>SAHS 112</td>
<td>Introductory Psychology for Allied Health Sciences</td>
<td>2</td>
</tr>
<tr>
<td>SAHS 122</td>
<td>Introductory Biochemistry</td>
<td>2</td>
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<tr>
<td>RDGY102</td>
<td>Introductory Radiography</td>
<td>2</td>
</tr>
<tr>
<td>GSPH 214</td>
<td>Writing for Public Health</td>
<td>3</td>
</tr>
<tr>
<td>UGRC 220-238</td>
<td>Introduction to African Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total: 20 Credits**

RDGY 200 Vocational Training I
3 Credits
This is a 6-week inter-semester clinical training period at the end of Semester 2 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will undertake introductory clinical training in an accredited Diagnostic Imaging Department/Unit. Students shall be evaluated at the end of the vocational training. The course is a pre-requisite for all Level 200 courses in Diagnostic Radiography.
**LEVEL 200**

*All the courses at level 200 are Compulsory*

### SEMESTER 3

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<thead>
<tr>
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<tbody>
<tr>
<td>RDGY 201</td>
<td>Radiography Physics I</td>
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<td>RDGY 203</td>
<td>Patient Management I</td>
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<td>RDGY 205</td>
<td>Radiographic Imaging Processes I</td>
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<td>RDGY 207</td>
<td>Radiographic Anatomy I</td>
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<td>SAHS 201</td>
<td>Computer Applications</td>
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<td>SOCI 316</td>
<td>Medical Sociology</td>
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<td>PSCY 307</td>
<td>Human Growth and Development I</td>
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### SEMESTER 4

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<tr>
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<td>PSCY 308</td>
<td>Human Growth &amp; Development II</td>
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<td>Patient Management II</td>
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<td>RDGY 206</td>
<td>Radiographic Anatomy II</td>
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<td>RDGY 208</td>
<td>Radiographic Imaging Processes II</td>
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<td>RDGY 212</td>
<td>Equipment for Diagnostic Imaging I</td>
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<tr>
<td>RDGY 214</td>
<td>Medical Terminology I</td>
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**RDGY 300 Vocational Training II**

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<td></td>
<td><strong>Total Credits</strong></td>
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This is a 6-week inter-semester clinical training period at the end of semester 4 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will also undertake clinical attachment at a Diagnostic Imaging Department/Unit in an accredited Health Facility. There shall be an evaluation at the end of the clinical attachment. The course is a pre-requisite for all Level 300 courses in Diagnostic and Therapy Radiography.

**NB:** Level 100 and 200 Courses are common to both Diagnostic and Therapy Radiography students and are prerequisites to progressing to Level 300 for the two (2) Programmes.

### DIAGNOSTIC RADIOGRAPHY

#### LEVEL 300

### SEMESTER 5

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>RDGY 301</td>
<td>Equipment in Diagnostic Imaging II</td>
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<td>RDGY 303</td>
<td>Radiographic Technique I</td>
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<tr>
<td>RDGY 305</td>
<td>Radiobiology and Radiation Protection</td>
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<td>RDGY 307</td>
<td>Radiation Physics</td>
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<td>RDGY 309</td>
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<td>RDGY 310</td>
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**Total Credits:** **19**

### SEMESTER 6

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<td>RDGY 304</td>
<td>Introduction to Specialized Imaging Modalities</td>
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<td>RDGY 306</td>
<td>Specialized Imaging Equipment</td>
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<td>RDGY 308</td>
<td>Introduction to Quality Assurance</td>
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<td>RDGY 310</td>
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<td>SAHS 302</td>
<td>Health Law &amp; Ethics</td>
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**Total Credits:** **18**
**RDGY400**  
**Vocational Training III**  
3 Credits  
This is a 6-week inter-semester clinical training period at the end of semester 6 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will also undertake clinical attachment at a Diagnostic Imaging Department/Unit in an accredited Health Facility. There shall be an evaluation at the end of the clinical attachment. The course is a pre-requisite for all Level 300 courses in Diagnostic and Therapy Radiography.

### LEVEL 400

#### SEMESTER 7

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<td>RDGY 401</td>
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<td>RDGY 403</td>
<td>Imaging Pathology and Pattern Recognition I</td>
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<td>RDGY 405</td>
<td>Quality Management in Diagnostic Imaging</td>
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<td>RDGY 410</td>
<td>Research Project</td>
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<td>RDGY 420</td>
<td>Clinical Practice II</td>
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<td>SAHS 401</td>
<td>Principles of Management</td>
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#### SEMESTER 8

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<td>RDGY 404</td>
<td>Imaging Pathology and Pattern Recognition II</td>
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<td>RDGY 420</td>
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Total Credit Hours = 168

### THERAPY RADIOGRAPHY

#### LEVEL 300

##### SEMESTER 5

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<td>RDGY 311</td>
<td>Radiation Physics I: Radioactivity and Radiotherapy Equipment</td>
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<td>RDGY 313</td>
<td>Radiation Oncology I: Principles</td>
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<td>RDGY 315</td>
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<td>RDGY 317</td>
<td>Radiobiology</td>
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Total Credit Hours = 19

##### SEMESTER 6

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<td>RDGY 316</td>
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<td>RDGY 318</td>
<td>Treatment Planning I</td>
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<td>RDGY 322</td>
<td>Radiation Oncology II: Treatment of Systems</td>
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<td>RDGY 308</td>
<td>Introduction to Quality Assurance</td>
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<td>RDGY 330</td>
<td>Clinical Practice I: Clinical Set Up and Patient Management</td>
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<td>RDGY 340</td>
<td>Clinical Practice II: Clinical Dosimetry and Treatment Planning</td>
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<tr>
<td>SAHS 302</td>
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Total Credit Hours = 21

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<tr>
<td>RDGY 400</td>
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LEVEL 400

SEMESTER 7
SAHS 401 Principles and Practice of Management 3
RDGY 407 Radiotherapy Physics III: Brachytherapy and Radiation Protection 3
RDGY 409 Treatment Planning II 2
RDGY411 Quality Management in Radiotherapy 2
RDGY 430 Clinical Practice I: Clinical Set Up and Patient Management 3
RDGY 440 Clinical Practice II: Clinical Dosimetry and Treatment Planning 3
RDGY 410 Research Project 5

Total Credit Hours = 170

SEMESTER 8
SAHS 402 Applied Health Sciences Management 3
RDGY 430 Clinical Practice I: Treatment Set Up and Patient Management 6
Clinical Practice II: Clinical Dosimetry and Treatment Planning 6
RDGY 440 Research Project 5

Total Credit Hours = 21

COURSE DESCRIPTIONS AND CONTENT

LEVEL 100

SEMESTER 1
RDGY 102 INTRODUCTORY RADIOGRAPHY
This course is designed to provide the basic skills and knowledge that the students will need to prepare them for their first experience of clinical work. It aims to provide them with an overview of the Imaging Department and a basic working knowledge of an X-ray room. Students will be required to take an active part in basic X-ray examinations of the appendicular skeleton.

The course will cover areas such as Introduction to the Imaging department; Image Formation; Radiographic Terminology; Body Surface Markings; Exposure Factors; First Contact with Patients; The Appendicular Skeleton; Radiographic examination: routine projections of the upper and lower limbs and Patient care appropriate to Radiographic examination.

RDGY 200 VOCATIONAL TRAINING I
This period forms the initial introduction of students to the radiology department so that they can familiarize themselves to the administrative and professional activities of the department. This is the first contact with patients and other members of the health care team and is the learning period of their inter- and intra-relationship with the various groups of people they encounter in the department as a preparation towards their professional development. Areas to be covered include Records and recording of patient data and information; Data and information storage and retrieval; Ward management (Nursing care and management) and Darkroom (processing) practice.

LEVEL 200

SEMESTER 3
RDGY 201 RADIOGRAPHY PHYSICS I
This course is aimed at educating students in the physics of medical imaging with both ionising and non-ionising radiation. Areas to be covered include Basic Physics: Structure of matter, atoms, molecules, elements and compounds; Phases of matter; Work, Energy and Power; Types of energy and their source; Mass and Weight, Inertia and Forces; Speed, velocity and acceleration; Dimensional analysis and fundamental units; Concept of energy; Thermal heat insulation; Magnetism; Electrostatics; Capacitors; Atomic Physics; Wave Motion
RDGY 202  RADIOGRAPHY PHYSICS II
This course further introduces the fundamental principles of physics underlying diagnostic X-ray production and radiography. Upon completion, students should be able to demonstrate an understanding of basic principles of physics as they relate to the operation of radiographic equipment. The course will cover Current Electricity; A.C Theory; Electronics; Electricity and Magnetism; Electromagnetic Induction; Electrical energy, power, circuits; Applications to Radiographic Instrumentation.

RDGY 203  PATIENT MANAGEMENT I
Areas to be covered are:
1. Professional attitude of the radiographer; Hygiene, infection and principles of asepsis: Causes of infection, its process, methods of spread and practical implications. Basic hygiene relative to staff, patients and environment infection control, HIV/AIDS. Consideration of specific situations such as an operating theatre, minor operation area, intensive care unit, and other areas where special hygiene precautions are required.
2. Function of Central Sterile Supply Department: including knowledge of methods of sterilization. A visit to C.S.S.D would be arranged. (The aim of this section should be to give an overall understanding of the complete situation so that a student could, for example apply the principles to the procedure for an intravenous injection or the application of a simple sterile dressing.)
3. General care of the patient: The psychology of the sick patient; Temperature, pulse, respiration and blood pressure – normal values and methods of taking and recording; common clinical abnormalities leading to physiological changes; The administration of bedpans, urinals, vomit bowls, and sputum pots; In-patient-care; Moving and lifting: Procedures related to moving patients of varying abilities, on and off chairs, tables, stretchers, bedpans, and the care and safety of the patients during these procedures. Correct methods and hazards of lifting and manoeuvring patients.

RDGY 204  PATIENT MANAGEMENT II
The course will provide knowledge about the following:
Drugs: Methods of administration; drug reactions especially to radiological contrast agents, their recognition and appropriate action to be taken; Emergency care of the patient; Nursing accessories: Identification, care and use of equipment and instruments in general use in the department; the resuscitation team and the use of resuscitation equipment; use, care and function of suction apparatus; administration of oxygen; sedation; Design of Radio diagnostic or Radiotherapy department; Organization of radio diagnostic or radiotherapy departments: Staff requirements for the practical running of the department for normal working and major incident occurrences; appointments systems; patient records and departmental statistics, including data handling by computers; Stock-taking, and stock-keeping relative to patient care; Economical use of resources; Medico-legal considerations: Ethical considerations; legal responsibilities and liabilities; Appropriate action in the event of accidents to patients or staff or staff on hospital premises, examination or treatment becoming the subject of legal proceedings; Medical ethics relating to the confidential nature of patients’ information; Safety legislation.

RDGY 205  RADIOGRAPHIC IMAGING PROCESSES I
The course will provide the knowledge of the radiographic image characteristics, factors that control image production and diagnostic quality and measures that are required to ensure the preservation of the diagnostic value of the image.

Areas to be covered include Sensitometry; Image quality; Control of secondary radiation; Radiographic image contrast and contrast enhancement; Film materials and storage of film materials; Film processing: principles and practice.

RDGY 207  RADIOGRAPHIC ANATOMY I
The course includes the study of the structure of human body and the normal function of its systems. Special emphasis is placed on radiographic anatomy (how the anatomical structures are presented on conventional and computed or sectional radiographic images)
The course will cover gross anatomy of the appendicular and axial skeleton; Osteogenesis, Muscles and Joints; Gross anatomy of various organs and glands in the body; Physiology and Pathology of Bones, Joints and muscle groups and attachment; skeletal fractures and some of the systems and organs of the body in relation to conventional radiographic images and cross-sectional images of computer-generated images such as ultrasound, CT, MRI and RNI.

RDGY 206  RADIOGRAPHIC ANATOMY II
This is the continuation of RDGY 207 and treats the digestive system, nervous system, urinary system and special organs of the body (eye, ear, nose and mouth)

Areas to be covered include gross anatomy of the systems, organs and glands; Physiology and Pathology of systems; organs and glands, in relation to conventional radiographic images and cross-sectional images of computer-generated images such as Ultrasound, CT, MRI and RNI.

RDGY 208  RADIOGRAPHIC IMAGING PROCESSES II
The course will provide knowledge about the X-ray darkroom; Automated and daylight film handling systems; Duplication and Subtraction; Principles of special imaging techniques; Identification and presentation of radiographs; Viewing of the radiographic image; Image quality control; Silver conservation and recovery.

RDGY 212  EQUIPMENT FOR DIAGNOSTIC IMAGING I
To provide students with an insight into the main components in an X-ray circuitry and the theoretical background of the design and operation of the circuit elements outlined in the syllabus and the effect of their performance on the quality of the diagnostic imaging. Areas will include mains supply (electrical supply); Stabilizing Equipment: Control of X-ray tube current and tube voltage (filament circuit); The outline of basic X-ray Circuit (High Tension Circuits) Basic principles of the following with a comparison of their radiographic merits and applications - self rectified (one pulse); single phase full – wave rectified (two-pulse); three phase, six and twelve pulse; capacitor smoothed; capacitor discharge; grid control systems; falling load generators; High Tension Cables Construction and design; The X-Ray tube and its electrical connection; Exposure timers and switching; Meters; Safety Devices.

RDGY 214  MEDICAL TERMINOLOGY I
The course will introduce the student to the concepts of disease. It will also equip the student with knowledge in Pathology and disease as they relate to various radiographic procedures are discussed. The topics will include pathology fundamentals; trauma/physical injury; system classification of disease; and medical terminology.

DIAGNOSTIC RADIOGRAPHY

LEVEL 300

SEMESTER 5

RDGY 301 EQUIPMENT FOR DIAGNOSTIC IMAGING II
The course shall provide a basic grounding in the theoretical and practical aspects of the diagnostic imaging equipment listed in the syllabus, principle of operation of the equipment, to management of diagnostic imaging equipment, the necessity for quality assurance, maintenance of hygiene, safe working practices, equipment inspection and servicing; general principles, hygiene, aspects of electrical and mechanical efficiency and safety; importance of equipment upkeep; cleaning routine and inspections; general care in use and recognition of malfunction; special care of mobile X-equipment state; simple tests and checks of equipment in use.

RDGY 303: RADIOGRAPHIC TECHNIQUE I
The course is designed to provide the theoretical basis of imaging the various anatomical areas through lectures and demonstrations so that students will be able to apply correctly such techniques in the practical settings. The course areas to be covered are conventional and other methods of imaging: Axial skeleton: Vertebral column; thoracic cage; skull; sinuses; facial bones; pelvis; chest(for the respiratory system)
**RDGY 305  RADIOBIOLOGY AND RADIATION PROTECTION**
The course is designed to provide an overview of the principles of the interaction of radiation with living systems. It will cover radiation effects on cells and the human body in general, radiation effects on molecules, cells, tissues and the body as a whole, actors affecting biological response, including acute and chronic effects of radiation. It will also cover personnel monitoring (Dosimetry), control of scattered radiation, general principles; Grids; Collimators and Beam Centering Devices.

**RDGY 307  RADIATION PHYSICS**
The course is designed to introduce students to the physics of the different radiographic modalities including Ultrasound (US), Magnetic Resonance Imaging (MRI), Computed Tomography (CT), Nuclear Medicine and X-ray Physics. The course will further provide students with the understanding and application of physics principles to these imaging modalities.

Areas to be covered are X-rays Physics and applications in imaging, Electromagnetic Induction; MRI physics and applications to imaging; Introduction to Ultrasound Physics and its applications in imaging; Introduction to CT Physics and its applications in imaging; Introduction to Nuclear Medicine and its applications in imaging, Radiation Measuring Devices.

**RDGY 309  MEDICAL TERMINOLOGY II**
This is continuation of RDGY 214 as it provides the student with an introduction to the concepts of disease. Pathology and disease as they relate to various radiographic procedures will be discussed. Topics include: pathology fundamentals; trauma/physical injury; system classification of disease; and medical terminology; cardiovascular system; respiratory; urinary system and male reproductive system; female reproductive system; obstetric conditions; breast; blood; endocrine system; skin and subcutaneous tissues; the teeth; nervous system, eye; ear.

Upon successful completion of the course, the student should be able to list examples and sites of : respiratory system diseases, reproduction system diseases, urinary system diseases, circulatory system diseases, endocrine system diseases, and nervous system and sensory organ system diseases. They should be able to also describe the etiology of the disease, describe the radiographic procedures for diagnosis (treatment) of the diseases and discuss the effects of the diseases in terms of effects on radiographic techniques.

**RDGY 310  CLINICAL PRACTICE I**
This course will introduce students to the practical aspects of techniques after Introductory Radiography and Radiography Technique I. It will cover the following areas:

General radiography: Observation, assistance and performance of clinical practice in casualty, in-patients and out patients for the appendicular and axial skeleton and the thoracic cavity.

Mobile Radiography: Observation, assistance and performance in theatre and wards.

Department Routine: Participation in duties concerned with departmental organization, documentation and appointment systems.

Contrast Studies: Observation, assistance and performance of routine alimentary tract, fluoroscopic examinations and intravenous urography.

Computed Tomography: Observation of anatomical systems in cross section.

**SEMESTER 6  RADIOGRAPHIC TECHNIQUE II**
The course will treat conventional and other methods of imaging: Digestive System: Ba swallow/meal and follow through; Ba Enema; Hepato-Biliary System: Liver; radiographic examinations to demonstrate the intra-hepatic and extra hepato-biliary systems; Urinary System: Reproductive System: Female reproductive System; male reproductive System; Nervous system and special senses-dacrocyst, ear, tongue, skin, salivary glands; Abdomen; Geriatric/infirm adaptation; Paediatric radiography-care neonates; Radiation protection of patient’s parent-helper; Mobile/Portable examinations: Safe operation of mobile radiographic, fluoroscopic equipment; Ward and Operating theatre radiography; Accident and Emergency Radiographic technique for very ill patients and also trauma patients. Radiation protection for patients and staff.
**RDGY 304 INTRODUCTION TO SPECIALIZED IMAGING MODALITIES**
This course will introduce to students other specialized imaging modalities (both using either ionizing or non-ionising radiation) available and their advantages and advantages in diagnostic medical imaging.

The course will cover Introduction to Imaging techniques and protocols of: Ultrasound; Computed Tomography Scan; Magnetic Resonance Imaging; Nuclear Medical Imaging; Digital Imaging; Computer Radiographic Imaging; PACS; Hospital Information System—Radiology Information System (HIS-RIS).

**RDGY 306 SPECIALISED IMAGING EQUIPMENT**
This course is designed to introduce students to computerized imaging equipment used for sectional anatomical imaging in diagnostic, therapy and nuclear medical imaging.

It will cover design, principle of operation/functions of the following equipment: CT Scan; ultrasound; MRI; gamma camera and scintigraphy; equipment for neuro-radiography; rapid serial equipment; image storage and transfer computed radiography and filmless imaging department.

**RDGY 308 INTRODUCTION TO QUALITY ASSURANCE IN DIAGNOSTIC IMAGING**
This course will equip students with knowledge about how to provide improve diagnostic information improving diagnostic information content, reducing radiation dose, reducing medical costs and improving departmental management and the quality of patient care.

At the end of the course, the student will become familiar with the specific requirements related to QA concepts, radiation protection in diagnostic radiology and procedure for reviewing and assessing the overall effectiveness of radiation protection.

It will treat topics such as Quality assurance definition; QA management and responsibilities; Outline of a QA and Radiation Protection programme for diagnostic radiology; QA Planning and organization in diagnostic radiology; Standards of acceptable image quality; Retake Analysis; Image quality and patient dose; Effect of poor quality images.

**RDGY 310 CLINICAL PRACTICE I**
This course will cover the following areas:

**General Radiography:** Performing at competency stage. Adapt action of techniques to suit paediatrics; Ward and Theatre patients and for patients in accident and emergency situation; recognition of patterns on radiographs.

**Fluoroscopy:** Undertaking and organization of routine fluoroscopy sessions and at the operating theatre using ‘C’– arm image intensifiers.

**Specialized Imaging Modalities:** Participation in areas such as computed tomography, ultrasound; radionuclide imaging, magnetic resonance imaging and other areas that use digital imaging.

**RDGY 400: VOCATIONAL TRAINING III**
This training is designed to enable students:

- Recognize life-threatening ECG tracing.
- Apply standard and transmission-based precautions.
- Apply appropriate medical asepsis and sterile technique.
- Demonstrate competency in the principles of radiation protection standards.

**LEVEL 400**
**SEMESTER 7**
**RDGY 401 RADIOGRAPHIC TECHNIQUE III**
This course will cover areas such as dental and maxillofacial radiographic procedures: radiographic baselines and planes used in imaging of the teeth; angulations for dental imaging; intra- and extra-oral imaging: periapicals, bitewings; occlusals and obliques; opg (orthopantomography); cephalometry; mounting of dental films.
RDGY 403 IMAGING PATHOLOGY AND PATTERN RECOGNITION I
This area to be covered are Radiographic film critique and quality control (Film faults); Identification of common basic pathologies and pattern recognition on radiographs of Appendicular and Axial skeleton and ability to modify or perform necessary additional projections; Basic Ultrasound in Obstetrics and gynaecology

RDGY 405 QUALITY MANAGEMENT IN DIAGNOSTIC IMAGING
This course will provide an understanding of the concept, principles and policies of quality management as it relates to radiation protection in diagnostic and interventional radiology. It will cover the concept of QA and its applications to ensure systematic evaluation and compliance with regulatory requirements; Requirements of patient care related to QA; Essentials of a Quality Control (QC) programme to ensure optimal image quality; The fundamental aspects and differences between QA and QC; The role and responsibilities of Management, staff and other professionals involved in the implementation of a QA programme; Assessment of internal and external quality audits, regular updating, methods of evaluation, reporting and recommendations; QC of general radiography system; QC control test on CT; QC on dental radiology system including design; QC of the processor; QC protocol of Mammography equipment; QC on viewing boxes (Film illuminator).

RDGY 420 CLINICAL PRACTICE II
Areas to be covered include
General radiography: Adaptation of general techniques to suit paediatrics, geriatrics, ward, theatre patients in accident and emergency.
Fluoroscopy: The undertaking and organization of routine screening sessions and adaptation to the operating theatre.
Other Imaging Modalities: Participation in image evaluation in areas such as computed tomography, ultrasound, radionuclide imaging, MRI and other digital imaging modalities.

SEMESTER 8
RDGY 402 RADIOGRAPHIC TECHNIQUE IV
The aim of this course is to introduce students to the fundamentals of vascular, lymphatic and sectional imaging using contrast media and other imaging modalities. This is to assist students to acquire a knowledge of the basic techniques and protocols for such examinations

The course will cover Techniques And Protocols for: Peripheral angiography, Carotid, abdominal aorta and femoral angiography; Venography; Lymphangiography; Myelography; Sialography; Dacrocystography; Interventional Radiographic Imaging; Digital Angiographic Subtraction Imaging (DSI); Sectional Imaging (CT, USG and MRI); Dental imaging

RDGY 404 IMAGING PATHOLOGY AND PATTERN RECOGNITION II
This is to introduce the student radiographer to the identification of common pathologies and pattern recognition on radiographs of the visceral organs; Ultrasound of organs other than Obstetrics and Gynaecology.
This course will cover Identification of common pathologies and pattern recognition on radiographs of the visceral organs on conventional radiographs, CT, MRI, Mammography, Dental and Ultrasound of organs other than Obstetrics and Gynaecology

RDGY 420 CLINICAL PRACTICE IV
Students would spend this period rotating through various units to obtain more hands-on experience practical and proficiency.

RDGY 410 RESEARCH PROJECT (Semesters 7 & 8)

THERAPY RADIOGRAPHY

LEVEL 300
RDGY 309 RADIOTHERAPY PHYSICS I
The course is designed to provide the students with the understanding for the physical principles of radioactivity and measuring of ionizing radiation. It will also help students to appreciate the terms used to describe quantity and quality of radiation and identity equipment used in radiotherapy. Also included are principles and functions; as well as the limitation of each equipment and the common cancers treated by each modality and the safety aspects.

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RDGY 315 RADIOThERAPY TECHNIQUE I
The course is designed to provide students with cognitive and evaluative skills necessary to understand and perform the required radiotherapy procedures. It includes mould room procedures, localization of tumours and treatment planning procedures. Other areas covered include verification of treatment plans and introduction to treatment accessories and equipment.

RDGY 316 RADIOThERAPY TECHNIQUE II
This course is designed to build on the knowledge and skills gained from radiotherapy techniques I to enable the students to perform a greater role with the radiotherapy department through application of their skills to execute complex treatment procedures.

RDGY 308 QUALITY ASSURANCE IN RADIOThERAPY
This course will deal with definition of Quality Assurance; QA management and responsibilities; Outline of a QA and Radiation Protection programme for diagnostic and therapy radiology; QA Planning and organization in diagnostic and therapy radiology; Standards of acceptable image quality; Treatment Planning and delivery; Image quality and patient dose.

RDGY 320 CLINICAL PRACTICE I
The clinical practicum has been designed to complement the academic and runs throughout the course. Clinical placements have been designed so that the students will be able to observe the practical application of the theoretical courses wherever possible. Assessment would be linked with the theoretical assessment to demonstrate practical application of knowledge.

RDGY 318 TREATMENT PLANNING I (Theory)
The course is designed to provide the theoretical knowledge on treatment planning which will form the foundation for the practical training in treatment planning. The course has further been designed to equip the students with the cognitive and evaluative skills necessary to understand and perform the require treatment planning procedures for various anatomical sites.

RDGY 314 RADIOThERAPY PHYSICS II (DOsiMETRY AN PRINCIPLES OF TREATMENT PLANNING)
The course is designed to provide basic knowledge and solid foundation in treatment prescriptions and appropriate definitions. Calculations of treatment dose with the treated volume to include tumour and skin/sub-dermal doses are also included. Other areas covered include manual drawing of simple and routine isodose distribution for single, parallel opposes and multi-field techniques. Interpretation of isodose distribution as well as verification of treatment plans with reference of beam/patient alignment is also covered.

RDGY 313 RADIATION ONCOLOGY 1: PRINCIPLES
The course is designed to provide an overview of malignant diseases as well as the nature and epidemiology of cancer. It is also designed to provide understanding to students about general principles of cancer management and to provide insight to students about the factors worth considering in choosing various treatment options and advances in oncology and radiotherapy practices.

RDGY 317 RADIOBIOLOGY
The course is designed to provide an overview of the principles of the interaction of radiation with living systems. Radiation effects on molecules, cells, tissues and the body as a whole is presented. Factors affecting biological response are presented, including acute and chronic effects of radiation.

LEVEL 400
SEMESTER 7
RDGY 411 QUALITY MANAGEMENT IN RADIOThERAPY
This course is to provide an understanding of the concept, principles and policies of quality management as it relates to radiation protection in diagnostic and interventional radiology.

The areas to be covered include the concept of QA and its applications to ensure systematic evaluation and compliance with regulatory requirements; Requirements of patient care related to QA; Essentials of a Quality Control (QC) programme to ensure optimal image quality; The fundamental aspects and differences between QA and QC; The role and responsibilities of Management, staff and other professionals involved in the implementation
of a QA programme; Assessment of internal and external quality audits, regular updating, methods of evaluation, reporting and recommendations; QC on the Cobalt 60, Linear Accelerator, Simulator and Brachytherapy Equipment

RDGY 407 RADIOThERAPY PHYSICS III (BRACHYTHERAPY AND RADIATION PROTECTION)
The course is designed to provide the students with the understanding of the principles of clinical use of radioactive substance in specific disease management. Relevant dose calculation in brachytherapy is also covered. The need for radiation protection measures in brachytherapy to minimize unnecessary radiation exposure to patients and staff is included in the course. The risk-benefit philosophy underpinning therapeutic radiography is also covered.

RDGY 430 CLINICAL PRACTICUM II: TREATMENT SET UP AND PATIENT MANAGEMENT
9 Credits (3 Credits for Semester 7 and 6 Credits for Semester 8)
Clinical practicum has been designed to enable the student to integrate clinical experience with the theoretical knowledge. The course has further been designed to enable the students take a greater role within the radiotherapy department through application of their skills and execute complex localization, verification and treatment procedures.

RDGY 322 RADIATION ONCOLOGY II (TREATMENT OF SYSTEMS)
The course is designed to provide understanding to students about the anatomical structures and physiological functions of the body and the tumours of the haemopoietic and lymphoreticular system, head and neck, ENT, Eye, the endocrine system, digestive and female reproductive system. It is also intended to provide insight to students about the factors worth considering in choosing various treatment options and advances in oncology and radiotherapy practices.

RDGY 340 CLINICAL PRACTICE III: DOSIMETRY AND TREATMENT PLANNING (Practicals)
9 Credits (3 Credits for Semester 7 and 6 Credits for Semester 8)
This course is planned to provide opportunities to students to translate into practice the theoretical knowledge on treatment planning. Areas covered include: record keeping; appointment system; equipment calibration and mould room techniques. Other areas covered are the performance of radiotherapy treatment procedures and demonstrating competencies in all aspects of treatment planning procedure.

RDGY 410 RESEARCH PROJECT (Semesters 7 & 8)
For each of the items mentioned in the various modules in this course, there is a task analysis form, which is meant as a guide. The student should use these as an aid during the practical demonstrations and for evaluation procedures. The Clinical Tutors and Staff should refer to these in the Clinical Log Book in order to complete the relevant forms accurately

Case Studies
Students are required to write up a case study on each system as specified in the Clinical Logbook, for presentation at a lecture time. A minimum of ten presentations is required to qualify for award of B. Sc degree.

INTERNSHIP
Candidates on completion of programmes shall proceed to undertake a year’s internship at an accredited health facility. Such internship shall be compulsory and shall be assessed. Candidate may be requested to repeat the internship for a specified period to be determined by the Examiners’ internship Board if not satisfactorily completed.

BSC IN PHYSIOTHERAPY

DEPARTMENTAL OBJECTIVES
At the end of the training, the physiotherapy graduand should be able to:

1. Promote the health and well being of the individual and the general public/society.
2. Prevent impairments, functional limitations, and disabilities in individuals at risk of altered movement behaviours due to health or medically related factors, socio-economic stressors, and lifestyle factors
3. Provide interventions to restore integrity of body systems essential to movement, maximise function and recuperation, minimise incapacity, and enhance the quality of life in individuals and groups of individuals with altered movement behaviours resulting from impairments, functional limitations, disabilities.
4. Promote research efforts and to share freely the results of such research and evaluation through a range of dissemination routes
5. Demonstrate duty and responsibility to use evidence to inform practice and to ensure that the care of clients, their carers and communities is based on the best available evidence.
6. Demonstrate adequate understanding of the role and function of the other disciplines, appreciating the core differences as well as the common features.
7. Exhibit professional actions and conduct that are always within professional code of Ethics and Conduct.
8. Develop effective working relationships with the colleagues and other health professionals through communication and improved understanding.
9. Develop an attitude and responsibility for life-long learning and continuous professional growth and development.

**LEVEL 100 COURSES**

**SEMESTER 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SAHS 101</td>
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<td>SAHS 103</td>
<td>Physical and Inorganic Chemistry</td>
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<td>SAHS 105</td>
<td>Organic Chemistry</td>
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<td>SAHS 107</td>
<td>Chemistry Practical</td>
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<td>SAHS 109</td>
<td>General Physics</td>
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<tr>
<td>SAHS 111</td>
<td>Biology</td>
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<td>SAHS 113</td>
<td>Introduction to Computer Studies</td>
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<td>UGRC110</td>
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**SEMESTER 2**

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<tr>
<td>SAHS 106</td>
<td>General Physiology</td>
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<tr>
<td>SAHS 122</td>
<td>Introductory Biochemistry</td>
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<tr>
<td>PSTR 104</td>
<td>Introduction to Physiotherapy</td>
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<tr>
<td>GSPH 214</td>
<td>Writing for Public Health</td>
<td>3</td>
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<tr>
<td>UGRC 220-238</td>
<td>Introduction to African Studies</td>
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<tr>
<td>SAHS 112</td>
<td>Introductory Psychology for Allied Health Sciences</td>
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*PSTR 100: Professional Practice Placement: Clinical Attachment I*  
Introductory Clinical Practice (4 weeks, 120 hours)  

**LEVEL 200 COURSES**

**SEMESTER 3**

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<td>SAHS 201</td>
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<td>SAHS 205</td>
<td>Introductory Biochemistry II</td>
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<tr>
<td>SAHS 203</td>
<td>Statistics</td>
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<td>PSTR 201</td>
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<td>PSTR 209</td>
<td>Electrophysics</td>
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<td>PSTR 211</td>
<td>Assessment Skills I</td>
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<td>PSCY 307</td>
<td>Human Growth &amp; Development I</td>
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<td>Medical Sociology</td>
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<td>SAHS 204</td>
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<tr>
<td>PSTR 202</td>
<td>Clinical Measurement &amp; Instrumentation                          2</td>
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<td>PSTR 204</td>
<td>Neuroscience                                                    2</td>
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<td>PSTR 206</td>
<td>Massage                                                         2</td>
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<td>PSTR 208</td>
<td>Health Promotion and Disease Prevention                         2</td>
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<td>PSTR 212</td>
<td>Biomechanics                                                   2</td>
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<td>Assessment Skills II                                            2</td>
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<td>PSCY 308</td>
<td>Human Growth &amp; Development II                                   3</td>
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<td><strong>Professional Practice Placement: Clinical Attachment II</strong>      3</td>
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<td>Clinical Practice (6 weeks, 180 hours)</td>
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<td><strong>LEVEL 300 COURSES</strong></td>
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<td>SEMESTER 5</td>
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<td>SAHS 301</td>
<td>Research Methodology                                            2</td>
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<td>PSTR 310</td>
<td>Clinical Rotation I                                             2</td>
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<tr>
<td>PSTR 301</td>
<td>Kinesiology                                                    2</td>
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<td>PSTR 303</td>
<td>Therapeutic Exercise                                            3</td>
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<td>PSTR 305</td>
<td>Electrotherapy I                                               3</td>
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<td>PSTR 307</td>
<td>Neurorehabilitation I                                           2</td>
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<td>PSTR 309</td>
<td>Rheumatology                                                   2</td>
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<td>PSTR 311</td>
<td>Systemic Pathology                                             2</td>
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<td>SAHS 401</td>
<td>Principles of management                                        2</td>
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<td>PSTR 410</td>
<td>Clinical Rotation II                                           2</td>
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<tr>
<td>PSTR 401</td>
<td>Obstetrics and Gynaecology                                      2</td>
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<tr>
<td>PSTR 403</td>
<td>Dermatology &amp; Burns                                             2</td>
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<tr>
<td>PSTR 405</td>
<td>Health and Physical Fitness                                     2</td>
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<tr>
<td>PSTR 409</td>
<td>Therapeutic Modalities II                                       2</td>
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<tr>
<td>PSTR 411</td>
<td>Cardiopulmonary &amp; Intensive Care                                2</td>
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<tr>
<td>PSTR 420</td>
<td>Project (Dissertation)                                          2</td>
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<td><strong>MLAB 402</strong></td>
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<td>Applied Health Sciences Management</td>
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<tr>
<td>MLAB 402</td>
<td>Applied Health Sciences Management                              2</td>
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</table>
### COURSE DESCRIPTIONS AND CONTENTS

**PSTR 104  INTRODUCTION TO PHYSIOTHERAPY**
This course informs students on the historical development and evolution of physiotherapy. It seeks to introduce students to the scope of practice of physiotherapy and create the awareness of the holistic roles of Physiotherapy in rehabilitation and health care delivery; and also the roles and contribution of other professionals within the healthcare team, i.e. nurses, doctors, dieticians, OT etc.

**PSTR 100  CLINICAL ATTACHMENT I**
This clinical course is to provide to students, an introduction and orientation to the healthcare environment, expose students to clinical practice in in-patient and out-patient rehabilitation and to expand their knowledge of the role of the physiotherapist and other healthcare workers, in accredited hospitals for observation of physiotherapy procedures.

**PSTR 211  ASSESSMENT SKILLS I**
The course introduces to students the theory and practice of basic physiotherapy skills and principles of a patient assessment and handling techniques in order to arrive at a definite impression, plan treatment and/or prescribe assistive devices accordingly.

**PSTR 202:  CLINICAL MEASUREMENTS AND INSTRUMENTATION**
This course educates and provides students with the skills, tools and instruments used in the assessment and evaluation of patients’ clinical conditions. The course aims to expose students on the use of evidence based evaluation using standardized objective measurement tools.

**PSTR 206  MASSAGE**
The course focuses on the acquisition of knowledge and skill in massage and myofascial release. It will cover the following areas:
- History of massage therapy.
- Physiological, psychosomatic and therapeutic effects of massage.
- Practice of soft tissue manipulations of muscles and joints for therapeutic purposes and understanding of the effects produced by each manipulation.
- Effects, uses and precautions (indications and contraindications) in massage.
- Myofascial release in management of myofascial pain.

**PSTR 208  HEALTH PROMOTION AND DISEASE PREVENTION**
This course seeks to develop an understanding of the theory of health promotion and disease prevention. It focuses on strategies including health education which aims at disease prevention, promotion of healthy lifestyles and behaviour change. The following areas will be covered:

**Health Promotion:**
- Educational theories and models of health behaviour related to patient learning
- Developments of physiotherapy health promotion programmes
- Ethics of health promotion
- Strategies for health promotion and life style changes
- Health promotion programmes in Ghana.
- Role of the physiotherapist and the multidisciplinary team in health education and health promotion
- Preparation of a physiotherapy related health education material for use in a health education context
- Principles of programme management, including assessment, planning, implementation and evaluation
Disease Prevention

- Epidemiology – Definition, objectives and applications.
- Types of epidemiological studies.
- Dynamics of disease transmission – modes of transmission, natural history of disease, levels of disease prevention, definitions (endemic, epidemic, zoonotic, carrier, herd immunity, quarantine, isolation, active immunity, passive immunity, surveillance),
- Principles of disease control, Outbreak investigation.
- Measures of morbidity and mortality (incidence, prevalence, rates).
- Epidemiological methods, screening.

PSTR 214 ASSESSMENT SKILLS II
This is a follow-up course to consolidate the theory and application of physiotherapy skills and principles of a patient assessment and handling techniques in order to arrive at a definite physical diagnosis/impression, plan treatment and set outcome measures.

PSTR 200 CLINICAL ATTACHMENT II
This clinical course is to provide to students, an orientation to the healthcare environment, expose students to clinical practice in in-patient, out-patient and community rehabilitation and to expand their knowledge of the role of the physiotherapist and other healthcare workers, in accredited hospitals for observation on procedures and participation in clinical seminars.

PSTR 301 KINESIOLOGY
The course is to enable the student appreciate the study of analysis of normal human movement as basis for clinical intervention in rehabilitation of abnormal movements.

PSTR 303 THERAPEUTIC EXERCISE
The course focuses on acquisition of knowledge base and skill in prescription, planning, implementation and supervision of therapeutic exercises.

PSTR 305 ELECTROTHERAPY- I
This course aims to impart to the student the basic principles of production and the use of electrical and thermal energy in pain modulation, inflammation and neuromuscular re-education.

PSTR 307 NEUROREHABILITATION I
The student is equipped to relate basic neuro-anatomical knowledge to problem identification and evaluation of treatment of neurological conditions. Emphasis is placed on upper motor neurone lesions.

PSTR 309 RHEUMATOLOGY
This course is to provide the student with knowledge of the diseases of muscles, bones and joints as well as physiotherapeutic intervention in ameliorating secondary conditions, treating and rehabilitating the sequelae of the disorders.

PSTR 310 CLINICAL ROTATION- I
This clinic based course is to introduce the student to in-patient, out-patient and community contacts and to transfer the classroom theoretical principles to hands-on skill acquisition.
Hands-on skills in all aspects of physiotherapy at a minimum of twelve hours per week in the clinic, covering 30 weeks (15 weeks each in semesters 5 and 6) in the physiotherapy outpatient clinic and the following clinical postings:
Medical (Neurological and cardiopulmonary) Rehabilitation, Orthopaedics and Surgery (including burns)
Paediatrics/Obstetrics and Gynaecology

PSTR 302 TRAUMATIC SKELETAL DISORDERS
The course aims to provide the student with knowledge of traumatic disorders and injuries to bones and joints as well as physiotherapeutic intervention in ameliorating secondary conditions, treating and rehabilitating the sequelae of the disorders and injuries.

PSTR 304 NEUROREHABILITATION II
This course is to equip the student to relate the knowledge of neurological deficits to problem-solving approach, evaluation of disabilities and rehabilitation of neurological conditions.
PSTR 306  ELECTROTHERAPY II
The course aims to impart to the student the basic principles of production and the use of electrical and thermal energy in pain modulation, inflammation and neuromuscular re-education.

PSTR 308  PATHOKINESIOLOGY
This course seeks to enable the student acquire the knowledge and skill of the causes, rehabilitation and prevention of abnormal human posture and movements.

PSTR 312  THERAPEUTIC MODALITIES I
This course is practical based and is to enable the student to demonstrate skills in the selection and the use of physiotherapeutic procedures and techniques. It will cover the following areas:

- All practical aspects of massage manipulations, kinesiology and therapeutic exercise.
- Hydrotherapy – Practice of exercise in water
- Effects and dosage of hot and cold baths. Techniques of pool therapy and precautions.
- Applications of all electrotherapeutic based modalities in physiotherapy, including thermotherapy, neuromuscular stimulation, sonotherapy, actinotherapy, cryotherapy and hydrotherapy.

The course will be examined as a practical type.

PSTR 314  PAEDIATRICS
The course is to teach about the acquired and congenital problems of children (including neonates and infants) and the role of physiotherapy in the holistic management of paediatric problems.

OTTR 312  COMMUNITY REHABILITATION
The unit examines further in-depth understanding of the influence of the environment on enabling occupation. The unit dwells on earlier knowledge on the concepts of community, societal structure and the importance of meaningful occupation. Emphasis is laid on WHO model of CBR and how the therapist could work with other MDT members to sustain this community rehabilitation model.

The unit is aimed to making therapy services accessible, acceptable, and affordable in the community setting.

PSTR 400  CLINICAL ATTACHMENT-II
This clinical course is to enable the student reinforce the acquired hands-on experience in physiotherapy settings outside the institution of training. It will involve hands-on skills in all aspects of physiotherapy at a minimum of thirty hours per week in the physiotherapy settings, covering 6 weeks, at facilities outside the training institution.

PSTR 401  OBSTETRICS AND GYNAECOLOGY
To enable the student acquire the knowledge and skill in providing safe and effective physiotherapy care to clients throughout pregnancy, labour and puerperium. It will deal with

- Review of pelvic floor anatomy.
- Physiology of Pregnancy
- Prenatal exercises.
- Utero-vaginal prolapse and vesico-vaginal fistula.
- Physiotherapy management of Utero-vaginal prolapse and vesico-vaginal fistula.
- Physiology and conduct of normal labour.
- Management of complications resulting from prolonged or obstructed labour using physiotherapy techniques.
- Common Gynaecological conditions and amenable to physiotherapy.
- Physiotherapeutic management of gynaecological conditions.

PSTR 403  DERMATOLOGY AND BURNS
The course is aimed at exposing students to the identification of various skin disorders and burns; and the role of physiotherapy in preventive, therapeutic and rehabilitative management. The following areas will be covered:

- Review of structure and functions of the Skin
- Introduction to phototherapy (with emphasis on ultra violet radiation)
- Aetiology, pathophysiology, clinical features and treatment of various skin diseases (Psoriasis, Acne Vulgaris, Vitiligo, Buruli Ulcer and Leprosy)
• Aetiology and classification of burns (skin depth, total body surface area)
• First aid in burns
• Clinical features of burns (Shock)
• Complications and diagnosis of burns
• Hospital management of burns (Exposed and closed methods)
• Surgical method of burns
• Physiotherapy management of the burnt patient
• Reconstructive Plastic Surgery (Hand therapy)

PSTR 405 HEALTH AND PHYSICAL FITNESS
The course focuses on the attainment and maintenance of physical fitness level in healthy individuals and the role of physiotherapy in health promotion and illness prevention.

PSTR 407 GERIATRICS
The course seeks to create awareness about the problems of the elderly and the role of physiotherapy in the holistic management of geriatric problems.

PSTR 409 THERAPEUTIC MODALITIES II
This course is practical based, and is to enable the student to demonstrate skills in the selection and the use electrical modalities and physiotherapeutic procedures and techniques.

PSTR 411 CARDIOPULMONARY & INTENSIVE CARE
This course aims to enable the student appreciate the role of physiotherapy in assessing, treating, evaluating and rehabilitating patients with cardio-pulmonary dysfunctions.

PSTR 420 PROJECT (DISSERTATION)
This is to introduce the student to basic concepts of research and its importance in the discovery of newer facts and in the support of evidence based practice in physiotherapy. It affords the student the opportunity of designing and carrying out independent research.

PSTR 404 SPORTS PHYSIOTHERAPY
The course is to enable the student to acquire knowledge and skill in the prevention and management of sports injuries.

PSTR 406 ERGONOMICS AND INDUSTRIAL PHYSIOTHERAPY
The course is to create the awareness about the role of physiotherapy in the prevention and management of work related musculoskeletal disorders. It will cover

**Ergonomics**
- The concept of ergonomics.
- Work station design and description.
- Occupational health; legal aspects.
- Industrial injuries and safety.
- Psychosomatic factors in WRMDs.
- Role of physiotherapy in prevention and management of work related musculoskeletal disorders and repetitive strain injuries.
- An industrial visit.

**Industrial physiotherapy**
- Historical evolution and principles of work site health care
- Common task demands in industry/Predisposing factors to injury and health education
- Work injury prevention and safety measures in industry
- Roles of physiotherapy in an industry/Heat injury/Class presentation
- Work related musculo skeletal disorders: Causes, epidemiology, risk factors, stages, clinical features and management
- Local inflammation.
Compression syndrome
Pain syndrome
Use of applied anatomy in identifying structures for manual therapy techniques
Applications of all electrotherapeutic based modalities in physiotherapy, including thermotherapy, neuromuscular stimulation, sonotherapy, actinotherapy, cryotherapy and hydrotherapy.
To be examined as a practical course.

PSTR 410  CLINICAL ROTATION- II
This clinical course is to further expose the student to in-patient, out-patient and community contacts and to reinforce the transfer of the classroom theoretical principles to hands-on skill acquisition.

BSC IN MEDICAL LABORATORY SCIENCES

DEPARTMENTAL OBJECTIVES
At the end of the programme, the students should be able to:
1. Perform laboratory-based diagnosis and prognosis of diseases by providing accurate, precise and timely results
2. Monitor the effectiveness of disease treatment by laboratory methods
3. Apply medical laboratory procedures to research on health related problems and to the development of new technologies
4. Manage a medical laboratory at least at the level of a district hospital
5. Advise hospital management on medical laboratory issues
6. Acquire and apply new knowledge and skills in medical laboratory science on a continual basis
7. Work efficiently as part of a team of health professionals in providing good quality affordable health care
8. Employ quality assurance and quality control procedures in the performance of duty
9. Demonstrate respect for rights and dignity of all persons and maintain acceptable standards of professional conduct and ethical behaviour in dealing with colleagues and other health professionals, patients and the general public.

LEVEL 100 COURSES

SEMESTER 1
UGRC 110  Academic Writing I  3
SAHS 101  Introductory Statistics  2
SAHS 103  Physical and Inorganic Chemistry  2
SAHS 105  Organic Chemistry  2
SAHS 107  Chemistry Practical  1
SAHS 109  General Physics  2
SAHS 111  Biology  2
SAHS 113  Introduction to Computer Studies  1
SAHS 115  Clinical Reasoning in Health Sciences  3

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SEMESTER 2
GSPH 214  Writing for Public Health  3
UGRC 220-238  Introduction to African Studies  3
SAHS 102  General Anatomy  3
SAHS 104  General Anatomy Practical  1
SAHS 106  General Physiology  3
SAHS 108  General Physiology Practical I  1
SAHS 122  Introductory Biochemistry  2
MLAB 102  Analytical Chemistry and Instrumentation  2
MLAB 104  Analytical Chemistry and Instrumentation Practical  1
MLAB 106  Introduction to Medical Laboratory Sciences  2

**LEVEL 200**

**SEMESTER 3**

SOCI 316  Medical Sociology  3
SAHS 201  Basic Computer Application  3
SAHS 203  Statistics  2
MLAB 201  Functional Histology  2
MLAB 203  Functional Histology Practical  1
MLAB 205  Introductory Biochemistry II  2
MLAB 207  Cell Biology  2
MLAB 209  Cell Biology Practical  1
MLAB 211  Introduction to Molecular Biology  2
MLAB 213  Introduction to Molecular Biology Practical  1

**SEMESTER 4**

SAHS 202  Immunology  2
MLAB 202  Cellular Pathology  3
MLAB 204  Introduction to Haematology and Transfusion Science  3
MLAB 206  Introduction to Molecular Diagnostics  2
MLAB 208  Introduction to Clinical Chemistry  3
MLAB 212  Introduction to Microbiology  3
 MLAB 214  Pathology Laboratory Practice and Tissue Processing Procedures  3

**SEMESTER 5**

SAHS 301  Research Methodology  2
MLAB 301  Cytopreparatory Techniques  2
MLAB 303  Basic Clinical and Laboratory Haematology  2
MLAB 305  Basic Clinical and Laboratory Haematology Practical  2
MLAB 307  Microbiology I  2
MLAB 309  Microbiology Practical I  2
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**SEMESTER 6**

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**TOTAL = 20 CREDITS**

**SEMESTER 7**

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**TOTAL = 20 CREDITS**

**SEMESTER 8**

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**TOTAL = 21 CREDITS**

**TOTAL = 159 CREDITS**
COURSE OUTLINES

YEAR ONE

UGRC 110 Academic Writing I
GSPH 214 Writing for Public Health
UGRC 220-238 Introduction to African Studies

SAHS 101 INTRODUCTORY STATISTICS
Types of data, descriptive statistics and plots, theoretical distributions, probability, estimation, hypothesis testing, and one-way analysis of variance. A brief introduction to correlation and univariate linear regression. Basic statistical methods for both continuous and dichotomous data.

SAHS 102 GENERAL ANATOMY
Introduction, Anatomical terminology and nomenclature, Structure and organisation of the cell, Basic tissues, Musculoskeletal system, Digestive System, Renal System, Integumentary System and Appendages, Reproductive System, Endocrine System, Special sensory organs

SAHS 103 PHYSICAL AND INORGANIC CHEMISTRY
Introduction to the principles of chemistry including physical and chemical changes, energetics, atomic structure, bonding, nomenclature, chemical calculations, chemical reactions (including solubility, neutralization, and oxidation-reduction) gas laws, solutions, acids and bases, pH, equilibrium, and nuclear chemistry.

The laboratory sequence will support the above topics including both qualitative and quantitative experiments, and analysis of data.

SAHS 104 GENERAL ANATOMY PRACTICAL
The laboratory sequence will support the above topic.

SAHS 105 ORGANIC CHEMISTRY
Molecular composition and structure of organic compound; Determination and calculation of empirical and molecular formulae; Stereochemistry and isomerism; Hybridization; Nomenclature of polyfunctional organic compounds; Saturated Hydrocarbons (Alkanes and cycloalkanes); Unsaturated Hydrocarbons (Alkenes, Alkynes, Aromatics); Alcohols, Phenols, Ethers, and Thioalcohols; Aldehydes and Ketones; Carboxylic Acids, Esters, and Related Compounds; Amines and Amides; Stereoisomerism; Synthetic polymers Plastics; Natural products (Alkaloids, terpenes, steroids. Pheromones).

SAHS 106 GENERAL PHYSIOLOGY I

SAHS 107 CHEMISTRY PRACTICAL
Safety in the chemistry laboratory; Errors in the chemistry laboratory; The use of the analytical balance; Calibration of volumetric ware: Pipette, Burette and volumetric flask; Preparation of standard solutions; Acid-base titration (basic); Identification of functional groups in organic compounds; Quantitative determination; Colorimetric determination of concentration of substances in coloured solutions; Experimental determinations with ultraviolet/visible light.

SAHS 108 GENERAL PHYSIOLOGY PRACTICAL I
The laboratory sequence will support the above topic.

SAHS 109 GENERAL PHYSICS
Conceptual view of physics, Newtonian mechanics, wave motion, heat and thermodynamics, fluids, Wave motion, electricity and magnetism, geometrical and physical optics, Introduction to concepts of relativity, quantum theory, atomic and nuclear physics. Application of physical principles to related scientific disciplines including life sciences.
SAHS 111  BIOLOGY
This is an introductory biology course with an emphasis on humans. Topics include fundamental concepts of cell biology, histology, microbiology, and genetics.

SAHS 113  INTRODUCTION TO COMPUTER STUDIES
What is a computer?; History of computers; Computer types; Hardware and software; Basic operations; Data sizes and speeds; Inside a computer case (Motherboard, Processor, Memory, Disks); Peripherals (Input Devices, Output Devices, Future Peripherals); System software; Application software; Personal Networks; Security; Internet; Development; Databases

SAHS 115  CRITICAL THINKING AND REASONING IN HEALTH
Health and health management information search and appraisal strategies; Socratic questioning; knowledge construction; reflective thinking; basis of clinical reasoning and scientific inquiry; creative/lateral thinking; models of health and disability; application; academic and professional communication; scholarship/scientific writing; ethics; collaborative models.

SAHS 116  INTRODUCTORY BIOCHEMISTRY I

MLAB 102  ANALYTICAL CHEMISTRY AND INSTRUMENTATION
Introduction to chemical analysis; Introduction to Data Acquisition and Electronics; Introduction to sensors; Data Handling; Volumetric Analysis; Volumetric glassware; Theory and methods of separation; Electrochemistry; Gravimetric Analysis; Basic Optics; Separation techniques; Fundamentals of electrophoresis; Spectroscopic method; Standards (Primary and Secondary); Titration

MLAB 104  ANALYTICAL CHEMISTRY AND INSTRUMENTATION PRACTICAL
Distinction between qualitative and quantitative goals of determinations; Choice of experimental designs; Sampling methods for all states of matter; Sample preparation and derivatization procedures; Availability and evaluation of standards; Standardization methodology; Physicochemical methods of measurement; Fundamental characteristics of instruments, including recording devices and data acquisition options; Comparison and critical selection of methods for both elemental and molecular determinations; Optimization techniques for various aspects of analysis; Methods of data evaluation

MLAB 106  INTRODUCTION TO MEDICAL LABORATORY SCIENCES
Description of SAHS MLS Program; MLS as a Profession, history, education, professional organization; Medical Terminology; Clinical Laboratory Structure and Departments; Dilutions and Phlebotomy; Health Professional Interview; Professional Ethics; Quality Assurance; Microbiology; Cytogenetics; Blood Bank; Clinical Chemistry; Hematology
YEAR TWO

SOCI 316   MEDICAL SOCIOLOGY
Current knowledge of health production emphasizes the need to perceive health as multidimensional in character. This is because of the critical nexus between the health status of an individual and the cultural, political, economic and the physical environment that influence his/her health-seeking behaviour. The multidimensional character of health is even more relevant in view of the fact that the definition of the patient is no longer restricted to an individual; the concept now applies to a whole community. Medical Sociology thus offers a junction where biology and society meet. The pursuit of this course thus gives the student a wider horizon to appreciate the various intermediations in health production. At the end of this course, students should be able to critically assess the outcomes of various interventions in health care processes.

SAHS 201   BASIC COMPUTER APPLICATION
An introduction to computers and data processing. Historical and current status of data processing and electronic digital computers; a survey of computer applications; foundations of computer programming; survey of programming languages. Survey of World Wide Web applications and use including browsers, search engines, e-mail, news groups, FTP, multimedia, etc. The computing security problem. Advanced features of microcomputer applications packages such as word processors, spreadsheets, graphic presentation software, etc. Creation and use of macros, styles, and scripts etc.

SAHS 202   IMMUNOLOGY
Theory and application of basic concepts in immunology, immunopathology, and immunologic testing methods. Cells, proteins and chemicals involved in the immune system. Immune disorders such as hypersensitivity, autoimmunity, immunodeficiency and protein abnormalities, transplant and tumor immunology, immunologic testing methods and flow cytometry.

SAHS 203   STATISTICS
This course provides the student with an enduring understanding of, and appreciation for, the statistical processes most used in healthcare research. Emphasis is placed on development of a working knowledge of basic statistical processes sufficient for evaluation and interpretation of the statistical methods and findings in published reports of research.

MLAB 201   FUNCTIONAL HISTOLOGY
Introduction, Covering and Glandular Epithelia, Connective Tissues, Muscular Tissues, Nervous Tissues, Integument, Respiratory system, Alimentary system, Urinary system, Reproductive system, Endocrine glands.

MLAB 202   CELLULAR PATHOLOGY
Introduction to Pathology (Cellular Response to injury, Tissue response to injury: - Acute and chronic inflammation; Healing and repair, Haemodynamic Disorders); Genetic Disorders; Pathology of Bacterial Infections; Disorders of Growth and Neoplasia

MLAB 203   FUNCTIONAL HISTOLOGY PRACTICAL
The laboratory sequence will support the above topics

MLAB 204   INTRODUCTION TO HAEMATOLOGY
Introduction (Definition and importance of specimens required and mode of collection, Use of syringes and needles of different sizes, lancets and vacutainer); Glassware (Slides, cover slip, beakers, measuring cylinders and pipettes, different flasks both glass and plastic); Equipment (The light microscope water bath incubators, weighing balances, centrifuges, fridges, colorimeters/spectrophotometers, cell counters (electronic and manual), auto pipettes, uses and maintenance; introduction to flow cytometry); Chemicals and Reagents (anticoagulants and preservatives in haematology, transfusion science; uses and preparation); Stains and staining (Introduction to Romanowsky stains. Thick and thin films); Preparation of solutions (Saline, buffers, metabisulphite solution, stock and working solutions (dilutions from stock) Haemoglobin estimation, sickling test, total WBC counts, ESR, reticulocyte count to be used as basis to elucidate above through demonstration and actual performance; ABO grouping as basis for particle agglutination.

MLAB 205   INTRODUCTORY BIOCHEMISTRY II
Hormones - General mechanisms of hormone action, Regulation of hormone level, Actions of specific hormones, Clinical correlations. Glycolysis, gluconeogenesis, TCA cycles - Schema of glycolysis -biomedical importance,

MLAB 206 INTRODUCTION TO MOLECULAR DIAGNOSTICS
Principles (Principles of Molecular Biology, Genomes and Nucleic Acid Alterations); Techniques and Instrumentation (Specimen Collection and Processing, Nucleic Acid Isolation, Nucleic Acid Techniques; Miniaturization: DNA Chips and Devices; Design and Operation of a Molecular Diagnostics Laboratory; Introduction to Evidence-Based Molecular Diagnostics); Applications (Inherited Diseases, Identity Assessment, Molecular Methods in Diagnosis and Monitoring of Infectious Diseases, Pharmacogenetics, Molecular Genetics in Diagnosis of Human Cancers)

MLAB 207 CELL BIOLOGY
Introduction, Comparison of Prokaryotic and Eukaryotic cells, Cell differentiation and types of specialisation, Cell structure and cellular organelles, Cell movements and transport, Cytoskeleton, Intercellular communication, Cell cycle and related cancers, Gene cloning and sequencing, Recombinant DNA technology, Oncogenes and Proto-oncogenes, Microscopy other Cell biology Tools.

MLAB 208 INTRODUCTION TO CLINICAL CHEMISTRY
To appreciate and prevent hazards in Clinical Chemistry Laboratory; Basic Equipment uses, calibration, units and Calculations in Clinical Chemistry; Function of Clinical Chemistry, study and alteration of steady state of biochemical nature; Body fluids such as water, urine biochemistry; Variation and sources as well as quality control in clinical chemistry; Carbohydrate metabolism and hypo/hyper – glycaemia.

MLAB 209 CELL BIOLOGY PRACTICAL
The laboratory sequence will support the above topics.

MLAB 211 INTRODUCTION TO MOLECULAR BIOLOGY
DNA Replication I; DNA Replication II; Transcription and RNA structure; Exon - intron splicing; tRNA structure and function; Genetic Code; Ribosomes and initiation of translation; Peptide Synthesis; Gene Expression (prokaryotes); Gene Expression (eukaryotes); Gene recombination (prokaryotes); Gene recombination (eukaryotes); Bacteriophages; Phage and plasmid growth; DNA amplification methods; DNA isolation and purification; Restriction enzymes; Recombinant DNA; DNA cloning; Genomic DNA cloning; DNA sequencing methods; DNA probes; RFLP and linkage analysis; Gene Mapping; Gene Transfer in animals. Introduction to RNA Technology. SNP analysis.

MLAB 212 INTRODUCTION TO MICROBIOLOGY
History of Microbiology; Microbiology Laboratory equipment; Laboratory safety measures; Types and preparation of glassware and specimen containers; Principles of specimen collection and documentation; Transportation, receipt and handling of specimen; Normal flora and transmission of microbial agents; Introduction to Parasitology and parasitism; Host-parasite interrelationships; Introduction to microscopy; Colonial morphology; Diagnostic techniques for staining of detection of parasites; Basic Parasitological staining techniques (negative and tissue staining); Introduction to Virology; Viral structure and classification; Replication of viruses; DNA and RNA viruses of medical importance; Ultra-structure of bacteria; classification of bacteria; Anaerobes and facultative anaerobes; Rickettsia and Chlamydia; Aerobic & microaerophilic rods and cocci; Pathogenic factors; Bacterial Genetics; Bacterial physiology, nutrition and biochemical characteristics

MLAB 213 INTRODUCTION TO MOLECULAR BIOLOGY PRACTICAL
Extraction and quantitation of DNA and RNA; long term storage of nucleic acid; Restriction enzyme digestion; PCR; Agarose and polyacrylamide gel electrophoresis; Nucleic acid transfer to a membrane with subsequent

**MLAB 214 PATHOLOGY LABORATORY PRACTICE AND TISSUE PROCESSING PROCEDURES**
Laboratory Safety including fires and fire extinguishers; Histopathology Laboratory Administration; Cytopathology Laboratory Administration; Quality Assurance Practices in Pathology Laboratories; Principles of fixation and fixatives; Tissues processing for paraffin embedding

**YEAR THREE**

**SAHS 301 RESEARCH METHODOLOGY**
Research principles (the research process, strategies for obtaining facts); Research practice (experiments, ethnographic studies, surveys); Research presentation (critical appraisal of research, the research presentation, the research report); Formats and styles for reports and papers

The Nature of Research; Variety of Research Methods, Finding Research Problems, Literature Review; Ethics in Research; The research proposal; Causation; Internal Validity; Sampling; External Validity; Survey designs (Research, Activity); Descriptive Statistics; Measurement and Construct Validity; Reliability; TBA; Inferential Statistics; Research Designs; Analytic Epidemiological Study; Qualitative Research; Psychographic Techniques; Interviewing, Focus Groups; Action Research; Evaluation Research

**MLAB 301 CYTOPREPARATORY TECHNIQUES**
Techniques for sample collection; Cytopreparatory and processing techniques; Smear preparation techniques; Fixation in cytology; Processing fluid samples; Special Preparatory Techniques: Cell Block Technique; Imprints; Cytologic Staining Techniques: Pap and Romanowsky stains including Diff Quick; Advanced Staining Techniques: Destaining and Secondary Staining; Types of Slide-Coating Adhesives.

**MLAB 302 GENERAL AND GYNAECOLOGIC CYTOLOGY**
Cytologic screening programmes; The Pap Smear; Cell Structure; Anatomy and histology of female genital tract; Cellular components of normal cervical smear; Hormonal Cytology; Cervical smear reporting; Evaluating the sample; Inflammation and benign reactions of the cervix; Microorganisms seen in the Pap smear; Terminology and nomenclature in cervical smear reporting; Human papilloma virus infection of the cervix; Histology and cytology of cervical pre-cancer; Cervical cancer; Risk factors; Role of HPV; Histology, grading and staging: Cytology; Automated cytology screening.

**MLAB 303 BASIC CLINICAL AND LABORATORY HAEMATOLOGY**
Haemopoietic tissue and stem cells, haemoglobin formation from foetus to adults; Erythropoiesis, myelopoiesis, structure of red cell membrane, metabolism of red cell.; Function of red cells, white cell and platelets; Causes and effects of reduced and increased white cell and red cell count; Abnormalities of haemoglobin synthesis and catabolism.; Diagnosis and investigation of haemolytic anaemias. Parasitic infections in Haematology; The thick and thin peripheral blood film in diagnosis; Blood viscosity and erythrocyte sedimentation rate. Supravital staining; Granulopoiesis and lymphopoiesis, variations in the granulocyte and lymphocyte counts; The immune response; The immunology and biochemistry of phagocytosis; The structure and function of immunoglobulins; Lymphocyte subsets.; Principles of manual cell count and eosinophil count; Cell counting statistical applications SD, CV, Control chart Protein electrophoresis.; Hb electrophoresis and tests of function of red cell membrane. Study of HbS, HbF and Hg A2 Haem pigments. Assay of some red cell enzymes e.g. G6PD; Principles of assay of iron TIBC, ferritin, Vitamin B12, folic acid and the schilling test;

**MLAB 304 GYNAECOLOGIC CYTOLOGY PRACTICAL 1**
Study material will include Pap smears, which may be stained by the students. Each student will be required to examine 10 to 15 slides per practical session and be able to identify and mark (for inspection) abnormal cells and write reports using appropriate terminology. Projected photomicrographs will be used to illustrate abnormalities when stained slides are not available

**MLAB 305 BASIC CLINICAL AND LABORATORY HAEMATOLOGY PRACTICAL**
anaemias e.g. Serum ferritin iron TIBC vitamin B12, Folic acid assay Schilling test
Investigation of haemolytic anaemias e.g. Sickling test; Hb electrophoresis, HbS, HbF, HbA2, Kleihauer test, osmotic fragility test, Ham’s test, G6PD screen.

MLAB 306 BASIC BLOOD TRANSFUSION

MLAB 307 GENERAL MICROBIOLOGY
Microbial pathogenesis; Opportunistic pathogens in health and disease conditions; Source transmission of microbial infections; Pathogenesis of viral, parasitic and bacterial diseases; Collection, transportation and storage of specimens for viral diagnosis; Diagnostic methods id Virology; Principles of Laboratory diagnosis of viral infections; Immunological basis of viral serological diagnosis; Immunological assays for viral diagnosis; Introduction to cell culture techniques; Quantitation of viruses; Arthropods and vectors of medical importance; Parasites oncology; Physiology and Biochemistry of Parasites; Routine urine preparation and examination; Bacterial specimens collection, transportation and storage; Bacterial specimens collection, transportation and storage; Principles and Methods of Diagnosis in Bacteriology; Production of antibodies; Molecular techniques in Microbiology; Viral respiratory & CNS infections and their laboratory diagnosis; Blood-borne viruses and their lab. Diagnosis; Viruses in stool and their detection methods.

MLAB 308 BASIC BLOOD TRANSFUSION PRACTICAL

MLAB 309 GENERAL MICROBIOLOGY PRACTICAL
Parasites identification techniques; Media preparation for parasites identification; Routine stool examination techniques (emulsification, wet smears, iodine preparations); Concentration techniques (sedimentation, floatation methods) for stool examination; Microscopy and staining; Media preparation for cell, virus culture; Electron micrograph of DNA & RNA viruses; Cell culture techniques and CPE observation; Parasites oncology; Biochemical tests.

MLAB 311 CLINICAL CHEMISTRY I
The concept of homeostasis, hydrogen ions and its disorders, renal function and abnormalities will be taught. Lipid metabolism will be introduced. Biochemical analyses related to dysfunctional organs will be discussed. Nutrition and micronutrients will be examined. HP axis / thyroid hormones will be examined.

MLAB 312 PARASITOLOGY AND BACTERIOLOGY
Review of bacterial structure and classification; Antimicrobial agents and Sensitivity testing; Genetic systems as targets of antimicrobial agents; MIC & MBC; Sterilization and disinfection; Bacterial resistance mechanisms and resistance to antimicrobial agents; Assay of biological substances; Quality control of foods; Immunoprophylaxis; Biotechnology as applied to diagnosis of infections; Structure, morphology & classification of protozoan parasites; Life cycles of parasites (nematodes, cestodes); Parasite ecology (alimentary canal, blood and other tissues); Zoonotic parasitic infections; Vector borne diseases (Protozoa, nematodes); Infections of the gut, GIT; Trematodes, cestodes and other nematodes infections; Larval cestodes infections and Larval migrans.

MLAB 313 CLINICAL CHEMISTRY PRACTICAL I
Demonstration of the effect of laboratory and extra laboratory factors affecting results, such pipetting errors, sampling techniques and handling; including venous stasis, storage of samples and causes of errors. End-point, kinetic and differential methods of spectrophotometry and interpretation of biochemical results. The use of log books to monitor competencies will be emphasized.
MLAB 314  PARASITOLOGY AND BACTERIOLOGY PRACTICAL
Specimens collection and storage (Bacteriological, Parasitological and Virological); Effects of physical and chemical agents on viruses; Immunological assays for viral diagnosis (Rapid tests for HIV, HBV, HCV); Molecular techniques in Microbiology; Urinary tract infections; Blood and CNS infection; Respiratory infections; Diagnosis of bacterial infections; Detection of bacterial pathogens by culture; Calibration, care and handling of Microscopes; Microscopy & Culture of blood, faecal and urine samples; Detection of parasites in blood, faecal and urine samples; Serology/other diagnostic techniques

MLAB 315  HISTOTECHNOLOGY I
Special Techniques in Tissue processing; Double embedding; Resin embedding for light microscopy; Decalcification; Frozen sections; Mounting media; Overview of theory of Staining; Routine Haematoxylin and eosin staining; Instrumentation; Basic Microscopy; Microtomy and Paraffin section cutting; Tissue Processors; Embedding centres; Cryostat; Automatic stainers and coverlippers; Floatation baths; Faults and Remedies in Paraffin Wax Sectioning

MLAB 316  CLINICAL CHEMISTRY II
Further complications of diabetes examinations will be introduced. Protein and lipid biochemistry involving non-routine analyses such as plasma proteins, lipo-proteins will be examined. CSF and its biochemistry will be taught. The immune system and some disorders, as well as tumour marker will be introduced.

MLAB 317  HISTOTECHNOLOGY PRACTICAL I
Preparation of fixatives; Tissue processing; dehydration, clearing, embedding using paraffin wax and alternatives; Microtomy; Staining: haematoxylin and eosin stain; Mounting

MLAB 318  CLINICAL CHEMISTRY PRACTICAL II
Instrumentation, phlebotomy, demonstration of variations – preanalytical errors, Various tests relating to Plasma Glucose Estimation, Total Protein Estimation (plasma & urine), Biochemical Analysis of CSF, Kidney function, Liver function test, Lipid Profile and trace Trace Elements related to fluid and electrolyte balance will be undertaken to develop the necessary competencies.

MLAB 319  CYTOPREPARATORY TECHNIQUES PRACTICAL
Papanicolaou stain for gynaecological specimens; Cytopreparation of fluid specimens: Includes sputum, urine, pleural effusion, ascitic fluid, CSF, joint effusions and pericardial effusions; Direct smears for sputum; Centrifugation; Cytocentrifugation; Filter methods; Fixation and pre-fixation; Wet alcohol fixation; Coating fixatives; Air-drying; Lysing fixatives; Papanicolaou and Romanowsky stains for fluid samples;

MLAB 322  HISTOTECHNOLOGY II
Carbohydrates; Classification; Special Staining Techniques; Application in Pathology; Connective Tissue Proper, Basement Membrane and Muscle; Types and structure of connective fibres; Skeletal, cardiac and smooth; Techniques for differential demonstration of connective tissue fibres and muscle; Application in Pathology; Lipids; Classification; Staining Methods of identifying lipids; Application of Lipid Histochemistry in Pathology; Protein and Nucleic acids; Principles of methods of demonstration; Tissue Deposits - Pigments, Minerals, and Amyloid; Types of Pigments and Minerals and histochemical demonstration; Structure, classification and composition of amyloid; methods of demonstrating amyloid; Demonstration of Infective Agents in Tissue Sections

MLAB 324  HISTOTECHNOLOGY PRACTICAL II
This course is intended to give practical knowledge of the demonstration of tissue components involve in diagnostic pathology. Students will acquire knowledge of various special staining techniques and identify factors that may give rise to faulty demonstrations
YEAR FOUR

SAHS 401  PRINCIPLES OF MANAGEMENT

SAHS 402  APPLIED HEALTH SCIENCES MANAGEMENT

MLAB 400  PROJECT

MLAB 401  NON-GYNAECOLOGIC CYTOLOGY
Cytology of the Urinary Tract; Review Anatomy and histology; Cellular components of urinary sediment; Pathology and cytology of non-neoplastic conditions; Urinary tract neoplasms – histology and cytology; Cytology of Serous Cavities (Review Anatomy and histology, Types of effusions, Benign cells in effusions, Cytology of Benign Effusions, Cytology of Malignant Effusions) Cerebrospinal and Synovial Fluids (Anatomy and physiology); Normal cytology of and benign reactive cells in CSF; Cytology of benign reactive conditions and neoplasms in CSF; Normal cytology of and benign reactive cells in synovial fluid; Cytology of benign reactive conditions and neoplasms in synovial fluid; Fine Needle Aspiration; Introduction, equipment, technique of aspiration, laboratory processing techniques including special studies, reporting and interpretation of results; Breast FNA; Normal cytology; Benign pattern; Malignant pattern; Thyroid FNA; Indications, place in diagnostic process, technical considerations including special studies; Normal cytology; Benign conditions; Malignant conditions;

MLAB 402  VOCATIONAL TRAINING IN HEMATOLOGY

MLAB 403  NON-GYNAECOLOGIC CYTOLOGY PRACTICAL
Study material will include non-gynaecological cytology preparations from samples obtained from various parts of the body and stained by the Papanicolaou and/or Romanowsky method as appropriate by students. Each student will be required to examine 10 to 15 slides per practical session and be able to identify and mark (for inspection) abnormal cells and write appropriate reports. Projected photomicrographs will be used to illustrate abnormalities when stained slides are not available.

MLAB 404  VOCATIONAL TRAINING IN CLINICAL CHEMISTRY

MLAB 405  HEMOSTASIS AND COAGULATION
Thrombopoiesis, thrombocytosis and thrombocytopenia. Platelet function, role of endothelial cells, platelets, in the haemostatic process; Coagulation factors, inhibitors and fibrinolysis in the haemostatic process.; Acquired and congenital bleeding disorders.; Standardization of thromboplastins.; Investigation of acquired and congenital bleeding disorders, to include screening tests, factor assays.; Control of anticoagulant therapy.; Detection of inhibitors, tests of fibrinolytic activity; Quality control and standardization in the coagulation laboratory;

MLAB 406  VOCATIONAL TRAINING IN MICROBIOLOGY

MLAB 407  HEMOSTASIS AND COAGULATION PRACTICAL
Bleeding Time, Whole blood clotting time,(WBCT), Prothrombin Time(PT), Partial Thromboplastin Time with Kaolin (PTTK),Standardization of thromboplastins, Thrombin time (TT). Mixing Tests using Aged and Adsorbed plasma. Reptilase time, Latex screening test for Fibrinogen/Fibrin Degradation Products (FDPs).Preparation of platelet rich plasma (PRP), platelet poor plasma (PPP).

MLAB 408  VOCATIONAL TRAINING IN CYTOTECHNOLOGY

MLAB 409  CLINICAL CHEMISTRY III
Neonatal screening, Pre and post – natal biochemistry; hormones of the reproductive as well as adrenal systems will be examined, Acid/base biochemistry and toxicity of substances including metals will be dealt with.
MLAB411 CLINICAL CHEMISTRY PRACTICAL III
Qualitative and quantitative measurements based on principles of various chemical pathology tests – using dry chemistry/observational methods, dipsticks/strips. Wet chemistry – spectrophotometric (kinetic) techniques using reagents and chemicals and electrophoresis, Elisa and chromatographic techniques. Interpretation of results from practicals. Hormonal assays, peptide hormones and steroid hormones analysis.

MLAB 412 VOCATIONAL TRAINING IN HISTOTECHNOLOGY

MLAB413 PARASITOLOGY, MYCOTOLOGY AND VIROLOGY
Structure and classification of fungi of medical importance; Environmental fungi; Dermatophytes; Fungal structure and classification; Investigation of superficial, subcutaneous and systemic fungal infections; Opportunistic fungi; Antifungal agents; Sensitivity testing of anti-fungal agents; Animal House management/ Cruelty to Animal Act (1986); Diseases and treatment of laboratory animals; Virus cultivation in eggs; Cell and virus culture and applications; Quantitation of viruses; Microscopy and staining methods for virus-infected tissues; Preservation /storage of cells and viruses; Public Health Virology (Viruses in water, sewerage, air and milk); DNA & RNA Viruses causing major diseases in humans; Diagnostic methods for detection of GIT parasites (Microscopy & Serology); Permanent staining techniques for detection of parasites (Concentration methods for R/E, for GIT parasites, blood parasites, etc); Routine examination of urine samples, expectorated sputum, aspirates and biopsy materials; Diagnosis of parasitic infection in immunocompromised host; Procedures for permanent preparation of arthropods Common problems in organism identification; Maintenance of insectaria.

MLAB415 PARASITOLOGY, MYCOTOLOGY AND VIROLOGY PRACTICAL
Basic techniques in Mycology; Preparation/Routine microscopic examination of fungal specimens; Contaminants and opportunistic pathogens in Mycology; Dermatophytes; Identification of yeasts; Systemic dimorphic molds; Investigation of fungal infections; Reagent preparation for parasitological investigations; Routine microscopic examination of faecal specimens; Concentration methods for R/E; Permanent staining – Iron Haematoxylin & Modified Kinyoun’s/ZN stains; Direct mount and stained preparations of sputum/aspirates; Giemsa/Leishman / Fields staining techniques; Buffy coat /Knot concentration methods; Permanent preparation of arthropods; Staining for detection of Pneumocystis carinii; Virus/ Cell culture techniques /Preservation of cells and viruses; Cultivation of Polio/ Yellow fever vaccine strains and CPE observation; Cultivation of Polio/ Yellow fever vaccine strains and CPE observation; Vaccine potency testing; Immunofluorescence and immunolological techniques in Virology

MLAB417 HISTOTECHNOLOGY III
Neurohistochemistry; Cellular Components of Nervous System; Nissl stains. Demonstration of Nerve Fibres; Demonstration of Myelin: Normal Myelin; degeneration products; combination techniques Demonstration of Neuroglial Cells; Demonstration of Nerve Endings; Immunohistochemistry; Definition of IHC; Paraffin sections and IHC; Unmasking Concealed Antigens; Reagents and antibodies for IHC (Labels: Enzymes, metals, radioactive materials); Chromogens and Substrates; Stability of Colour; Immunohistochemical methods; Reaction Product Intensification and Counterstains (Factors Influencing Immunohistochemistry Procedure, Application in Diagnostic Pathology); Immunofluorescence (Introduction, Fluorochromes, Staining Procedures: Direct and Indirect Staining); Enzyme Histochemistry (Techniques for Demonstration of Enzymes).

MLAB419 HISTOTECHNOLOGY PRACTICAL III
BSC IN DIETETICS

DEPARTMENTAL OBJECTIVES
At the end of the programme, the dietitian will be able, in addition to the specific duties of a dietitian stated in section 2 above, to:

- Demonstrate the ability to confidently work autonomously with individual clients on a one to one basis assessing needs, providing therapeutic advice and facilitating behaviour change based on the clinical and personal information available as well as the evidence base for practice.
- Translate the most up to date public health and scientific research information on food, health and disease into practical advice to facilitate behaviour change and enable people to make appropriate lifestyle and food choices.
- Show awareness of his/her role and sphere of influence within the organisation, and demonstrate the ability to work in a collaborative manner with a range of healthcare professionals and other staff in enabling safe and effective dietetic service delivery.
- Understand the limits of his/her current scope of practice and work within these and demonstrate awareness of the clinical risks associated with any dietetic care plan.
- Show familiarity with government policies for the provision of health care as they impinge on the dietetic service and understanding of policy issues concerned with public health nutrition in Ghana.
- Demonstrate familiarity with the current systems for the provision of health care, education and social sciences and recognise opportunities to influence health and social policy and practices.
- Demonstrate a systematic understanding of the key aspects of the range of disciplines underpinning dietetics and ability to critically evaluate and synthesize these key aspects into dietetic care.

LEVEL 100 COURSES
All the courses at Level 100 are compulsory

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
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<tbody>
<tr>
<td>SAHS 101</td>
<td>Introductory Statistics</td>
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<tr>
<td>SAHS 103</td>
<td>Physical and Inorganic Chemistry</td>
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<td>SAHS 105</td>
<td>Organic Chemistry</td>
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<td>SAHS 107</td>
<td>Chemistry Practical I</td>
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<td>SAHS 109</td>
<td>General Physics</td>
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<tr>
<td>SAHS 111</td>
<td>Biology</td>
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<tr>
<td>SAHS 113</td>
<td>Introduction to Computer Studies</td>
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<td>SAHS 115</td>
<td>Clinical Reasoning in Health Sciences</td>
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<td>UGRC 110</td>
<td>Academic Writing I</td>
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<th>SEMESTER 2</th>
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<tr>
<td>DIET 102</td>
<td>Introduction to Professional Studies</td>
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<tr>
<td>SAHS 102</td>
<td>General Anatomy</td>
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<td>SAHS 106</td>
<td>General Physiology</td>
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<td>SAHS 108</td>
<td>General Physiology Practical</td>
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<td>SAHS 122</td>
<td>Introductory Biochemistry</td>
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<td>MLAB 102</td>
<td>Analytical Chemistry and Instrumentation</td>
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<td>GSPH 214</td>
<td>Writing for Public Health</td>
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<tr>
<td>UGRC 220-238</td>
<td>Introduction to African Studies</td>
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DIET 200: Professional Practice Placement: Clinical Attachment I
Introductory Clinical Practice
(6 weeks, 120 hours)
## LEVEL 200 COURSES

All the courses at Level 200 are compulsory

<table>
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<tr>
<th>SEMESTER 3</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>DIET 201</td>
<td>Communication Skills &amp; Nutrition Education</td>
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<tr>
<td>DIET 203</td>
<td>Basic Concepts in Nutrition</td>
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<tr>
<td>SAHS 201</td>
<td>Computer Applications</td>
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<td>SAHS 203</td>
<td>Statistics</td>
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<tr>
<td>SAHS 205</td>
<td>Introductory Biochemistry II</td>
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<tr>
<td>PSYC 307</td>
<td>Human Growth and Development I</td>
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<tr>
<td>SOCI 316</td>
<td>Medical Sociology</td>
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<th>SEMESTER 4</th>
<th>Course Code</th>
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<tbody>
<tr>
<td>SAHS 202</td>
<td>Immunology</td>
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<td>SAHS 204</td>
<td>General Pathology</td>
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<tr>
<td>DIET 202</td>
<td>Nutrition Assessment</td>
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<td>DIET 204</td>
<td>Nutritional Biochemistry</td>
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<tr>
<td>DIET 206</td>
<td>General Anatomy for Dietitians</td>
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<tr>
<td>DIET 208</td>
<td>Microbiology</td>
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<tr>
<td>DIET 210</td>
<td>Microbiology (Practical)</td>
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<td>DIET 212</td>
<td>Food Analysis (Practical)</td>
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<tr>
<td>PSYC 308</td>
<td>Human Growth and Development II</td>
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<tr>
<th>Course Code</th>
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<tr>
<td>DIET 300:</td>
<td>Professional Practice Placement: Clinical Attachment II</td>
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<tr>
<td></td>
<td>Introductory Clinical Practice <strong>(6 weeks, 180 hours)</strong></td>
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## LEVEL 300 COURSES

All the courses at Level 300 are compulsory

<table>
<thead>
<tr>
<th>SEMESTER 5</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SAHS 301</td>
<td>Research Methodology</td>
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<tr>
<td>DIET 303</td>
<td>Food Service and Catering Management (Theory)</td>
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<tr>
<td>DIET 305</td>
<td>Food Service and Catering Management (Practical)</td>
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<tr>
<td>DIET 307</td>
<td>Nutrition in the Life Cycle</td>
<td>2</td>
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<tr>
<td>DIET 309</td>
<td>Genetics</td>
<td>2</td>
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<tr>
<td>DIET 310</td>
<td>Dietetic Practicum I <strong>(9 hrs x 17 wks: 153 hrs)</strong></td>
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<tr>
<td>DIET 311</td>
<td>Co-ordinated Course in Physiology and Biochemistry</td>
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<tr>
<td>DIET 313</td>
<td>Food Safety</td>
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<tr>
<td>DIET 315</td>
<td>Pharmacology in Dietherapy</td>
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<tr>
<th>SEMESTER 6</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SAHS 302</td>
<td>Health Law and Ethics</td>
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<td>DIET 302</td>
<td>Food Quality, Processing and Preservation</td>
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<td>DIET 304</td>
<td>Food Quality, Processing and Preservation (Practical)</td>
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<td>DIET 306</td>
<td>Diet and Diseases I</td>
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<td>DIET 308</td>
<td>Diet Therapy I</td>
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<tr>
<td>DIET 310</td>
<td>Dietetic Practicum (I) <strong>(9 hrs x 17 wks: 153 hours)</strong></td>
<td>3</td>
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<tr>
<td>DIET 314</td>
<td>Community Nutrition</td>
<td>2</td>
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<tr>
<td>DIET 316</td>
<td>Food Habits</td>
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</table>
DIET 400: Professional Practice Placement: Clinical Attachment III
Introductory Clinical Practice (6 weeks, 180 hours) 2

LEVEL 400 COURSES
All the courses at Level 400 are compulsory

SEMIESTER 7
SAHS 401 Principles of Management 2
DIET 400 Dietetic Practicum II 4
(D12hrs x17wks: 204 hours)
DIET 403 Diet and Disease II 3
DIET 405 Diet Therapy II 3
DIET 407 Nutrition and Health Promotion 2
DIET 410 Project Work 4

SEMIESTER 8
SAHS 402 Applied Health Service Management 3
DIET 404 Diet and Disease III 3
DIET 406 Diet Therapy III 3
DIET 408 Special Topics in Nutrition and Dietetics 2
DIET 410 Project Work 4
DIET 412 Dietetic Practicum II 4
(12hrs x17wks: 153 hours)

TOTAL CLINICAL HOURS 1302

COURSE OUTLINES

DIET 102 INTRODUCTION TO PROFESSIONAL PRACTICE
This course is designed to introduce students to the skills, attitudes and behaviour required of dieticians in the health sector in relation to patients, public and health professionals.

DIET 201 COMMUNICATION SKILLS AND NUTRITION EDUCATION
The work of dieticians involves dealing with groups of people or individual clients. Consequently good communication skill is a vital requirement. This course allows students to develop their knowledge and skills in verbal and written communication and also emphasizes on ethical implications. The course further seeks to provide an understanding of nutrition education and its use in promoting attitudinal changes that result in eating practices and food habits that promote health and well-being.

DIET 202 NUTRITION ASSESSMENT
This course introduces the student to methods of measuring and monitoring of nutritional status of groups and individuals in health and disease. Emphasis is laid on dietary, nutritional, anthropometrical, clinical, biochemical, health and social indicators essential for adequate nutrition intervention.

DIET 203 BASIC CONCEPTS IN NUTRITION
This course deals with the properties and functions of food constituents, including the functions, metabolism, and sources of the main macro- and micro-nutrients, effects of deficiency and toxicity, and the various food commodity groups.

DIET 204 NUTRITIONAL BIOCHEMISTRY
The biochemical basis for mammalian nutritional requirements will be surveyed. Diets will be analyzed for nutritional adequacy and the consequences of nutritional deficiencies will be elaborated. The relationship between energy expenditure, energy uptake, and weight loss or gain will be studied. Recent studies on gene expression and nutrients, free-radicals, leptins and integration of metabolism will be discussed. Selected biomarkers of nutritional status will be discussed.
DIET 206  GENERAL ANATOMY FOR DIETITIANS
This course is designed to give students the grounding in the structural and functional basis of certain systems in the human body. It will build on the knowledge previously acquired in General Anatomy and General Physiology. The course will therefore focus on and study in detail specific organ systems in the body that are of direct relevance and importance for dietitians.

DIET 208  MICROBIOLOGY
This course has been designed to promote food-borne infectious disease control through protective measures primarily within the responsibility of the individual that promote health and limit the spread of food-borne infectious diseases in families and communities.

DIET 210  MICROBIOLOGY PRACTICAL
This course involves laboratory exercises, presenting techniques and fundamental principles of modern microbiology. It is designed to complement the information presented in DIET 313. The practicals cover a variety of microbial techniques, with experiments designed to illustrate basic concepts of parasitology, bacteriology, virology and immunology (with emphasis on food-related microbes).

DIET 212  FOOD ANALYSIS (PRACTICAL)
The aim of this course is to introduce students to analytical techniques for the determination of macronutrient constituents of foods and formulated diets. The course involves laboratory introduction to principles and analytical techniques of nutritional research. It emphasizes on analytical concepts and skills required to determine nutrient function and methods for assessing the composition of foods. Students will gain knowledge on the concept of preparing food samples for analysis and how to operate instruments, which are used to analyze food.

DIET 302  FOOD QUALITY, PROCESSING AND PRESERVATION (THEORY)
The course provides an overview of food processing and preservation techniques. Principles of food preservation and processing by different techniques such as heating, chilling, freezing, dehydration, canning, salting, etc. for meat, vegetables and dairy products are discussed. Methods used in prolonging the shelf life of foods and their effects on the quality and safety of food, food additives, post harvest technology and management and health risks associated with foods are also covered.

DIET 303  FOOD SERVICE AND CATERING MANAGEMENT (THEORY)
This course aims at equipping students with basic food preparation methods, which is integrated with work on portion size and modification of diet to meet special dietary needs in some clinical conditions. It explores basic food science principles through food preparation, recipe modification, and sensory evaluation (taste testing required). Students are introduced to basic cooking skills, techniques, and recipe modification. Basic menu planning and meeting nutritional requirements while restricted to a budget are also covered.

DIET 304  FOOD QUALITY, PROCESSING AND PRESERVATION (PRACTICAL)
The course provides students some analytical skills for the evaluation of food quality using laboratory exercises to determine some physical, chemical and microbiological characteristics of foods. It covers analysis of foods and food products for chemical components, compliance to standards and detection of adulterants in foods. It equips students with practical skills related to preservation of foods and the use of various techniques and additives for food preservation.

DIET 305  FOOD SERVICE AND CATERING MANAGEMENT (PRACTICAL)
This course aims at equipping students with basic food preparation methods which is integrated with work on portion size and modification of diet to meet special dietary needs in some clinical conditions. The understanding of food ingredients and techniques of food preparation is applied to positive nutritional practices and health promotion goals. Assigned recipes are prepared during each laboratory.

DIET 306  DIET AND DISEASE I
The course covers the basic biochemical, physiological and pathological processes in some diseases that are caused by dietary abnormalities and/or require dietary modifications in their clinical management. The aim is to help students develop an understanding of the causes of disease and an appreciation of the methods used to make an accurate diagnosis and to be able to recognize the clinical signs and symptoms of disease and to communicate this effectively to patients and family in context. It will look at how the diseases covered are medically managed.
DIET 307  NUTRITION IN THE LIFE CYCLE
The course covers the nutrient requirement and special nutrition concerns during various stages of human growth and development. The biology of the life cycle including development, growth, maturation and ageing and its impact on nutritional requirements of humans from the zygote to the elderly is covered. The course emphasizes the critical analyses of beneficial and adverse outcomes of various nutrient intakes and dietary patterns on the nutritional status and well-being through integration of nutrition and other health sciences in understanding nutritional needs during the life cycle.

DIET 308  DIET THERAPY I
The course covers the application of dietary modifications in the treatment, management and prevention of disease conditions discussed in Diet and Disease I. It involves a brief summary of the anatomical physiological, and metabolic abnormalities in acute and chronic illness and the role of medical nutritional therapy in their prevention and care. The course focuses on principles of diet therapy, therapeutic adaptations of normal diet, classification of therapeutic diets and assessment of patients needs. Routine Hospital diets – standard and progressive diet, light diet, clear liquids, full liquids, semi solids, soft solids are also discussed.

DIET 309  GENETICS
This course examines the role of nutrients and other biologically active food components on gene expression. Emphasis will be placed on the understanding of how genes and the environment interact and the metabolic and physiologic consequences of these interactions. Students will be introduced to the pathogenesis of genetic aberrations and how these may affect bioavailability of food nutrients.

DIET 310  DIETETIC PRACTICUM I
This is a clinical course that provides opportunities for the dietetics student to observe and gain experience dietetics practice. It involves application of knowledge gained in theoretical courses to patient management. Students will be introduced to art of history taking and the science of interpreting laboratory results.

DIET 311  CO-ORDINATED COURSE IN PHYSIOLOGY AND BIOCHEMISTRY
The course seeks to develop a critical understanding of the biochemical nature of bio-molecules and their metabolic function and reviews gastro-intestinal physiology and the physiology of metabolism as relates to energy balance and neuro-endocrine regulation of food intake.

DIET 313  FOOD SAFETY
This course covers the issues of food safety and the methods for prevention and control of food hazards. It covers hazards and toxicity associated with food and their implications for health, the regulations and the monitoring agencies involved food safety and food standards food laws. The role of different food additives in the processing of different foods and their specific functions in improving the shelf life, quality, texture and other physical and sensory characteristics of foods.

DIET 314  COMMUNITY NUTRITION
This course aims to critically evaluate the factors affecting diets of various populations and to provide understanding of community nutrition problems and appropriate intervention methods to address these problems. It defines the scope of community nutrition and the relationship between social stratification and nutritional status. It covers nutrition surveys, surveillance and monitoring of community programmes and schemes and community based nutrition intervention strategies. It equips students to manage the nutritional care of population groups across life cycle.

DIET 315  PHARMACOLOGY IN DIET THERAPY
The course provides a general overview of pharmacology, including kinetics, dynamics, classification and therapeutics of drugs, and principles and mechanisms of drug action. Special emphasis is put on drug-nutrient interactions. The aim is to equip the dietetics student with ability to determine whether medical problems are due to food-drug interactions.

DIET 316  FOOD HABITS
This course is designed to create awareness of the economic, religious, cultural, socio-political and psychological factors that influence the eating habits of individuals and communities. It covers the historical perspective between early food habits and social organization, diversity of food habits and patterns across cultures.
DIET 403  DIET AND DISEASE II
This course continues on DIET AND DISEASE I and covers the basic biochemical, physiological and pathological processes in some diseases that are caused by dietary abnormalities and/or require dietary modifications in their clinical management. It aims at helping students to develop an understanding of the causes and underlying processes and mechanisms of disease and an appreciation of the methods used to effect an accurate diagnosis and to develop an ability to recognize the clinical signs and symptoms of disease and an ability to communicate this effectively in context. Medical management of the diseases described will be covered.

DIET 404  DIET AND DISEASE III
This course is a continuation of DIET AND DISEASE II and covers the basic biochemical, physiological and pathological processes in some diseases that are caused by dietary abnormalities and/or require dietary modifications in their clinical management. It aims at helping students to develop an understanding of the causes and underlying processes and mechanisms of disease and an appreciation of the methods used to effect an accurate diagnosis and to develop an ability to recognize the clinical signs and symptoms of disease and an ability to communicate this effectively in context. Medical management of the diseases described will be covered.

DIET 405  DIET THERAPY II
The course covers the application of dietary modifications in the treatment, management and prevention of disease conditions discussed in Diet and Disease II. It covers principles of diet therapy, therapeutic adaptations of normal diet, classification of therapeutic diets and assessment of patients needs. It involves a brief summary of the anatomical, physiological, and metabolic abnormalities in acute and chronic illness and the role of medical nutritional therapy in their prevention and care.

DIET 406  DIET THERAPY III
The course covers the application of dietary modifications in the treatment, management and prevention of disease conditions discussed in Diet and Disease III. It covers principles of diet therapy, therapeutic adaptations of normal diet, classification of therapeutic diets and assessment of patients needs. It involves a brief summary of the anatomical, physiological, and metabolic abnormalities in acute and chronic illness and the role of medical nutritional therapy in their prevention and care.

DIET 407  NUTRITION AND HEALTH PROMOTION
This course seeks to develop an understanding of the theory of health promotion in relation to nutrition, sports ethics and lifestyle changes. Students learn the theoretical basis of effective health promotion communications and develop effective nutrition communication skills through application in a variety of settings. Provides hands-on experiences in counselling, educational program development, awareness campaigns and oral and written communications.

DIET 408:  SPECIAL TOPICS IN NUTRITION AND DIETETICS
This course is designed to provide students with insight into current issues in nutrition and dietetics through critical review of literature and concise and organised presentation of facts. It provides students with an understanding of selective current nutrition issues and prepares students to render evidence-based conclusions about topics of interest to the public, government and industry using a framework that is founded in the analysis of research. The course affords students the opportunity to acquire knowledge and skills in understanding nutritional science literature and the implications of interpreting data and formulating conclusions about nutrition issues.

DIET 410  PROJECT WORK
The course is designed to teach students how to gather information, analyze, present and discuss data and address current issues in dietetics. Students are given the opportunity to conduct an individual investigation of a diet-related problem.

DIET 412  DIETETIC PRACTICUM III
The course provides practical experience for dietetic students to work with practicing dieticians in Hospitals and elsewhere. It builds on the experiences obtained in the vocational training periods and practicum I.
PROFESSIONAL PRACTICE PLACEMENT

DIET 200  CLINICAL ATTACHMENT I
This is a 4-week, whole day, inter-semester clinical training period at the end of semester 4 (i.e. during the long vacation). Students will undertake introductory clinical training involving directed observation and clinical experience to allow them to obtain practical hands-on experience. The attachment will be undertaken in Korle-Bu Teaching Hospital, Ridge Hospital, 37 Military Hospital, Princess Marie Louise Hospital and Tema General Hospital. It will be extended to Komfo Anokye Teaching Hospital, Efia Nkwanta Hospital, Ho Regional Hospital, Cape Coast Regional Hospital and Koforidua Regional Hospital as and when students’ numbers increases. Students shall be evaluated at the end of the vocational training. The course is a pre-requisite for level 300 courses in Dietetics. Students will complete a logbook and will be assessed at the end of the course using the logbook and an oral examination.

DIET 300  CLINICAL ATTACHMENT II
This is a 6-week, whole day, inter-semester clinical training period at the end of semester 6 (i.e. during the long vacation) during which students work independently but under supervision of faculty and/or experienced dieticians to obtain practical hands-on experience in patient assessment, diagnosis, counselling and dietary management. The vocational training will be undertaken in Korle-Bu Teaching Hospital, Ridge Hospital, 37 Military Hospital, Princess Marie Louise Hospital, and Tema General Hospital. It will be extended to Komfo Anokye Teaching Hospital, Efia Nkwanta Hospital, Ho Regional Hospital, Cape Coast Regional Hospital and Koforidua Regional Hospital as and when students’ numbers increases. Students shall be evaluated at the end of the vocational training. The course is a pre-requisite for level 400 courses in Dietetics. Students will complete a logbook and will be assessed at the end of the course using the logbook and an oral examination.

DIET 400  CLINICAL ATTACHMENT III
This is a 6-week, whole day, inter-semester clinical training period at the end of semester 6 (i.e. during the long vacation) during which students work independently but under supervision of faculty and/or experienced dieticians to obtain practical hands-on experience in patient assessment, diagnosis, counselling and dietary management. The vocational training will be undertaken in Korle-Bu Teaching Hospital, Ridge Hospital, 37 Military Hospital, Princess Marie Louise Hospital, and Tema General Hospital. It will be extended to Komfo Anokye Teaching Hospital, Efia Nkwanta Hospital, Ho Regional Hospital, Cape Coast Regional Hospital and Koforidua Regional Hospital as and when students’ numbers increases. Students will complete a logbook and will be assessed at the end of the course using the logbook and an oral examination.

BSC IN OCCUPATIONAL THERAPY

DEPARTMENTAL OBJECTIVES
The programme is to:
1. Equip students with the specific knowledge based and skills that are required for competent practice of occupational therapy at the beginning level;
2. Develop students’ understanding of the holistic nature of a person’s health status and its implications on the delivery of health care service with emphasis on rehabilitation;
3. Develop students’ analytical thinking, problem solving, interpersonal and communication skills;
4. Develop students’ ability to integrate knowledge, skills and attitudes to practice competently in occupational therapy;
5. Develop students’ skills in self-directed learning and positive attitudes towards continuing professional and personal development.
6. Synthesize current biological, behavioural and clinical sciences for occupational therapy practice with due reference to the holistic approach to health care issues;
7. Plan, implement and evaluate programmes of therapy which help patients/clients acquire adaptive skills, social effectiveness and physical abilities essential for participation in own life roles;
8. Contribute to the planning, organising, staffing, leading and assuring the quality of service of an occupational therapy unit;
9. Apply knowledge and interpersonal skills learned to work co-operatively as a member of the health care team which aims at reintegrating the disabled back to their families and into the community; and,

LEVEL 100 COURSES
All the courses at Level 100 are Compulsory

SEMESTER 1
SAHS 101 Introductory Statistics 2
SAHS 103 Physical and inorganic Chemistry 2
SAHS 105 Organic Chemistry 2
SAHS 107 Chemistry Practical 1
SAHS 109 General Physics 2
SAHS 111 Biology 2
UGRC 110 Academic Writing I 3
SAHS 113 Introduction to Computer studies 1
SAHS 115 Clinical Reasoning in Health Sciences 3

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SEMESTER 2
SAHS 102 General Anatomy 3
SAHS 104 General Anatomy Practical 1
SAHS 106 General Physiology 3
SAHS 108 General Physiology Practical 1
OTTR 102 Introductory to Occupational Therapy 2
SAHS 112 Introductory Psychology for Allied Health Sciences 2
SAHS 122 Introductory Biochemistry 2
UGRC 220-238 Introduction to African Studies 3
GSPH 214 Writing for Public Health 3

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OTTR 100 VOCATIONAL PRACTICE PLACEMENT 3
This is a 6-week inter semester clinical training period at the end of semester 2 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will undertake introductory clinical training in an accredited Hospital Ward/Unit. Students shall be evaluated at the end of the clinical affiliation. The course is a pre-requisite for Level 200 in Occupational Therapy.

LEVEL 200 COURSES
All the courses at Level 200 are compulsory

SEMESTER 3
OTTR 203 Occupational Therapy Theory and Practice 2
PSTR 201 Advanced Anatomy 2
PSTR 203 Advanced Anatomy Practical 1
SAHS 205 Basic Computer Application 3
PSCY 307 Human Growth & Development I 3
SAHS 207 General Biochemistry 2
SAHS 211 Statistics 2
SAHS 209 Medical Sociology for Allied Health Sciences 2

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SEMESTER 4
PSTR 206 Neuroscience 2
OTTR 202 Occupational Therapy for Physical Dysfunction 3
OTTR 204 Individuals, Institutions and Change 2
PSTR 208 Health Promotions and Disease Prevention 2
OTTR 200  VOCATIONAL PRACTICE PLACEMENT  3
This is a 6-week inter semester clinical training period at the end of semester 4 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will undertake introductory clinical training in an accredited Hospital Ward/Unit. Students shall be evaluated at the end of the clinical affiliation. The course is a pre-requisite for all Level 300 courses in Occupational Therapy.

LEVEL 300 COURSES
All the courses at level 300 are compulsory

SEMESTER 5
OTTR 301  Enabling Expression of Needs  2
PSTR 301  Kinesiology  2
PSTR 307  Neuro-rehabilitation I  2
OTTR 303  Environmental Planning I  3
OTTR 305  Orthotics/Seating  3
OTTR 307  Occupational Therapy Practice Skills I (Practical)  2
SAHS 301  Research Methodology  2
PSTR 309  Rheumatology  2
PSTR 311  Systemic Pathology  2

SEMESTER 6
OTTR 302  Designing for Clients Needs (+ Practical)  3
PSTR 302  Traumatic Skeletal Disorders  2
PSTR 304  Neuro-Rehabilitation II  2
SAHS 302  Health Law and Ethics  2
OTTR 304  Environmental Planning II (Building design)  2
OTTR 306  OT for Psychosocial Dysfunction  3
OTTR 308  Management of Practice and Change  2
OTTR 312  Community Therapy Services  3

OTTR 300  VOCATIONAL PRACTICE PLACEMENT  3
This is a 6-week inter-semester clinical training period at the end of semester 6 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will undertake clinical attachment at a Hospital ward/Unit in an accredited health facility. There shall be an evaluation at the end of the clinical attachment. The course is a pre-requisite for all Level 400 courses in Occupational Therapy.

LEVEL 400 COURSES
All the courses at level 400 are compulsory

SEMESTER 7
OTTR 401  Occupational Therapy Practice Skills II  2
OTTR403  Inter-professional Assessment  2
PSTR 403  Dermatology & Burns  2
OTTR 405  OT for Developmental Dysfunction (Pediatrics)  2
OTTR 407  Geriatrics OT  2
SAHS 401  Principles of Management  3
OTTR 400  Practice Placements I (intra sem.) 3days/week  3
OTTR 410  Project (Dissertation)  3

SEMESTER 8
SAHS 402  Applied Health Sciences Management  3
OTTR 402  Vocational Rehabilitation for OT  2
OTTR 404  Evidencing Practice & Debate on OT current Issues  2
COURSE DESCRIPTIONS AND CONTENTS

OTTR 201  INTRODUCTION TO OCCUPATIONAL THERAPY
This unit is focused on ensuring clear understanding of the profession of Occupational therapy and the historical development. The unit examines the ability to confidently discuss Occupational Therapy in the areas of philosophy, models, and scope of practice, prospects, associated limitations and the role of the occupational therapist in the health care system.

OTTR 203  OCCUPATIONAL THERAPY THEORY AND PRACTICE
The unit is to assist students to gain understanding of disability in the socio-cultural context. The unit will further inform on OT theoretical frameworks and approaches used for different disabling conditions and situations. Students will be expected to appreciate information gathering, synthesizing and importance of confidentiality in Occupational Therapy practice.

OTTR 202  OCCUPATIONAL THERAPY FOR PHYSICAL DYSFUNCTION
This course will examine areas to develop students understanding of the impact of altered physical function on occupational performance. Students will be introduced to skills of assessment and recording. It will also examine in-depth knowledge and demonstration of understanding in evaluating neuromuscular and motor skills, somatic sensory function, special senses, cognitive and perceptual skills in relation to occupational performance.

OTTR 204  INDIVIDUALS, INSTITUTIONS AND CHANGE
The course will assist the student to develop awareness of the needs of persons who have been, are, or could be affected by institutional living. The course will enhance students understanding on how to integrate knowledge on healthcare services with the study of effects of institutional living and the application of theory and concepts of change and its management.

OTTR 301  ENABLING EXPRESSION OF NEEDS
This unit will examine the development of different forms of communications and consider the occupational performance needs of people with related communication difficulty. The unit will also examine the normal development of communication skills associated with communication problems and the impact on occupational performance. Students will appreciate and evaluate a range of tools and techniques associated with assessment and treatment of persons with communication disorders. The unit will again assist the student to develop an understanding of the function of the variety of supporting services and agencies relevant to communication and inter agency working with the OT.

OTTR 303  ENVIRONMENTAL PLANNING I
This unit will examine areas to gaining understanding of the influence of the environment on enabling occupation. This will explore the concept of disability and its associated legal issues. Students will also be guided through the exploration of the concept of community.

OTTR 305  ORTHOTICS & SEATING
This unit will examine occupational performance components deficits with a variety of conditions/injuries. The unit will explore the analysis and assessment on how orthotic interventions may address and facilitate different levels of occupational performances. The unit will further examine appropriate use of wheelchair by wheelchair dependants and their carers to mitigate affected occupational performance areas.

OTTR 307  OCCUPATIONAL THERAPY PRACTICE SKILLS I (PRACTICAL)
The unit will examine skills and techniques in the assessment of performance components of occupational performance areas of self-care, productivity and leisure with consideration to physical and social/cultural environment. The student would be able to interpret and record a full assessment of patients with physical dysfunction.
OTTR 302  DESIGNING FOR CLIENTS’ NEEDS (PRACTICAL DEMONSTRATION)
This unit is based on problem solving and practical workshop activity. Students will work in groups and will have the opportunity to make a prototype, or adapt a piece of domestic or therapeutic equipment to meet the needs of an identified client or client group. The unit will guide students to explore and describe materials which are locally available, and their potential usage in construction of adaptive equipment.

OTTR 304  ENVIRONMENTAL PLANNING II
This unit will examine the need to enable students to be fully aware of how the environment can be physically adapted to facilitate independence in all areas of activity of daily living. Students will demonstrate basic technical drawing techniques in order to be able to understand building plans and to draw adaptations. The unit will also examine areas of communicating knowledgeably with others responsible for providing accessible and suitable work environments for disabled persons and domestic settings for disabled and elderly people.
There will also be the need to examine relevant legislative factors affecting environmental design and provision of work place and domestic fixtures and fittings.

OTTR 306  OCCUPATIONAL THERAPY FOR PSYCHOSOCIAL DYSFUNCTION
The unit will enlighten students to gain understanding of mental illness in relation to occupational performance. The unit also examines how OT improves functional capacity and quality of life for people with mental illness in the areas of employment, education, community living, and home and personal care through the use of real life activities in therapy treatments.

OTTR 308  MANAGEMENT OF PRACTICE AND CHANGE
This unit will assist students to develop skills of self efficacy, applying personal and organisational theory to the effective management of professional practice. The unit will also examine the theory and practice of personal management and organisational skills to evaluate opportunities and constraints upon the development of professional practice within changing health service systems.

OTTR 312  COMMUNITY THERAPY SERVICES
The unit examines further in-depth understanding of the influence of the environment on enabling occupation. The unit dwells on earlier knowledge on the concepts of community, societal structure and the importance of meaningful occupation. Emphasis is laid on WHO model of CBR and how the therapist could work with other MDT members to sustain this community rehabilitation model.
The unit is aimed to making therapy services accessible, acceptable, and affordable in the community setting.

OTTR 401  OCCUPATIONAL THERAPY PRACTICE SKILLS II (PRACTICAL)
The unit will examine areas to assist students to have a thorough understanding of the occupational therapy process and its application.
The area of study will lead to demonstrate a good understanding of each stage of the occupational therapy process.

OTTR 403  INTER-PROFESSIONAL ASSESSMENT
The unit will provide students with an opportunity to explore areas of professional assessment of individuals and family care needs while working with other professional team members. The unit will compare and contrast professional roles and boundaries within the inter-disciplinary team and analyse the concept of effective team work to provide holistic care.

OTTR 405  OCCUPATIONAL THERAPY FOR DEVELOPMENTAL DYSFUNCTION
To enable students to have knowledge and skills to plan and carry out assessment and treatment of children with common conditions as seen in OT practice. The unit will assess occupational performance areas of self care, play, productivity and leisure. The unit will ensure students appreciation to various developmental disabilities in the areas of identification and management.

OTTR 407  OCCUPATIONAL THERAPY AND GERIATRICS
This area will examine knowledge and skills to plan and carry out OT assessment and treatment with elderly patients with common physical conditions as seen in OT practice. The unit will enable the ability to construct OT assessment and treatment plans.

OTTR 402  VOCATIONAL REHABILITATION
The unit will explore the philosophy and purpose of vocational rehabilitation/ training. This area of study will enable students to acknowledge how healthy working life continually provides working age people with the opportunity, ability, support and encouragement to work in ways which allows them to sustain and improve their health and
wellbeing. The unit takes into consideration sense of identity, social structure and routine, social networks, skills and meaning to the concept of leisure.

**OTTR 404 EVIDENCING PRACTICE & DEBATE ON CURRENT OCCUPATIONAL THERAPY ISSUES**

This unit aims to develop a basic understanding of the methods used to provide evidence to underpin professional practice in occupational therapy. It examines the ability to understand how the academic knowledge base of the profession is developed and applied.

The unit also examine current socio-political issues and their effect on OT practice and development.

Students will also be introduced to process management of transition from students to qualified practitioners.

**OTTR 400 PRACTICE PLACEMENT (ROTATION)**

This course is a two semester-long practice placement during level 400 in 3 different settings (Physical Health, Mental Health, and Rehabilitation Centre) to develop students’ identification with the occupational therapy profession through observation and practice under supervision.

Students will be doing three days per week in semester 7 and two days per week during semester 8 when they will be assessed.

The placement will be scheduled as 10 weeks in physical health, 10 weeks in mental health and 14 weeks at a CBR centre. Students will be expected to manage a case load of three to four clients or groups under supervision.

Students will be provided with detailed information on specific objectives for each skill area in a logbook and they shall complete each area in relation to experiences obtained on the field.

Each student is expected to write a journal with details of the facility, write up three case studies and reflection on learning.

Students will be assessed using the logbook and an oral examination.

**INTER-SEMESTER VOCATIONAL PRACTICE COURSES**

These courses are taken during the inter-semester breaks and so run in three segments, each lasting 6 weeks. Students are required to spend a minimum of 4 hours each day.

**OTTR 100**

This is a whole day clinical training at the end of semester 2. Students will undertake introductory clinical training involving direct observation and clinical experience to allow them to become familiar with Departmental routine and to experience patient care in the clinical reception. The students will learn about appointment system, initial referral clinic appointments, review clinic/appointment and follow-up clinic/appointment and the organization of occupational therapy service in the country.

The attachment will be undertaken in Korle-Bu Teaching Hospital and the Pantang Mental Hospital and any other suitable hospital as determined by the Department and approved by the SAHS Board.

Students will complete a logbook and will be assessed at the end of the training using the logbook and an oral examination.

**OTTR 200**

This is the second segment is an 8-week, whole day clinical training period at the end of semester 4. Students will begin to apply theoretical knowledge and develop the range of skills needed to work as an occupational therapist with specified clients/care groups in a range of work settings.

The attachment will be undertaken in Korle-Bu Teaching Hospital and Pantang Mental Hospital and any other suitable hospital as determined by the Department and approved by the SA.

Students will complete a logbook and will be assessed at the end of the training using the logbook and an oral examination.
OTTR 300
This is the third and last segment and takes place at the end of semester 6. It is a clinical posting that offers students experiences in a range of settings which include acute hospital wards and out patients’ centres and community rehabilitation centres. Students are expected to further develop their practices which will include devising, monitoring and review of care plans for various disabling conditions. Students will complete a logbook and will be assessed at the end of the training using the logbook and an oral examination.

GRADUATION REQUIREMENTS
i. Candidates shall have satisfied ALL University and Faculty Requirements
ii. Candidates shall have taken and passed all courses at Levels 200 (36 credits) 300 (40 credits)
iii. Candidates shall be required to specialize in one of the four subject areas at Level 400 as follows:

Microbiology
For specialization in Microbiology, candidates shall have taken and passed all Level 400 courses (36 credits) in Microbiology plus Project Work in an approved area of Microbiology; as well as all the courses in Laboratory Organization and Applied Health Service Management. A total of 125 credits shall have been accumulated.

Histotechnology/Cytotechnology
For specialization in Histotechnology/Cytotechnology, candidates shall have taken and passed all Level 400 courses (38 credits) in Pathology plus Project Work in either Histotechnology or Cytotechnology and all the courses in Laboratory Organization and Applied Health Service Management. A total of 128 credits shall have been accumulated.

Chemical Pathology
For specialization in Chemical Pathology, candidates shall have taken and passed all Level 400 courses (37 credits) in Chemical Pathology plus Project Work in an approved area of Chemical Pathology; as well as all the courses in Laboratory Organization and Applied Health Service Management. A total of 129 credits shall have been accumulated.

Haematology
For specialization in Haematology, candidates shall have taken and passed all Level 400 courses (37 credits) in Haematology plus Project work in an approved area of haematology; as well as all the courses in Laboratory Organization and Applied Health Service Management. A total of 128 credits shall have been accumulated.

The courses in Introduction to African Studies are compulsory.

ACADEMIC YEAR
The Academic Session shall comprise two semesters.

STRUCTURE OF SEMESTER
A semester shall be of 20 weeks duration, which shall be structured as follows:
  17 weeks of Teaching
  1 week of Revision
  2 weeks of Examinations

DURATION OF PROGRAMME
1. The minimum period for completing the Bachelor’s degree programmes shall be 8 semesters and the maximum period shall be 12 semesters.
2. A student who is unable to complete his/her programme within the maximum period allowed shall lose all credits accumulated, and his/her studentship cancelled. Such a student may, however, be allowed to re-apply for admission into the University.
3. The minimum and maximum periods are calculated from the date of first registration.

INTERRUPTION OF STUDY PROGRAMME
1. A student may break his/her study programme but may not break for more than 4 continuous semesters, so however that the maximum period allowable for the completion of the programme is not exceeded.
2. A student who wishes to interrupt his/her course of study shall apply in advance to the Dean of the School, stating reasons why he/she wants to interrupt his/her study programme, and permission duty granted before he/she leaves the University. The Executive Secretary/Senior Assistant Registrar shall communicate the decision of the Dean to the applicant before he/she leaves the University.

3. A student who interrupts his/her studies for more than 4 continuous semesters shall be deemed to have lost any accumulated credits. Consequently, his/her studentship shall be cancelled. Such a student may, however, be allowed to re-apply for admission into the University.

COURSE CREDIT
One (1) course credit shall be defined as follows:
   i. One-hour tutorial, or
   ii. One practical session (of two or three hours), or
   iii. Six hours of field work.
   per week for a semester

WRITTEN EXAMINATIONS
These may take the form of a combination of the following:
   i. Written essays lasting not more than 30 minutes per question each
   ii. Short essays not lasting more than 15 minutes per question each
   iii. Multiple choice questions

PRACTICAL/CLINICAL EXAMINATION REQUIREMENTS
Candidates are required to pass practical/clinical examinations, which shall include an oral component, at levels 300 and 400. Candidates shall obtain a minimum mark of 50% in order to pass.

PROJECTS
All candidates shall be required to undertake an oral defence of their project work. A minimum of 50% shall be required to pass.

GRADING SYSTEM
Student performance in a course shall be graded as follows:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Marks</th>
<th>Grade Point</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80 – 100</td>
<td>4.0</td>
<td>Outstanding</td>
</tr>
<tr>
<td>B+</td>
<td>75 – 79</td>
<td>3.5</td>
<td>Very Good</td>
</tr>
<tr>
<td>B</td>
<td>70 – 74</td>
<td>3.0</td>
<td>Good</td>
</tr>
<tr>
<td>C+</td>
<td>65 – 69</td>
<td>2.5</td>
<td>Fairly Good</td>
</tr>
<tr>
<td>C</td>
<td>60 – 64</td>
<td>2.0</td>
<td>Average</td>
</tr>
<tr>
<td>D+</td>
<td>55 – 59</td>
<td>1.5</td>
<td>Below Average</td>
</tr>
<tr>
<td>D</td>
<td>50 – 54</td>
<td>1.0</td>
<td>Marginal Pass</td>
</tr>
<tr>
<td>*E</td>
<td>45-49</td>
<td>0.5</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>F</td>
<td>0 – 44</td>
<td>0</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Note: *Although this is a failure grade, it may still be accepted as fulfilling prerequisite for other courses.

Other Grades

<table>
<thead>
<tr>
<th>Grade</th>
<th>Interpretation</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Fail</td>
<td>0</td>
</tr>
<tr>
<td>Z</td>
<td>Disqualification</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>0</td>
</tr>
<tr>
<td>Y</td>
<td>Continuing</td>
<td>0</td>
</tr>
<tr>
<td>AUDI</td>
<td>Audit</td>
<td>0</td>
</tr>
</tbody>
</table>
Grade Point (GP): Each Grade is assigned an equivalent grade point as indicated above. The number of (grade) points earned by a student, for each course completed, is computed as the product of the number of credits for the course and the grade point equivalent letter of the grade obtained in that course.

Cumulative Grade Point Average (CGPA): The student's cumulative grade point average is calculated by dividing the total number of grade points obtained, up to any specified time, by the total number for credits of all courses for which the student has registered up to that time.

Final Grade Point Average (FGPA): The FGPA is the CGPA for all courses under consideration calculated up to the end of a student's academic programme.

DEFINITION OF GRADES
Pass Grades: Grades A to D constitute Pass grades.

Failure Grades: Grades E, F, X, Z constitute Failure grades.

Continuing: A grade Y (for Continuing) shall be awarded at the end of a semester to any student who is taking a course which continues into the next semester.

Audit: A grade AUDI shall be awarded for attendance at lectures where no examination is taken, or where an examination is taken, but no mark can be returned, for good reasons. The Grade AUDI is not taken into account in the calculation of the FGPA.

Non-Completion of Course:
1. A grade I (for Incomplete) shall be awarded to a student who is unable to complete a course for reasons adjudged by the Board of Examiners as satisfactory. Such a student shall be expected to complete the course the very next time the course is available.
2. A grade X shall be awarded to a student who is unable to complete a course for reasons adjudged by the Board of Examiners as unsatisfactory.

Disqualification:
1. A grade Z denotes Disqualification from an examination as a result of an examination malpractice or offence, and shall be awarded whenever it is established that a candidate had attempted to gain an unfair advantage in an examination, be it in a Principal subject or an Ancillary or any other paper.
2. A candidate awarded a grade Z may be debarred from taking a University Examination for a stated period, or indefinitely, or may be expelled from the University altogether.
3. A grade Z may be awarded only by the Board of Examiners.

ELIGIBILITY FOR EXAMINATIONS
A student shall attend all such lectures, tutorials, seminars and practicals and undertake all other activities and assignments as are approved by the University in addition to those prescribed for the courses for which he/she has registered.

Each Department shall, with the approval of the Academic Board, determine the requirements for the courses they offer. A student who does not fulfil the requirements for any course shall not be allowed to take the examination for that course.

A student who is absent for a cumulative period of 25% from all lectures, tutorials, practicals and other activities prescribed for any course in any semester shall be deemed to have withdrawn from the course. Such a student shall not be permitted to sit the semester examination.

REGISTRATION FOR EXAMINATIONS
Registration for a University examination shall require endorsement of the Registration List by the Head of department to the effect that the candidate has pursued satisfactorily the approved course(s) of study in each subject being offered over the prescribed period and has attended at least 85 per cent of lectures, tutorials, practicals and other activities prescribed for course(s) of study in the subject. A candidate's registration shall not be valid unless it is so endorsed.

Endorsement shall be withheld if a candidate is deemed not to have followed satisfactorily the approved course of
study. In any event of the withholding of an endorsement, the Head of Department shall request the confirmation by
the Board of the School of Allied Health Sciences.

Where applicable, candidates shall have up to 3 weeks (21 days) from the commencement of the semester within which
to ADD or DROP courses.

After 21 days of the semester, departments shall publish for verification by students, lists of registered candidates for all
the courses offered by the department. The lists of registered candidates shall be forwarded to the Academic Affairs
Office before the end of the sixth week of the semester. **These lists shall be deemed as constituting final registration
for end-of-semester examination.** This means that by the end of the sixth week, students whose names do not appear
in any course list shall not be allowed into the end-of-semester examination for that particular course. Similarly,
students who are duly registered for a course but who fail to take the end-of-semester examination for that course shall
be deemed to have absented themselves from the examination of that particular course, for which grade X shall be
awarded.

**SEMESTER EXAMINATIONS**
Each course, with the exception of a project work shall normally be completed in one semester.

A final (end-of-semester) examination shall normally be required as a part of every course. An examination schedule
showing time and place of examination for each course shall be published each semester.

The marks obtained in the end-of-semester examination shall constitute 70% of the grade for the course while
continuous assessment constitutes the remaining 30%, except for practicals or other courses which are assessed entirely
by continuous assessment.

Time allotted to examination papers shall be as follows:

i. 1- Credit Course - 1 hour
ii. 2- Credit Course - 2 hours
iii. 3 or 4- Credit Course - 2 to 3 hours

**EXTERNAL EXAMINERS**
External examiners shall be required for level 300 and 400 of the programmes.

All External examiners shall be required to submit a written report on all aspects of the examination in which they took
part.

**STUDENT IN GOOD STANDING**
A student in good standing shall be one whose Cumulative Grade Point Average (CGPA) is at least 1.00 (Grade D).

**PASSING AND WITHDRAWAL REGULATIONS FOR PROGRESSION**
**General Regulations**

1. A candidate shall be deemed to have satisfied the requirements for progression if he/she has obtained a CGPA
   of 1.00 or better overall in all examinations.

2. In addition to the above, the candidate shall have satisfied Faculty/Departmental requirements for entry to
   subjects at the next level.

3. There shall be no probation.

4. A candidate who does not qualify to progress to the next level on the basis of 1 and 2 above shall be asked by
   the Registrar to withdraw from the University.

**DEFERMENT OF EXAMINATION**
**On Grounds of Ill-Health:** A student who has satisfied all the requirements as prescribed in Section 22 but is unable
to take the main (end-of-semester) examination on grounds of ill-health, shall, on application to the Registrar, and on
provision of a Medical Certificate issued by the Director of University Health Services, be allowed to defer the
semester examination and take the examination at the next offering. Subsequent applications for deferment on grounds of ill-health shall be subject to a Medical Certificate issued by a properly constituted Medical Board.

**On Grounds Other than Ill-Health:** In cases of requests for deferment on grounds other than ill-health, the appropriate Dean shall invite the applicant for an interview and advise the University accordingly. It shall be the student's responsibility to satisfy the University beyond reasonable doubt why he/she wishes to defer the examinations.

In all cases of requests for deferment of examinations, the applicant(s) shall obtain written responses from the Registrar before leaving the University.

**DECLARATION OF RESULTS**
Results of semester examinations taken at the end of each semester shall normally be published by the Executive Secretary before the commencement of the next semester.

A result slip indicating the student’s performance in the examination shall be made available to the student.

**SUPPLEMENTARY EXAMINATION**

i. A student who fails in any course shall be allowed to re-write the examination in the failed course at a Supplementary Examination to be held in the Long Vacation. If he/she passes the Supplementary Examination he/she shall be awarded a mark not exceeding 50%.

ii. A student shall be allowed to take not more than 5 courses in all subject areas at any one time as Supplementary Examinations.

iii. Supplementary Examinations shall not include continuous assessment marks.

iv. Supplementary Examination shall be held in the long vacation.

**EXAMINERS' BOARD**
There shall be an Examiners Board for the Main and Supplementary Examination in respect of BSc. in Medical Laboratory Sciences, BSc. in Diagnostic Radiography, BSc. in Therapy Radiography, BSc. in Physiotherapy, BSc. in Dietetics and BSc. in Occupational Therapy and all other programmes and at all levels.

The Examiners Board for each programme shall comprise the following:

i. Dean - Chairperson
ii. Head of Department
iii. Internal Examiners from the Department
iv. External Examiners
v. Executive Secretary
vi. Senior Assistant Registrar (Academic) - Secretary

The Examiners Board shall receive, consider and determine the results of the BSc. programmes at all levels.

The Examiners Board shall be required to make appropriate recommendations on any candidate based on his/her performance and also on any aspect of the examination as it deems fit.

**ELIGIBILITY FOR THE BACHELOR'S DEGREE**
A Bachelor's degree appropriately designated shall be awarded to a candidate who has been properly admitted to the University, has followed the approved courses’ of study over the prescribed period and has satisfied the following conditions:

*For the avoidance of doubt, a student may be denied graduation if he/she does not follow subjects assigned to him/her at either Level 100 or 200*

**University Requirements:**

a. evidence of regular enrolment in the degree programme;
b. discharge of all obligations owed to the University;
c. a pass in all University Required Courses;
d. satisfactory performance in the appropriate University examinations.
School/Departmental Requirements:
Satisfactory discharge of such requirements as may be prescribed by the faculty/school/department for the degree.

REQUIREMENTS FOR BACHELOR'S GRADUATION
A student shall be deemed to have satisfied the requirements for graduation if:
1. He/she has fulfilled all General University and Faculty/School requirements;
2. Obtained passes in all courses and subjects;
3. He/she has accumulated the minimum number of credits required by the Faculty/School.

Project Work:
This shall be submitted for assessment before the date of the last paper in the second semester examination. In default, the candidate shall be asked to submit the project work the following semester and it shall be treated as a repeat examination, with all its implications.

- CLASSIFICATION OF DEGREE
  a. All end-of-semester examination results from Level 100, including University and School required courses, shall be taken into account in the computation of the Final Grade Point Averages (FGPA) for the classification of the Bachelor’s degree.
  b. The GPAs from Levels 100 to 400 shall have equal weighting.
  c. In the determination of the FGPA, a weighted average of all repeat courses shall be used.

The BSc. in Allied Health Sciences degrees shall not be classified. However, based on the University’s classification, the FGPA interpretations are as follows:

<table>
<thead>
<tr>
<th>Class of Degree</th>
<th>Range of Final Grade Point Average (FGPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class</td>
<td>3.60-4.00</td>
</tr>
<tr>
<td>Second Class (Upper Division)</td>
<td>3.00-3.59</td>
</tr>
<tr>
<td>Second Class (Lower Division)</td>
<td>2.00-2.99</td>
</tr>
<tr>
<td>Third Class</td>
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<td>Fail</td>
<td>0.00-0.99</td>
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CONFIRMATION OF AWARD OF DEGREE
A list of candidates who are deemed eligible for the award of degrees shall be laid before the Academic Board for approval. No award shall be confirmed unless the Academic Board is satisfied that the candidate has met all the conditions for the award of a degree.

PRESENTATION OF AWARD
Following confirmation of an award of a degree as, the candidate shall be entitled to be awarded the degree Bachelor of Science under the seal of the University at a Congregation of the University assembled for that purpose. The degree shall indicate the principal subject or subjects offered and the class awarded.

CANCELLATION OF AWARD
Notwithstanding previous confirmation of an award of a degree and presentation of a certificate, the Academic Board may at any time cancel an award, even with retrospective effect, if it becomes known that:

i. a candidate had entered the University with false qualifications, or
ii. a candidate had impersonated someone else, or a candidate had been guilty of an examination malpractice, for which a grade Z would have been awarded, or that there are other reasons that would have led to the withholding of confirmation of the award in the first place.

In any such event, the decision of the Academic Board shall be published on the University Notice Board and the candidate notified. Such cancellation and the reasons for it shall be entered on the candidate's transcript.
**DATING OF BACHELOR'S DEGREE**
The Bachelor’s degree of the University of Ghana shall be dated with reference to the last day of the Semester during which the final examination is taken. This provision shall, however, not apply to the Medical and Dental Schools.

However, in the case of students who face disciplinary action, the dating of the certificate shall be the date on which the sanction is fully served.

**TRANSCRIPT OF ACADEMIC RECORD**
At the end of a student’s programme, the University shall, on the payment of an appropriate fee, issue to the particular student a complete transcript of his/her academic record. This transcript shall be marked *Student Copy* and shall record all courses attempted and all results obtained.

In writing the Bachelor’s degree certificate or in writing a student’s transcript, programme/specialisation shall be clearly indicated.

**TRANSFER STUDENTS**
A student transferring from one university to this university shall take courses over a study period of at least 4 semesters as a full-time student, and satisfy all University and Faculty/School/Departmental required courses.

The classification of the degree shall be based only on the courses taken at this University.

**REPEAT EXAMINATION**
A student may decide to re-register for, and repeat, a **failed course only** on a future occasion upon payment of the appropriate fee. If he/she repeats the course and passes its examination, he/she shall be awarded the full grade earned on that occasion. The student’s transcript will show the number of occasions the candidate took the examination for that particular course and the grades earned on all such occasions.

**INTERNSHIP**
Candidates on completion of programmes shall proceed to undertake a year’s internship at an accredited health facility. Such internship shall be *Compulsory*. 
B.SC. IN DENTAL LABORATORY SCIENCES
(Professional-focused)

LEVEL 100 COURSES
All the Courses at Level 100 are Compulsory

SEMESTER 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SAHS 101</td>
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<tr>
<td>SAHS 103</td>
<td>Physical and Inorganic Chemistry</td>
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<td>SAHS 105</td>
<td>Organic Chemistry</td>
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<td>SAHS 111</td>
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<td>UGRC 150</td>
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<td>DLAB 100</td>
<td>Clinical Reasoning in Health Sciences</td>
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<td>UGRC 110</td>
<td>Academic Writing I</td>
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SEMESTER 2

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<tr>
<td>SAHS 106</td>
<td>General Physiology</td>
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<td>SAHS 108</td>
<td>General Physiology Practical</td>
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<tr>
<td>SAHS 112</td>
<td>Introductory Psychology for Allied Health Sciences</td>
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<td>SAHS 122</td>
<td>Introductory Biochemistry</td>
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<td>GSPH 214</td>
<td>Writing for Public Health</td>
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<tr>
<td>UGRC 220</td>
<td>Liberal and African Studies</td>
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<td>DLAB 102</td>
<td>Introduction to Dental Laboratory Sciences</td>
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<td>DLAB 104</td>
<td>Basic Dental Material Science</td>
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<tr>
<td>DLAB 106</td>
<td>Introduction to Dental Morphology</td>
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DLAB 100 VOCATIONAL TRAINING I 3
This is a 4-week inter-semester Dental Laboratory training period at the end of Semester 2 to allow students to obtain practical hands-on experience. Students shall be evaluated at the end of the Vocational Training. The course is a pre-requisite for all Level 200 courses in Dental Laboratory Sciences.

LEVEL 200 COURSES
All the Courses at Level 200 are Compulsory

SEMESTER 3

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<tr>
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<td>SAHS 211</td>
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<td>PSCY 307</td>
<td>Human Growth and Development I</td>
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<td>SOCI 316</td>
<td>Medical Sociology</td>
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<td>DLAB 201</td>
<td>Dental Material Science I</td>
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<tr>
<td>DLAB 203</td>
<td>Dental Morphology</td>
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SEMESTER 4

This is a 6-week inter-semester Dental Laboratory training period at the end of Semester 4 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will undertake Dental Laboratory training in an accredited Dental Laboratory. Students shall be evaluated at the end of the vocational training. The course is a pre-requisite for all Level 400 courses in Dental Laboratory Science.

LEVEL 300 COURSES
All the Courses at Level 300 are Compulsory

SEMESTER 5

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<tr>
<th>Course Code</th>
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<tr>
<td>DLAB 301</td>
<td>Maxillofacial Prosthesis I</td>
<td>3</td>
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<tr>
<td>DLAB 303</td>
<td>Complete Dentures III</td>
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<td>DLAB 307</td>
<td>Fixed and Functional Orthodontics</td>
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<td>DLAB 309</td>
<td>Fixed and Functional Orthodontics Practicals</td>
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<td>DLAB 311</td>
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<td>DLAB 315</td>
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TOTAL CREDITS: 18
SEMESTER 6

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<td>SAHS 302</td>
<td>Health Law and Ethics</td>
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<td>DLAB 302</td>
<td>Maxillofacial Prosthesis II</td>
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<tr>
<td>DLAB 304</td>
<td>Introduction to Dental Implant Prosthesis</td>
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<tr>
<td>DLAB 306</td>
<td>Complete Dentures IV</td>
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<td>DLAB 312</td>
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<td>SLAB 306</td>
<td>Clinical Observation</td>
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**TOTAL CREDITS:** 18

**DLAB 300  VOCATIONAL TRAINING III  3**

This is a 6-week inter-semester Dental Laboratory training period at the end of Semester 6 (i.e. during the long vacation) to allow students to obtain practical hands-on experience. Students will undertake Dental Laboratory training in an accredited Dental Laboratory. Students shall be evaluated at the end of the Vocational Training. The course is a pre-requisite for all Level 400 courses in Dental Laboratory Science.

**LEVEL 400 COURSES**

*All the Courses at Level 400 are Compulsory*

SEMESTER 7

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<td>DLAB 401</td>
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<tr>
<td>DLAB 403</td>
<td>Dental Laboratory attachment in Removable Partial Dentures</td>
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<tr>
<td>DLAB 405</td>
<td>Dental Laboratory attachment in Complete Dentures</td>
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<td>DLAB 407</td>
<td>Dental Laboratory attachment in Removable Orthodontics</td>
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**TOTAL CREDITS:** 19

SEMESTER 8

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<td>DLAB 404</td>
<td>Applied Removable Partial Dentures</td>
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<td>DLAB 420</td>
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**TOTAL CREDITS:** 19

**COURSE DESCRIPTIONS**

**DLAB 102  INTRODUCTION TO DENTAL LABORATORY SCIENCES**

The course will introduce students to skills required for successful and safe manipulation of materials and the techniques required to construct dental prosthesis. It will also focus on the development of basic skills to produce
simple dental appliances. Course content include: dental laboratory safety procedures and precautions including cross-infection decontamination and health and safety legislation, concepts and techniques associated with the construction of dental casts in dental stone, dental articulators viz plane line average value, semi-adjustable and fully adjustable, special trays in shellac, acrylic and metal, occlusal rims in wax, direct and indirect relining repairs, tissue protectors and orthodontic base plates.

DLAB 104 BASIC DENTAL MATERIAL SCIENCE
This course aims at developing an understanding of the general requirements of materials for both intra-oral and dental laboratory use; to foster an understanding of the structure of dental materials – their advantages and limitations; to develop a thorough knowledge of the principles underlying materials technology, including the properties, processing, manipulation and safe handling of dental materials. Topics to be covered include: selection and evaluation of dental materials, properties of dental and impression materials, their classifications, constituents and functions, dental plasters, manufacturing properties, classifications and uses, dental waxes, base plate materials and their constituents, properties, classifications and uses, dental separating/abrading and polishing materials, classifications and uses, manufacturing properties and handling characteristics.

DLAB 106 INTRODUCTION TO DENTAL MORPHOLOGY
The course is designed to describe important anatomic features, normal morphology and various nomenclature systems of the human dentition. It course focuses on the identification of primary and permanent teeth based on anatomic features and describes the unique anatomic morphology of human dentition. The content of the course will include: dental morphology, nomenclature and usage, crown morphology, root morphology, number of roots in upper anterior and lower anterior and posterior teeth, number of deciduous and permanent teeth in the upper and lower jaws, number of quadrants and the teeth in each quadrant, anatomical classification, tooth classification and name of surfaces, different system of charting.

DLAB 201 DENTAL MATERIAL SCIENCE I
The course is designed to develop an understanding of the general requirements of materials for both intra-oral and dental laboratory use; to foster an understanding of the structure of dental materials, their advantages and limitations; to develop a thorough knowledge of the principles underlying materials technology, including the properties, processing, manipulation and safe handling of dental materials. Topics to be treated include: selection and evaluation of dental materials, properties of dental materials, refractory investments - their properties and handling characteristics, metallurgy, physical properties, constituents and heat treatments of dental alloys and fluxes.

DLAB 203 DENTAL MORPHOLOGY
The course aims at enabling students to describe the unique anatomic features for all teeth in human dentition; identify occlusal problems and record their presence; and describe anatomic considerations demonstrated in common clinical dental restorative procedures. Topics to be covered include: embrasures, contact points, and their relation to disease, anatomic changes due to age, developmental pits and grooves, accurate recording, documentation, contours and relationships, tooth eruption and exfoliation.

DLAB 205 DENTAL MORPHOLOGY PRACTICALS
This is a practical course designed to draw and carve out important anatomic features, normal morphology and to appreciate the occlusal relationship of human dentition. Students should be able to draw and carve different views of all the teeth by their contours and anatomic features; appreciate the unique anatomic features for all the teeth in human dentition; and identify occlusal problems and record their presence. Topics to be covered include: carving in plaster/pumice and wax blocks of crown and root of permanent teeth, embrasures and contact points, developmental pits and grooves, contours and relationships, and anatomic changes due to age.

DLAB 207 DENTAL ANATOMY
The aim of this course is to expose students to anatomic factors affecting the design of prostheses, restorations and orthodontic appliances and to facilitate communication within the dental team. By the end of the course, students should be able to illustrate a detailed knowledge and demonstrate an understanding of: the temporomandibular joint,
the facial and cranial skeleton, teeth and surrounding structures, the oral cavity and other relevant surrounding structures of the head and neck, the oral environment and common disorders of the oral cavity. Additional topics to be covered include: skeletal anatomy of the human head and neck, the anatomy of the orofacial musculature, the anatomy of the masticatory system and its effects on the oral environment, patterns of tooth loss and eruption and an outline of disorders and diseases which affect the oral cavity.

**DLAB 209 COMPLETE DENTURES I**
This course is intended to introduce students to the uses and application of dental articulators, and clinical records. It will also focus on the principles of tooth arrangement and conditions needed to maximise the function of dentures. It will enable students to make models from different types of impression materials; demonstrate an understanding of the suitability of the types of material used to construct special trays; recognise the types and functions of dental articulators, occlusal rims and how to select and set up the correct mould and shade of acrylic teeth. Topics to be treated include: impression casting and model making, special trays, types and functions of occlusal rims, types of dental articulators, and types of dental facebows, mounting of models on different types of dental articulators.

**DLAB 211 COMPLETE DENTURES PRACTICALS I**
This is a practical course aimed at introducing students to the different types of impression materials and approaches of making models from each. By the end of the course, students should be able to make models from different types of impression materials; construct occlusal rims using modelling wax; mount models on different types of dental articulators with/without facebow; fabricate acrylic teeth in the dental laboratory; set up full complete upper and lower dentures in class 1 skeletal jaw relationships; wax up, festoon and process complete acrylic dentures. Content of the course will include: types of models from different impression materials, construction of special trays using various materials, construction of occlusal rims, and ways of mounting models on different types of articulators.

**DLAB 213 REMOVABLE ORTHODONTICS I**
The aim of this course is to assist students to design and construct removable orthodontic appliances. The course will enable students to demonstrate a realisation of the aims and objectives of removable appliances in orthodontic treatment; demonstrate an understanding and recognition of the aetiology of malocclusion, know the principles of design and construction of removable appliance components and apply knowledge gained to construct removable orthodontic appliances; and realise the physiological changes that take place during tooth movements. The course contents will include: concept of normal occlusion, study models and cephalometric radiographs, their roles in treatment planning and record keeping, aetiology of malocclusion: soft tissue, hard tissue, local factors, design of removable active orthodontic appliances.

**DLAB 215 REMOVABLE ORTHODONTIC PRACTICALS I**
This is a practical course designed to enable students to construct a standard study model using orthodontic stone; construct various retainers used in orthodontic appliances; and construct different removable appliances in orthodontic treatment. Content will include: orthodontic trimming of study models and wire bending, designing of removable active orthodontic appliances.

**DLAB 202 ORAL PATHOLOGY**
The aim of this course is to expose the dental laboratory students to basic knowledge of oral pathology relative to their area of specialization in health care. By the end of the course, students should be able to recognise common conditions of hard and soft tissues of the oral and maxillofacial complex resulting from pathological entities of microbial, autoimmune, and behavioural origin; and recognise when usual treatment procedures must be altered to accommodate diseases processes. The content of the course will cover: definitions, cellular alterations, cellular specialization, fluid systems of the body and description of oral lesions, developmental diseases of soft tissue, bone and the teeth, healing, repair and regeneration.
**DLAB 204  **  ORAL RADIOLOGY
The course will enable students to demonstrate basic understanding of conventional and digital radiography in dentistry; assist in producing dental radiographs in the dental X-ray department and demonstrate basic understanding of CT and MRI in dental and maxillofacial imaging. It will focus on the production of X-rays, properties and interaction of X-rays with matter, dental imaging modalities, types of dental films, dental and maxillofacial radiographic procedures radiographic baselines and planes used in imaging of the teeth angulations for dental imaging, intra- and extra-oral imaging; periapicals, bitewings; occlusals and oblique dental imaging, processing of dental images radiobiology and radiation protection.

**DLAB 206  **  DENTAL MATERIAL SCIENCE II
This course will offer students the exposure required to demonstrate an understanding of the suitability of materials used in oral and laboratory environments; know the general requirements of materials for intra-oral and dental laboratory use; display detailed knowledge of the materials used within the oral cavity and the dental laboratory essential for safe construction of dental appliances and restorations. It focuses on: basic principles underlying materials technology, properties, processing and safe manipulation of dental materials; basic laboratory practices and performances, properties and preparation of dental materials; classification of dental materials, physical and chemical properties of dental materials and interpretation of numeric values from various sources.

**DLAB 208  **  COMPLETE DENTURES II
This course aims at introducing students to the use of dental articulators, clinical records, the principles of tooth arrangement and the conditions needed to maximise the function of dentures. The course will enable students to make models from different types of impression materials; demonstrate an understanding of the suitability of different types of materials used to construct special trays and recognise the types and functions of dental articulators. This course is a continuation of course DLAB 209. Topics to be covered include: types of dental facebows, mounting of models, Factors affecting the functions of upper and lower complete dentures, selection and fabrication of acrylic teeth, principles of occlusion and introduction to balanced articulation.

**DLAB 212  **  COMPLETE DENTURES PRACTICALS II
This is a practical course that aims at introducing students to the uses and applications of different types of impression materials and approaches of making models. It will enable students to construct occlusal rims; mount models on different types of dental articulators with/without dental facebow; fabricate acrylic teeth in the dental laboratory; set up full upper and lower complete dentures in class 1 skeletal jaw relationships; and wax up, festoon and process complete acrylic dentures. This course is a continuation of DLAB 211. Topics to be covered include: mounting of models, fabrication of acrylic teeth, setting up of full upper and lower complete dentures, waxing up and festooning.

**DLAB 214  **  REMOVABLE ORTHODONTICS II
This course aims at designing and constructing removable orthodontic appliances. It is intended to enable students to demonstrate an understanding and recognition of the aetiology of malocclusion, the application of the principles of design and construction of removable appliance components; and evaluate the physiological changes that take place during tooth movements. This Course is a continuation of DLAB 213. The content will cover: design of removable passive orthodontic appliances, construction of appliances for orthodontic treatment, effects of application of force to teeth and their supporting structures, fitting and adjusting of appliances and aspects of clinical and dental team work.

**DLAB 216  **  REMOVABLE ORTHODONTIC PRACTICALS II
This course will introduce students to the designing and construction of removable orthodontic appliances. It will focus on how to construct a standard study model using orthodontic stone, the various retainers used in orthodontic appliances; and how to construct different removable appliances in orthodontic treatment. This course is a continuation of course DLAB 215. The course content include: designing of removable passive orthodontic appliances, construction of appliances for orthodontic treatment, fitting and adjusting of appliances on the model.
DLAB 218  REMOVABLE PARTIAL DENTURES I
The aim of this course is to enable students to synthesise the technical procedures needed to construct complex upper and lower partial dentures to acceptable clinical standards; advise on technical aspects during treatment planning; present partial dentures with modified palatal/lingual aesthetic or reinforced inclusions; create natural tissue colour and contour utilising denture base toning materials. It will also focus on semi-adjustable dental articulators, use of dental facebows and associated clinical records, physiology of the temporomandibular joint and mandible and the principles of tooth arrangement for class II and class III partial dentures.

DLAB 222  REMOVABLE PARTIAL DENTURES PRACTICALS I
The course offers students the ability to construct complex upper and lower acrylic partial dentures to acceptable clinical standards; construct acrylic partial dentures with modified palatal/lingual aesthetic or reinforced inclusions; and create natural tissue colour and contour utilising denture base toning materials. Topics to be treated include: articulation of models on semi-adjustable dental articulators, use of dental facebows and associated clinical records and arrangement of acrylic teeth for class II cases in acrylic partial dentures.

DLAB 224  FIXED PROSTHODONTICS I
This Course aims at providing a firm basis for the construction of accurate fixed prosthesis required for conservative restorations. By the end of the course, students should be able to develop conceptual and practical competencies in the construction of dyes for fixed prosthesis; demonstrate an understanding of the principles involved in their design and construction; demonstrate an understanding of the various treatments for damaged teeth; relate the effect of occlusal forces to restorative design; and analyse the indications and techniques used to construct a wide range of conservative restorations. Topics to be treated include: interpretation of prescriptions, principles of occlusion and tooth preparation, dye preparation and model making, types of margins, temporary acrylic jacket crowns, post and core, metallic crowns, metallic crowns with acrylic facing.

DLAB 226  FIXED PROSTHODONTIC PRATICALS I
This is a practical course designed to provide a firm basis for the construction of accurate fixed prosthesis required for conservative restorations. By the end of the course, students should be able to produce dies for the construction of fixed prosthesis; fabricate acrylic jacket crowns; fabricate post and core; and fabricate metal crowns. Topics to be covered include: interpretation of prescription, dye preparation and model making, acrylic jacket crowns, types of margins, post and core, metallic crowns, metallic crowns with acrylic facing.

DLAB 301  MAXILLOFACIAL PROSTHESIS I
The aim of this course is to introduce students to the principles of maxillofacial prosthesis and the methods of construction. By the end of the Course, students should be able to demonstrate an understanding of the principles of intra and extra oral maxillofacial prosthetics; demonstrate an understanding of the occlusal principles in maxillofacial prosthetics; and list the different types of obturators. The content of the course will include: introduction to maxillofacial prosthetics, types of maxillofacial defects, types of maxillofacial prosthesis, occlusal principles in maxillofacial prosthetics occlusal principles in maxillary defect prosthesis, complete dentures in maxillofacial prosthetics, removable partial dentures in maxillofacial prosthetics.

DLAB 303  COMPLETE DENTURES III
This course aims at building on the introductory principles of treatment of the upper and lower arches and single arch edentulous patient and extending these to class II and class III skeletal jaw relationships; and developing an understanding of the concepts and construction processes of copy dentures. On completion of the course, students should be able to relate knowledge of the upper and lower arches and single arch restoration to the construction of upper and lower complete dentures for class II and class III skeletal jaw relationships in balanced articulation and occlusion; and produce copy dentures and soft linings. Topics to be covered include: introduction to balanced articulation and occlusion, principles of upper and lower complete tooth arrangement in class II and class III skeletal jaw relationship.

DLAB 305  COMPLETE DENTURES PRACTICALS III
This is a practical course is designed to build on the introductory principles of treatment of the upper and lower arches and single arch edentulous patient and extend this to class II skeletal jaw relationships. On completion of the course, students should be able to construct an upper and lower complete dentures for class II skeletal jaw
relationships in balanced articulation and occlusion; and produce copy dentures, relining, and rebasing, remaking
and soft lining. Topics will include: introduction to balanced articulation and occlusion, principles of upper and
lower complete denture tooth arrangement in class II, relining, rebasing, remaking and soft lining.

DLAB 307  FIXED AND FUNCTIONAL ORTHODONTICS
The aim of this Course is to give the student a comprehensive understanding of fixed orthodontic and functional
appliance techniques. By the end of the Course, students should be able to realize the objectives of fixed orthodontic
treatment; demonstrate an understanding and application of the principles of design and construction of fixed
appliance components; Topics to be covered will include: fixed appliance techniques, design and construction of
fixed appliances, attachments and their designs, anchorage principles, design and uses of functional appliances,
modes of action of functional appliances, and role of dental laboratory scientists in fixed and functional orthodontic
treatment.

DLAB 309  FIXED AND FUNCTIONAL ORTHODONTIC PRACTICALS
The aim of this course is to enable students construct a range of fixed and functional orthodontic appliances. By the
end of the course, students should be able to construct fixed appliances used in orthodontic treatment and construct
the different types of functional appliances used in orthodontic treatment. Topics to be covered include: fixed
appliance techniques, principles, design and construction of fixed appliances, use of attachments and their designs,
anchorage, principles, design and uses of functional appliances, modes of action of functional appliances, use of
attachments and their designs.

DLAB 311  REMOVABLE PARTIAL DENTURES II
This course aims at applying the principles of tooth arrangement learnt in course DLAB 303 to the construction of
prostheses for patients requiring partial restorations. The students will develop experience of arranging teeth in class
II and class III skeletal jaw relationships. The use of semi adjustable dental articulators as well as skills for denture
construction will be covered. Students will also develop a critical awareness of aesthetic and functional
requirements of a combination of complete and partial dentures for individual patients. New methods of tooth
arrangement will also be introduced. Other topics to be covered will include: technical procedures for construction
of complex upper and lower partial dentures to acceptable clinical standards, treatment planning, modifications of
partial dentures, palatal/lingual aesthetic or reinforced inclusions, and denture base toning materials.

DLAB 313  REMOVABLE PARTIAL DENTURES PRACTICALS II
This course is designed to offer students the skills needed to construct complex upper and lower acrylic partial
dentures to acceptable clinical standards; construct acrylic partial dentures with modified palatal/lingual aesthetic or
reinforced inclusions; and create natural tissue colour and contour utilising denture base toning materials. The
arrangement of acrylic teeth for class II and III cases in acrylic partial dentures, alternative palatal/lingual design,
natural “set ups”, negative or positive spaces, and colour tone for tissue naturalisation will also be covered.

DLAB 315  FIXED PROSTHODONTICS II
The aim of this course is to provide a firm basis for the construction of accurate fixed prosthesis required for
conservative restorations. By the end of this course, the students should be able to demonstrate an understanding of
all aspects of fixed prosthodontics. Topics to be covered will include: principles of fixed prosthodontics, types of
fixed prosthodontics, types of pontics, waxing of fixed prosthodontics and metal ceramic crowns.

DLAB 317  FIXED PROSTHODONTIC PRACTICALS II
This is a practical course aimed at providing a firm basis for the construction of accurate fixed prosthesis required for
conservative restorations. On completion of the course, students should be able to fabricate inlays, onlays,
porcelain fused to metal crowns (PFM), they should be able to fix all ceramic crowns and bridges. This practical
course will also introduce students to different types of ceramic crowns, porcelain fused to metal crowns and bridges
e.g. conventional and resin bonded bridges, inlay, onlay and pinlay restorations.

DLAB 302  MAXILLOFACIAL PROSTHESIS II
The aim of this course is to enable students understand the principles of maxillofacial prosthesis and the methods of construction. On completion of the course, students should be able to demonstrate an understanding of the principles of intra and extra oral maxillofacial prosthetics; demonstrate an understanding of the occlusal principles in maxillofacial prosthetics; and identify the different types
of obturators. Topics to be covered include: occlusal principles in maxillofacial prosthetics, occlusal principles in maxillary defect prosthesis, fixed partial dentures in maxillofacial prosthetics, fabrication of obturators, fabrication of extra-orbital prosthesis, fabrication of nose and ear episthesis, fabrication of orbital prosthesis and implants in maxillofacial prosthesis.

DLAB 304  INTRODUCTION TO DENTAL IMPLANTS PROSTHESIS

The course will consider the introduction and terminology applied in prosthesis. It will focus on occlusal considerations for implant-supported prostheses, provisional prostheses, single-tooth prosthetics, partial edentulous implant prosthetics, treatment planning for total edentulous mouth and design of frameworks for complete prostheses. In addition areas such as treatment planning for the edentulous mandible with removable prostheses, treatment planning for the edentulous mandible with fixed prostheses, treatment planning for the edentulous maxilla with removable prostheses and treatment planning for the edentulous maxilla with fixed prostheses, implant supported overdentures, interocclusal registration, remount procedures and complications and solutions will also be considered.

DLAB 306  COMPLETE DENTURES IV

This course aims at building on the introductory principles of treatment of the upper and lower arches and single arch edentulous patient and to extend these to class II and class III skeletal jaw relationships; and developing an understanding of the concepts and construction processes of copy dentures. By the end of the course, students should be able to relate knowledge of the upper and lower arches and single arch restoration to the construction of upper and lower complete dentures for class II and class III skeletal jaw relationships in balanced articulation and occlusion; and produce copy dentures and soft linings. This course is a continuation of DLAB 303. Topics to be treated include, relining, rebasing, remaking and soft lining, denture repair and copy dentures.

DLAB 308  COMPLETE DENTURES PRACTICALS IV

This is a practical course designed to build on the introductory principles of treatment of the upper and lower arches and single arch edentulous patient and extend these to class III skeletal jaw relationships. It also aims at developing an understanding of the concepts and construction processes of copy dentures. On completion of the course, students should be able to construct an upper and lower complete dentures for class III skeletal jaw relationships in balanced articulation and occlusion; and produce copy dentures, relining, and rebasing, remaking and soft lining. This Course is a continuation of DLAB 305. The course will look at complete tooth arrangement in class III skeletal jaw relationship, denture repair and copy dentures.

DLAB 312  FIXED PROSTHODONTICS III

The aim of this course is to provide a firm basis for the construction of accurate fixed prosthesis required for conservative restorations. By the end of this course, the students should be able to demonstrate an understanding in all aspects of fixed prosthodontics. This course is a continuation of DLAB 315. The course will focus on methods of casting dental alloys, inlay, onlay and pinlay restorations. It will also consider topics such as: soldering of dental alloys, comparison of soldering techniques, veneers and CAD-CAM systems.

DLAB 314  FIXED PROSTHODONTIC PRACTICALS III

This is a practical course that aims at providing a firm basis for the construction of accurate fixed prosthesis required for conservative restorations. By the end of the Course, the students should be able to fabricate inlays, onlays, porcelain fused to metal crowns (PFM), veneers, all ceramic crowns and bridges. This course is a continuation of DLAB 317. Areas to be covered include: methods of casting dental alloys, soldering of dental alloys, comparison of soldering techniques, veneers and CAD-CAM.

DLAB 316  REMOVABLE PARTIAL DENTURES III

The aim of this course is to enable students understand the principles and construction of cast removable partial dentures. By the end of this course, the students should be able to list Kennedy's classification of cast partial dentures; and demonstrate an understanding of the principles and construction of cast partial denture. This course is
a continuation of DLB 311. It will cover areas such as: introduction to cast removable partial dentures, survey and design, mandibular major connectors, maxillary major connectors, minor connectors, retention and retainers and types of cast clasps.

**DLAB 318 REMOVABLE PARTIAL DENTURES PRACTICALS III**

This is a practical course and a continuation of DLAB 313. The course will cover: laboratory procedures for framework including retipoding; blockout and relief; duplication; waxing the framework; spruing the framework; investing the refractory cast; casting recovery; finishing the framework; final polishing. Additional areas to be covered are: laboratory procedures for completing the cast removable partial dentures, waxing denture base contours; setting of artificial teeth; investment process; deflasking; finishing and polishing.

**DLAB 322 CLINICAL OBSERVATION**

This course is designed to enable students to appreciate the processes involved in the development of functional teams; consolidate skills and knowledge acquired during the course and observe applications to clinical situations; demonstrate an understanding of the importance of patients’ attitudes, beliefs and their confidentiality; develop methods of comparative observation; develop individual maturity, self-awareness and confidence; and compare various concepts which promote the development of teamwork. The course will enable students to observe and compare the effective operation and problem solving of dental teams, record and evaluate any noticeable technical/system differences and analyse treatment planning and organisation of a work situation, appraise different uses of materials and techniques, appraise communication and group dynamics within the dental team.

**DLAB 401 DENTAL LABORATORY ATTACHMENT IN FIXED PROSTHODONTICS**

This is a 4-week, whole day, laboratory training in Semester 7. Students will undertake dental laboratory training involving direct observation and dental laboratory experience to allow them to obtain practical hands-on experience. The attachment will be undertaken in accredited health facilities. Students will complete a logbook and will be assessed at the end of the course using the logbook and an oral examination.

**DLAB 403 DENTAL LABORATORY ATTACHMENT IN REMOVABLE PARTIAL DENTURES**

This is a 4-week, whole day, laboratory training in Semester 7. Students will undertake dental laboratory training involving direct observation and dental laboratory experience to allow them to obtain practical hands-on experience. The attachment will be undertaken in accredited health facilities. Students will complete a logbook and will be assessed at the end of the course using the logbook and an oral examination.

**DLAB 405 DENTAL LABORATORY ATTACHMENT IN COMPLETE DENTURES**

This is a 4-week, whole day, laboratory training in Semester 7. Students will undertake dental laboratory training involving direct observation and dental laboratory experience to allow them to obtain practical hands-on experience. The attachment will be undertaken in accredited health facilities. Students will complete a logbook and will be assessed at the end of the course using the logbook and an oral examination.

**DLAB 407 DENTAL LABORATORY ATTACHMENT IN REMOVABLE ORTHODONTICS**

This is a 4-week, whole day, laboratory training in Semester 7. Students will undertake dental laboratory training involving direct observation and dental laboratory experience to allow them to obtain practical hands-on experience. The attachment will be undertaken in accredited health facilities. Students will complete a logbook and will be assessed at the end of the course using the logbook and an oral examination.

**DLAB 402 APPLIED FIXED PROSTHODONTICS**

Students will be required to construct prosthesis meant for patients in Semester 8. Each student will be evaluated based on the aesthetics, accuracy and functional purposes of the prosthesis fitted in the patient mouth.

**DLAB 404 APPLIED REMOVABLE PARTIAL DENTURES**

Students will be required to construct prosthesis meant for patients in Semester 8. Each student will be evaluated based on the aesthetics, accuracy and functional purposes of the prosthesis fitted in the patient mouth.
**DLAB 406 APPLIED COMPLETE DENTURES**
Students will be required to construct prosthesis meant for patients in Semester 8. Each student will be evaluated based on the aesthetics, accuracy and functional purposes of the prosthesis fitted in the patient mouth.

**DLAB 408 APPLIED REMOVABLE ORTHODONTICS**
Students will be required to construct prosthesis meant for patients in Semester 8. Each student will be evaluated based on the aesthetics, accuracy and the functional purposes of the appliance in the patient mouth.
1. ADMISSION

1.1 Further to the General Regulations regarding admission into the University of Ghana, a candidate for admission to the Clinical Part of the BDS Degree programme must have obtained the BSc (Med. Sci) degree of the University of Ghana.

The following provisions may be followed for admission into the BSc. (Med. Sci) programme (which runs in the Medical School)

i. The admission would be based on Senior High School results in Science (WASSCE results). However, all GCE ‘A’ Level Science, International Baccalaureate and its equivalent applicants would be considered, and admitted to Level 100.

ii. There would be Quotas Committees in each of the two Schools to determine the number of students to be admitted, as well as the Senior High School and other examinations cut-off aggregate for admissions from time to time.

iii. Applicants would be shortlisted for a structured interview.

iv. Each School would constitute its own Admissions Committee to interview and admit students.

v. Applicants would be required to select only one School that is UGMS or UGDS. Where applicants have multiple School choices, the application would be sent to the first choice only.

vi. Applicants from less endowed Schools as listed by Ministry of Education (MOE), should be given plus 3 aggregate after the cut-off aggregate is determined.

vii. Ten percent (10%) of admissions would be reserved for students from less endowed Schools after the interview.

viii. The University’s recommendations on gender (gender ratio) would be taken into consideration during admissions.

ix. To progress from Level 100 to Level 200, a student should make a minimum of Cumulative Grade Point Aggregate (CGPA) of 2.0 that is Grade C, which is equivalent to mark of 60-64%. It is interpreted as Average by the new Students Handbook for Faculty of Science.

1.2 Candidates with the Bachelor’s degree in Medical/Biological and Physical Sciences as well as those who may have completed part of the BDS (or its equivalent) in a recognised University may be considered for admission on the recommendation of a Special Committee appointed by the Dean. The Special Committee of not less than five (5) persons, shall vet the transcripts of the candidate as well as the course content of the degree, with a view to determining the suitability of the degree of previous training and make appropriate recommendations to the Dean.
2. DURATION AND STRUCTURE
2.1 The Clinical Part of the BDS Degree programme shall be of 3 years duration, structured as follows:
   (a) First Clinical Year (BDS Final Part I) - 48 weeks
   (b) Second Clinical Year (BDS Final Part II) - 42 weeks
   (c) Third Clinical Year (BDS Final Part III) - 45 weeks

3. ACADEMIC YEAR
   The Academic Year shall comprise two Semesters.

4. STRUCTURE OF SEMESTER
4.1 First Clinical Year (BDS Final Part I) 48 Teaching Weeks
   (a) Semester 7 - 27 weeks
   (b) Inter-Semester Break - 2 weeks
   (c) Semester 8 - 21 weeks
   (d) Revision for BDS Final Part I - 1 weeks
   (e) Examination - 1 weeks
   (f) Long Vacation - 4 weeks
   (g) Supplementary Exam - 1 week (after 6 weeks)

4.2 Second Clinical Year (BDS Final Part II) 42 Teaching Weeks
   (a) Semester 9 - 18 weeks
   (b) Revision - 1 weeks
   (c) End of Semester Examination - 2 weeks
   (d) Inter-Semester Break - 6 weeks
   (e) Semester 10 - 24 weeks
   (f) Revision - 1 weeks
   (g) End of Semester Examination - 1 weeks
   (h) Long Vacation - 6 weeks
   (i) Supplementary Exams - 1 week (after 6 weeks)

4.3 Third Clinical Year (BDS Final Part III) 45 Teaching Weeks
   (a) Semester 11 - 23 weeks
   (b) Inter-Semester Break - 2 weeks
   (c) Semester 12 - 22 weeks
   (d) Revision for BDS Final Part III - 2 weeks
   (e) Final Part II Examination - 3 weeks
   (f) Supplementary Exams - 1 week (after 15 weeks)

5. COURSES FOR YEARS 1, 2 & 3
5.1 First Clinical Year (BDS Final Part I): Semesters 7 & 8
5.1.1 Duration - 48 weeks: The period shall be devoted to the following courses:
5.1.2 Semester 7: 27 weeks
   The first 10 weeks shall be devoted to the following courses to be run concurrently:
   (i) Oral Biology I
   (ii) Dental Material Science I
   (iii) Dental Morphology I
   (iv) Behavioural Science I
   (v) Biostatistics and Research Methodology I
   (vi) Introduction to Clinical Dentistry I
The rest of the semester shall be divided as follows:

<table>
<thead>
<tr>
<th></th>
<th>Course Description</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>(vii)</td>
<td>Introduction to Nursing Skills</td>
<td>1 week</td>
</tr>
<tr>
<td>(viii)</td>
<td>Introduction to Clinical Skills</td>
<td>4 weeks</td>
</tr>
<tr>
<td>(ix)</td>
<td>Human Disease I</td>
<td>12 Weeks</td>
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</tbody>
</table>

5.1.3 **Semester 8: 21 weeks**

<table>
<thead>
<tr>
<th></th>
<th>Course Description</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Co-ordinated Course II (Human Disease)**</td>
<td>12 Weeks</td>
</tr>
<tr>
<td>(ii)</td>
<td>Specialty Rotations (including Trauma/Accident Center, ENT/Ophthalmology, Dermatology &amp; General Anaesthesia Haematology)</td>
<td>8 Weeks</td>
</tr>
</tbody>
</table>

5.2 **Second Clinical Year: BDS Final Part II, Semesters 9 & 10**

5.2.1 **Duration - 42 weeks:** This period shall be devoted to the following courses:

5.2.2 **Semester 9: 18 weeks**

<table>
<thead>
<tr>
<th></th>
<th>Course Description</th>
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<tbody>
<tr>
<td>(i)</td>
<td>Operative Technique and Endodontics</td>
</tr>
<tr>
<td>(ii)</td>
<td>Prosthetics Dentistry</td>
</tr>
<tr>
<td>(iii)</td>
<td>Local Anaesthesia and Surgical Anatomy</td>
</tr>
<tr>
<td>(iv)</td>
<td>Community Dentistry, Ethics and Jurisprudence I</td>
</tr>
<tr>
<td>(v)</td>
<td>Oral Pathology I</td>
</tr>
<tr>
<td>(vi)</td>
<td>Oral Radiology I</td>
</tr>
<tr>
<td>(vii)</td>
<td>Oral Biology II</td>
</tr>
<tr>
<td>(viii)</td>
<td>Dental Material Science II</td>
</tr>
<tr>
<td>(ix)</td>
<td>Dental Morphology II</td>
</tr>
<tr>
<td>(x)</td>
<td>Behavioural Science II</td>
</tr>
<tr>
<td>(xi)</td>
<td>Biostatistics and Research Methodology II</td>
</tr>
<tr>
<td>(xii)</td>
<td>Introduction to Clinical Dentistry II</td>
</tr>
</tbody>
</table>

5.2.3 **Semester 10: 24 weeks**

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<tr>
<th></th>
<th>Course Description</th>
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</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Advance Operative Technique &amp; Endodontics</td>
</tr>
<tr>
<td>(ii)</td>
<td>Oral Diagnosis</td>
</tr>
<tr>
<td>(iii)</td>
<td>Local Anaesthesia and Exodontia</td>
</tr>
<tr>
<td>(iv)</td>
<td>Restorative Dentistry I</td>
</tr>
<tr>
<td>(v)</td>
<td>Orthodontics &amp; Pedodontics I</td>
</tr>
<tr>
<td>(vi)</td>
<td>Periodontics I</td>
</tr>
<tr>
<td>(vii)</td>
<td>Oral Pathology II</td>
</tr>
<tr>
<td>(viii)</td>
<td>Oral Radiology II</td>
</tr>
<tr>
<td>(ix)</td>
<td>Community Dentistry, Ethics and Jurisprudence II</td>
</tr>
</tbody>
</table>

5.3 **Third Clinical Year: BDS Final Part III, Semester 11 & 12**

5.3.1 **Duration - 40 weeks:** This period shall be devoted to the following Courses:

5.3.2 **Semester 11: 23 weeks**

<table>
<thead>
<tr>
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<th>Course Description</th>
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<tbody>
<tr>
<td>(i)</td>
<td>Community Dentistry</td>
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<tr>
<td>(ii)</td>
<td>Oral Medicine and Dental Therapeutics I</td>
</tr>
<tr>
<td>(iii)</td>
<td>Oral &amp; Maxillofacial Surgery I</td>
</tr>
<tr>
<td>(iv)</td>
<td>Dental Practice Management I</td>
</tr>
<tr>
<td>(v)</td>
<td>Restorative Dentistry II</td>
</tr>
<tr>
<td>(vi)</td>
<td>Periodontics II</td>
</tr>
<tr>
<td>(vii)</td>
<td>Orthodontics &amp; Pedodontics II</td>
</tr>
</tbody>
</table>
5.3.3 **Semester 12: 22 weeks**
(i) Oral Medicine and Dental Therapeutics II  
(ii) Oral & Maxillofacial Surgery II  
(iii) Dental Practice Management II  
(iv) Restorative Dentistry III  
(v) Periodontics III  
(vi) Orthodontics & Pedodontics III

6. **SCHEME OF EXAMINATION**

6.1 The Clinical part of the BDS degree programme shall be examined as indicated in section 6.2 to 6.7 below:

6.2 **First Clinical Year (BDS Final Part I)**
At the end of the First Clinical Year, candidates shall be required to take the BDS Final Part I Examinations in Human Disease (including General Medicine, General Surgery, ENT, Ophthalmology, Dermatology and Trauma and General Anesthesia).

6.3 **Second Clinical Year (BDS Final Part II)**

a. At the end of the First Semester of the Second Clinical Year, candidates shall be required to take the BDS Final Part II End-of-Semester Examinations in Biomaterial Science, Oral Biology, Prosthetic Dentistry, Operative Technique, Behavioural Science, Oral Surgery I, Oral Pathology I and Biostatistics & Research Methodology.

b. At the end of the Second Semester of the Second Clinical Year, candidates shall be required to take the BDS Final Part II End-of-Semester Examinations in Diagnostic Dental Sciences (including Oral Pathology II, Oral Diagnosis and Oral Radiology), Community Dentistry, Ethics & Jurisprudence and Oral Surgery II etc. All other courses will be evaluated by Continuous Assessment.

6.4 **Third Clinical Year (BDS Final Part III)** -
At the end of the Third Clinical Year, candidates shall be required to take the BDS Final Part III Examinations in Oral Medicine & Dental Therapeutics, Oral & Maxillo-Facial Surgery, Restorative Dentistry (including Conservative, Endodontics & Prosthetics), Periodontics, Orthodontics & Pedodontics and Community Dentistry (Long Essay).

6.5 A candidate shall not proceed to the Second Clinical Year (i.e. BDS Final Part II) until he/she has completed the courses and passed the BDS Final Part I examinations.

6.6 A candidate shall not proceed to BDS Final Part III until he/she has completed the courses and passed both end-of-semester examinations at BDS Final Part II.

6.7 The pass mark for all subjects at the BDS Final Parts I, II & III is 50%, provided that the candidate shall have passed the clinical and/or practical examinations.

7. **MINIMUM/MAXIMUM PERIOD FOR COMPLETING THE BDS PROGRAMME**

7.1 The minimum period for completing the Clinical BDS programme shall be six semesters or three Academic Years.

7.2 The maximum period for completing the Clinical BDS programme shall be twelve semesters or six Academic Years.
7.3 A candidate who is unable to complete his or her programme within the maximum period allowed, shall lose all credits accumulated. Such a candidate shall not be allowed to re-apply for admission into the BDS degree programme.

7.4 Subject to the provision under Section 7.5, candidates shall be required to take the first examination immediately following the completion of the relevant courses/subjects and may not postpone their entry without special written permission of the Dean.

7.5 A candidate who has not complied with the prescribed requirements for any course/subject or who has not performed satisfactorily in other duties prescribed or associated with a course/subject of instruction may, on the recommendation of the relevant Department, be refused admission to the examination of the year concerned and be required to repeat part or the whole of the course/subject of instruction leading to the particular examination.

7.6 A candidate who fails in only one course/subject of an examination at the first examination shall be referred in that course/subject and shall be required to take the examination in the referred course/subject at the supplementary examination following the main examination.

7.7 A candidate who fails in more than one subject at the first examination shall be deemed to have failed the whole examination and may on the recommendation of the Board of Examiners be required to:

   Either

   (i) repeat the whole of the examination at the supplementary examination immediately following the main examination; or,

   (ii) repeat only those course(s)/subject(s) in which he/she failed, provided he/she attains at least 55% in the course(s)/subject(s) in which he/she passed, and not less than 45% in the course(s)/subject(s) in which he/she failed (pass mark is 50%); or,

   (iii) repeat the year without the option of the supplementary examination.

7.8 A candidate who fails to complete an examination at the supplementary examination may, on the recommendation of the Board of Examiners, be required to withdraw from the Dental School or to repeat the whole or part of the course of instruction leading to that examination, before presenting himself/herself for re-examination.

7.9 Notwithstanding the provisions of Section 7.2 above, a candidate shall not present himself/herself for the whole or any part of the same examination on more than 3 (three) occasions.

7.10 A candidate who passes an examination as a whole at the first attempt and reaches the requisite high standard in a subject(s) may, on the recommendation of the Board of Examiners be awarded (a) Distinction; or (b) Credit; in such subject(s) in accordance with such rules as may be approved by the Academic Board.

7.11 Further to Section 1.3 above, the Board of the Dental School is empowered to determine whether a course of study pursued in the examinations passed in other recognized institutions by any candidate wishing to enter the professional courses at the Dental School may be accepted for the purpose of exemption from part or all of the Basic and Para-Clinical Sciences (the BSc. - Med.Sci. programme).

7.12 No exemption shall be granted from any part of the Clinical BDS courses/subjects and examinations.
8. **INTERUPTION OF STUDY PROGRAMME**

8.1 A student may break his/her study programme but not break for more than 4 continuous semesters, so however that the maximum period allowable for the completion of the programme is not exceeded. Such a student shall be allowed to continue the programme from where he/she had left off.

8.2 A student who wishes to interrupt his/her course of study shall apply in advance to the Dean of the Dental School, starting reasons why he/she wants to interrupt his/her study programme, and permission duly granted before he/she leaves the University. The decision of the Dean shall be communicate to the applicant by the Executive Secretary/Registrar before he/she leaves the University.

8.3 A student who breaks his/her studies for more than 4 continuous semesters shall be deemed to have lost any accumulated credits. Such a student may be allowed to re-apply for admission.

8.4 Where the ground for interruption of studies is medical, the Director of University Health Services shall be required to advise the Registrar on the propriety and length of period of interruption. The Registrar shall cause the Director of University Health Service to investigate any medical Report reaching his office from any health delivery facility outside the University Hospital and advise accordingly.

9. **ELIGIBILITY FOR EXAMINATIONS**

9.1 A candidate shall attend all such lectures, tutorials, seminars, satisfy the clinical and laboratory requirements and undertake all other assignments as approved by the University.

9.2 Each department shall, with the approval of the Academic Board, determine the requirements for the subjects they offer.

9.3 Further to Section 9.1 above, a candidate shall attend lectures, tutorials, practical and other activities prescribed for the courses/subjects for which he/she has registered and execute all assignments given.

9.4 A candidate who does not fulfill the requirements for any course/subject shall not be allowed to take the examination in that course/subject.

9.5 In any case, a student who is absent for a cumulative period of 21 days from all lectures, tutorials, ward rounds, clerkships and other activities prescribed for any course/subject in any semester shall be deemed to have withdrawn from the course/subject. Such a student shall not be permitted to sit for the semester examination.

10. **REGISTRATION FOR EXAMINATIONS**

10.1 Registration for a Dental School examination shall require endorsement of the Registration Form by the Head of Department to the effect that the candidate has pursued satisfactorily the approved course(s) of study being offered over the prescribed period and has attended at least 85% of lectures, tutorials, clinical, laboratory assignment and other activities prescribed for the course(s)/subject(s). A candidate’s registration shall not be valid unless it is so endorsed.

10.2 Endorsement as in (Section 10.1) above, shall be withheld if a candidate is not deemed to have followed satisfactorily the approved course of study as in Section 10 above.

10.3 In any event of the withholding of an endorsement, the Head of Department shall request the confirmation by the Dean, subject to subsequent approval by the Board of the Dental School.
11. **SUPPLEMENTARY EXAMINATIONS**

11.1 Supplementary Examinations for BDS Final Parts I and II shall be held within six weeks after the main examinations.

11.2 Supplementary Examinations for BDS Final Part III Examinations shall be held within 15 weeks after the main examinations.

11.3 The provisions of Section 7.8 above shall apply to all Supplementary Examinations.

11.4 Supplementary Examinations shall not include continuous assessment marks.

12. **EXTERNAL EXAMINERS**

12.1 External Examiners shall be required for both the main and supplementary examinations for the BDS Final Parts I, II and III.

12.2 All External Examiners shall be required to submit a written report on all aspects of the examination in which they took part.

13. **DEFERMENT OF EXAMINATION**

13.1 **On Grounds of Ill-Health:** A student who has satisfied all the requirements as specified in Section 9, but is unable to take the main examination on grounds of ill health, shall, on application to the Executive Secretary/Registrar, and on provision of a Medical Certification issued or endorsed by the Director of University Health Services/Head of Department of Medicine, University of Ghana Medical School, be allowed to take supplementary examination as his/her main examination. He/she shall be credited with the grade obtained in the supplementary examination. Subsequent application for deferment, on grounds of ill-health, shall be subject to a Medical Certificate issued by a properly constituted Medical Board.

13.2 **On Grounds other than Ill-Health:** In cases of deferment on grounds other than ill-health, the Dean of the Dental School shall invite the applicant for an interview and advise the University as appropriate. It shall be the student’s responsibility to satisfy the University beyond reasonable doubt why he/she wishes to defer the examinations.

13.3 In all cases of deferment of examinations, the applicant(s) shall obtain written responses from the Executive Secretary/Registrar before leaving the University.

14. **EXAMINERS BOARD**

14.1 There shall be an Examiners Board for the main and supplementary examinations, in respect of the BDS Final Parts I, II and III.

14.2 The Examiners Board for the BDS Final Part I, shall comprise the following:

(i) Dean - Chairman
(ii) Head of Department of Oral Pathology and Oral Medicine
(iii) Head of Department of Medicine and Therapeutics
(iv) Head of Department of Surgery
(v) Internal Examiners from the Departments concerned
(vi) External Examiners (optional)
(vii) Executive Secretary
(viii) Assistant Registrar (Academic) - Secretary
14.3 The Examiners Board for the BDS Final Part II shall comprise the following:
   (i) Dean - Chairman
   (ii) Head of Department of Oral Pathology and Oral Medicine
   (iii) Head of Department of Oral & Maxillofacial Surgery
   (iv) Head of Department of Restorative Dentistry
   (v) Head of Department of Biomaterials Science
   (vi) Head of Department of Anaesthesia
   (vii) Internal Examiners from the Departments concerned
   (viii) External Examiners (optional)
   (ix) Executive Secretary
   (x) Assistant Registrar (Academic) - Secretary

14.4 The Examiners Board for the BDS Final Part III shall comprise the following:
   (i) Dean - Chairman
   (ii) Head of Department of Oral & Maxillofacial Surgery
   (iii) Head of Department of Oral Pathology and Oral Medicine
   (iv) Head of Department of Community & Preventive Dentistry
   (v) Head of Department of Restorative Dentistry
   (vi) Head of Department of Orthodontics & Pedodontics
   (vii) Internal Examiners from the Departments concerned
   (viii) External Examiners (optional)
   (ix) Executive Secretary
   (x) Assistant Registrar (Academic) - Secretary

14.5 The Examiners Board shall receive, consider and determine the results of the BDS Final Parts I, II and III examinations.

14.6 The Examiners Board shall be required to make appropriate recommendations on any candidate based on his/her performance and also on any aspect of the examination as it deems fit.

15. DECLARATION OF RESULTS

15.1 Results of the BDS Final Parts I, II and III Examination shall normally be published by the Executive Secretary/Registrar on the School Notice Board after the Examiners’ Board has determined the results.

15.2 The results as published shall be subject to the approval of the Board of the Dental School and the Academic Board.

15.3 A results indicating the student’s performance shall be made available to him/her.

16. ELIGIBILITY FOR THE BDS DEGREE

16.1 The BDS degree shall be awarded to a candidate who has been properly admitted to the University, has followed the approved courses of study over the prescribed period and has satisfied the following conditions.

16.2 University Requirements
   (i) evidence of regular enrolment in the degree programme;
   (ii) discharge of all obligations owed to the University;
   (iii) a pass in all University required courses; and,
   (iv) satisfactory performance in the appropriate University Examinations.
16.3 Faculty/Departmental Requirements
Satisfactory discharge of such requirements as may be prescribed for the degree.

17. REQUIREMENTS FOR GRADUATION
17.1 A candidate shall be deemed to have:
   (i) satisfied all General University and Faculty requirements; and,
   (ii) Obtained at least 50% in each subject featured in the BDS Final Parts I, II and III examinations.

17.2 In addition to the above all candidates shall be required to attend the Swearing-in Ceremony and take the Hippocratic Oath.

18. CONFIRMATION OF AWARD OF DEGREE
18.1 A list of candidates who are deemed eligible as in Sections 16 and 17 shall be laid before the Academic Board of the University for approval as soon as practicable.

18.2 No award shall be confirmed unless the Academic Board of the University is satisfied that the candidate has satisfied all the conditions for the award of a degree.

19. CANCELLATION OF AWARD
19.1 Notwithstanding previous confirmation of an award of a degree as in Section 18, the Academic Board of the University may at any time cancel an award even with retrospective effect, if it becomes known that:
   (i) a candidate has entered the University with false qualifications;
   (ii) a candidate has impersonated someone else;
   (iii) a candidate has been guilty of an examination malpractice for which a grade Z would have been awarded; or,
   (iv) there are other reasons that would have led to the withholding of confirmation of the award in the first place.

19.2 In any such event, the decision of the Academic Board of the University shall be published on the University Notice Boards and the candidate notified. Such cancellation and the reasons for it shall be entered on the candidate’s transcript.

20. TRANSCRIPT OF ACADEMIC RECORD
20.1 At the end of a student’s programme, the University shall, on the payment of an appropriate fee, issue to the particular student a complete transcript of his/her academic record. This transcript shall be marked Student’s Copy and shall record all courses attempted and all results obtained.

21. CLASSIFICATION OF DEGREE
21.1 The BDS degree shall not be classified.
ADMISSION REQUIREMENTS AND REGULATIONS FOR THE BSC (MED. SCI.)
AND BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (MB CHB)
DEGREE PROGRAMMES

1.0 GENERAL REGULATIONS
1.1 The University runs a modular course structure. Under this structure, the University’s academic programme
has been organized into a semester system, and instruction takes the form of courses evaluated in terms of
credits. Units of courses are examinable at the end of every semester and, if passed, a student shall earn
credit(s) for the Units. The courses are coded and arranged in progressive order of difficulty, or in levels of
academic progression.

1.2 Each faculty shall provide detailed information about the structure of course leading to the award of
Bachelors’ degree.

1.3 It is the responsibility of each student admitted to the University of Ghana, to be familiar with the specific
requirements of the degree as well as the rules, regulations and policies of the University.

1.4 Each student is responsible for ensuring that the courses in which registration is effected satisfy the
programme requirements of the Bachelor’s degree sought; advice and/or counseling for all who need
assistance is freely available.

1.5 It is also understood that every student, by the act of registering, agrees to abide by all rules, regulations
and policies of the University of Ghana and of the Faculties or Departments in which that student is
registered.

1.6 Each student is expected to be familiar with the General Information outlined in this Handbook as well as
the information pertaining to the Medical School. Students shall therefore be held liable for any lapses.
When in doubt, students may consult their Heads of Department in writing with a copy to the Executive
Secretary asking that advice be given in writing.

1.7 Exemption from any of these General Regulations may be granted only by the express permission of the
Academic Board on the recommendation of the appropriate Faculty Board.

1.8 The University reserves the right to change rules, regulations and policies, as well as programme and
course requirements given in this Handbook without prior notice.

2.0 ADMISSION TO THE BSC (MED. SCI.) AND MB CHB PROGRAMMES
2.1 Further to the General Regulations regarding admission into the University of Ghana, admission to the
Medical School for the BSc (Med. Sci.) and MB ChB Programmes shall follow an interview of eligible
candidates to be based on Senior High School performance (WASSCE results). However all GCE A’
Level, International Baccalaureate and its equivalent applicants would be considered, and admitted to Level
100.

3.0 Bachelor of Science (Medical Sciences)
(Bsc (Med. Sci.)) Programme

3.1 ACADEMIC YEAR/STRUCTURE
The Academic Session shall comprise two semesters.

3.2 Semesters 1 & 2 (in the Faculty of Science) shall be used to upgrade the level of science of the SSSCE
candidates to levels currently prevailing at the GCE Advanced Level in the Sciences. During this first year
of the programme a semester shall be of 16 weeks duration, which will be structured as follows:
13 weeks of Teaching
1 week of Revision
2 weeks of Examinations.

3.1 All the courses in Level 100 are compulsory.
4.0 Courses/Subjects for Levels 100
Biological Sciences Option:
First Semester

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>TITLE</th>
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<tbody>
<tr>
<td>UGRC 150</td>
<td>Critical Thinking and Practical Reasoning *</td>
<td>3</td>
</tr>
<tr>
<td>ABCS 101</td>
<td>Introductory to Animal Biology</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>Practical Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 101</td>
<td>Practical Physics I</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 113</td>
<td>Mechanics and Thermal Physics</td>
<td>2</td>
</tr>
<tr>
<td>MATH 101</td>
<td>General Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>UGRC 110</td>
<td>Academic Writing I*</td>
<td>3</td>
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<tr>
<td>TOTAL CREDITS</td>
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<td>19</td>
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</tbody>
</table>

*University required courses

Second Semester

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<tr>
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<th>TITLE</th>
<th>CREDITS</th>
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</thead>
<tbody>
<tr>
<td>UGRC 110</td>
<td>Academic Writing I *</td>
<td>3</td>
</tr>
<tr>
<td>UGRC 131-136</td>
<td>Understanding Human Societies *</td>
<td>3</td>
</tr>
<tr>
<td>BOTN 104</td>
<td>Growth of Flowering Plants</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>Practical Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 102</td>
<td>Practical Physics II</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 114</td>
<td>Electricity and Magnetism</td>
<td>2</td>
</tr>
<tr>
<td>UGRC 220-238</td>
<td>Introduction to African Studies *</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL CREDITS</td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

*University required courses

4.1 Progression to Level 200:
To progress to Level 200 a candidate shall be required to make a minimum Cumulative Grade Point Average (CGPA) of 2.0. Failure to obtain this shall disqualify a candidate as a Medical/Dental student.

4.2 Semesters 3, 4, 5 & 6 (Basic Sciences and Para-Clinical Sciences)
A semester shall be of 18 weeks duration and be structured as follows:
15 weeks of Teaching
2 weeks of Revision
1 week of Examinations.

4.3 Level 200 Courses, Semesters 3 and 4
Students shall study the following subjects: Medical Sociology, History of Western Medicine, Psychology, Anatomy, Medical Biochemistry, and Physiology. All the courses are compulsory. A candidate shall be required to pass all courses before progressing to Level 300.

4.4 Level 300 Courses: Semesters 5 & 6
Semester 5 & 6 shall be devoted to courses in the Para-Clinical Sciences (Chemical Pathology, Haematology, Microbiology, Pathology, and Pharmacology). A candidate shall be deemed to have passed
all courses in order to be eligible for the award of a BSc (Med. Sci.) degree.

Students, after Semester 6, may opt for a year’s Intercalated BSc (Hons) Degree programme in the Basic Sciences and Para-Clinical Sciences subjects. Such students shall have attained at least a credit in the relevant subject. The final decision on admission to a particular Intercalated BSc Degree will be made by the relevant department.

5.0 Definition of Course Unit

A course unit shall be defined as follows:

i. One-hour lecture = 1 Unit
ii. One-hour tutorial = 1 Unit
iii. One, two/three-hour practical session = 1 Unit

6.0 Definition of Course Credit

A credit shall be defined as follows:

i. One-hour lecture or tutorial/week/semester
ii. One two/three-hour practical/week/semester.

7.0 Grading System for Courses & Subjects

7.1 Student performance in a subject/course shall be graded as follows:

<table>
<thead>
<tr>
<th>GRADE</th>
<th>NUMERICAL MARKS %</th>
<th>GRADE POINT</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80 - 100</td>
<td>4.0</td>
<td>Outstanding</td>
</tr>
<tr>
<td>B+</td>
<td>75 - 79</td>
<td>3.5</td>
<td>Very Good</td>
</tr>
<tr>
<td>B</td>
<td>70 - 74</td>
<td>3.0</td>
<td>Good</td>
</tr>
<tr>
<td>C+</td>
<td>65 – 69</td>
<td>2.5</td>
<td>Fairly Good</td>
</tr>
<tr>
<td>C</td>
<td>60 – 64</td>
<td>2.0</td>
<td>Average</td>
</tr>
<tr>
<td>D+</td>
<td>55 – 59</td>
<td>1.5</td>
<td>Below Average</td>
</tr>
<tr>
<td>D</td>
<td>50 – 54</td>
<td>1.0</td>
<td>Marginal Pass</td>
</tr>
<tr>
<td>*E</td>
<td>45 – 49</td>
<td>0.5</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>F</td>
<td>0 - 44</td>
<td>0</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Note: *Although this is a failure grade, it may still be accepted as fulfilling prerequisite for other courses.

Other Grades

<table>
<thead>
<tr>
<th>GRADE</th>
<th>INTERPRETATION</th>
<th>GRADE POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Fail</td>
<td>0</td>
</tr>
<tr>
<td>Z</td>
<td>Disqualification</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>0</td>
</tr>
<tr>
<td>Y</td>
<td>Continuing</td>
<td>0</td>
</tr>
<tr>
<td>AUDI</td>
<td>Audit</td>
<td>0</td>
</tr>
</tbody>
</table>

7.2 Grade Point (GP): Each Grade is assigned an equivalent grade point as indicated above. The number of (grade) points earned by a student, for each course completed, is computed as the produce of the number of credits for the course and the grade point equivalent letter of the grade obtained in that course.

7.3 Cumulative Grade Point Average (CGPA): The student’s cumulative grade point average is calculated by dividing the total number of grade points obtained, up to any specified time, by the total number for credits of all courses for which the student has registered up to that time.

7.4 Final Grade Point Average (FGPA): the FGPA is the CGPA for all courses under consideration calculated up to the end of a student’s academic programme.

7.5 Definition of Grades

Pass Grades: Grades A - D constitute Pass grades.
7.6 **Failure Grades**: Grades E, F, X, Z constitute Failure grades.

7.7 **Continuing**: A grade Y (for Continuing) shall be awarded at the end of a semester to any student who is taking a course which continues into the next semester.

7.8 **Audit**: A grade AUDI shall be awarded for attendance at lectures but where no examination is taken, or where an examination is taken, but no mark can be returned, for good reasons. The grade AUDI is not taken into account in the calculation of the FGPA.

7.9 **Non-Completion of Course**:
   i. A grade I (for Incomplete) shall be awarded to a student who is unable to complete a course for reasons adjudged by the Board of Examiners as satisfactory such a student shall be expected to complete the course the very next time the course if available.
   ii A grade X shall be awarded to a student who is unable to complete a course for reasons adjudged by the Board of Examiners as unsatisfactory.

8.0 **Disqualification**
   i A grade Z denotes Disqualification from an examination as a result of an examination malpractice or offence, and shall be awarded whenever it is established that a candidate had attempted to gain an unfair advantage in an examination, be it in a Principal subject or an Ancillary or any other paper.
   ii A candidate awarded a grade Z may be debarred from taking a University Examination for a stated period, or indefinitely, or may be expelled from the University altogether.
   iii A grade Z may be awarded only by the Board of Examiners.

8.1 **Honours**:
For Basic Sciences and Para-Clinical Sciences, Honours shall be awarded as follows:
- Distinction - 80-100%
- Credit - 70-79%

9.0 **STUDENT IN GOOD STANDING**
A student in good standing shall be one whose mark is at least 50% in each course.

10.0 **PROBATION AND WITHDRAWAL**
10.1 A student who fails to obtain a 50% mark in a course shall be eligible for the Supplementary Examinations.

10.2 A student who fails to obtain the requisite pass in a course after the Supplementary Examinations shall be asked by the Executive Secretary to repeat the year and the course.

10.3 A student who fails to obtain the requisite pass in the course after repeating the year shall be asked by the Executive Secretary to withdraw from the Medical School.

10.4 A student can proceed to the next stage of the programme if and only if he/she has passed all the courses of the preceding level.

11.0 **DURATION OF PROGRAMME**
11.1 The minimum period for the Basic Sciences and the Para-Clinical Sciences shall be 4 semesters and the maximum period shall be 8 semesters.

11.2 A candidate who is unable to complete his/her programme within the maximum period allowed shall lose all credits accumulated. Such a candidate shall not be allowed to re-apply for admission into the BSc (Med. Sci.) degree programme.

12.0 **INTERRUPTION OF STUDY PROGRAMME**
12.1 A student may break his/her study programme but may not break for more than 4 continuous semesters, so however that the maximum period allowable for the completion of the programme is not exceeded. Such a
student shall be allowed to continue the programme from where he/she had left off.

12.4.1 A student who wishes to interrupt his/her course of study shall apply in advance to the Dean of the Medical School, stating reasons why he/she wants to interrupt his/her study programme, and permission duly granted before he/she leaves the University. The decision of the Dean shall be communicated to the applicant by the Executive Secretary before he/she leaves the University.

12.4.2 A student who breaks his/her studies for more than 4 continuous semesters shall be deemed to have lost any accumulated credits. Such a student may be allowed to re-apply for admission Medical School.

12.3 Where the ground for interruption of studies is medical, the Head of the Medical School Clinic shall be required to advise the Dean on the propriety and length of period of interruption. The Dean shall cause the Head of the Medical School Clinic to investigate any medical report reaching his office from any health delivery facility outside the Medical School Clinic and advice accordingly.

13.0 SCHEME OF EXAMINATION FOR BSC (MED. SCI.) DEGREE
13.1 A final (end-of-semester) examination shall normally be required as a part of every course. An examination schedule showing time and place of examination for each course shall be published each semester.

13.2 The marks obtained in the end-of-semester examination shall contribute 70% of the grade for the course while continuous assessment shall contribute the remaining 30% (except for practicals or other courses which may be assessed entirely by continuous assessment).

13.3 Time allotted to examination papers shall be as follows:
   1-Credit Course - 1 hour
   2-Credit Course - 2 hours
   3-or more Credit Course - 2 to 3 hours.

14.0 ELIGIBILITY FOR EXAMINATIONS
14.1 A student shall attend all such lectures, tutorials, seminars and practicals and undertake all other assignments as approved by the University.

14.2 Each Department shall, with the approval of the Academic Board, determine the requirements for the subjects they offer.

14.3 Further to 14.1 above, a student shall attend lectures, tutorials, practicals and other activities prescribed for the courses/subjects for which he/she has registered, and to execute all assignments given.

14.4 A student who does not fulfill the requirements for any course/subject shall not be allowed to take the examination for that course/subject.

14.5 In any case, a student who is absent for a cumulative period of 21 days from all lectures, tutorials, ward rounds, clerkships and other activities prescribed for any subject in any semester shall be deemed to have withdrawn from the course/subject. Such a student shall not be permitted to sit for the semester examination.

15.0 REGISTRATION FOR EXAMINATIONS
15.1 Registration for a Medical School Examination shall require endorsement of the Registration Form by the Head of Department to the effect that the candidate has pursued satisfactorily the approved course(s) of study being offered over the prescribed period, and has attended at least 85% of lectures, tutorials, practicals and other activities prescribed for the course(s)/subjects. A candidate’s registration shall not be valid unless it is so endorsed.

15.2 Endorsement as in (15.1) above shall be withheld if a candidate is not deemed to have followed satisfactorily the approved course of study (as in Section 14).
15.3 In any event of the withholding of an endorsement, the Head of Department shall request the confirmation by the Board of the Medical School.

16.0 SUPPLEMENTARY EXAMINATIONS

16.1 BSc (Med. Sci.) Subjects

16.1.1 The Examiners’ Board shall decide whether a student who fails in any course shall be allowed to re-write the examination in the failed course as a Supplementary Examination (to be held in the Long Vacation). If he/she passes the Supplementary Examination he/she shall be awarded a grade not higher than B- or a Grade Point of 2.50 (i.e. 50 – 54 marks).

16.1.2 Supplementary Examinations shall not include continuous assessment marks.

16.1.3 Supplementary Examinations shall be held six weeks after the main examination.

16.1.4 A student shall be allowed to take not more than 6 courses in all subject areas at any one time as the Supplementary Examinations.

16.1.5 A student who at any time would be required to re-write Supplementary Examinations in more than 6 courses in all the subject areas shall repeat the year.

17.0 DEFERMENT OF EXAMINATION

17.1 On Grounds of Ill-Health: A student who has satisfied all the requirements as specified in Section 14, but is unable to take the main (end of semester) examination on grounds of ill health, shall, on application to the Executive Secretary, and on provision of a Medical Certificate issued or endorsed by the Head of the Medical School Clinic be allowed to take supplementary examination as his/her main examination. He/she shall be credited with the grade obtained in the supplementary examination.

17.2 Subsequent application for deferment, on grounds of ill-health, shall be subject to a Medical Certificate issued by a properly constituted Medical Board.

17.3 On Grounds other than Ill-Health: In cases of deferment on grounds other than ill-health, the Dean of the Medical School shall invite the applicant for interview. It shall be the student’s responsibility to satisfy the Medical School beyond reasonable doubt why he/she wishes to defer the examinations.

17.4 In all cases of deferment of examinations, the applicant(s) shall obtain written responses from the Executive Secretary before leaving the Medical School.

18.0 EXAMINERS’ BOARD

18.1 There shall be Examiners’ Board for the main and supplementary examinations in respect of:

(i) Basic Sciences

(ii) Para-Clinical Sciences

18.2 The Examiners’ Board for Basic Sciences shall comprise the following:

Dean - Chairman
Heads of Departments of Anatomy, Medical Biochemistry, Physiology
Internal Examiners for the various courses
Executive Secretary
Senior Assistant Registrar (AA) - Secretary

18.3 The Examiners’ Board for Para-Clinical Sciences shall comprise the following:

Dean - Chairman
Heads of Departments of Chemical Pathology, Haematology, Microbiology, Pathology and Pharmacology

Internal Examiners for the various courses
Executive Secretary
Senior Assistant Registrar (AA) - Secretary
18.4 Examiners’ Board(s) shall receive, consider and determine the results of the respective examinations.

18.5 Each Board shall be required to make appropriate recommendations on any candidate based on his/her performance and also on any aspect of the examination as it deems fit.

19.0 DECLARATION OF RESULTS
19.1 Results of semester examinations, taken at the end of each semester shall normally be published by the Executive Secretary on the School Notice Board before the commencement of the next semester.

19.2 A result slip indicating the student’s performance in the examination shall be made available to the student.

20.0 ELIGIBILITY FOR THE BSC (MED. SCI.) DEGREE
20.1 The BSc (Med. Sci.) degree shall be awarded to a candidate who has been properly admitted to the University, has followed the approved courses of study over the prescribed period and has satisfied the conditions as stated in Regulations 20.2 and 20.3 below.

20.2 University Requirements:
   i. evidence of regular enrollment in the degree programme
   ii. discharge of all obligations owed to the University
   i. a pass in all University required courses
   ii. satisfactory performance in the appropriate University Examinations.

20.3 Faculty/Departmental Requirements
   Satisfactory discharge of such requirements as may be prescribed for the degree.

21.0 REQUIREMENTS FOR GRADUATION
21.1 A candidate shall be deemed to have:
   i) satisfied all General University and Faculty requirements;
   ii) obtained at least 50% in each subject featured in the Level 200, Level 300 and MBChB Final Part I and II examinations;

21.2 In addition to the above, all candidates are required to attend the Swearing-in-Ceremony and take the Hippocratic Oath.

22.0 CONFIRMATION OF AWARD OF DEGREE
22.1 A list of candidates who are deemed eligible as in Regulations 20 and 21 shall be laid before the Academic Board of the University for approval as soon as practicable.

22.2 No award shall be confirmed unless the Academic Board of the University is satisfied that the candidate has satisfied all the conditions for the award of a degree.

23.0 CANCELLATION OF AWARD
23.1 Notwithstanding previous confirmation of an award of a degree as in Regulation 22 the Academic Board of the University may at any time cancel an award even with retrospective effect if it becomes known that:
   (i) a candidate has entered the University with false qualifications
   (ii) a candidate has impersonated someone else
   (iii) a candidate has been guilty of examination malpractice for which a grade Z would have been awarded
   (iv) there are other reasons that would have led to the withholding of confirmation of the award in the first place.

In any such event, the decision of the Academic Board of the University shall be published on the University Notice Boards and the candidate notified. Such cancellation and the reasons for it shall be entered on the candidate’s transcript.

24.0 TRANSCRIPT OF ACADEMIC RECORD
At the end of a student’s programme, the University shall, on the payment of an appropriate fee, issue to the particular student a complete transcript of his/her academic record. This transcript shall be marked Student’s Copy and shall record all courses attempted and all results obtained.

25.0 **CLASSIFICATION OF DEGREE**
The BSc (Med. Sci.) and MB ChB degree shall not be classified. The Intercalated BSc (Hons) degree shall be classified in accordance with general University regulations.

**OUTLINE OF COURSES IN THE BSC (MED. SCI.) DEGREE PROGRAMME**

**SCHOOL REQUIRED COURSES**

i) Psychology  
ii) Medical Sociology  
iii) History of Western Medicine  
iv) Medical Computer Literacy

Students are required to take the following courses in the Departments of Sociology, History and Psychology at the University of Ghana.

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 201</td>
<td>Introduction to General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOCI 316</td>
<td>Medical Sociology</td>
<td>3</td>
</tr>
<tr>
<td>HIST 205</td>
<td>History of Western Medicine in Ghana</td>
<td>3</td>
</tr>
</tbody>
</table>

The course in the Medical Computer Literacy is run by the Medical School Library.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDS 301</td>
<td>Medical Computer literacy</td>
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**Objectives**
The main objective of the course is to equip students with the requisite skills and knowledge to reflect the rapid changes in technology and the increasing availability of electronic sources that are changing library services. The course also would equip the student with skills that will enable them to be in a better position to be more independent in information seeking. At the end of the course the student will:

1. be able to appreciate the various strategies of information retrieval and the wide range of information sources available.
2. be knowledgeable in the use of the computer as an electronic resource

**THE BASIC MEDICAL SCIENCES**

All the courses available under the Basic Sciences programme in the Medical School are compulsory.

**DEPARTMENT OF ANATOMY**

**Objectives**
The aims of the Anatomy course are that students should gain sufficient knowledge and understanding of human anatomy to function competently as a clinical student and to provide a solid foundation for more advanced anatomical and medical studies throughout a career in medicine.

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**ANAT 205 - Human Embryology (2 Credits)**

**Course Information**

**Course Objectives:** At the end of this course the student should be able to do the following:

1. Demonstrate comprehension of the intricate influence on normal conception of various factors that determine fertility, successful coitus, fertilization, and immediate post-zygotic events.
2. Utilize information on pre-zygotic events of human development to respond appropriately to problem-based
3. Explain how twins and other multiple births occur, and how knowledge of the processes involved is utilized to effect cloning in animals.

4. Demonstrate understanding of the anatomical facts (illogicalities and asymmetries in organ positions, innervations, and blood supply) in the adult on an embryological basis.

5. Correlate the different congenital malformations possible in neonates or later in life with events in development of different systems of the body.

6. Demonstrate understanding of the development of the major organ systems, namely; Respiratory, Cardiovascular, Central Nervous, Digestive, Urinary, and Reproductive.

7. Describe normal developmental processes involved in formation of the head/neck and orofacial structures with reference to the pharyngeal apparatus and derivatives.

**Course Description:**
This course is taught to level 200 medical and dental students who are introduced to basic concepts in human embryology. In the early part of the course students are introduced to ethical and social issues of human reproductive biology with respect to contraception, ART, and cloning. This is followed by general embryology focussed on pre-zygotic and immediate post-zygotic events including development of the foetal membranes and establishment of body form. Students are then taught systemic embryology involving, cardiovascular, central nervous, respiratory, digestive, urinary, and genito-urinary systems. Throughout the course there is brief discussion of the origin of major human malformation and birth defects. Students are impressed upon to correlate what they learn with the gross anatomy and histology lectures.

**Assessments:**
There are three 2-hour assessments that test factual recall, comprehension, and application of knowledge in problem-based case scenarios. The questions include a variety of objectives (single best answer, True or False, & Matching), as well as short answers that fill in gaps, and diagrams to be labelled.

Two of the assessments are in-course; with the first assessment being conducted about mid-way in the semester and covering principally general embryology. The second in-course assessment takes place towards the end of the semester and covers mainly systemic embryology. Questions in the in-course examinations are relatively more detailed than in the end of semester examination. The marks for the two in-course assessments are pooled and a mean found for each student. The average in-course mark constitutes thirty percent (30%) of the final mark in the course.

There is an end of semester examination that covers all of the material covered in the entire course. This examination includes more general questions and case-based questions that could not be asked until all of the systems have been taught. The mark obtained by each student in the end of semester examination constitutes seventy percent (70%) of the mark in the course. A student requires forty percent (40%) total mark (in-course plus end of semester) to pass in the course.

**Course Content:**

1. Introduction To Embryology
   - Relevance/Gametogenesis, Fertilization, Cleavage Division & Blatocyst Formation.

2. Contemporary Aspects Of Reproductive Technology
   - Contraception, Assisted Embryology, Cloning, Pre-Natal Diagnostic Procedures.

3. Pre-Embryonic Development
   - 2nd Week Of Development, Implantation Bilaminar Disc, Chorionic Sac Formation

4. Twin Formation And Anomalies
   - Types Of Twins And Their Chorionic Sacs, Types Of Conjoined Twins.

5. Formation Of Foetal Membranes
   - Placenta, Umbilical Cord, Amniochorion, Amnion, Allantois, Their Functions & Anomalies.
6. Development Of Brain & Spinal Cord
   Gastrulation, Neurulation, & Anomalies.
7. Heart Development & Anomalies
   Heart Tube Formation, Folding, Partitioning, & Anomalies.
8. Development Of Blood Vessels
9. 1st In Course Assessment
   Weeks 1-9
10. Development Of The Face
    Nose & Mouth, Palate, And Pharyngeal Apparatus
11. Development Of Digestive System
    Oesophagus, Stomach, Liver, Pancreas, Small & Large Intestines, Anus, & Anomalies
12. Development Of Respiratory System
    Trachea, Lungs, And Anomalies.
13. Development Of Urinary System
    Kidneys, Ureters, Urinary Bladder, & Anomalies
14. Development Of Genital System
    Gonads, Genital Ducts, External Genitalia & Anomalies
15. Prenatal Diagnostic Procedures
    Amniocentesis, Choriocnic Vilus Sampling, Cordocentesis, Foetoscopy, Foetal Cells In Maternal Circulation, Ultrasonography
16. 2nd In-Course Assessment
    Weeks 10 -16
17. Revision
18. End of Semester Examinations.

ANATOMY 201 Human Gross Anatomy 7 Credits

Course Description:
This course is taught to level 200 Medical/Dental students, and postgraduate Anatomy (M.Phil & Ph.D) students. The students are introduced to the history and evolution of Anatomy as a basic medical science, and then students are instructed on the whole human body through five regional presentations. The regions are Upper limb, Thorax, Head and Neck, Abdomen/Pelvis/Perineum, and lower limb. Anatomy is concerned with the structure and function of the body. Human Gross Anatomy is the basic course in which students learn the morphological setting upon which human clinical knowledge and experiences are built. The course emphasizes the correlation between anatomical structure and function, clinical application, and usage of correct anatomical terminology. Thus, great stress is placed on learning normal structural-functional relationships in the human body. Hence ANAT. 201 offers a study of the fundamental structure and organization of the organs and systems of the human body. Students acquire information through lectures, tutorials, and cadaver dissections (hic locus ubi mors gaudet succurrere vitae – “here is the place where death enjoys helping life”). Dissection is supplemented by the study of surface projections, organ models, osteologic specimens, radiographs and transverse sections, small group tutorials, and table-side quizzes. Clinically-related presentations and problem sets are used to emphasize the clinical relevance of learning anatomical structure and how it relates to function. Students are encouraged to adopt self-learning, and group learning techniques using various aids including compact discs, DVDs, anatomical websites, and interactive software. At the end of the course, students should have sufficient knowledge to form hypothetical diagnoses based on presentations of lost or impaired function.

Objectives:
To acquire a precise and accurate structural knowledge of the basic organs and organ systems of the human body and describe concisely their functions.

To develop an appreciation and understanding of the 3-dimensional complexity of the human body through a detailed knowledge of the relational positions of major organs.

To become fluent in the terminology of the major regions and cavities, directions and planes of section of the human body in order to communicate this 3-dimensional complexity to others accurately and succinctly.

To be able to identify gross anatomical details of the major organs and organ systems from dissections, prosections, organ models, radiographs, and diagrams.

To gain sufficient knowledge and understanding of the morphology of the human body to function competently as a clinical student.

To acquire adequate foundation for more advanced anatomical and medical/dental studies throughout a professional career.

Examinations: There are four (regional) in-course assessments and one (global) end of semester examination. The in-course assessments cover (i) Upper limb and Thorax, (ii) Head and Neck, (iii) Abdomen, Pelvis and Perineum, and (iv) Lower limb. Each of continuous assessment has both a theory and practical component, except the last (lower limb) which is practical examinations only. The end of semester examination is theory only. The practical examinations are confined to questions that ask you to identify or recognize organs or parts of organs in cadavers, models, and radiographs. More complex questions about material covered in practical are included in the theory examination, reflecting the fact that the laboratory and lecture material really cannot be separated from each other. The philosophy of the practical test is that the student should be able to recognize and identify all major bones (their parts, foramina, protuberances, surface markings, muscle attachments, etc.) in the body either in articulated or disarticulated skeleton; as well as in situ (in cadavers). Students are also required in practical examinations to identify all major named muscles in the body, the nerves and blood vessels that supply them. The parts of all major organs and viscera in the body are pinned for students to identify in the practical exams in both cadavers and on radiographs. This is often easy for students who have worked diligently during the practical sessions and done some modest reviewing before the examinations.

Examination format: All in-course assessment theory examinations are two-hour papers of various objective-type questions (single best answer or 1 in 5; True or False, Matching, and diagrams to be labelled); as well as short answer or fill-in-the-gap questions and clinical or problem-based case deductions. Each practical exam involves identifying 120-200 pinned structures at sixty to seventy spots. Students are given two minutes to identify 2-3 structures at every spot in a “steeple chase” fashion. There is no end of semester practical examination, therefore the average of the four in-course practical assessments constitute the final practical mark for the course.

End of semester examination: This is "somewhat" cumulative, which means that, in addition to the ‘new’ material taught in the last two weeks (Lower limb) before the fourth (last) in-course assessment, cumulative questions will focus on functions of the whole body and organ systems that could not be asked until all the organ systems have been covered. For that matter, more problem-based or clinical questions are presented in this examination than in continuous assessments.

Exam percentage values: The total of the four in-course theory assessments is worth thirty percent (30%). The end of semester examination is worth 70% of the theory marks in this course. The combined theory (in-course plus end of semester) mark that adds up to one hundred percent (100%) is scaled down to sixty percent (60%). The average of the four practical assessment marks, which adds up to one hundred percent (100%) is scaled down to forty percent (40%), representing the contribution of the practical assessments to the final mark in this course. Finally, the addition of the theory mark scaled to 60% and the practical mark scaled to 40% gives the final mark in this course. A student requires forty percent as final mark to pass in this course.

Course Content
1. **Introduction to Anatomy**
   - History of Anatomy
   - Terminologies
   - Circulatory System & Lymphatic System
   - Nervous System
   - Musculo–Skeletal System
2. **Upper Limb**
   - Pectoral Region & Breast
   - Brachial Plexus
   - Axilla
   - The Hand
   - Joints of Upperlimb
   - Surface Anatomy & Radiology
   - Tutorial: Peripheral Nerve Injuries

3. **Thorax**
   - The Thoracic Cage
   - Pleurae & Lungs
   - The Heart
   - Mediastinum
   - Tutorial: Clinical Problems of The Thorax
   - Surface Anatomy & Radiology

4. **Head & Neck**
   - Introduction to Head & Neck
   - Cranial Nerves
   - Triangles of The
   - Meninges & Intracranial Venous Sinuses
   - Temporal & Infratemporal Regions
   - Tutorial: Clinical Problems of Head & Neck I
   - The Orbit
   - The Larynx
   - Tutorial: Head & Neck
   - Clinical Problems of Head & Neck
   - Lymphatic Drainage of Head & Neck
   - Surface Anatomy & Radiology

5. **Abdomen, Pelvis, & Perineum**
   - Anterior Abdominal Wall & Inguinoscrotal Region
   - Abdominal Cavity
   - Tutorial: Clinical Problem of Abdomen
   - Kidney & Ureters
   - Pelvic Organs
   - Perineum
   - Male Genital System I
   - Tutorial: Clinical Problems Of Pelvis
   - Surface Anatomy & Radiology
   - Pelvis & Perineum

6. **Lower Limb**
   - Overview of Lower Limbs
   - Gluteal Region
   - Venous & Lymphatic Drainage of Lower Limbs
   - Joint of the Lower Limbs
   - Tutorial: Clinical Problems Lower Limb
   - Surface Anatomy & Radiology

**ANAT. 203 Medical Histology 4 Credits**

Course Information:

This course is taught to level 200 Medical/Dental students, and postgraduate Anatomy (M.Phil & Ph.D) students. The students are introduced to the history and evolution of histology as an anatomical science, particularly the central role played by inventions of the microscope and microtome. They are taught the structural organisation of
cells and the distinguishing morphological characteristics of the four basic tissues, namely; epithelium, connective tissue, muscular tissue, and nervous tissue. After acquiring this basic knowledge, students are taught how the four types of tissues combine to form organs and organ systems. This portion of the course focuses on the normal microscopic features of the major organ systems of the body, providing a framework for understanding their normal physiological functions; as well as pathological changes in diseases/truma of these systems. Histological study of the systems is done mindful of regional/systemic coordination with the Gross Anatomy and Medical Embryology courses.

Throughout the histology course it is impressed upon students to look for correlations with Physiology, and links with biochemical composition of tissue structures that provide correlation with Medical Biochemistry. Students are always reminded that the knowledge acquired in this course prepares them to examine the basic pathologic abnormalities that affect tissue and organ function, including mechanisms of cell injury and inflammation in histopathology course at level 300.

Each class period begins with a one-hour lecture; followed by three hours spent in the laboratory. Practical (laboratory) work entails examining slides with the light microscope, and/or examining micrographs of histological sections of relevant organs.

**Course Objectives:** At the end of the course the student should be able to do the following.

1. Demonstrate knowledge of the evolution of histology as an anatomical discipline with reference to key terminologies, persons, inventions, and techniques that have pushed it (histology) into a central place in clinical medicine.

2. Demonstrate a clear understanding of how recurring patterns in the organisation of cells are used to distinguish microscopic structures of animal tissues.

3. Show competence in the use of the light microscope and other related laboratory techniques, to identify/distinguish histological slides and/or photomicrographs of tissue sections.

4. Make useful three-dimensional deductions from two-dimensional images seen under the light microscope or in printed micrographs that relate structure to function.

5. Demonstrate understanding of the processes necessary to make tissues useful for microscopic study, the limitations imposed by histological processing, and why most medical histology slides are prepared from non-human mammals.

6. Utilize knowledge gained to respond appropriately to problem-based case studies.

**Role of Practical Sessions:** Laboratory (practical) sessions have many purposes in this course. The practicals are designed to provide students with an active learning experience that reinforces the major points described in lectures. Practical also provide students with more specifics than can be covered in lectures. The primary goal of this course being to equip students with requisite know-how to identify/distinguish microscopic sections of tissues, demands that they acquire visual familiarity with slides. The act of examining prepared slides of tissues and organs drives home the points/features that characterize and/or distinguish histological sections more thoroughly than is possible in the more passive experience of sitting in class and listening to a description of the same features. Furthermore, the process of having to find specific features in a larger field of tissue under the microscope confers proficiency in light microscopy and provides students with an understanding of tissue structure that cannot be gained from hours of examining perfect pictures of that tissue. Hence, the lectures and practical sessions complement each other and really are not separate components in this course. The practicals are therefore in total tandem with the lecture material.

**Laboratory Guidenotes and Workbook:** This laboratory manual was written specifically for slides that students may no longer have in their slide boxes. However, adequate generalized information has been given in it to facilitate its use for studying histological sections of most mammalian tissue/organs. The manual takes students on a guided tour through the relevant features for typical light microscopic sections of tissues/organs relevant to each lecture topic. Under “Work To Be Done” subheadings, the manual contains detailed descriptions that guide students
through what to look for in each of the specific slides of each tissue. There are also briefing notes on some basic points necessary for independent study of the slides. “Workbook Exercises” at the end of each session challenge students to integrate lectures with the practicals and extend their knowledge into the wider context of science in general and basic/clinical medicine in particular. The workbook exercises would be marked and constitute ten percent (10%) of the final practical mark in the course.

**Examinations:** There are two in-course assessments and one end of semester examination. Each of the continuous assessments has both a theory and practical component. The practical examination is confined to questions that ask you to identify or recognize the major tissue/organ sections and/or their main components. More complex questions about material covered in practical are included in the theory examination, reflecting the fact that the laboratory and lecture material really cannot be separated from each other. The philosophy of the practical test is that the student should be able to recognize and identify all slides or micrographs presented in the practical examination. This is often easy for students who have worked diligently during the practical sessions and done some modest reviewing before the examination.

**Examination format:** All in-course assessment theory examinations are two-hour papers of various objective-type questions (single best answer or 1 in 4; True or False, Matching, and diagram to be labelled); as well as short answer or fill-in-the- gap questions and clinical or problem-based case deductions. Each practical exam will involve identifying forty to fifty slides and micrographs. Students are given two minutes to focus and identify histological slides, or printed micrographs in a “steeple chase” fashion. There is no end of semester practical examination, therefore the average of the two in-course practical assessments plus the mark obtained from the workbook exercises will constitute the final practical mark for the course.

**End of semester examination:** This is "somewhat" cumulative, which means that, in addition to the ‘new’ material taught in the last week before the second in-course assessment, cumulative questions will focus on comparisons between different tissues or organ systems that could not be asked until all the organ systems have been covered. For that matter, more problem-based questions are presented in this examination than in continuous assessments.

**Exam percentage values:** Each of the two in-course theory assessments is worth fifteen percent (15%); making thirty percent (30%) in total. The end of semester examination is worth 70% of the theory marks in this course. The combined theory (in-course plus end of semester) mark that adds up to one hundred percent (100%) is scaled down to sixty percent (60%). The average of the two practical assessment marks, which adds up to one hundred percent (100%) is first scaled to ninety percent (90%) to allow for addition of the 10% mark given for the practical workbook exercises. The new practical total (adding up to 100%) is secondarily scaled down to forty percent (40%), representing the contribution of the practical assessments to the final mark in this course. Finally, the addition of the theory mark scaled to 60% and the practical mark scaled to 40% gives the final mark in this course. A student requires forty percent as final mark to pass in this course.

**Course Content:**

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<td>2. Routine Histological Techniques</td>
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<td>3. Introduction to Microscopy</td>
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<td>4. Covering Epithelia</td>
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<td>5. Glandular Epithelia</td>
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<td>6. Connective Tissues</td>
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<td>7. Cartilage and Bone</td>
<td>Cartilage and Bone Tissues</td>
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<td>8. Muscle Tissue</td>
<td>Types of Muscle</td>
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9. Nervous Tissue
   Types of Nervous Tissues
10. Central Nervous System
    Brain and Spinal Cord
11. The Heart
    Review/Heart
12. Blood/Lymph Vessels
    Blood and Lymph Vessels
13. Blood
    Blood
14. Respiratory System
    Trachea and Lung
15. Gastrointestinal Tract - I.
    Oropharyngeal Structures
16. Gastrointestinal Tract - II.
    Postpharyngeal Gut

17. In-Course Assessment I
    Weeks 1-8 Assessment

18. Accessory Glands of G.I.T.
    Liver, Gall Bladder and Pancreas
19. Endocrine Glands I
    Thyroid/Parathyroid & Pineal Glands
20. Endocrine Glands II
    Hypophysis & Supra-Renal Glands
21. Lymphoid Tissues I.
    Thymus and Lymph Node
22. Lymphoid Tissues II
    Spleen & Tonsils
23. Integument
    Skin & Appendages
24. Urinary System
    Urinary System
25. Male Genital System I
    Testis/Spermatogenesis
26. Male Genital System II
    Genital Ducts & Glands, Penis
27. Female Genital System I.
    Ovary/Oogeneis & Oviducts
28. Female Genital System II.
    Uterus/Endometrial Cycle, Placenta & Vagina.

29. In-Course Assessment II
    Weeks 9-14 Assessment

30. Special Sense Organs
    Eye & Ear
31. Revision
32. End of Semester Examination
ANAT. 202  Neuroscience  4 Credits  
Course Information

Outline:
Taught to level 200 medical and dental students in the second semester, this course introduces students to the anatomical and physiological principles of neuroscience important to practicing health professionals. The course utilizes an integrated approach to provide insight into the fundamental concepts of anatomy and physiology as they relate to the nervous system. In the early part of the course a regional approach is used to study the surface landmarks, internal anatomy, and blood supply of the spinal cord, brainstem, and forebrain. This provides the framework and terminology to be used in the later part of the course, which adopts a systems approach to the study of the central nervous system. The middle to later part of the course focuses on the sensory systems, the motor system, limbic system, and higher cortical function in that order. Throughout the course, basic anatomy and physiology are coordinately presented in tandem fashion to emphasize normal functions and neurologic disorders that involve the particular system being studied. Case studies and problem-based learning methods are utilized to emphasize the correlation of basic and clinical material. Both written and practical examinations are used to assess students’ progress in the course.

Course Content:
1. ANAT:  Introduction to the Central Nervous System
2. PHYG:  Functional development of the System
3. ANAT:  Internal features of the spinal cord I
4. ANAT:  Internal features of the spinal cord II
5. PHYG:  Basic Neurophysiology I & II
6. PHYG:  Functional transmission I & II
7. ANAT:  Internal & External features of the medulla I & II
8. ANAT:  External & Internal features of the midbrain
9. ANAT:  Thalamus, subthalamus, epithalamus
10. PHYS:  Sensory Physiology: Principles of receptor function
11. PHYS:  Somatic sensation
12. PHYS:  Physiology of pain I & II
13. PHYS:  Function of the reticular formation
15. PHYS:  CSF Function System. Function of CSF
16. ANAT:  Anatomy of the cerebral cortex I & II
17. ANAT:  Review of descending and ascending pathways I & II
18. PHYS:  Function of cerebral cortex I & II
19. PHYS:  Physiology of motor system I, II, III
20. ANAT:  Anatomy of cerebellum
21. PHYS:  Physiology of the cerebellum
22. ANAT:  Basal ganglia and its function
23. PHYS:
24. ANAT:  Autonomic nervous system
25. PHYS:  Physiology of autonomic nervous system
26. ANAT:  Anatomy of hypothalamus
27. PHYS:  Functions of the hypothalamus
28. PHYS:  Temperature regulation
29. ANAT:  Visual and olfactory pathways
30. PHYS:  Physiology of vision I & II
31. PHYS:  Physiology of olfaction
32. ANAT:  Auditory and vestibular pathways
33. PHYS:  Physiology of the auditory system
34. PHYS:  Physiology of posture
35. ANAT: Blood supply of the central nervous system
36. PHYS: Cerebral circulation

DEPARTMENT OF MEDICAL BIOCHEMISTRY

Objectives
The prime objective of teaching of medical biochemistry is to illustrate the biochemical basis of human function and disease.

BIOC 201 Molecular Cell Biology (3 Credits)
BIOC 202 Intermediary Metabolism (5 Credits)
BIOC 204 Medical Genetics (4 Credits)

Molecular Cell Biology: Bioc 201 (3 Credits)
Overview: The program outlines the molecular components of the cells, cell function with regards to selected tissues, introduction of macromolecules, Protein structure and function.

Molecular Components of Cells: principal chemical constituents and main metabolic activities. Characteristics of and differences between eukaryotes, prokaryotes and viruses.


Protein structure: Peptide bond, levels of structure of proteins. Protein stability and protein folding and misfolding and disease; prion disease. Eg. Amyloidosis. Molecular chaperons. Protein purification and techniques for investigating their structure and function. Protein function related to their structure: myoglobin; structure, function and properties. Hemoglobin; structure, function, properties and abnormalities. Carbon monoxide poisoning.


Signal transduction; Surface-acting hormones; Catecholamines, polypeptide hormones and growth factors. Receptors and G-Protein transducers, second messengers, intra cellular-acting hormones, steroids, thyroid hormones and retinoids.

Intermediary Metabolism BIOC 202 5 Credits
Overview: Biochemical pathways in the metabolism of macromolecules and selected clinical correlates. Also...
Bioenergetics: Chemical energy and concepts of energy transfer within cells; free energy change. Reaction coupling equilibrium constants and their significance. “High energy” compounds as “energy currency”: Inter-conversion of high-energy phosphate via ‘equilibrium’ kinases. Principles of energy abstraction. Energy source and utilization: NADH and NADPH; Caloric value of fuels; Respiration Quotient. Energy balance; Basal Metabolic Rate. Diseases associated with changes in NAD and NADP levels.


Lipids: Physical and chemical characteristics of fats; structure and properties, nomenclature and roles of fatty acid.


Interplay between muscle and liver during starvation and re-feeding, alanine-glucose cycle. Formation and role of glutamines.

Inborn errors of amino acid metabolism: illustrated by phenylketonuria, methylmalonic- acidurias, maple syrup urine disease, and propionicacidemia. The formation and breakdown of serine and glycine. The catabolism of

Xenobiotic Oxidation: The role of cytochrome P450-dependent monoxygenase system in the metabolism of drugs and other xenobiotics.

Factors affecting foreign compound metabolism. Oxidation of different classes of xenobiotics and induction of cytochrome P450s of different specificity. Role of P450 systems in “normal” metabolism: cholesterol synthesis, synthesis of prostaglandin, leukotriene and 1, 25-dihydroxy-vitamin D3; synthesis of adrenocortico steroid hormones.


Determining bilirubin concentration using the Van den Bergh reaction. Iron metabolism; transport and storage, disease state resulting from aberrations in these processes.


BIOC 204 Medical Genetics 3 Credits

Overview: Gene structure and function/structural and functional genomics


Transcription and RNA processing: differences between eukaryotic and prokaryotic transcription; antibiotics as inhibitors. Gene profiles and quantitative traits. Protein-coding genes; Primary transcript and processing; introns/exons, 5'-caps, poly (A) tail. Alternative processing e.g. IgM, calcitonin. Processing defects e.g. some thalassaemias.


Recombinant DNA Technology in Medicine: Gene Cloning and Recombinant DNA technology in medicine. Hybridization, oligo probes for diagnosis, Restriction enzymes, Northern, Western and Southern blots. Polymerase chain reaction (PCR) for gene amplification. Strategies for genetic screening illustrated by sickle cell gene; allele-specific probes, direct and indirect RFLPs. (DNA microarray)
Chromosomal diseases: mendelian disorders; inborn errors of metabolism; multifactorial disorder; non-classic Mendelian disorders; laboratory investigations of genetic diseases.

Bioinformatics/systemic approaches in genomics.

DEPARTMENT OF PHYSIOLOGY

Objectives
The objective of this subject is to emphasize the physiological concepts of homeostasis and mechanisms of regulation. Clinical relevance of topics in all systems is given prominence.

PHYG 201 Endocrine and Reproductive Physiology (4 Credits)
PHYG 202 Cardiopulmonary Physiology (4 Credits)
PHYG 204 Renal and Gastrointestinal Physiology (3 Credits)

Introduction
The department of physiology currently provides a 2-semester 13-credit undergraduate programme of study which aims to help students to acquire new knowledge and skills, and independent-learning habits and attitudes essential for future medical practice. The following describe organization of the subject, methods of instruction and assessment, credit distribution in the courses, broad objectives of courses, and outlines of lecture topics.

Subject presentation
The subject is taught by systems and emphasizes the physiological concepts of homeostasis and mechanisms of regulation. Clinical relevance of topics in all systems is given prominence.

The following systems are currently taught, essentially in sequence.

1st semester
The cell
General principles of cellular physiology
Excitable tissue
Blood physiology
Endocrine system
Metabolism
Reproduction

2nd semester
Gastrointestinal system
Body Fluids and Renal system
Cardiovascular system
Respiratory system
Neuroscience

Methods of Instruction
- Lectures to deliver up-to-date knowledge in a concise form, stimulate interest in topics, and provide a guide to further learning
- Practicals to reinforce factual information and develop critical observation and analytical skills. Computer simulation of some experiments is provided, where equipment is unavailable. Interactive computer software is also available in the laboratory for student self-study.
- Tutorials to develop problem-solving skills, and the ability of students to integrate knowledge.
- Seminars on course-relevant topical issues, presented by students to students and faculty, aims to develop skills in independent knowledge acquisition.
- Study guides and Reference materials are provided from recommended textbooks, journals, and the internet.
Methods of Assessment

- In-course assessment (I.A) tests are conducted basically at the end of every system or module, taught within each course. The number of IA's therefore, range from 1 to 3 in each course, depending on the number of systems covered. All I.A.'s count for a total of 30% of the final course mark of 100.

- End-of-semester exams assess material covered in all courses taken in the semester. The end-of-semester paper in each course counts for a total of 70% of the final course mark of 100.

- To obtain a pass in Physiology as a subject, student must have passed with a weighted percentage point of 50 (i.e. 50%), considering all courses and credits taken in both semesters.

Recommended Textbooks

The department recommends the following textbooks for lectures in all courses, for tutorials and for independent study.

i. Textbook of Medical Physiology by Guyton & Hall
ii. Review of Medical Physiology by Ganong
iii. Human Physiology: From cells to Systems by Sherwood

OUTLINE OF PHYSIOLOGY COURSES

Level 200
Semester 4

BIOC. 201 Cell Biology (1 Credits)
The course reviews the functional organization of the cell. The student should know cell organelles and their functions, understand cell membrane structure as it relates to membrane function, and know the types of transport through membranes, as well as, the regulation of transport systems. In this course the student should understand the concept of homeostasis and balance, be aware of the different types of feedback systems and their impact, understand control systems, their effects and regulation, and overall understand the process of signal transduction including intercellular messengers, receptors, their properties and regulation.

- The Cell and its function
- Functional systems of the cell, membranes of the cell, intercellular connections
- Membrane transport
- The cell and its environment: homeostasis and feedback mechanisms

Body Fluids & Physiology of blood
The student should understand that the body may be viewed as a system of fluid compartments separated by membranes, and to appreciate the mechanisms which determine the volume and composition of the various compartments. This course deals with blood. At the end of this course the student will be able to describe the structure, formation and functions of different blood cells in order to understand the causation and pathophysiology of common haematological disorders such as anaemias.

In addition the student will be able to understand the classifications of blood groups and appreciate their roles in blood transfusion. Also, during this course the student will recognize the mechanism of haemostasis and blood coagulation so as to understand the pathophysiology of diseases arising from excessive bleeding or intravascular clotting.

- Composition, size, compartments and function of body fluids
- Function of Blood and lymph
- Inflammatory responses
- Immune mechanisms
- Blood groups, and blood transfusion
- Haemostasis
- The autonomic nervous system: components and function

Laboratory Practicals: Introduction to laboratory work; General instrumentation; Red cell osmometry. Skeletal muscle and compound action potential; Blood composition and blood grouping.

PHYG 204 Renal/Gastrointestinal Physiology 3 Credits
Renal Physiology
By the end of this course, the student should learn sufficient basic renal physiology. He should be able to recognize the importance of renal function in homeostasis through regulation of water and electrolyte balance and acid-base balance; and appreciate the kidney as an endocrine organ secreting important regulatory hormones.

- Functional Structure, components of renal function
- Methods used in studying renal function
- The process of glomerular filtration and its measurement
- Renal haemodynamics
- Renal handling of various solutes – reabsorption and secretion
- Renal concentrating mechanisms
- The kidney in homeostasis: renal involvement in total body sodium, potassium, water and acid-base regulation
- Renal hormonal function
- Micturition and its control
- Effects of loss of renal function
- Acid-base balance
- Clinical correlates in acid-base balance

Laboratory practicals: Regulation of urine volume in man. Effect of haemorrhage and replacement fluid infusion on renal function.

**Gastrointestinal Physiology**

By the end of this course, the student should learn sufficient basic gastrointestinal physiology. Through lectures, practicals and tutorials, he should be able to describe the functions and regulation of the gastrointestinal tract, and understand the pathophysiology and mechanisms of certain gastrointestinal problems e.g. peptic ulcer.

- Organisation of the digestive system
- Gastrointestinal hormones
- Mechanical processes of the digestive system
- Secretions and chemical digestion
- Absorption from the gastrointestinal tract
- Pancreas, liver and gall bladder
- Clinical physiology of peptic ulcer, cholecystectomy, pancreatectomy and malabsorption

Laboratory practicals: Salivary secretions; Gastrointestinal motility in vitro.

**PHYG 202  Cardiopulmonary Physiology  4 credits**

**Cardiovascular System**

This course deals with the heart and the circulation system. At the end of this course the student will be able to explain how the heart works as a pump and the role of the chambers, valves and the muscle. Special emphasis will be placed on heart sounds, E.C.G. and introduction to abnormal cardiac function. In the second part of this course, the student will be introduced to the physics of haemodynamics and the regulation of circulation. This will enable the student to understand the responses of cardiovascular system to stress, e.g. haemorrhage and exercise, and to develop an awareness of the disturbed physiology underlying some major cardiovascular problems such as heart failure and cardiac ischaemia. In addition, during this course, the student will acquire basic preliminary skills in using laboratory and bed side techniques commonly encountered in clinical cardiology e.g. recording an E.C.G., and measuring blood pressure and pulse.

- Overview, function, components and architecture of the CVS
- The heart as a pump: mechanical and electrical events
- Electrocardiography
- Clinical correlates
- The vascular tree: structural adaptation of the vascular segments and their functions
- Haemodynamics
- Regulatory mechanisms; regulation of cardiac output, systemic blood pressure, general and regional blood flow
- Circulation through special regions: cerebral, renal, coronary, splanchnic and skeletal muscle blood flow
- Cardiovascular adjustments in health and disease
Laboratory practicals: Physiology of cardiac muscle, factors affecting cardiac output, effect of haemorrhage and replacement transfusion. Blood pressure measurement and ECG in man.

Pulmonary physiology

The course covers the general functions of the respiratory system but concentrates mainly on the role of the system as a gas exchange organ. This involves a consideration of the principles of the mechanics of breathing, ventilation, gas transfer, gas transport in blood, and the regulation of ventilation. The acute changes and the compensatory response of the respiratory system to high altitude.

Students will be expected to relate above principles to the diagnosis, presentation, pathophysiology and management of common clinical respiratory conditions such as acute bronchial asthma, acute airway obstruction, and chest wall injuries etc.

- Organization of the respiratory system
- The physics of breathing
- Gas laws
- Spirometry
- Elastic and none elastic forces
- Surface tension
- Dynamics of ventilation
- Work of breathing
- Transport and exchange of gases
- Clinical problems of gas transport and exchange
- The pulmonary circulation
- Ventilation perfusion relationships and clinical correlates
- Regulation of respiration
- Respiratory adjustments in health and disease
- Pulmonary function tests

Laboratory practicals: Spirometry and respiratory patterns in different states.

- **PHYG 201**  
  **Endocrine/Reproduction**  
  **3 Credits**

Endocrine/Reproduction

In this course the student should be able to understand the basic principles of endocrine physiology, know the types of hormones and their regulation, and comprehend the concept of hormones as fine control systems. For each of the major endocrine systems, the student should be aware of their functional anatomy, synthesis of hormones, secretion and metabolism of hormones, action of hormones, and pathophysiological changes related to hypo-and hyperfunction.

- General Principles of intercellular communication in a multicellular organism
- Endocrine; pancrine end autocrine mechanisms
- The endocrine and nervous systems compared
- Molecular Basis of Hormone Action.
- Main types of chemical messenger
- Signal transduction across membranes.
- Surface-action hormones; catecholamines, polypeptide hormones and growth factors.
- Receptors and G-protein transducers, second messengers, classes of protein kinases (cyclic nucleotide regulated, Ca2+ regulated, tyrosine protein kinases) cascades and signal amplification
- Relation of oncogenes to signal transduction molecules.
- Defects in cell signalling.
- Intra cellular-acting hormones, steroids, thyroid hormones and retinoids.
- Steroids as regulators of gene transcription
- Cytoplasmic nuclear receptors for steroid hormones.
- Biochemical aspects of neuro-transmission and neuroactive drugs.
- Characteristics of endocrine glands
- Hormones: definition, synthesis, secretion and transport
- Hormone tissue interaction: receptors, second messengers and “cascade phenomenon”
- Experimental methods in endocrinology
The hypothalamus and pituitary axis.
Regulation of hormone secretion: negative and positive feedback control
Homeostatic role of hormones
Regulation of blood glucose
Regulation of body fluid volume and composition
Regulation of energy balance
Hormones of the pancreas
Suprarenal glands
Thyroid gland
Parathyroid glands
Posterior pituitary hormones
The growth axis
Prostaglandins and thromboxanes
Clinical correlates of endocrine hyper – or hypo – function

Laboratory practicals:

Reproduction
At the completion of the course, students are expected to have clear knowledge of the essential elements of male and female reproductive physiology including: sex determination, sex differentiation, spermatogenesis, sperm viability, male sex hormones, ovarian structure and hormonal changes from birth to menopause, female sexual cycles, ovarian and placental hormones, pregnancy, parturition and lactation, contraception, important clinical/pathophysiological correlations.
Genetics in relation to reproduction
Sexual differentiation
Gametogenesis
Male and Female reproductive physiology
The menstrual cycle: ovarian, uterine and vaginal cycles
Physiology of pregnancy
Hormones of placenta
The feto-placental unit
Hormonal control of parturition
Physiological changes in lactation and breast development
Hormonal contraception

Laboratory practicals:

ANAT 202 Neuroscience 4 Credits

Neuroscience
This course aims to provide basic information on the functions of the central nervous system which enables the body to perform coordinated and accurate voluntary and involuntary movements. The course highlights reflex functions that adapt the body to changing environmental conditions and bring about appropriate responses to a very large variety of stimuli. It also emphasizes the highly integrated nature of neurological mechanisms especially in the performance of such complex processes as memory, learning, judgment and speech. Certain topics of related pathophysiology are included along with the normal neurophysiology to reinforce the concepts of normal function.
General design of the nervous system
Sensory system
Receptor physiology
Somatic and visceral sensory mechanisms
Special sensory organs, optics and vision, taste and olfaction, audition.
Motor system
Organisation of the spinal cord for motor functions – spinal reflexes, spinal integration
Lower motor neurone function
Pyramidal and Extrapyramidal systems
Disturbances of the pyramidal and extrapyramidal system functions
Sleep and consciousness – the reticular activating system, the generalized thalamocortical system, the EEG
Hyperactivity of the nervous system – epilepsy
Sleep and wakefulness.
Visceral function of the nervous system
The medulla oblongata control of vital function (respiration, heart rate and blood pressure)
Medullary autonomic reflexes, vomiting etc.
Autonomic nervous system
The hypothalamus and its function
Behavioral functions of the central nervous system
The limbic system, motivation
Sexual behaviour.
Higher functions of the central nervous system
Learning, Memory, Speech, Calculations, Social awareness.

Laboratory practicals: Reflexes in frog and rabbit, vision and audiometry, human cutaneous sensation and reflexes in man.

PHYSIOLOGY CURRICULUM

Introduction
The Department of Physiology currently provides a 2-semester 13-credit undergraduate programme of study which aims to help students to acquire new knowledge and skills, and independent-learning habits and attitudes essential for future medical practice. The following describe organization of the subject, methods of instruction and assessment, credit distribution in the courses, broad objectives of courses, and outlines of lecture topics.

Subject presentation
The subject is taught by systems and emphasizes the physiological concepts of homeostasis and mechanisms of regulation. Clinical relevance of topics in all systems is given prominence.

The following systems are currently taught, essentially in sequence.

1st semester
The cell
General principles of cellular physiology
Excitable tissue
Blood physiology
Endocrine system
Metabolism
Reproduction

2nd semester
Gastrointestinal system
Body Fluids and Renal system
Cardiovascular system
Respiratory system
Neuroscience

Methods of Instruction
- Lectures to deliver up-to-date knowledge in a concise form, stimulate interest in topics, and provide a guide to further learning
- Practicals to reinforce factual information and develop critical observation and analytical skills. Computer simulation of some experiments is provided, where equipment is unavailable. Interactive computer software is also available in the laboratory for student self-study.
- Tutorials to develop problem-solving skills, and the ability of students to integrate knowledge.
Seminars on course-relevant topical issues, presented by students to students and faculty, aims to develop skills in independent knowledge acquisition.

Study guides and Reference materials are provided from recommended textbooks, journals, and the internet.

Methods of Assessment

- In-course assessment (I.A) tests are conducted basically at the end of every system or module, taught within each course. The number of IA's therefore, range from 1 to 3 in each course, depending on the number of systems covered. All I.A.'s count for a total of 30% of the final course mark of 100.
- End-of-semester exams assess material covered in all courses taken in the semester. The end-of-semester paper in each course counts for a total of 70% of the final course mark of 100.
- To obtain a pass in Physiology as a subject, student must have passed with a weighted percentage point of 50 (i.e. 50%), considering all courses and credits taken in both semesters.

Recommended Textbooks

The department recommends the following textbooks for lectures in all courses, for tutorials and for independent study.

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**OUTLINE OF PHYSIOLOGY COURSES**

**Level 200**

**Semester 4**

**BIOC 201 Cell Biology 1 Credit**

The course reviews the functional organization of the cell. The student should know cell organelles and their functions, understand cell membrane structure as it relates to membrane function, and know the types of transport through membranes, as well as, the regulation of transport systems. In this course the student should understand the concept of homeostasis and balance, be aware of the different types of feedback systems and their impact, understand control systems, their effects and regulation, and overall understand the process of signal transduction including intercellular messengers, receptors, their properties and regulation.

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Laboratory Practicals: Introduction to laboratory work; General instrumentation; Red cell osmometry. Skeletal muscle and compound action potential; Blood composition and blood grouping.
PHYG 204 Renal/Gastrointestinal Physiology 3 Credits

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By the end of this course, the student should learn sufficient basic renal physiology. He should be able to recognize the importance of renal function in homeostasis through regulation of water and electrolyte balance and acid-base balance; and appreciate the kidney as an endocrine organ secreting important regulatory hormones.

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Laboratory practicals: Salivary secretions; gastrointestinal motility in vitro.

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Circulation through special regions: cerebral, renal, coronary, splanchnic and skeletal muscle blood flow.

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Laboratory practicals: Physiology of cardiac muscle, factors affecting cardiac output, effect of haemorrhage and replacement transfusion. Blood pressure measurement and ECG in man.

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Relation of oncogenes to signal transduction molecules.
Defects in cell signalling.
Intra cellular-acting hormones, steroids, thyroid hormones and retinoids.
Steroids as regulators of gene transcription
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Hormone tissue interaction: receptors, second messengers and “cascade phenomenon”
- Experimental methods in endocrinology
- The hypothalamus and pituitary axis.
- Regulation of hormone secretion: negative and positive feedback control
- Homeostatic role of hormones
- Regulation of blood glucose
- Regulation of body fluid volume and composition
- Regulation of energy balance
- Hormones of the pancreas
- Suprarenal glands
- Thyroid gland
- Parathyroid glands
- Posterior pituitary hormones
- The growth axis
- Prostaglandins and thromboxanes
- Clinical correlates of endocrine hyper – or hypo – function

Laboratory practicals:

**Reproduction**
At the completion of the course, students are expected to have clear knowledge of the essential elements of male and female reproductive physiology including: sex determination, sex differentiation, spermatogenesis, sperm viability, male sex hormones, ovarian structure and hormonal changes from birth to menopause, female sexual cycles, ovarian and placental hormones, pregnancy, parturition and lactation, contraception, important clinical/pathophysiological correlations.
- Genetics in relation to reproduction
- Sexual differentiation
- Gametogenesis
- Male and Female reproductive physiology
- The menstrual cycle: ovarian, uterine and vaginal cycles
- Physiology of pregnancy
- Hormones of placenta
- The feto-placental unit
- Hormonal control of parturition
- Physiological changes in lactation and breast development
- Hormonal contraception

Laboratory practicals:

**ANAT 202 Neuroscience 4 Credits**

*Neuroscience*
This course aims to provide basic information on the functions of the central nervous system which enable the body to perform coordinated and accurate voluntary and involuntary movements. The course highlights reflex functions that adapt the body to changing environmental conditions and bring about appropriate responses to a very large variety of stimuli. It also emphasizes the highly integrated nature of neurological mechanisms especially in the performance of such complex processes as memory, learning, judgment and speech. Certain topics of related pathophysiology are included along with the normal neurophysiology to reinforce the concepts of normal function.
- General design of the nervous system
- Sensory system
- Receptor physiology
- Somatic and visceral sensory mechanisms
- Special sensory organs, optics and vision, taste and olfaction, audition.
- Motor system
- Organisation of the spinal cord for motor functions – spinal reflexes, spinal integration
- Lower motor neurone function
Pyramidal and Extrapyramidal systems
Disturbances of the pyramidal and extrapyramidal system functions
Sleep and consciousness – the reticular activating system, the generalized thalamocortical system, the EEG
Hyperactivity of the nervous system – epilepsy
Sleep and wakefulness.
Visceral function of the nervous system
The medulla oblongata control of vital function (respiration, heart rate and blood pressure)
Medullary autonomic reflexes, vomiting etc.
Autonomic nervous system
The hypothalamus and its function
Behavioral functions of the central nervous system
The limbic system, motivation
Sexual behaviour.
Higher functions of the central nervous system
Learning, Memory, Speech, Calculations, Social awareness.
Laboratory practicals: Reflexes in frog and rabbit, vision and audiometry, human cutaneous sensation and reflexes in man.

THE PARA-CLINICAL SCIENCES
All the courses available under the Para-clinical Sciences programme in the Medical School are compulsory

DEPARTMENT OF CHEMICAL PATHOLOGY

Objectives
To introduce students to basic principles and concepts of biochemical bases of diseases and to provide hands-on approach to experimental and investigative procedures.

CPAT 301 General Chemical Pathology (Theory) (2 Credits)
CPAT 303 General Chemical Pathology (Practical) (1 Credit)
CPAT 302 Systematic Chemical Pathology (Theory) (1 Credit)
CPAT 304 Systematic Chemical Pathology (Practical) (1 Credit)

CPAT 301 General Clinical Chemistry
Introducing Chemical Pathology
Methodology, Standardization, Quality Control
Nutrition I – PEM
Nutrition II – Vitamins & Antioxidants
Nutrition III - Trace Elements
CSF
Proteins
Enzymes in Diagnosis
Liver Function
In-born Errors of Metabolism
Biochemical Effects of Malignancy
Tumour Markers
Interpretation of Laboratory Results
Toxicology
Water & Electrolytes
Acid-Base Balance
Renal Function

CPAT 302 Systematic Chemical Pathology theory
Carbohydrate Metabolism
Diabetes mellitus
Hypoglycaemia
CaPTH, Vit D
Metabolic Bone Disease
Clinical Laboratory Practice
Quality Assurance
Data Interpretation
Gastric Function
Disorders of Gastro-intestinal
Function: Achlorhydria, Pernicious
Anaemia, Hyperacidity
The Pancreas
Function & Disorders
Disorders of Purine metabolism
Gout
Disorders of Iron Metabolism
Hypothalamic-Pituitary Axis
Pituitary Hormones
Adrenal Function
Sex Hormones Causes & Investigation of Infertility
Disorders of Thyroid Function
Lipid Disorders
The Metabolic Syndrome
Clinical Laboratory Practice
Instrumentation
Insulin Actions & Disorders

**CPAT 303  General Clinical Chemistry Practical**
Cerebro-Spinal Fluid (CSF): Physical and Chemical Examinations
Determination of total serum Proteins & Albumin using the Biuret & Bromocresol green methods
Serum Protein electrophoresis
Liver Function tests
Bilirubin: Total, Direct and Indirect

**CPAT 304  Systemic Clinical Chemical Practical**
Serum glucose estimation
Determination of Urine glucose using
a. glucose oxidase urine strip
Determination of glucose and protein in urine using URS-2P Urine strip
Determination of Serum/Plasma Cholesterol
Determination of serum/plasma triglyceride

**DEPARTMENT OF HAEMATOLOGY**

**Objectives**
To train medical students to understand and appreciate the structure, composition and functions of blood and blood forming organs as well as the causes and effects of their diseased states. The student must also know the principles of diagnosis and management of these diseases and the use of blood and blood products.

**HAEM 301**  Fundamental haematology, the Anaemias and Blood Transfusion (Theory)  (1 Credit)
**HAEM 303**  Fundamental haematology, the Anaemias and Blood Transfusion (Practical)  (1 Credit)
**HAEM 302**  Abnormal haemostasis and Haemat-oncology (Theory)  (1 Credit)
**HAEM 304**  Abnormal haemostasis and Haemat-oncology (Practical)  (1 Credit)

**Semester 5**
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<td>4</td>
<td>Folic Acid and Vitamin B₁₂ metabolism, Megaloblastic anaemias. Sources of Vitamin B₁₂ and folic acid. Absorption, metabolism, storage and excretion of B₁₂ and folic acid. Causes of deficiency: symptoms and signs of macrocytic anaemia due to these deficiencies. Features of megaloblastosis. Other causes of macrocytic anaemia. <strong>Practical</strong> Slide projection of megaloblastic marrow and peripheral blood features of B₁₂ and folate deficiency. Slide work. Macrocytosis, polychromasia, interpretation of red cell indices.</td>
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The peripheral blood appearance in the alpha and beta thalassaemias.
Clinical features of Beta thalassaemia major.

**Practical**
Projection: Clinical and peripheral blood features of SCA and thalassaemia major. Slide SCA and thalassaemia major.
Haemoglobin electrophoresis and Kleihauer test
Hb F estimation.

**Week 7**
Haemolytic Anaemia III
G6PD deficiency, congenital membrane defects and acquired haemolytic anaemia.
Red cell metabolism: Forms of G6PD
Inheritance and clinical effects of acquisition of G6PD enzyme defect.
Hereditary spherocytosis: inheritance, the membrane defect and disease state. Acquired defects – PCH, PNH, bacterial and parasitic causes.

**Practical**
Test for haematuria and haemoglobinuria.
Examination of thin blood films. Reporting of thin blood films.

**Week 8**
Aplastic anaemia and other causes of Bone Marrow failure.
Definition of aplasia and bone marrow failure.
Aetiological classification of aplasia, emphasis on environmental pollutants, occupational hazards and drugs.
Congenital causes. Presentation, diagnosis and management.

**Week 9**
The White Cell.
Stem cell and myelopoiesis; haemopoietic growth factors.
Mononuclear and polymorphonuclear cells
Functions of various leucocytes. Morphology and maturation.
Neutrophil kinetics and cytochemistry. Lymphocyte subsets.
Changes in count following disease.

**Practical**
Slide projection
Total white cell count and differential count.
Demonstration ESR

**Week 10**
The Acute Leukaemias
Classification: epidemiology, chromosomal abnormalities, presentation, complications, diagnosis and cytochemistry.

**Practical**
Slide projection:
Differential white cell count. Lymphocytosis, neutrophilia and eosinophilia.

**Week 11/12**
myeloproliferative disorders.
CML, primary proliferative polycythaemia, myelosclerosis, thrombocythaemia. CML epidemiology, clinical features, changes in peripheral blood and marrow, course and complications.
Primary and secondary polycythaemia, clinical course and complications of primary polycythaemia.
Myelosclerosis, pathogenesis, bone marrow and peripheral blood changes, clinical course.
Primary thrombocythaemia, nature, clinical features, course and prognosis.

**Practical**
Slide projection;
Thin film on CML, CLL and Neutrophilia.

**Week 13**
The Spleen and Lymphoproliferative disorders
Structure and function of the Spleen.
Extramedullary haemopoiesis.
Causes of splenomegaly, effect of splenectomy.
Definition of lymphoproliferative disorders.

**Practical**
Cytochemical staining;
Differential leucocyte count. CLL.

**Week 14**
Lymphoproliferative disorders
The lymphomas including Burkitt Lymphoma.
Classification and staging of lymphomas, presentation and clinical course.
Chronic lymphocytic leukaemia. Diagnosis and clinical course.

**Practical**
Slide projection
Thin blood films.

**Week 15**
The platelet and vessel wall
Megakaryocyte and formation of platelets. Structure and function of the platelet; adhesion, aggregation and procoagulant function: the vessel wall.

**Practical**
Platelet count, thin blood film, Hess test, bleeding time.

**Week 16**
Quantitative and qualitative abnormalities of platelet including IT P.
Tests of platelet function; aggregation tests.

**Week 17**
Assessment on white cells and platelets

**Semester 6**
**HAEM 302, 304**
**Clinical Haematology and Transfusion Medicine**

**Week 1**
Principles of Haematologic examination.
Cell counting, red cell indices and their interpretation, interpretation of total and differential cell count, histochemical staining, bone marrow examination, aspiration and trephine, scanning.
Principles of management of the patient with anaemia or agranulocytosis.

**Practical**
Interpretation of indices

**Week 2**
The approach to the patient with anaemia.
Manifestations of acute and chronic anaemia. Specific clinical features of iron deficiency, B$_{12}$ and folic acid deficiency. Symptoms and signs to include integumentary, cardiac, respiratory, alimentary, genitourinary and neuromuscular systems. Differential diagnosis.

Laboratory diagnosis of iron deficiency, folic acid and B$_{12}$ deficiency, biochemistry, occult blood, serum and urine chemistry, absorption studies e.g. Schilling test.


**Week 3**
Treatment of Anaemia
Iron deficiency, Vit B12 or folic acid deficiency, simple anaemias.
Treatment of underlying disorder. Indications for blood (Red Blood Cell) transfusion.
Monitoring of therapy.
Anaemia of chronic disorders.


**Week 4**
The Haemolytic Anaemias.
Clinical presentation of sickle cell disease, crisis, organ damage, management of crisis, steady state, bone marrow transplantation.
Radiological changes
Prevention including genetic counselling, prenatal diagnosis.
Thalassaemia major and thalassaemia intermedia. Differences in clinical presentation, course and prognosis. Laboratory diagnosis.
Hypertransfusion and problems of iron overload.
Acute haemolysis in G6PD deficiency. Diagnosis and management.

**Practical**
G6PD assay, cellulose acetate gel electrophoresis, screening.
Sickle cell solubility test
Tutorial on haemolytic anaemias.

**Week 5**
Blood coagulation and inhibitory systems; the fibrinolytic system.
Vascular and platelet bleeding disorders and their investigation.

**Practical**
Assessment on anaemias
Theory and Clinical problems.
The acute leukaemias. Clinical presentation, diagnosis; preparation of patient for chemotherapy; chemotherapy and bone marrow transplantation, their complications and management.

**Week 6**
Inherited and acquired deficiency of clotting factors
Haemophilia, liver failure.

**Practical**
P.T., A.P.T.T., T.T.
The lymphomas, Clinical staging.
Presentation, diagnosis, combination and single drug chemotherapy, radiotherapy.

**Week 7**
Hypercoagulable state and control of anticoagulant.

**Practical**
Investigation of patient with a bleeding disorder including platelet disorders.
Immune deficiency states
Acquired and inherited.

**Week 8**
The Blood Groups. ABO and Rhesus blood groups. The genetics and biochemistry of ABH blood group substances. Secretors and non secretors.
ABO and Rhesus blood grouping, tile and microplate methods.
Red cell membrane and metabolism of the red cell.

**Week 9**
HLA system. Application of blood group in clinical medicine, anthropology, genetics and forensic pathology.
Assessment. Bleeding disorders and haematological malignancies.
Theory and Clinical case problem.
Burkitt’s lymphoma compared to Hodgkin’s.

**Week 10**
Antigen – antibody reactions and factors affecting them.
Immunoglobulins and complement. The coomb’s test. ELISA test.

**Practical**
Tests for Haemolysins, ELISA tests and coomb’s test.
Radionucleids. Schilling test and red cell survival.
Use of radio isotopes in haematology. Regulations and precautions; scanning.

**Week 11**
Clinical Blood Transfusion I
The blood donor; screening and bleeding. Storage of blood and components.
Particle agglutination. Tanned red cells and latex.
Tutorial on Chronic Lymphocytic leukaemia.

**Week 12**
Clinical Blood Transfusion II
Blood, blood components and Blood substitutes
 Compatibility testing

**Practical**
 Compatibility testing.
 Immune Haemolytic anaemias
 Cold and warm type.  Haemolytic disease of newborn.

Week 13  Complications of blood transfusion, their investigation, prevention and management.
 Visit to the Blood Bank.
 Free.

Week 14  Tutorial
 Clinical Case Problem.
 Free


 Tutorial. Haematological malignancies.

Week 17  Tutorial. Haemolytic anaemias.

**Practical**
 Clinical Case Problem
 Safe Blood Transfusion

**DEPARTMENT OF MICROBIOLOGY**

**Objectives**
The course intends to let the students know the structure of a microorganism, its antigens and pathogenic mechanisms relate to disease causation and the antimicrobial agents, which could be used for treatment. At the end of the course, the student should have a sound theoretical knowledge of specific examples of microorganisms and be able to perform simple tests and interpret them. They should also know the principles underpinning investigation of infectious diseases.

**MICB 301**  **Bacteriology and mycology (Theory)**  (4 Credits)
**MICB 303**  **Bacteriology and mycology (Practical)**  (1 Credit)
**MICB 302**  **Virology/Parasitology (Theory)**  (4 Credits)
**MICB 304**  **Virology/Parasitology (Practical)**  (1 Credit)

**MICB 301  Introduction to Microbiology (Bacteriology/Mycology)  4 Credits**
The course is designed to give initial introduction to microbial agents and their classification Followed by detailed study of bacteria and fungi of medical importance.

**Objectives**
The student should be able to:
- Describe the general characteristics of bacteria, fungi, parasites and viruses and their antigenic components.
- Describe growth requirements and methods of identification of bacteria and fungi
- Explain the pathogenic mechanisms of various disease causing organisms
- Demonstrate an understanding of investigation of infectious disease
- State causes of nosocomial infection and principles of control – sterilization and disinfection, isolation etc
- Explain immunological basis of disease causation and prevention.
- State the use of vaccines for prophylaxis
Content
General characteristics and classification of bacteria, parasites, fungi and viruses.
Growth characteristics of bacteria and fungi and their identification.
Innate and acquired immunity, hypersensitivity,
Normal flora of various sites in the body.
Methods of Sterilization and Disinfection, Disinfectants
Antimicrobial & antifungal agents, Nosocomial infection,
Investigation of bacterial and fungal infections.

MICB 303  Practical I (Bacteriology/Mycology)  1 Credit
General
This practical course is designed to teach the student about morphology of microbial agents and simple staining and other techniques for their identification.

Objectives
1. To perform various staining techniques
2. Identify organisms in either stained or unstained specimens by morphological characteristics
3. Demonstrate an understanding of basic principles of investigation of disease

Content
Staining: - Gram, Methylene blue, Ziehl-Neelsen, Nigrosin
Simple tests for identification of bacteria and fungi
Reading of sensitivity plates and interpretation of findings

MICB 302  Virology/Parasitology  4 Credits
General
The course is designed to introduce students to the principles underlying the dynamics of parasitic and viral infections. This will enable them to understand how the interaction between parasites/viruses, humans and the environment promote the occurrence of parasitic and viral infections and human immunological response to their infection.

Objectives
The student should be able to:
- Describe the general characteristics and classification of viruses, chlamydiae, mycoplasma and rickettsiae and how infection caused by these are transmitted
- State principles of immunization and antimicrobial treatment
- Explain the pathogenic mechanisms of viruses, chlamydiae, mycoplasma and rickettsiae
- Explain host parasite relationships.
- Describe the general characteristics of parasitic protozoa, helminthes and their pathogenic mechanisms
- State methods of diagnosis, control and treatment of parasitic infections
- Demonstrate an understanding of investigation of parasitic and viral diseases

Contents

MICB 304: Practical II (Virology/Parasitology)  (1 Credits)
General
The course is designed to illustrate the experimental principles involved in course MICB 402 and to acquaint students with the laboratory methods applied in clinical diagnosis.

Objectives:
- Describe methods of virus cultivation and identification
- Explain the basic laboratory techniques for identification of viruses and diagnosis of viral infections.
- Explain the basic laboratory techniques for identification of parasites and diagnosis of parasitic infection of medical importance.

Contents:
Demonstration practicals will be mounted on the following test methods: ELISA, Western blot, Complement fixation test, Immunofluorescence test, Haemagglutination inhibition test and Simple rapid test. Tissues cultures will be mounted for identification of viral CPE (and description of types), Animal and embryonated egg inoculation. Electron micrographs showing morphological characteristics of representative virus groups. Basic laboratory techniques (Microscopy/ELISA/Culture) for identification of parasites. Direct and Iodine wet smears, Preparation of thick/thin blood films, Giemsa staining. Examination of prepared slides of parasites. Identification of vectors of medical importance, Simple rapid test.

DEPARTMENT OF PATHOLOGY

Curriculum for Level 300

Introduction
The Department of Pathology currently offers the following courses at Level 300:

PATH 305 General Pathology (Practical) (1 Credit)
PATH 303 Immunology & Immunopathology (2 Credits)
PATH 304 Systemic Pathology (Practical) (2 Credits)
PATH 301 General Pathology (Theory) (3 Credits)
PATH 302 Systemic Pathology (Theory) (5 Credits)

Objectives
To make the student understand the basic principles of causation, mechanisms and characteristics including manifestations of the major categories of diseases and subsequently, to know the specific diseases as they affect individual organs or multiple organs of causation and processes featuring in general pathology.

1. General Pathology (PATH 301 and PATH 305)
This is the current understanding of the basic principles of causation, mechanisms and characteristics including manifestations of the major categories of diseases. It is the foundations of knowledge that must be laid down before the pathology of the general pathology are understood before attempt is made to teach and study.

2. Immunology and Immunopathology (PATH 303)
This is the current knowledge and understanding of the basic components of the immune system and the principles of the basic immune reactions and how abnormal reactions lead to disease.

3. Systemic Pathology (PATH 302 and PATH 304)
This is the current knowledge of specific diseases as they affect individual organism or systems and their effects on the body as a whole. The operation of one or more categories of causation and processes featuring in general pathology may be responsible for the genesis of each specific disease.

Recommended textbooks include:
Robbins Pathologic Basis of Disease (Cotran, Kumar and Collins) Sixth Edition
Muir’s Textbooks of Pathology
General and Systematic Pathology (ed. Underwood) Second Edition
General Pathology (Walter and Israel)
Pathology (Rubin and Faber) Third Edition
The student is expected to learn by a process of gathering information, acquiring and organizing knowledge, gaining
understanding, and striving toward wisdom. In this process, participation in and “doing” are, at least, as important as listening and hearing. Students must attend all lectures and participate in all laboratories and tutorials. Prior preparation before lectures, practicals and tutorials is beneficial and essential. Every student must make the effort to contribute to discussions during practical sessions and formal tutorials. Lectures must be considered as guide to the material to be covered. When reading or written assignments are given, students must take note and comply.

PATH 301  General Pathology Theory  3 Credits
Course Objectives
At the end of the course the student shall, when required, be able to:
- Describe and explain in own words the scientific basis of disease causation
- Classify the various causes of disease
- Describe in a logical and sequential fashion the events and explain the mechanisms involved in various process
- Describe and analyze the morphologic and/or functional changes induced by various pathogenetic processes
- Differentiate between processes and mechanisms that produce similar morphologic and/or functional changes
- State and explain clearly all the terminology introduced in the course
- Deduce and predict the outcomes (morphologic, biochemical and/or functional changes/consequences) of a given pathogenetic process
- State and/or explain the underlying pathogenetic process when given a specific scenario
- Write an essay, short or long, on any of the topics treated in the course. Here the emphasis is on the clarity of thought, good usage of language including appropriate terminology and clear understanding of the topic
- Answer multiple-choice including True/False and matching questions on every topic treated in class

Content
A. Introduction to Pathology
- History of pathology
- Techniques available in pathology

B. Characteristics and Nomenclature Of Disease
- Aetiology; Pathogenesis; Manifestation and Presentation; Complications and Sequelae; Prognosis.
- Primary and Secondary; Acute and Chronic; Prefixes and Suffixes; Syndromes.
- Inherited and Acquired; Congenital; Iatrogenic

C. Cellular Basis of Disease
- Cell proliferation; Homeostasis and steady state.
- Cellular response to injury

D. Tissue Response to Injury – Inflammation, Healing and Repair
- Acute inflammation
- Chronic inflammation
- Healing and repair

E. Circulatory Disturbances
- Hyperaemia and congestion
- Oedema
- Thrombosis
- Disseminated intravascular coagulation
- Embolism
- Ischaemia and infarction
- Shock

F. Disorders of Growth and Neoplasia
- Disorders of development
- Dysplasia
- Neoplasia
General Pathology Practical (PATH 305) – 1 Credit
This course is held in the first semester of level 300 (semester 5 of the B.Sc. program).
There is one session of two hours duration every week. The class is discussions are on Microscopic and Gross Pathology Practicals.

Course Objectives
At the end of the course:

**Microscopy:** Given a histological section the student will be able to:
- Clearly describe the histologic features present
- Identify the pathologic process giving rise to those features
- State and explain the underlying mechanisms
- List/predict and give reasons for likely beneficial and harmful (complications) effects

**Gross Pathology:** Given a potted gross pathologic specimen the student will be able to:
- Identify all the organs present
- Clearly describe the gross pathologic features present
- Identify the pathologic process giving rise to those features
- State and explain the underlying mechanisms
- List/predict and give reasons for likely beneficial and harmful (complications) effects

**Microscopy:** The practical or laboratory sessions consist of histological examination of typical examples of the morphologic changes produced by the various processes discussed in lectures and tutorials. Slides for each session are selected according to the pathologic process under discussion. Students must be able to identify and describe either in writing or verbally, the histological features of the various processes and explain the underlying mechanisms. They must be able to state/predict beneficial and harmful (complications) effects of the processes. Demonstration slides may be mounted to show examples of various processes, which may not be in the class sets.

**Gross Pathology:** Students will be shown formalin-fixed potted specimens in the W. N. Laing Museum, pictures or fresh autopsy specimens in the autopsy room to illustrate various conditions discussed in the course. Students must be able to describe, either in writing or verbally, the gross appearances of the specimens and state and the particular pathologic process (es) and explain the mechanisms of the process (es) involved. They must be able to state/predict beneficial and harmful (complications) effects of the processes. The format of the session shall be in the form of a group discussion and, while it is instructor-led, it is student based

2. Immunology and Immunopathology
This course is run in the first semester of the level 300 (semester 5 of the B.Sc. program). Lectures will identify and explain the features and functions of key chemical and cellular components of the immune system and how they interact and respond to foreign agents. Tutorials will be organized periodically to further explain key principles.

Course Objectives
At the end of the course the student shall, when required, be able to:
- Describe in own words the chemical and cellular components of the immune system and explain the function(s) of each.
- Classify the various immune responses that result in disease
- Describe in a logical and sequential fashion the events and explain the immunological mechanisms involved in various disease processes
- State and explain clearly all the terminology introduced in the course
- Deduce and predict the outcomes (morphologic, biochemical and/or functional changes/consequences) of a given pathogenetic process
- State and/or explain the underlying pathogenetic process when given a specific scenario.

Content
- Introduction to immunology
- Antigen; antibody
- Cellular basis of immune response
- Humoral immune response
- Regulation of immune response
- Immunological tolerance
- Hypersensitivity reactions
- Transplantation
- Autoimmune diseases

Recommended Textbooks for Immunology include:
Basic and clinical immunology by Daniel P Stiles and Abba I Terr
Immunobiology-the immune system in health and disease by Charles A Janeway, Paul Travers, Mark Walport, J Donald Capra
Essential Immunology by Ivan Riott
Robbins Pathologic Basis of Disease (Cotran, Kumar and Collins) SEVENTH Edition

Systemic Pathology (PATH 302) - 5 Credits
Lectures will cover definition, classification and aetiology including associations and risk and predisposing factors, pathogenesis, morphologic manifestations, complications and natural course of the disease as appropriate.

Course Objectives
At the end of the course the student shall, when required, be able to:
- Give the definitions of the diseases covered in the course
- State the aetiology or aetiological factors including predisposing and risk factors, age and sex differences and other epidemiological factors (as appropriate) of the various diseases covered in the course
- Classify each disease into subtypes where appropriate
- Describe in a logical and sequential fashion the pathogenesis of each disease taught during the course
- Describe and analyze the morphologic and/or functional changes seen in the diseases discussed during the course
- State and explain clearly all the terminology introduced in the course
- State and describe with reasons the possible outcomes (morphologic, biochemical and/or functional changes/consequences) of a given disease including effects on other organs or systems.
- Write an essay, short or long, on any of the diseases treated in the course. Here the emphasis is on the clarity of thought, good usage of language including appropriate terminology; clear understanding of the disease and ability to relate to effects on other organs or systems.
- Answer multiple-choice including True/False and matching questions on every topic treated in class.

Content
A. Cardiovascular System
- Vascular diseases
- Systemic hypertension
- Cardiac failure
- Pathophysiological concepts; manifestations; compensatory mechanisms
- Ischaemic heart disease
- Rheumatic fever
- Endocarditis
- Pericarditis
- Valvular diseases
- Congenital heart disease

B. Respiratory System
- Nose, nasal sinuses, nasopharynx
- Larynx and trachea
- Bronchial asthma; bronchitis; emphysema; bronchiectasis
- Pneumonias
- Interstitial lung diseases
- Pulmonary oedema; uraemic lung
- Pulmonary hypertension and cor pulmonale
- Respiratory failure
- The pleura
- Neoplasms: Lung and pleura

C. Lymphoreticular System
- The spleen: Functions; inflammatory conditions; storage diseases; neoplasms
- Lymph nodes: Inflammatory and infectious diseases; lymphomas; metastatic neoplasms

D. Gastrointestinal System
Diseases of:
Salivary glands
- Pharynx
- Oesophagus
- Stomach
- Intestines
- Anus

E. Liver, Biliary Tract, Pancreas
Circulatory disturbances of liver
- Jaundice; liver failure; hepato-renal syndrome
- Infections:
  a. Viral hepatitis: HVA, HVB, HVD, HVC, HVE, HVG infections
  b. Yellow fever and other viral infections
  c. Schistosomiasis; Amoebic abscess
- Chemical-induced liver injury
  a. Alcoholic liver disease
  b. Bile-induced: Intra – and extra-hepatic biliary obstruction
  c. Drug-induced: Predictable and unpredictable; hepatotoxic and cholestatic
- Cirrhosis of liver
- Tumour of liver
- Gall stones and cholecystitis
- Neoplasms of gall bladder
- Acute and chronic pancreatitis
- Neoplasms of pancreas

F. Nervous System
- Congenital abnormalities of nervous system
- Pathology of intra-cranial expanding lesions
- Traumatic lesions of CNS
- Hydrocephalus
- Circulatory disturbances of CNS
- Infections of nervous system
- Demyelinating diseases
- Storage diseases
- Spinal cord degeneration; motor neurone lesions

G. Urinary System
Kidney
- Structure and function
- Congenital diseases
- The glomerular diseases
- Acute and chronic renal failure
- Pyelonephritis: Acute and chronic
- Miscellaneous renal diseases
  a. Cortical necrosis, interstitial nephritis
  b. Neoplasms of kidney
Pelvis, Ureters, Bladder
- Lithiiasis
- Obstructive uropathy
- Inflammation
- Neoplasms of urothlium
- Congenital anomalies

H. Male Genital System
- Congenital anomalies
- Inflammations
- Neoplasms of penis and scrotum
- Neoplasms of testis
- Male infertility

I. Female Genital System and Breast
Disease of:
- Vulva and vagina
- Cervix
- Endometrium
- Ovary and fallopian tubes
- Breast

J. Diseases of Bone
- Inflammatory disease of bone: Osteomyelitis (Acute and chronic)
- Metabolic diseases of bone
- Paget’s disease of bone
- Neoplasms: Osteogenic sarcoma: Chondrosarcoma

K. Diseases of Joints
- Arthritis
- Tumours of synovium and tendon sheath

L. Diseases of Skeletal Muscle
- Inflammatory diseases: Bacterial myositis: Viral polymyositis
- Muscular dystrophies
- Drug induced, toxic and endocrine myopathies
- Disorders of neuromuscular transmission: Myasthenia gravis: Eaton-Lambert syndrome.

M. Autoimmune Diseases
- Systemic lupus erythematosus
- Progressive systemic sclerosis
- Others

N. Endocrine System
Diseases of:
- The pituitary
- The adrenals
- The thyroid
- The parathyroids
- The pancreas (endocrine)

Systemic Pathology Practical (PATH 304) 2 Credits
Course Objectives
At the end of the course:
Microscopy: Given a histological section the student will be able to:
- Identify the tissue or organ(s)
- Clearly describe the histological features present
- Make a diagnosis based on the features identified and described
- State the cause (s) of the disease
- Identify the pathologic process giving rise to those features when requested
- State and explain the underlying mechanisms when requested
- List/predict and give reasons for likely complications

**Gross Pathology:** Given a potted gross pathologic specimen the student will be able to:
- Identify all the organs present
- Clearly describe the gross pathologic features present
- Make a diagnosis based on the features identified and described
- Identify the pathologic process giving rise to those features
- State and explain the underlying mechanisms
- List/predict and give reasons for likely complications

This course is run in the second semester of the level 300 (semester 6 of the B.Sc. program). It is divided into two sessions a week, each of two hours duration. The sessions are devoted to histological examination of typical examples of the morphologic features of the various diseases discussed in lectures and tutorials. Slides for each session are selected according to the pathologic system and disease under discussion and students must be able to identify and describe, either in writing or verbally, the histological features and state the diagnosis. Students must be able to state the aetiology, list and explain complications and discuss pathogenesis and predict the prognosis. Students will be shown formalin-fixed specimens in the W.N. Laing Museum or fresh autopsy specimens in the autopsy room to illustrate various conditions discussed in the course. Students must be able to describe, either in writing or verbally, the gross appearances of the specimens, state the particular pathologic process (es) involved and explain their mechanisms, state diagnosis and predict likely complications and prognosis giving reasons.

The format of each session in gross pathology shall be in the form of a group discussion and, while it is instructor-led, it is student based.

**Continuous Assessment**
Objective questions shall be used to assess theoretical knowledge during the semester. This will constitute 10-30% of final theory course mark.
Practical assessments shall be done by in-course format and will be the final course mark.

**Terminal Assessment**
The end of semester examination shall comprise a theory paper of objective type questions for 2-3 hours. There will be multiple choice questions and the true or false type objective questions. Marks would be deducted for wrong answers for the true/false type questions. The terminal assessment will form 70-90% of final course mark.

**DEPARTMENT OF PHARMACOLOGY**

**Objectives**
In this course students will be trained to know and explain: the general principles that apply to all areas of pharmacology, the pharmacologic role of endogenous substances (autacoids) in inflammation, with the view to interpret the rational use of their antagonists in clinical practice, how synthetic drugs (chemotherapeutic agents) and products of micro-organisms (antibiotics) produce toxic effect on organisms that invade the body and thereby produce therapeutic effect, the action of drugs on organ systems of the body with the view to identifying their effect, therapeutic uses, toxicity and contraindications and the basic principles, occupational and environmental toxicology, recognition of toxicity, and antidotal procedures.

At the end of the entire programme the student should be able to apply the knowledge acquired to drug management of diseases and apply the knowledge and skills acquired to define and explain emerging concepts in drug action.

**Revised Curriculum**
### Undergraduate Syllabus

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<td>General &amp; Autonomic Pharmacology (Theory) (3 Credits)</td>
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<tr>
<td>PHAM 302</td>
<td>Systemic Pharmacology, Endocrines &amp; Toxicology (Theory) (4 Credits)</td>
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<tr>
<td>PHAM 303</td>
<td>General &amp; Autonomic Pharmacology (Practical) (1 Credit)</td>
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<tr>
<td>PHAM 304</td>
<td>Systemic Pharmacology, Endocrines &amp; Toxicology (Practical) (1 Credit)</td>
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<tr>
<td>PHAM 305</td>
<td>Autacoids, Anti-inflammatory &amp; Antimicrobial Agents (Theory) (2 Credits)</td>
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### DETAILS OF UNDERGRADUATE SYLLABUS

#### PHAM 301 General & Autonomic Pharmacology (3 Credits)

**A. General Pharmacology**

**B. Autonomic Pharmacology**
- Introduction to Autonomic Nervous System, Cholinergic System, Cholinomimetic drugs, Anticholinergic drugs, Adrenergic System, Direct acting sympathomimetic drugs, Mixed and Indirect acting sympathomimetic drugs, Adrenergic-blockers (α-blockers), Adrenergic-blockers (β-blockers)

#### PHAM 302 Systems Pharmacology (4 Credits)

**A. Cardiovasculo-Renal Pharmacology**
- Diuretic agents, Antihypertensive drugs, Antianginal drugs, Antidysrhythmic drugs, Drugs used to treat heart failure, Anticoagulants, Drugs used to treat anaemia, Anti-hyperlipidaemic drugs.

**B. Respiratory Pharmacology**
- Drugs for treatment of Asthma, Anti-allergic agents, Mucolytics, Antitussives, Respiratory Stimulants

**C. Pharmacology of the Nervous System**
- General Anaesthetic Agents, Local Anaesthetic Agents, Sedative-Hypnotic Drugs, Antidepressants drugs, Opioid Analgesics and Antagonists, Antipsychotic Drugs, Drugs used in Parkinsonism, Anticonvulsants, Drugs of Abuse and Addiction

**D. Gastro-Intestinal Pharmacology**
- Antacids, Anti-spasmodics, Laxatives and Costives, H$_2$-receptor antagonists, Proton Pump Inhibitors, Antiemetics

**E. Endocrine Pharmacology**
- Corticosteroids, Anti-thyroid drugs, Antidiabetic drugs, Sex hormones and Antifertility, Oxytocics and Tocolytics

**F. Chemotherapeutics**
- Principles of Chemotherapy, Antifungal Agents, Anthelmintics, Anti-protozoal drugs, Antituberculous drugs, Drugs used in the treatment of Leprosy, Cancer Chemotherapy, Antiviral Drugs

**G. Toxicology**
- Principles of Toxicology, Environmental and Occupational Toxicology, Snake, Insects & Crustaceans bites etc., Therapeutic drugs of toxicological importance.

#### PHAM 303 & 304 Practicals (1 Credit Each)

1. Introduction to Laboratory Studies/Practices
2. Routes of drug Administration and variations in drug response
3. Relationship between drug dose and pharmacological response
4. Action of some agonists and antagonists on the isolated guinea-pig ileum
5. Effect of histamine on the microcirculation and its blockade by H1-receptor antagonists
6. Action of Local anaesthetics – $X^2$ test
7. Modes of action of neuromuscular blockers
8. Action of drugs on the human eye
9. Rational Pharmacotherapy & P-Drug Concept

PHAM 305  Autacoids, Anti-Inflammatory and Antimicrobial Drugs  (2 Credits)

A.  Autacoids and Anti-inflammatory Drugs
    Histamine and Antihistamines, 5-Hydroxytryptamine, Kinnins, Prostaglandins, Non-Steroidal Anti-Inflammatory Drugs, Drugs used in the treatment of gout

B.  Antimicrobial Agents
    Quinolones, Sulphonamides and Trimethoprim, Penicillins, Cephalosporins, Tetracyclines, Chloramphenicol, Aminoglycosides, Polymyxins, Antibiotics with Specialized Indications and Urinary antiseptics

REGULATIONS FOR THE CLINICAL PART OF THE BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (MB, ChB) DEGREE PROGRAMME

1.0  ADMISSION
1.1 Further to the General Regulations regarding admission into the University of Ghana, a candidate for admission to the Clinical Part of the MB ChB degree programme shall have obtained the B.Sc. (Med. Sc.) degree of the University of Ghana.

1.2 Candidates with the Bachelor’s degree in Basic Medical/Biological Sciences, as well as those who may have completed part of the MB ChB (or its equivalent) in a recognized university, may be considered for admission on the recommendation of a special committee appointed by the Dean. The Special Committee shall vet the transcript of the candidate as well as course content of the degree, with a view to determining the suitability of the degree or previous training and make appropriate recommendations to the Dean.

2.0  DURATION AND STRUCTURE
2.1 The Clinical Part of the MB ChB degree programme shall be of 3 years duration and structured as follows:
   (a)  1st Clinical Year - 37 weeks
   (b)  2nd Clinical Year - 45 weeks
   (c)  3rd Clinical Year - 44 weeks

3.0  ACADEMIC YEAR
    The Academic Year shall comprise two semesters.

4.0  STRUCTURE OF SEMESTER
4.1 First Clinical Year - 37 Teaching Weeks
   (i)  Semester 7 - 23 Weeks
        Clinical Rotations
   (ii) Inter-Semester Break - 2 weeks
   (iii) Semester 8 - 14 Weeks
        Clinical Rotations

4.2 Second Clinical Year - 45 Teaching Weeks
   (i)  Semester 9 - 24 weeks
        Clinical Rotations
   (ii) Inter-Semester Break - 2 weeks
   (iii) Semester 10 - 21 Weeks
        Clinical Rotations

4.3 Third Clinical Year - 44 Teaching Weeks
(i) Semester 11 - 24 weeks
   Clinical Rotations
(ii) Inter-Semester Break - 2 weeks
(iii) Semester 12 - 20 Weeks
   Clinical Rotations

5.0 SUBJECTS FOR CLINICAL YEARS 1 - 3

5.1 First Clinical Year - Semesters 7 & 8
5.1.2 Semester 7 shall be devoted to the following:
   Junior Clerkship in Community Health*  8 weeks
   Medical Psychology*  8 weeks
   Introduction to Nursing Skills  1 week
   Introduction to Clinical Skills  4 weeks
   Coordinated Course I (Medicine & Surgery,
   Community Health, and Applied Pathology and
   Inputs from other Clinical Departments)  10 weeks
   Medical Ethics  10 weeks
   * These courses run concurrently.
   This Semester shall last 23 weeks.
5.1.3 Lectures in Medical Ethics shall be given concurrently with Coordinated Course I and examined at the end of the semester.
5.1.4 Semester 8
   Semester 8 shall cover the following:
   Coordinated Course II (Medicine, Surgery, Community
   Health and Applied Pathology)
   Trauma & Orthopaedics
   This Semester shall last 14 weeks.

5.2 Second Clinical Year – Semesters 9 and 10
5.2.1 Semester 9
   Semester 9 subjects shall be:
   Junior Clerkship in Obstetrics/Gynaecology
   Junior Clerkship in Child Health
   Junior Clerkship in Psychiatry
   Specialties I (Dermatology, Ophthalmology, ENT)  Forensic Medicine
   This semester shall last 24 weeks.
5.2.2 Semester 10
   Semester 10 subjects shall be:
   Senior Clerkship in Obstetrics/Gynaecology
   Senior Clerkship in Child Health
   This Semester shall last 21 weeks.

5.3 Third Clinical Year – Semesters 11 and 12
5.3.1 Semester 11
   Semester 11 subjects shall be:
   Clinical Psychiatry
   Senior Clerkship in Medicine & Therapeutics
   Senior Clerkship in Surgery
   Senior Clerkship in Community Health
   Specialties II (Anaesthesia, Urology and Orthopaedics, Radiology
The semester shall last 24 weeks.

5.3.2 Semester 12
In this semester, the subjects taken in Semester 11, except Clinical Psychiatry, shall be continued for another 20 weeks.

6.0 MINIMUM/MAXIMUM PERIOD FOR COMPLETING THE MB CHB PROGRAMME
6.1 The minimum period for completing the Clinical MB ChB programme shall be 6 semesters or three academic years.
6.2 The maximum period for completing the Clinical MB ChB programme shall be 12 semesters or 6 academic years.
6.3 A candidate who is unable to complete his/her programme within the maximum period allowed shall lose all credits accumulated. Such a candidate shall not be allowed to re-apply for admission into the BSc (Med. Sci.) and MB ChB degree programmes.
6.4 Subject to the provision under Regulation 6.5, candidates are required to take the first examination immediately following the completion of the relevant subjects and may not postpone their entry without special written permission of the Board of the Medical School.
6.5 The candidate who has not complied with the prescribed requirement for any subject or who has not performed satisfactorily in other duties prescribed or associated with a course of instruction may, on the recommendations of the relevant department, be refused admission to the examination of the year concerned and be required to repeat part or the whole of the course of instruction leading to the particular examination.
6.6 A candidate who fails in only one subject of an examination at the first examination shall be referred in that course/subject and shall be required to take the examination in the referred course/subject at the supplementary examination following the main examination.
   (See Regulation 11.0).
6.7 A candidate who fails in more than one subject at the first examination shall be deemed to have failed the whole examination and may on the recommendation of the Board of Examiners be required to:
   (i) Repeat the whole of the examination at the supplementary examination immediately following the main examination, or
   (ii) repeat only those subjects in which he/she failed, provided that he/she obtains at least 55% in the subject(s) in which he/she passed and not less than 45% in the subject(s) in which he/she failed (pass mark is 50%), or
   (iii) Repeat the year without the option of the supplementary examination.
6.8 A candidate who fails to complete an examination at the Supplementary Examination may, on the recommendation of the Board of Examiners, be required to withdraw from the Medical School or to repeat the whole or part of the course of instruction leading to that examination, before presenting him/herself for re-examination.
6.9 Notwithstanding the provisions of Regulation 6.2 above, a candidate shall not present himself/herself for the whole or any part of the same examination on more than three occasions.
6.10 A candidate who passes an examination as a whole at the first attempt and reaches the requisite high standard in a subject(s) may, on the recommendation of the Board of Examiners be awarded Honours:
   (a) Distinction, or (b) credit in such subject(s), in accordance with such rules as may be approved by the Academic Board.
6.11 Criteria for such Honours are:
   Distinction - 75 – 100%
   Credit - 65 – 74%
6.12 Further to Regulation 1.2 above, the Board of the Medical School is empowered to determine whether a course of study pursued in the examinations passed in other recognized institutions by any candidate wishing to enter the professional courses at the Medical School may be accepted for the purpose of exemption from part or all of the Basic and Para-Clinical Sciences.
6.13 No exemption shall be granted from any part of the MB ChB subjects and examination.

7.0 INTERRUPTION OF STUDY PROGRAMME
7.1 A student may break his/her study programme but may not break for more than 4 continuous semesters, so however that the maximum period allowable for the completion of the programme is not exceeded. Such a
A student shall be allowed to continue the programme from where he/she had left off.

7.2 A student who wishes to interrupt his/her course of study shall apply in advance to the Dean of the Medical School, stating reasons why he/she wants to interrupt his/her study programme, and permission duly granted before he/she leaves the University. The decision of the Dean shall be communicated to the applicant by the Executive Secretary before he/she leaves the University.

7.3 A student who breaks his/her studies for more than 4 continuous semesters shall be deemed to have lost any accumulated credits. Such a student may be allowed to re-apply for admission to Medical School.

7.4 Where the ground for interruption of studies is medical, the Head of the Medical School Clinic shall be required to advise the Dean on the propriety and length of period of interruption. The Dean shall cause the Head of the Medical School Clinic to investigate any medical report reaching his office from any health delivery facility outside the Medical School Clinic and advice accordingly.

8.0 SCHEME OF EXAMINATIONS FOR CLINICAL SUBJECTS

8.1 The clinical part of the MB ChB degree programme shall be examined as indicated in Sections 8.2 to 8.5 below.

8.2 First Clinical Year - Semesters 7 & 8
In semesters 7 & 8, candidates shall be assessed entirely by continuous assessment and end-of-rotation tests. Candidate must have performed satisfactorily in the continuous assessment and end-of-rotation tests in order to proceed to the Second Clinical Year.

8.3 Second Clinical Year - Semesters 9 & 10 (MB ChB Final Part I)
At the end of the Second Clinical Year, candidates shall be required to take the MB ChB Final Part I Examinations in Child Health and Obstetrics & Gynaecology.

8.4 Third Clinical Year - Semesters 11 & 12 (MB ChB Final Part II)
At the end of the Third Clinical Year, candidates shall be required to take the MB ChB Final Part II Examinations in Medicine & Therapeutics, Psychiatry, Surgery and Anaesthesia and Community Health.

8.5 The methods of examination shall be:
8.5.1 Written – MCQ, short essays
8.5.2 Clinical – one long case and two short cases
8.5.3 Orals
8.5.4 Objective Structured Clinical Examination (OSCE) in Anaesthesia and Obstetrics and Gynaecology.

8.6 A candidate shall not proceed to the Third Clinical Year (i.e. MB ChB Final Part II) until he or she has completed the course and passed each subject in the MB ChB Final Part I Examinations.

8.7 The pass mark for all subjects at the MB ChB Final Parts I & II Examinations shall be 50%.

9.0 ELIGIBILITY FOR EXAMINATIONS

9.1 A student shall attend all such lectures, tutorials, seminars, ward rounds and clerkships and undertake all other assignments as approved by the University.

9.2 Each Department shall, with the approval of the Academic Board, determine the requirements for the subjects they offer.

9.3 A student who does not fulfill the requirements for any subject shall not be allowed to take the examination for that subject.

9.4 In any case, a student who is absent for a cumulative period of 21 days from all lectures, tutorials, ward rounds, clerkships and other activities prescribed for any subject in any semester shall be deemed to have withdrawn from the course/subject. Such a student shall not be permitted to sit for the semester examination.

10.0 REGISTRATION FOR EXAMINATIONS

10.1 Registration for a Medical School Examination shall require endorsement of the Registration Form by the Head of Department to the effect that the candidate has pursued satisfactorily the approved course(s) of study being offered over the prescribed period, and has attended at least 85% of lectures, tutorials, ward rounds, clerkships and other activities prescribed for the subjects. A candidate’s registration shall not be valid unless it is so endorsed.

10.2 Endorsement as in (10.1) above shall be withheld if a candidate is not deemed to have followed satisfactorily the approved course of study (as in Section 9).

10.3 In any event of the withholding of an endorsement, the Head of Department shall request the confirmation by the Board of the Medical School.
11.0 SUPPLEMENTARY EXAMINATIONS
11.1 Supplementary examinations for Final Part I shall be held in six (6) weeks after the main examinations.
11.2 Supplementary examinations for Final Part II shall be held in three (3) months after the main examinations.
11.3 The provisions of Regulation 6.8 above shall apply to all supplementary examinations.

12.0 EXTERNAL EXAMINERS
12.1 External examiners shall be required for both the main and supplementary examinations for the MB ChB Final Parts I & II Examinations.
12.2 All External Examiners shall be required to submit a written report on all aspects of the examination in which they took part.

13.0 DEFERMENT OF EXAMINATION
13.1 On Grounds of Ill-Health: A student who has satisfied all the requirements as specified in Section 8, but is unable to take the main (end of semester) examination on grounds of ill health, shall, on application to the Executive Secretary, and on provision of a Medical Certificate issued or endorsed by the Head of the Medical School Clinic be allowed to take supplementary examination as his/her main examination. He/she shall be credited with the grade obtained in the supplementary examination.
13.2 Subsequent application for deferment, on grounds of ill-health, shall be subject to a Medical Certificate issued by a properly constituted Medical Board.
13.3 On Grounds other than Ill-Health: In cases of deferment on grounds other than ill-health, the Dean of the Medical School shall invite the applicant for interview. It shall be the student’s responsibility to satisfy the Medical School beyond reasonable doubt why he/she wishes to defer the examinations.
13.4 In all cases of deferment of examinations, the applicant(s) shall obtain written responses from the Executive Secretary before leaving the Medical School.

14.0 EXAMINERS’ BOARD
14.1 There shall be Examiners’ Board for the main and supplementary examinations in respect of:
   i) MB ChB Final Part I
   ii) MB ChB Final Part II
14.2 The Examiners’ Board for MB ChB Final Part I shall comprise the following:-
   Dean - Chairman
   Vice Dean
   Heads of Departments of Child Health, and Obstetrics and Gynaecology
   Internal Examiners
   External Examiners (optional)
   Executive Secretary
   Senior Assistant Registrar (AA) – Secretary
14.3 The Examiners’ Board for MB ChB Final Part II shall comprise the following:-
   Dean - Chairman
   Vice Dean
   Heads of Departments of:
   Medicine & Therapeutics
   Surgery
   Community Health
   Anaesthesia
   Pathology
   Psychiatry
   Radiology
   Internal Examiners
   External Examiners (optional)
   Executive Secretary
   Senior Assistant Registrar (AA) - Secretary
14.4 Examiners’ Board(s) shall receive, consider and determine the results of the respective examinations.
14.5 Each Board shall be required to make appropriate recommendations on any candidate based on his/her performance and also on any aspect of the examination as it deems fit.

15.0 DECLARATION OF RESULTS
15.1 Results of end of rotation examinations shall normally be published on the department notice boards with copies to the Executive Secretary.
15.2 Results of the MB ChB Final Part I and II Examinations shall normally be published by the Executive Secretary on the School Notice Board after the Examiners’ Board has determined the results.
15.3 The results as published shall be subject to the approval of the Board of the Medical School and the Academic Board.
15.4 A results slip indicating the student’s performance shall be made available to him/her.

16.0 ELIGIBILITY FOR THE MB ChB DEGREE
16.1 The MB ChB degree shall be awarded to a candidate who has been properly admitted to the University, has followed the approved courses of study over the prescribed period and has satisfied the conditions as stated in Regulations 16.2 and 16.3 below.
16.2 University Requirements
   ii. evidence of regular enrolment in the degree programme
   ii. Discharge of all obligations owed to the University
   iii. a pass in all University required courses
   iv. Satisfactory performance in the appropriate University Examinations.
16.3 Faculty/Departmental Requirements
Satisfactory discharge of such requirements as may be prescribed for the degree.

17.0 REQUIREMENTS FOR GRADUATION
17.1 A candidate shall be deemed to have:
   i) Satisfied all General University and Faculty requirements;
   ii) Obtained at least 50% in each subject featured in the MBChB Final Part I and II examinations;
17.2 In addition to the above, all candidates are required to attend the Swearing-in-Ceremony and take the Hippocratic Oath.

18.0 CONFIRMATION OF AWARD OF DEGREE
18.1 A list of candidates who are deemed eligible as in Regulations 16 and 17 shall be laid before the Academic Board of the University for approval as soon as practicable.
18.2 No award shall be confirmed unless the Academic Board of the University is satisfied that the candidate has satisfied all the conditions for the award of a degree.

19.0 CANCELLATION OF AWARD
19.1 Notwithstanding previous confirmation of an award of a degree as in Regulation 18 the Academic Board of the University may at any time cancel an award even with retrospective effect if it becomes known that:
   (i) a candidate has entered the University with false qualifications
   (ii) a candidate has impersonated someone else
   (iii) a candidate has been guilty of examination malpractice for which a grade Z would have been awarded
   (iv) There are other reasons that would have led to the withholding of confirmation of the award in the first place.
19.2 In any such event, the decision of the Academic Board of the University shall be published on the University Notice Boards and the candidate notified. Such cancellation and the reasons for it shall be entered on the candidate’s transcript.

20.0 TRANSCRIPT OF ACADEMIC RECORD
At the end of a student’s programme, the University shall, on the payment of an appropriate fee, issue to the particular student a complete transcript of his/her academic record. This transcript shall be marked Student’s Copy and shall record all courses attempted and all results obtained.
21.0 CLASSIFICATION OF DEGREE
The MB ChB degree shall not be classified.

COMPETENCIES THAT A STUDENT SHOULD EXHIBIT ON GRADUATION IN RELATION TO THEIR SUBSEQUENT TRAINING AND FUTURE ROLES IN THE HEALTH SYSTEM

Knowledge
At the end of the training the student must be able to demonstrate knowledge and understanding of the Basic, Para-Clinical, Clinical, Behavioural and Social Sciences including Public Health relevant to the practice of medicine.

Attitude
The student should be able to:
- maintain the highest standard of professional conduct and medical ethics
- demonstrate respect for, and the responsibility for, preserving human life from the time of conception and the need for human beings to live and be treated with dignity and humanity
- Accept and demonstrate the importance of team work in health delivery.

Skills
The students must be able to demonstrate appropriate:
- Communication skills.
- Clinical Skills.
- Promotive, preventive, rehabilitative skills and be able to organise and carry out health programmes in collaboration with other members of the health team to improve health.
- Management skills.

LIFE LONG LEARNING AND CONTINUING PROFESSIONAL DEVELOPMENT
The student should be able to demonstrate the importance of research in the management of patients and the advancement of medical knowledge and cultivate life long learning habits. Further to the above, it is deemed essential to inculcate into the student a sense of patriotism to serve the motherland.

OBJECTIVES OF THE CLINICAL COURSES OF THE MB CHB DEGREE PROGRAMME

DEPARTMENT OF ANAESTHESIA

Objectives
At the end of the clerkship, the students should be able to:
- assess patients properly before anaesthesia and surgery for both elective and emergency Operations
- know the types of anaesthesia that can be given for surgery, e.g. General Anaesthesia Regional techniques, different types of anaesthetic drugs, their side-effects and drawbacks
- take care of the critically ill patient peri-operatively
- resuscitate patients (CPR)
- know the various methods of pain relief and the problems associated with them

Lecture Topics
1. Introduction to Anaesthesia
2. Pre-Operative Assessment and Premedication
3. Intravenous General Anaesthesia Agents I-Thiopentone, Ketamine
4. Intravenous General Anaesthesia Agents 2-Propofol Other Agents Including Neuroleptics
5. Inhalational Anaesthetic Agents 1 - General Considerations Ether, Stages of Anaesthesia, Etc
6. Inhalational Anaesthetic Agents 2 - Halothane and Newer Agents
7. Muscle Relaxants 1- General and Deporalizers
8. Muscles Relaxants 2-Non-Deporalizers
9. Local Anaesthesia Agent 1- General Considerations Including Mechanism of Action
10. Local Anaesthesia 2- Clinical Applications and Techniques Including Spinal/Epidural
11. Pain Relief – Acute/Chronic Pain

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12. Airway Management Including Endotracheal Intubation
13. Monitoring In Anaesthesia (Peri-Operative, Intensive Care)
14. Obstetric Anaesthesia & Analgesia
15. Emergency Anaesthesia

**Tutorial Topics**
1. Obstetric Anaesthesia & Analgesia
2. Airway Management Including Endotracheal Intubation
3. ECG
4. Post-Operative Complications
5. Chest X-Ray
6. Head Injuries & Management of the Unconscious Patient
7. Maintenance of Anaesthesia and Reversal
8. Difficult Airway, Assessment and Management
9. Intravenous Injection Techniques, Complications of Common Intravenous Anaesthetic Agents, and Their Management
10. Positioning In Theatre – Supine, Prone, Lateral, Sitting
11. Anaesthetic Machines and Circuits
12. Inadequate Ventilation – Causes, Management
13. Basic Life Support and Advance Cardiac Life Support
14. Local Anaesthetic Agents – Spinal, Epidural and Complications
15. Modes of Pain Relief (Acute and Chronic)
16. Anaesthesia for the Patient with Sickle Cell Disease, Diabetes
17. Anaesthesia for the Patient with Hypertension, Asthma
18. Management of Multiple Trauma Patients

**Practicals**
CPR1 Theory & Practical, BLS, Acls
CPR Practical Manikin Practices

N/B:  Practical Theatre Sessions to cover all the above and more

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**DEPARTMENT OF COMMUNITY HEALTH**

**Objectives**
The goal of the department of community health is to train medical students to be able to identify major problems affecting the health of communities and their solutions.

The student should be able to function effectively as a Medical Officer at district level, and should be interested in deepening his/her knowledge and interest in the field of community health after the undergraduate course through medical update courses and research.

**SENIOR CLERKSHIP PROGRAM IN COMMUNITY HEALTH**
The Senior Clerkship in Community Health is to expose the medical student to the Health and Health Systems of the Country. It investigates whether the health facilities are meeting the health needs of the people in the rural and urban communities. Students get an indepth understanding of how the local government collaborates with the various sectors of health. The programme relies on a strong understanding of the scientific basis of Community Health topics given during the Junior Clerkship programme and the contents of the Coordinated Course in Medicine and Surgery.

- Students rotate through the department in subgroups and for a period of 10 weeks covering the areas below
  - Study of urban health system (Urban Health Programme)
  - Ankaful Leprosarium programme
  - District Clerkship
  - Community Diagnosis at Danfa Rural area
- Field visits to major public health facilities in Accra and
- End of clerkship examinations (10-day programme)

The programme also aims at equipping students with skills in research, data analysis and playing advocacy role for health improvement.

**Departmental Objectives of Community Health Training Programme**

The goal of the department of community health is to train medical students to identify major problems affecting the health of communities and their solutions. The student should be able to function effectively as a medical officer at the district level, and should be interested in deepening his/her knowledge and interest in the field of community health after the undergraduate course through medical update courses and research.

**Specific Objectives**

1. Make a diagnosis of the health problems in a community, taking into considerations the major ecological factors, which influence health such as social, physical and biological environment
2. Draw up health programmes feasible for the existing health care system with due consideration of resources and interests of the community
3. Organize and carry out the programmes in collaboration with members of the health team and the community
4. Stimulate the community to modify their behavior with a view of improving their health status.
5. Administer health programmes and personnel, using appropriate management and evaluation techniques
6. Maintain the development of knowledge and skills in Community Health.
7. Carry out scientific investigations/research into the health problems of a community or individuals.

**Field Stations:**
Danfa Rural Health Centre
District Health Clerkship Hospitals
Akosombo Hospital
Apam Hospital
Nkawkaw Catholic
Nsawam Hospital
Suhum Hospital
Winneba Hospital
Atibie Hospital

**Links with the Ministry of Health and other Organisations**
Public Health Reference Laboratory
Disease Control Unit
Centre for Health Information Management
University of Westminster
Liverpool School of Tropical Medicine

**Urban Health System (Urban Health Clerkship)**
Study of urban health system (Mamprobi clerkship) Mamprobi, Kaneshie, Ussher, La, Mamobi Polyclinics

**Learning Objectives**
By the end of the rotations, the student will be able to:

Demonstrate knowledge of the staffing, functions and problems of the various units of the polyclinic (study the structure and administration of the polyclinic)

Participate in the different Health Services provided by the polyclinics and to assess their impact on the health consciousness and health status of the community.

**Urban Health Programme**
Students are to work closely with the heads of the various units – Senior PHN, Senior Nursing Office I/C of Maternity, Sister I/C of FP, Purchasing Officer, Lab Technician, Pharmacists, I/c Nutrition Rehabilitation Centre, Health Inspector etc. In order to learn how they function and also to observe the day to day problems encountered during the course of their work and how they go about solving them. Students are to participate in other field activities to the clinics.

Students should produce a report of their clerkship at the polyclinic and to provide feedback to the staff of the polyclinic as well as staff.

**Pharmacy Unit**
- Describe drug procurement
- Explain the need for Book – keeping (entries etc)
- Demonstrate knowledge about storage of drugs in the polyclinic
- Explain how drugs are dispensed including co-ordination with the prescriber

**X-ray Unit**
- To study types of x’rays usually done at the clinic
- To study protection from x’radiation from both staff and patients
- To study general problems with the x’ray machine
- To study storage and (weather) conditions for films
- Chemical and equipment

**Laboratory Unit**
- To participate and learn about
  - Haemoglobin
  - WBC’s estimation and chemicals involved
  - Sickling Tests
  - Blood film for malaria parasites BF
  - Urine tests, stools tests chemicals and procedure

**Records and Statistics Unit**
- to learn about data collection and analyst
- to learn about the various returns in the unit
- to learn about various forms used to collect information

**Maternity Unit**
- to participate in deliveries
- to observe cord dressing

**The School Health Programme**
- to learn about the functions of the school clinic
- to learn about the general sanitation of the school compound
- students participate in school hygiene inspection

**Visit to 2 private Clinics in the district**
- to learn about its organisation and functions

**Visit to Environmental Health Department**
- to learn about its organisation and functions

**Ankaful Hospital Programme, Ankaful**
(1 week field visit to leprosarium)
**Objective of the Programme**

1. **To expose medical students to control of leprosy in Ghana**
   (i) Introduction: History of Leprosy, Bacteriology Epidemiology, slit skin smear (practicals)
   (ii) Immunology, Evolution of lesions, Clinical features, Classification of leprosy, Clinical work in wards (examination of lesions)
   (iii) Differential diagnosis, complications of leprosy, Reactions in leprosy, Clinical work in wards (assessment of disability)
   (iv) Chemotherapy in Leprosy, MDT, rationale and administration, disability grade and prevention of disability, (practical orthopaedics and physiotherapy), Health education sessions with patients
   (v) History of Leprosy in Ghana, Principles of Leprosy control and control measures, Charting of patients (practical) Post test, Video on Leprosy.

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**THE DISTRICT CLERKSHIP: INSTRUCTION GUIDE**

**A: Work in Hospital**

**The Objective of the Clerkship** is to introduce the students to the types and management of medical problems seen in district hospitals

1. Students are required within the hospital setting to act as clinical clerks in all specialties as are relevant in their institutions for the entire duration of the clerkship.
2. They should examine patients, attend ward rounds, assist in the theatre, laboratory etc. and carry out assignments as are scheduled for them.
3. They are expected to do night duties and behave as if they were part of the staff of the hospital rather than as visitors. They should keep the regulations of the hospital.
4. Students should also learn the administrative problems of the running of the hospital – personnel, supplies, relationship to the community etc. through sessions with the Senior Medical Officer in charge and the Hospital Secretary.
5. Students should take part in any outreach programme of the hospital to the district. They should also lean about the sanitation and hygiene of the district in general and of the hospital in particular e.g. water supply, refuse disposal and sanitary measures.
6. They must see some of the common endemic and communicable diseases e.g. Tuberculosis, Measles, Enteric Fever, Diarrhoea Diseases, Pneumonia, Infectious Hepatitis and study their pathogenesis and natural history.
7. They should also how common surgical and obstetrical and gynaecological cases are handled at the district level.

**B: Work in the Community**

Students should:-
(a) Take part in the programmes being carried out by the health workers in the field.
(b) Observe closely the roles of the various health workers in the team considering their background, training and experience with a view to a critical examination of their appropriateness for their tasks.
(c) Evaluate the effectiveness of the services e.g. is the service reaching all those at risk? Are the time at which the service is rendered convenient to the community? Are the services technically sound and are they achieving the desire objectives?
(d) Participate in the following programs; Health Education to selected target population such as School Health, Home visiting, Communicable disease control and Environment Sanitation. In particular for Environmental Sanitation.

**Environmental Sanitation**

With Health Inspector and accompany him on at least three normal duty rounds, and also do special on site inspections with him. Identify sanitation problems in the health institution and the community. Discuss problems. Examine drinking water resources of the community and visit sites of refuse disposal (solid waste) and methods of excreta disposal e.g. wells, ponds, pit latrine construction and sitting. Examine drainage system and determine any
health hazards posed. Food hygiene – slaughtering of animals, food handling, markets, chop bars and drinking places. Examine and discuss vector problems and see what measures of control are used. Inspect housing in the community, sitting, structures, ventilation, drainage, refuse disposal over crowding, physical planning of community roads, traffic problems, play grounds and other community amenities.

Vital Events (Births and Deaths) Recording
Study procedures and forms used for collecting vital and epidemiological data and how data are dispatched to the centre. Is there a feed-back of information from the centre (e.g. Regional Headquarters, or Ministry of Health, Accra) what are the problems of Maternal Mortality Rate, Crude Death Rate etc) Suggest improvements.

C. Health Administration
Students should familiarize themselves with the administrative set up for health from Regional MOH down to the local level. What are the lines of authority? How is planning done? What is the method for reviewing performance of health staff at the local level? Who forms the health team? Is the work-load evenly shared?

How do the workers reach out to the community? Is there easy communication with higher levels of health administration? Study the relationship of the local health institution to the local administration and to private medical care in the community.

Local Health Committee or District Council or Town Management Town Management Council
Students should find out the structure of local administration of the community (traditional and modern), and determine how this enhances or impedes health progress. Who are the opinion leaders in the community? The student must attend one meeting at least of a health committee or any such equivalent body. Students must keep a log book of their activities. Students should also record in the log book some basic statistical information about the hospital and the district. Information should be gathered about the number of hospital beds, numbers and types of personnel; out-patient attendance, in-patient statistics, spectrum of diseases seen; age and sex distribution of patient etc.

A brief district profile should also be included:

Log Book Account of District Clerkship: Summary
The lay out should include: Date, Place of Activity, Description of Activities and comments. The comments should include notes on topics covered as well as lessons learnt.

DANFA DISTRICT CLERKSHIP (TWO WEEKS)
The main activity is the community diagnosis of one of the villages or communities in or around Danfa Project Area 1. Then visits to programmes in other health related sectors such as the Abokobi Rural Bank, Abokobi Agricultural Project, Centre for Plant Medicine and Research, Mampong School for the Deaf and others.

Grand Round
At the end of the rotation, a grand round will be held in the conference room where a report of the community diagnosis will be presented. Almost all the members of staff of the department will be present. Different individuals read out findings in the areas of History of the Village, demographical findings, and source of water, environmental sanitations, and attitudes towards common endemic diseases, immunization status etc. and recommendations. This should be put in a form of a report for the department.

FORMAT OF REPORT
The reports should consist of:
Introduction
Location of the village from Danfa Health Centre
Provide the historical background of the village
Description of the layout of the houses and important landmark, Eg. Chief’s palace.
The type of vegetation, the ethnic composition of the population
The occupation and major economic activity of the people.

**Rationale or reason for the survey of the clerkship**

1. To study the health situation of the village with the mind to identify any serious endemic diseases and any factor that would militate against achieving a higher health status, be it directly or indirectly.
2. To highlight the felt needs of the community
3. To make recommendations based on the survey findings as to how to improve the health status of the people with emphasis on the use of local resources and feasible economically accessible methods.

Describe the main and specific objectives, for example to determine

- the demographic indices
- the level of environmental sanitation
- the nutritional status of children under 5 years
- the level of immunization
- the prevalence of malaria, helminthiasis and schistosomiasis
- the accessibility and utilization of medical facilities
- finally the utilization of Maternal Child Health and Family Planning Clinics

**METHODOLOGY**
Describe all the steps taken from preparation of instruments and the arrangement for the field work. The subject areas of the questionnaire, the samples to be taken form the subjects, any measurements. The laboratory examinations and the nature of the analysis to be done.

**Limitation of the methodology**
Specify any issue which should be taken into consideration in the report of the study.

**DATA ANALYSIS AND PRESENTATION OF RESULTS**

**Demography**
Total Population and age-specific population size of interest to health programmes. Migration and mortality rate estimates. Ethnic composition, occupational status, religious and educational status.

**Environmental Health**
A description of the environmental situation, housing, water supply, refuse disposal facilities, drainage, excreta disposal.

Sources of health care, disease burden, nutritional status, knowledge, attitude and practice regarding health habits and illnesses. Immunization status and use of health services.

Felt needs of the community

**Discussion**
Discussion of the results of survey and field activities and interpretation of results

**Recommendation**
Appropriate recommendations based on findings and discussions should be included.

**REPORT ON THE FEEDBACK TO THE COMMUNITY**
After the community diagnosis in the village, a report of your findings and recommendations must be presented to the community

**One Week Programme:**
Field visits to major public health facilities in Accra

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<th>DAY/DATE</th>
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<tbody>
<tr>
<td>Monday</td>
<td>1. Students meet with Faculty (8.30 am)</td>
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<td>Day</td>
<td>Events</td>
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<td>Tuesday</td>
<td>Occupational Health</td>
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<td>- Visits and Discussion (8.30 am)</td>
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<td>- Lecture (1.00 pm)</td>
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<td>Wednesday</td>
<td>1. Slaughter House (8.30 am)</td>
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<td>2. City MMOH</td>
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<td>3. Seminar on Environmental health Problems (2.00 pm)</td>
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<td>Thursday</td>
<td>1. Waste management department Lecture and Visit (8.30 am)</td>
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<td>Friday</td>
<td>1. Port Health – Tema (8.30 am)</td>
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<td>2. epidemiology (2.00 pm)</td>
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<tr>
<td>Monday</td>
<td>Public Health Advocacy (All staff) (8.30 am)</td>
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<td>Collection of Log Books</td>
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<td>Tuesday</td>
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<td>Wednesday</td>
<td>End of Clerkship Examinations</td>
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<td>Thursday</td>
<td>1. Oral Examination</td>
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<td>2. Evaluation (All staff and students)</td>
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<td>Friday</td>
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**ADVOCACY TOPICS**

**Public Health Advocacy**

The purpose of this is to give students the opportunity to critically examine important issues of the public health concern. It is now well recognized that health development requires intersectoral and multidisciplinary approach although doctors diagnose solutions. The learning objectives, the students should be able to:-

1. write reports, memoranda, position papers
2. present such papers at a plenary of their peers and staff
3. evaluate the work of their peers

Students ballot for topics on issues of public health concern at the beginning of their sub internship. About 8 weeks later, the students make presentation which is criticized by their peers and the faculty. The content, style logic and the scientific basis. Style of presentation and how convincing the arguments are count in the award of marks.

*Examples of some of the topics*

1. Make a case for male involvement in family planning in Ghana
2. One of the effective strategies identified for the prevention and control of malaria is the use of insecticide-treated mosquito nets (ITNs). Discuss the factors that affect their adoption and appropriate use.
3. Make a case against the Ministry of Health’s policy of promoting exclusive breastfeeding for the first six months of an infant’s life. Discuss
4. Rural electrification or portable water for all rural communities. Take a stand and defend it.
5. Treatment and counseling of rape victims are both vital for recovery and help create a feeling of safety in addition to providing opportunities to talk about the violent experience. Make a proposal for the exemption policy to cover these two services.
6. The future of Traditional Medicine in Ghana. Discuss
7. Support for extended family members in dwindling because of Interstate Succession Law. Discuss
8. At a Ghana Medical and Dental Council Meeting you were appointed the leader of a committee responsible for looking into the topic “Medical education in Ghana is clinically biased. There is an urgent need to incorporate and strengthen other relevant components.” Give an outline of your report and recommendations.
9. Antiretroviral drugs are being introduced on a larger scale in Ghana by December. Is it the solution to the dilemma of HIV/AIDS? Discuss.
10. Evaluate the DOTS management of TB in Ghana
11. What accounts for the lack of reliable health statistics in Ghana? Give suggestions for improvement
12. Alcohol and Tobacco Industries in Ghana are a necessary evil. Discuss
13. Health is too important to be left in the hands of doctors alone. Discuss
14. You are a principal speaker at a national road safety campaign to be launched on Christmas Eve at Nsawam. Give an outline of your speech
15. Emancipation of the female species in Ghana is only in name. Discuss
16. Make a case for male involvement in family planning in Ghana
17. Make a case for Post Mortems for all deaths.
18. Accra remains filthy. Trace what has been done in the past and suggest what can be done.
19. Discuss the Human Rights Implication of anti-armed robbery campaign by the Police/Military
20. Numbers are increasing daily despite massive public education on measures to stop the spread of HIV. Sex between married couples is a major factor. Discuss
21. Privatization of water. Is it a viable alternative?
22. Make a case against Capital Punishment
23. Maintenance of the Aged in Ghana is becoming a big problem. As a concerned citizen discuss how this problem could be managed
24. Make a case for making HIV counseling and testing during the antenatal period mandatory
25. Discuss the Human Rights implication of selecting some HIV/AIDS patients for subsidized treatment with antiretroviral drugs in Ghana
26. Assess the impact of Oral Re-hydration Therapy (ORT) 35 years after its introduction in 1968
27. The Community Based Health Planning and Services (CHPS) arrangement remains the Key Strategy for expanding health service provision in Ghana. Discuss.
28. Why has the Guinea Worm Eradication Programme experienced mixed fortunes over the years?
29. One of the focal points of the Ghana Poverty Reduction Strategy (GPRS) is the HIV/AIDS pandemic. Why this emphasis.
30. The introduction of Additional Duty Hours Allowance (ADHA) and the establishment of a Vehicle Revolving Fund for Health Workers are viable measures to retain Ghanaian Health Workers. Discuss
31. Each year, April 7 is celebrated as World Health Day. Describe its significance to Ghana’s Public Health Delivery System.
32. Health is both a consequence and a cause of poverty. Discuss
33. Adequate efforts are being made by MOH/GHS to ensure universal access to a range of reproductive health services for eligible Ghanaians. Discuss
34. Make a case against the Donor-pooled Fund popularly known as the common basket. Assess progress being made by the GHS towards the elimination of maternal and neonatal tetanus by 2005
35. Financing Tertiary Education in Ghana: The way forward. Discuss
36. World Rural Women’s Day is celebrated every year on October 15. Write a memo to the Minister for Women Affairs on the plight of the rural Ghanaiian Women
37. Make a case for allocating resources for SARS
38. The carnage on our roads has become a national concern. Suggest strategies to reduce it.
39. The Government’s proposed policy for financing health care is health insurance. Discuss how this policy is being implemented.
40. Majority of Ghanaians do not have safe water. The Government has no money to extend the present system to cover all Ghanaians. Suggest ways to extend services.
41. The environmental Health Unit used to be under Ministry of Health (MOH). It is now under the Ministry of Local Government and Rural Development. Discuss the advantages and disadvantages on this transfer.
42. Write a memo to the Vice President suggesting strategies which should be adopted to make his campaign against indiscipline more successful.
43. The proposed National health Insurance scheme is intended to cover all Ghanaians in the near future. Yet, 70% of the working force is in the non-formal sector and 40%of Ghanaians are living below the poverty line. A good ministerial task force on health care financing explaining how the 100% coverage can be achieved.
44. “It is said that malaria treatment is less expensive than its prevention and we are therefore better of spending the little resource on malaria treatment. Discuss
45. It appears while communicable diseases are being brought under control, non-communicable diseases are on the increase. Discuss the problem and its implications.
46. Water is essential to life and the past large outbreaks of disease and many deaths were water associated. Compare and contrast the Government’s recent pronouncement on water supply against the background of water use as enshrined in the PHC concept.

47. The wide gap between antenatal coverage (98.4% in 2001) and supervised delivery (50.4% in 2001) remains a major challenge to the Ghana Health Service. Suggest feasible ways of closing the gap.

48. Reproductive and Child Health programmes focus more on the client and on quality of care. Discuss.

49. Fifteen years after the Safe Motherhood Conference in Nairobi, Kenya, Ghana’s institutional maternal mortality rate increased to 2.6/1000 LBS (from 2.14/1000 LBS). Identify effective strategies to reverse this trend.

50. The provision of quality health care to underserved communities depends on partnerships. Discuss.

51. Financing Health Care should it be Cash and Carry or Health Insurance?

52. Accra is being invaded by physically challenged persons. How do we reverse this trend?

53. You have been asked by the Family Health International representative in Ghana to present a paper at one of its programme planning meetings on the topic “Interdisciplinary and interdepartmental approach to HIV prevention among women of reproductive age.” Give an outline of your objective(s) strategies and action plan.

EXAMINATION FORMAT

Section A (One Essay – 50 marks)
1. Briefly describe the epidemiology of Guinea worm infection in Ghana. What control measures might be appropriate for a large rural Community?
2. Discuss the management and control of Cerebro Spinal Meningitis in Ghana.

Section B: (10 short essay type questions – 100 marks)
4. Sketch the life cycle of Plasmodium falciparum. Distinguish between stable and unstable malaria
5. What factors account for the resurgence of yaws in Ghana
6. What is “vaccine administration rate?” Briefly outline the importance of this rate in an immunization programme.

Section C: (50 multiple choice questions – 100 marks)
1. All the following are complications of malaria
   (a) Coma without localization of malaria
   (b) Hyperpyrexia with acute mental change
   (c) Decreased intravascular haemolysis
   (d) Hyperplastic intravascular splenomegaly
   (e) Acute renal failure
2. Surveillance of communicable diseases implies
   (a) The continuous scrutiny of all factors related to disease occurrence and control
   (b) Periodic prevalence field surveys
   (c) Ad Hoc study of Laboratory findings
   (d) Study of incidence of notifiable diseases
   (e) Development of trends in incidence of the diseases
3. The signs and symptoms of malaria in young children include all of the Following:
   a) Spleen Enlargement
   b) Anaemia
   c) Convulsion
   d) Diarrhoea
   e) Vomiting

LONG ESSAYS TOPICS
1. A survey of Nutritional Status of under-fives in a village community (ASUBOI) using Anthropometric Assessment
2. A study of the Nutritional Rehabilitation Programme at the Kotobabi Rehabilitation Centre
3. Birthweights and perinatal mortality in Ghana
4. A study of the use of local substitutes in the preparation of Complementary Feeds in the Mamprobi Area, Ablekuma District
5. A study of Morbidity and Mortality Patterns among Low Births Weight Infants in Korle Bu Teaching Hospital
6. Feeding cost and its effects on the health and nutritional status of families at Adabraka – A suburb of Accra
7. A study of knowledge, attitude and practice of men towards contraception at Korle Bu Polyclinic
8. Infant feeding habits amongst hospital staff (doctors and nurses) and nursing mothers at the Korle Bu Teaching Hospital Accra.

CENTRE FOR TROPICAL CLINICAL PHARMACOLOGY AND THERAPEUTICS
Courses in clinical pharmacology are taught during the coordinated course in medicine. During the subintern period a more patient based programme will be followed. The objective of this clinically based programme is to assist the potential doctor in the art of decision making in therapeutics when he or she is confronted with a patient.

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<td>Use and Misuse of Antibiotics</td>
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<td>Drug Treatment of Malaria</td>
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<td>Controlled Drugs and Dependence</td>
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<td>Clinical Trials</td>
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<td><strong>Seminar:</strong> Management of Drug Overdose and Poisoning</td>
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<td>Drug Formulations, Bioavailability and Bioequivalence</td>
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<td>Introductory Clinical Pharmacokinetics</td>
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<td>Vaccines and Vaccination</td>
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<td>Antibiotic Prophylaxis in Surgery</td>
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<td>Prescription writing</td>
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<td>Drug Management of cardiovascular Disorders</td>
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<td>Drug Treatment of Common Infestations</td>
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<td>Standard Treatment Guidelines &amp; Essential Medicines List</td>
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<td>Adverse Drug Reactions, Principles of Drug Interactions</td>
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<td>Non-steroidal Anti-inflammatory Drugs</td>
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DEPARTMENT OF CHILD HEALTH

Objectives
By the end of the programme the student
1. should have been exposed to the socio-economic and cultural factors that influence the health of children in Ghana. (Community Paediatrics)
2. should know about nutrition, growth and development and their abnormal states. This includes children with special needs.
3. should have acquired the relevant knowledge and skills necessary to take care of the more common child health problems in an emergency (emergency paediatrics)
4. should know and be able to manage the common diseases among children in Ghana and the west African sub-region (acute paediatrics)
5. should have been exposed to the health needs of adolescents. (Adolescent paediatrics)

Undergraduate Curriculum for the Department Of Child Health
1. Course Title - Undergraduate Curriculum in Child Health & Paediatrics. UGMS
2. Target Group - 2nd Clinical Year UGMS Students
3. Course Duration - 24weeks Junior Clerkship 8weeks x 3 groups
16weeks Senior Clerkship 8weeks x 2 groups
2weeks Revision Period
2weeks Final Part I Exam
4. Concurrent Courses - Specials and Obst. & Gynae during the Junior Clerkship
Obst. & Gynae during the Senior Clerkship

Programme Rationale

Goal/Aim
At the end of the clerkship the student:
- should be armed with adequate knowledge, skills and attitude to enable him elicit a good history from the patient
- perform a physical examination to formulate a reasonable problem list (differential diagnosis)
- manage the medical problem
- draw up plans to prevent further occurrence and
- promote the healthy growth and development of the patient involved.

Objectives:
By the end of the programme the student:
  a. Should have acquired the relevant knowledge, skills and attitudes to take care of common child health emergencies that present to the emergency room (emergency paediatrics).
  b. Should know and be able to manage common acute diseases that affect children in Ghana and the West African Subregion (Acute paediatrics).
  c. Should know and be able to manage as well as follow up children with chronic childhood diseases. (Chronic paediatric problems)
  d. Should know about nutrition, growth and development requirements of children and their abnormal states including the children with special needs.
  e. Should know and be able to manage the common conditions that affect the neonate (Neonatal paediatrics)
  f. Should have been exposed to the health needs of the adolescent patient (Adolescent paediatrics)
  g. Should be knowledgeable of the socio-economic and cultural factors that influence the health of children in Ghana (Community paediatrics).

CRITERIA FOR ADMISSION
Students who have successfully completed the 1st clinical year of the UGMS. Other students with equivalent qualifications may be admitted at the discretion of the UGMS/CHS/UG Admission Board.

Student Progression in the Course – Assessment
The course is divided into junior and senior clerkship sessions of eight weeks duration each. The student will be examined at the end of each session. The examination will be a theory written paper and a practical clinical examination in each session. The exam scores constitute continuous assessment and contribute 30% of the final marks.

**Teaching and Learning Methods**
The following teaching methods will be used. Their percentage contribution to the total number of teaching contact hours is included in brackets.

1. Didactic lectures (7%)
2. Small group classroom tutorials (7%)
3. Investigative Research Techniques (14%)
4. Bedside Teaching & Practical Hands on experience (72%)

**Didactic Lectures**
These are teacher – led and teacher – implemented activities. A series of lectures on a range of topics (see curriculum content) are given throughout the year to the whole class. Those one-hour lectures will be held once a week. Lecturers are senior members from the Department of Child Health or other relevant departments. The topics for lecturers are reviewed periodically and changed as necessary to keep them vibrant and relevant to the changing needs of the country.

**Tutorials**
These are held two times a week for the group of students doing their paediatric clerkship at the time. Tutorials combine student-centred learning and tutor-led activities. They are interactive tools where the students read about the topic to be discussed before hand. The tutorial time is then spent discussing the topic in a tutor-led session.

**Bedside Teaching/Practical Hands on Experience**
This combines student led and tutor led activities. These are held in small groups several times a week and take various forms viz:

1. The teacher selects a patient or patients with the clinical signs and symptoms he/she wants to teach about. He/she takes the students through that particular session.
2. The student presents the history and examination findings of a patient he has clerked to the teacher and the rest of the students, for discussion.
3. The student joins the general ward round of the consultant. Here he learns mainly from observing the teachers’ examination skills and discussion with doctors in training.

**Direct hands-on experience**
The students act as a sub-intern during the second half of his/her clerkship. He/she is member of the paediatric team attending emergencies and other referred cases during his/her team’s duty days. He/she consolidates his history, examination and investigative skills. He/she develops procedural skills such as venepuncture, placing intravenous lines, and lumber puncture, under supervision.

**Investigative Research Techniques**
The students participate in a Community Paediatric Project in which a topic in community paediatrics is selected and investigated. There are two such topics in the academic year, one in junior and one in senior clerkship. The findings of their research are written up and presented to faculty and invited guests at an open forum.

**Teaching Space**
For efficient teaching the department needs adequately sized tutorial and lecture halls to meet the student intake needs. We also need one side laboratory for basic investigations.

Other hospitals with part-time lecturers could be used for small group teaching attachments.

**Support Services**
The department should have a departmental library. In addition the main UGMS library should have paediatric holding, a well-equipped computer room with internet access, LCD projector, CD ROMs for teaching, photocopying facility and other teaching requirements.
Teaching Staff
The teaching staff will be employed by the University of Ghana. The faculty establishment is 18 – 21 for senior members and an unspecified number of part time lecturers and teaching assistants.
Teaching assistants will be holders of the Membership Diploma of West African College of Physicians. Membership of Ghana College of Physician and Surgeons and its equivalent.
Lecturers will be holders of the Fellowship of the West African College of Physicians or of the Ghana College of Physicians and Surgeons, or equivalent qualifications. Equivalence of qualifications will be determined by the University of Ghana.

Certification
Student Progression in the Course – Assessment will be done by:
   a. Continuous Assessment and
   b. End of Course Examination
The student will have 3 examination assessments; one at the end of junior clerkship, one at the end of senior clerkship, and the last one at the end of the academic year named the MB ChB Part I Final exam.
The student should have attended a minimum of 80% of the course as assessed by the faculty.
The final examination at the end of the programme consists of 3 parts.
Theory - A written paper consisting of 2 parts; an essay type paper and multiple choice paper.
Clinical Exams - One long case, 3 – 4 short cases
Oral Exams - Viva Voce
The open marking system will be used throughout the examinations with a pass mark of 50%. The candidate must pass the clinical examination to pass the examination. They must also have an overall pass mark of at least 50%.
The unsuccessful candidate will be referred to take the supplementary exam 6 weeks after the finals but where a candidate has failed both Child Health and Obst. & Gynaec examinations, he/she may be asked to repeat or redo the whole year.
A candidate who fails the supplementary exam will be required to repeat the year.

Quality Assurance
This will be ensured by:
   1. The presence and reports of external examiners at the examination
   2. Implementation of external examiners recommendations
   3. Employers’ appraisal

KNOWLEDGE CONTENT
1. Recognize common child health emergencies, identify their cause and manage appropriately.
   Dehydration
   Shock
   Severe Anaemia
   Convulsions
   The Unconscious Child
   Acute Respiratory Distress
   Airway Obstruction
   Acute Abdomen

2. Recognize common acute paediatric infection and their complications and manage appropriately
   Malaria
   Meningitis/ Encephalitis
   Pneumonias
   Urinary Tract Infection
   Otitis Media
   Pharyngotonsillitis
   Tuberculosis

3. HIV/AIDS

4. Viral Infections
5. Enteric Fever

6. Cardiac Problems
   Circulatory changes at Birth
   Congenital Heart Disease (CD)
   Cyanotic CHD
   Acyanotic CHD

6.3 Acquired Heart Disease
   6.3.1 Rheumatic Heart Disease
   6.3.2 Infective Endocarditis

6.4 Cardiomyopathies

6.5 Cardiac Failure

7. Respiratory Problems
   7.1 Respiratory Infection
   7.1.1 Upper respiratory tract infection
   7.1.2 Lower Respiratory Tract Infections
      - Pneumonias
      - Bronchiolitis
      - Empyema

7.2 Respiratory Tract Obstruction
   7.2.1 Upper Respiratory Tract Obstruction
   7.2.2 Asthma

8. Renal Problems
   Nephrotic Syndrome
   Glomerulonephritis
   Renal failure
   Pyelonephritis/UTI
   Renal Anomalies
   Renal Masses

9. Gastrointestinal /Liver Problems
   Gastroenteritis /Diarrhoea Dehydration
   Abdominal Pain
   Malabsorption
   Inflammatory Bowel Disease
   Hepatitis
   Acute Liver Failure
   Chronic Liver Disease

10. Nutrition
    10.1 Normal Nutrition
    10.2 Kwashiorkor
    10.3 Marasmus
    10.4 Micronutrient deficiency

11. Haematologic Problems
    11.1 Anaemias
    11.2 Sickle cell Disease
    11.3 Bleeding Disorders
    11.4 Blood Transfusion

12. Oncology Problems
12.1 Leukaemias
12.2 Lymphomas
12.3 Other Solid Tumours
12.4 Principles of Chemotherapy

13. Neonatal Problems
13.1 Neonatal Resuscitation
13.2 Low birth weight Infant
13.3 Birth Asphyxia
13.4 Birth Injuries
13.5 Neonatal Jaundice
13.6 Neonatal Sepsis/Infection
13.7 Neonatal Seizures
13.8 Congenital Anomalies

14. Growth and Developmental Problems
14.1 Normal Growth
14.2 Normal Developmental Milestones
14.3 Abnormalities in Growth
14.4 Abnormalities in Development
14.4.1 Learning Difficulties

15. Skin Disorders
15.1 Rashes of Infancy
15.2 Viral Exanthems
15.3 Allergic Eruptions
15.4 Skin manifestation of Systemic Disease

16. Endocrine and Metabolic Disorders
16.1 Diabetes Mellitus
16.2 Hypoglycaemia
16.3 Thyroid Disorders
16.4 Other Inborn Errors of Metabolism

17. Genetics
17.1 Common Chromosomal Abnormalities
17.2 Congenital Anomalies

18. Bone and Joint Disorders
18.1 Osteomyelitis
18.2 Septic Arthritis
18.3 Congenital Disorders of Hip, Knee and Feet
18.4 Connective Tissue Disorders

19. Neurological Disorders
19.1 Infections
19.1.1 Bacterial
19.1.2 Viral
19.1.3 Tuberculous
19.2 Seizures
19.3 Cerebral Palsy
19.4 Neurology Abnormalities
19.4.1 Neural Tube Defects
19.4.2 Hydrocephalus etc
19.5 Neuromuscular Disorders
19.6 Neurodegenerative disorders
19.7. Disorders of Vision/Hearing/Speech

20. Behaviour Disorders
   20.1 Psychiatric Disorders
   20.2 Autism
   20.3 ADHD
   20.4 Drug Abuse

21. Injuries and Poisonings
   21.1. Non Accidental Injuries
   21.2. Accidental Ingestion/Inhalation

22. Psycho Social/Community Paediatrics
   22.1. Integrated Management of Childhood Illnesses (IMCI)
   22.2. Immunization
   22.3. Child Survival Strategies
   22.4. Communicating with Families
   22.5. Child Protection/Child Abuse

23. Paediatric Surgery
   23.1. Neonatal Surgical Emergencies
   23.2. Other Childhood Emergencies
   23.3. Common Surgical Problems
   23.4. Burns
   23.5. Trauma

24. Childhood Dental Problems
   24.1 Dental Problems in the Child
   24.2. Dental Developmental Problems
   24.3. Oral Manifestation of Systemic Disease

25. The Child and the Law and Society
    The Rights of the Child

CURRENT WHOLE GROUP LECTURE SERIES
1. Overview of the Normal Child and the Sick Child
2. Paediatric Haematology I & II
3. Common Malignancies
4. Endocrine and Metabolic Disorders
5. Paediatric Respiratory Disorders I & II
6. Paediatrics Nephrology I & II
7. Childhood TB
8. Neonatal Paediatrics I & II
9. Paediatric Cardiology I & II
10. Nutrition and Nutritional Disorders
11. Surgical Paediatrics I & II & III
12. Childhood Dental Problems and Service I & II
13. Growth and Development
14. Psychosocial Paediatrics I & II
15. The Child, Society and the Law I & II

CURRENT SMALL GROUP TUTORIAL TOPICS
Junior Clerkship
16. Examination of Newborn/Low Birth Weight
17. Congenital Infections and Neonatal Sepsis
18. Neonatal Asphyxia and Neonatal Resuscitation
19. Neonatal Jaundice
20. Vomiting in 1st week of life
21. Infant feeding and PCM
22. The 8 diseases in Ghana’s Childhood Immunization Programme and Rubella
23. Integrated Management of Childhood Illnesses: Overview
24. Diarrhoeal Disease and Fluid Therapy
25. Malaria
26. Meningitis and Encephalitis
27. Enteric Fever/PUO
28. Acute Respiratory Distress
29. Sickle Cell Disease

**Senior Clerkship**

1. Child Survival Strategies
2. Child Abuse
3. Obstructive Respiratory Disorders
4. Anaemia
5. The Floppy Infant
6. Seizure Disorders and Cerebral Palsy
7. Bone and Joint Disorders
8. Accidental Poisoning in Children
9. AIDS in Children
10. Parasitic Infestation
11. Assessment of Vision/Hearing and its Disorders
12. Clinical X-Rays I (Abdominal, Skeletal, Brain CT)
13. Clinical X-Rays (Cardiorespiratory)
14. Communicating with families, Health Education, Bad News

**Clinical Skills Development**

The student, at the end of the programme, should be familiar with the following procedures, having actually done them (A) or having observed the procedure (B).

**A**
- Detailed history taking
- Comprehensive clinical examination of new patient
- Follow up examination of patient
- Urinalysis at bedside
- Weighing and measurement of Child (patient) and plotting on charts
- Measurement of blood pressure using the appropriate cuff for size of Child
- Venepuncture – taking samples or getting IV access
- Examination of ear drum
- Examination of throat
- Catheterization of bladder
- Setting up a drip
- Administering oxygen
- Suctioning a patient
- Paediatric Resuscitation
- Neonatal Resuscitation

**B**
- Lumbar Puncture
- Exchange transfusion
- Blood transfusion
- Suprapubic aspiration
- Fine needle aspiration
- Chest tube insertion
- Simple incision & drainage (I+D)
- Bone marrow aspiration
The Department of Medicine and Therapeutics is the second largest department in the University of Ghana Medical School comprising the clinical and academic/research sub-specialties units of cardiology, clinical pharmacology, dermatology, endocrinology, gastroenterology, infectious diseases, nephrology, neurology, nuclear medicine, and respiratory medicine. Aside from running undergraduate courses in internal medicine, the Department organizes programmes for other academic and higher professional qualifications at the masters level and for membership and fellowship diplomas for the Ghana College of Physicians and Surgeons and the West African College of Physicians. The department is additionally responsible for the provision of clinical services to the Korle-Bu Teaching Hospital in Accra covering the areas of chest diseases, drug addiction, infectious diseases, kidney dialysis, adult medical emergency, general medical and sub-specialty in-patient and out-patient services.

**Mission**
The mission of the Department is to produce highly disciplined, scientifically knowledgeable and skilled clinicians capable of functioning effectively in any rural or urban medical set up in Ghana, and working at a standard acceptable in the international community of medicine.

**Courses**
The Department organizes and runs the following courses:

a. **Introduction to Nursing (Level 500): Duration - 1 week**
   This course introduces pre-clinical students to common nursing procedures and practices. It is run by senior nursing practitioners and tutors.

b. **Introductory Course in Clinical Medicine (Level 500): Duration - 4 weeks**
   This course is intended to help the 1st clinical year student acquire skills in gathering of clinical information from history taking and physical examination. It consists of clinical demonstrations on the ward and lectures as well as an introduction to medical ethics. The course is evaluated towards the end by a written examination and a feedback session with tutors.

c. **Junior Clerkship (Level 500): Duration - 24 weeks**
   This is a coordinated course undertaken in conjunction with the Department of Surgery. The course consists of daily lectures covering all the internal medicine sub-specialty areas together with bedside teaching and tutorials on the wards for two groups of continuing 1st clinical year students, each spending 12 weeks in medicine or surgery, followed by the other discipline for another 12 weeks. The course emphasizes the application of clinical techniques and laboratory/radiological investigations in making a diagnosis in different clinical scenarios. It is evaluated in the 12th week by both a written and clinical examination as well as a feedback session with tutors.

d. **Dermatology Course (Level 600): Duration - 24 weeks**
   This course for 2nd clinical year students consists of weekly lectures and clinical out-patient sessions for three small groups, each spending 8 weeks in dermatology and two other specialty areas (psychiatry and otolaryngology). The course is evaluated by a written examination.

e. **Senior Clerkship (Level 700): Duration - 40 weeks**
   This course is provided for students in their final year coming to the Department in four separate groups for 10 weeks each. Other rotations during this period include general, orthopaedic and urological surgery and community health. It is a more concentrated and detailed course in internal medicine covering all aspects of diagnosis and patient management. The focus is to prepare the student for the housemanship or internship after graduation. There are no formal lectures, however, numerous teaching and learning opportunities exist at all times during ward rounds, bedside teaching, emergency room and out-patient reviews and at weekly Friday clinical meetings. Students are also required to organize weekly student-led clinical presentations which are supervised by a tutor. Students are additionally encouraged to develop the ability to acquire knowledge and information from recommended reference books, journals, other library material and reliable internet sources. Two weeks of this rotation are spent in a hospital outside Korle Bu Teaching Hospital.
Hospital and another two at the mortuary. At the mortuary students learn to carry out a basic autopsy examination and to appreciate the correlation between ante-mortem diagnosis and post-mortem findings. The course is evaluated by a written and clinical examination which forms part of the continuous assessment for the final MB ChB examination.

**Basic Requirements for the Courses**

Students must acquire the following for all clinical courses in internal medicine: white coat, approved name tag, wrist watch with a ‘seconds’ hand, stethoscope, pocket torch, tendon hammer, measuring tape and pocket-size diagnostic set.

**Expectations**

Students would be expected to have mastered the following procedures and/or be certified by a tutor or clinical assistant to have repeatedly performed the following by the end of the sub-internship; veni-puncture for blood samples, insertion of intravenous lines, preparing of thick and thin films for malaria parasites, staining blood film for malaria parasites, Gram's and Zeihl Neilson staining of sputum, urinalysis, blood glucose testing with a glucose meter, lumbar puncture, thoracocentesis, abdominal paracentesis, electrocardiogram lead placement and recording.

They would also be expected to have observed the following; liver and renal biopsy, haemodialysis, pleural biopsy, bronchoscopy, colonoscopy and gastroesophagogoduodenoscopy.

**DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY**

**Objectives**

The objective of the course is to produce a student

1. Who is equipped with the attitude, knowledge and skills he/she will need to develop into a competent doctor after completion of his/her housemanship (internship) training
2. Who will have a sound foundation for specialist training in Obstetrics and Gynaecology if he/she so desires.

**LEVEL 600 - SENIOR CLERKSHIP**

**OBSTETRICS AND GYNAECOLOGY WORKSHOP**

Tuesdays/Fridays

2.00 - 4.00 p.m.

**Student Team**  **Subject**

E  - The Bony Pelvis. Landmarks and Diameters. Features of Gynaecoid,  
   - Android pelvises, anthropoid, platypeloid.  
   - Value of adult gynaecoid pelvis.  
   - Assessment of pelvic capacity;  
   - Clinical and radiological. The fetal skull.

D  - Fetal Distress in Labour. Clinical  
   - Fetal Distress, Bio-chemical Fetal  
   - Distress, Diagnosis, monitoring cord presentation and cord prolapse.  
   - Resuscitation of the newborn

B  - Normal and Abnormal Labour  
   - The Partograph

A  - Adolescent Pregnancy

C  - P.P.H.

E  - A.P.H.

C  - Face, Brow, Shoulder and Compound  
   - Presentations. Incidence, aetiological  
   - Factors, diagnosis, Management.  
   - Maternal and Fetal Complications.
A - Breech presentation. Incidence;
- Aetiological factors: Diagnosis.
- Antenatal Management; External
- Cephalic Version (ECV) Contra-
- Management of Breech Labour; Maternal

B - Post-Menopausal Bleeding (PMH)
- Definition Aetiology. Investigations Management

C - Recurrent Abortion, Septic

D - Maternal and Perinatal Mortality Rates

A - Pain Relief in Labour

LEVEL 600 - SENIOR CLERKSHIP
WORKSHOP SCHEDULE

LECTURES:  
Tuesdays 8.30 a.m. to 9.30 a.m.
Thursdays 4.00 p.m. to 5.00 p.m.

CLASS WORKSHOPS:  
Tuesdays 2.00 p.m. to 4.00 p.m.
Fridays 2.00 p.m. to 4.00 p.m.

Guidelines for Class Workshops
The Residents shall prepare a comprehensive outline of the subject. He shall first discuss the outline with his Consultant and then with the students of the Team who are to present the subject.

The Residents shall moderate the presentation and discussion. At the end the Consultant shall summarise, emphasizing the core points of the subject.

Clerkship Hand-Out
You are all welcome into the Department of Obs/Gynae. I will like you to appreciate that in this department you deal with the most personal and intimate parts of the females and hence your approach to the patient should be very tactful and polite.

For the first time in your training you have the opportunity to do a lot for the patient yourself and it is our wish that you take the opportunity to get involved in the work of the Department.

The Clerkships are combined ones and hence you must pay equal attention to both Obstetrics and Gynaecology. Students in each group starting the Junior Clerkship period will be allocated to one of the 5 firms within the department. Each student should follow the weekly timetable of the firm to which he or she is attached, as far as ward work, clinics and operating sessions are concerned. Such a timetable should be obtained from the Consultant-in-charge working in the firm. Over and above this work, students must devote as much of their time during this Clerking period to the labour suite, and they should follow their Unit Doctors on emergency duty.

The duties in the labour suite should include history taking and admission of patients, routine observations normally carried out in the first stage room eg. fetal heart monitoring, pulse and blood pressure readings, testing of urine, setting up and monitoring intravenous infusion, vaginal examinations to assess progress of labour, normal vaginal deliveries under supervision and repair of episiotomies or perineal tears. Students must try as much as possible to follow up cases from the time of admission into the labour suite to the time of discharge from the postnatal ward, so that they will be able to record their observations.

You will be expected to complete a partograph for each patient that you follow up in the labour suite and deliver. This must be signed for you by the supervision midwife/Doctor soon after the delivery and submitted at the end of the Clerkship. Students should take every opportunity to examine patients, observe and assist in operative vaginal deliveries, and also Caesarean sections. Suturing Episiotomies is a Must and All Students Should Learn, Perform and Repair Episiotomies.

In the labour suite the students must conduct themselves well. They must realise that the Sister or Midwife is in-charge of the patients in the labour suite. They must therefore carry out routine procedures as instructed by her and
also not to undertake any other procedures on patients without her knowledge or that of the doctor. Students, while working in the labour suite, must change into proper labour suite attire, which is obtainable from the Sister. There will be several routine rounds in the labour suite, both by Junior and Senior member of staff and you are advised to avail yourself for them. Students must be present in the Department especially the labour suite when on call as much as possible throughout the duty period in order to be present when the cases are being managed. Needless to say, if a student is unwell, has a sore throat, cold, septic finger and infection, he or she should not attend the labour suite or operating theatres. The student should inform a member of the senior staff in their firm. The periods spent in the clinic (both antenatal and gynaecological) should be utilized to the full. The student should train himself in taking histories and seize every opportunity of examining patients. Students should attach themselves to Members of the senior Staff. These clinics should give the student a clear idea of the numbers, type of patients and abnormal conditions seen in our community. In the ante-natal and postnatal wards students are responsible for clerking cases and also in helping the junior staff with the work-up of patients. Students should as much as possible follow up cases that they have witnessed or managed in the labour suite. Each student will be allocated a certain number of beds and the students will be responsible for clerking the patients that occupy these beds. The students must be prepared to present such cases during ward rounds. While in postnatal wards students should familiarise themselves with the care of babies especially of the ones they delivered. Such care includes proper examination to exclude congenital abnormalities, bathing, preparation of feeds, observation of weight charts and breast feeding. Students should also try and follow up babies being cared for in the Neonatal Intensive Care Unit. In Gynaecological wards the students would be allocated a number of beds for which they will be responsible. Duties include clerking and work up of patients and assisting in the operating theatre. They should be ready to present them during ward rounds.

In summary these are:-

For Obstetrics Details are per heading of 10 witnessed cases of normal deliveries.

Full details of 3 cases delivered personally. Each case must be signed by the Supervising sister or midwife or Medical Officer in the Labour Suite. Summary of at least 20 more normal cases delivered personally by the student. Signatures of supervising midwife must be obtained in each case. See as many abnormal cases as you possibly can and write up as described under each section.

For Gynaecology Full details of 10 cases personally clerked and followed up during the period of clerkship. The cases should be as varied as possible.

Details should include:
History Examination Laboratory Diagnosis Operation findings and procedures Histological examination
Results and prognosis
Critical appraisal of the management

The empty pages at the end of this book are reserved for the gynaecological cases. Each patient selected for write up must be certified by the Team’s Consultant as having been managed by/with the student.

**OBSTETRICS & GYNAECOLOGY CLERKSHIP**

**Rationale**
The Obstetrics and Gynaecology Clerkship should concentrate on the basic sciences as applied to obstetrics and gynaecology and on the common clinical conditions that the student is bound to see during the period of the Clerkship.

**Objectives**
By the end of the Junior and Senior Clerkships, the student will:

- Have a sound grasp of the basic sciences as applied to obstetrics and gynaecology
- Be able to perform the following clinical activities satisfactorily:
  - History taking and history presentation
  - Physical examination and presentation of findings
  - Be able to describe/discuss with confidence the treatment and management of complications of the common clinical conditions listed below

*Although both clerkships will cover all the course objectives, the Junior Clerkship will be more focussed on the first two objectives while the Senior Clerkship will put more emphasis on the discussion of treatment and management of complications.*

**Teaching Aids**
- Bony Pelvis
- Fetal skull
- Surgical Instruments
- Pathology pots

**Topics**

**Bony Pelvis**
Bones, joints and ligaments of the pelvis
Pelvic inlet (brim), cavity and outlet
- Pelvic inclination
- Pelvic axis
- Definitions and normal values of the diameters of the adult gynaecoid (female) pelvis at:
  - Brim
  - Mid-pelvis
  - Outlet
- Features of adult gynaecoid pelvis, i.e. the features that make the bony pelvis suitable for parturition
- Major differences between the gynaecoid pelvis and each of the following pelvic types:
  - Anthropoid
  - Android
  - Platypelloid

**Fetal Skull**
- Description of the following:
  - Bones of the fetal skull
  - Sutures and fontanels
  - Vertex
  - Identification of the vertex presentation on vaginal examination
- Description and normal values of diameters of the fetal skull at term
- Presenting diameters in:
Well-flexed OA position
Deflexed OA position
OP position

Moulding:
Definition and dynamics
Grading
Benefits and dangers

Engagement:
Determination on abdominal examination and on vaginal examination
Prognostic significance

Pelvic Floor
- Levator ani muscles and their covering fasciae
- Functions of the levator ani
- The supports of the pelvic organs
- Blood supply
- Nerve supply

Perineum
- Muscles
- Fasciae
- Vascular supply
- Nerve supply

Maternal Adaptation to Pregnancy / Physiological changes in Pregnancy
- Cardiovascular system
- Haematological system
- Respiratory system
- Renal system
- Gastrointestinal system
- Uterus

PREGNANCY
Diagnosis
Antenatal Care
Estimation of Gestational Age - Pregnancy Dating
- Clinical methods
- Ultrasound scan
The booking scan: The variables reported on in the booking scan
Complications in Early Pregnancy
- Hyperemesis gravidarum
- Vaginal bleeding
  - Miscarriage (spontaneous abortion)
    - Threatened
    - Inevitable
    - Incomplete
    - Complete
    - Septic
    - Missed
  - Ectopic pregnancy
  - Molar pregnancy

Medical Conditions in Pregnancy
- Anaemia
- Malaria
• Haemoglobinopathies (Sickle Cell Disease)
• Hypertensive Diseases in Pregnancy
• Diabetes in pregnancy

Non-medical Pregnancy Complications
Antepartum Haemorrhage
Multiple Pregnancy
Malpresentation (Breech presentation)
Premature rupture of membranes

Labour - Spontaneous
Mechanism of Labour in OA Position (Cardinal Movements)
Management of Labour and the Partograph
• Definitions of the 1st and 2nd Stages
• Historical basis of the partograph
  ➢ Cervical dilatation curve: cervicograph
  ➢ Latent and active phases of labour
  ➢ Derivation of the alert and action lines
• Features of the partograph
• Normal partograph
• Using the partograph to diagnose abnormal labour delayed labour and the cause

3rd Stage of Labour
• Definition
• Physiology
  ➢ Mechanisms responsible for separation of the placenta
  ➢ Mechanisms responsible for haemostasis at the placental site
• Complications of 3rd stage
  ➢ Primary postpartum haemorrhage
  ➢ Retained placenta
• Management of 3rd stage
  ➢ Low-risk patient
  ➢ High-risk patient

Active management of 3rd Stage of labour
Components:
  Administration of uterotonic agents (drug of choice is oxytocin 10 units IM)
  Controlled cord traction
  Uterine massage after delivery of the placenta

Induced Labour
• Indications and contraindications
• Cervical assessment: Bishop’s score
• Methods

Episiotomy
• Definitions
• Muscles and nerves involved
• Types
• Advantages and disadvantages of each type
• Repair
• Complications

Perineal Tears
• Degrees: definitions
• Predisposing factors
• Prevention
• Management of 4th degree tear: operative, post-operative, subsequent deliveries

Cephalo-Pelvic Disproportion (CPD)
• Definition
• Causes
• Complications
• Diagnosis: Antenatal, intrapartum

Primary Postpartum Haemorrhage (P.PPH)
• Definition
• Causes in order of their frequencies
• Determining the cause
• Differentiating uterine atony P.PPH from other causes (lower genital tract laceration P.PPH)
• Management of P.PPH from uterine atony
• Management of P.PPH from lower genital tract lacerations (technique of inspecting the lower genital tract)

Secondary Postpartum Haemorrhage
• Definition
• Causes
• Management

Puerperium
• Definition
• Management of the normal puerperium including family planning
• Complications
  ➢ Puerperal pyrexia: Causes and Investigations
  ➢ Factors that predispose to puerperal sepsis (genital tract infection)

Caesarean Section
• Indications
• Preoperative preparation
• Types: classical and lower segment
• Description of steps in lower segment caesarean section
• Advantages of the lower segment section
• Complications

Breastfeeding
• Advantages of breast milk over cow milk
• Definitions of exclusive breastfeeding, replacement feeding, mixed feeding
• Disadvantages and dangers of replacement and mixed feeding
• Physiology of suckling
• Benefits of breastfeeding:
  ➢ Breast milk
  ➢ Suckling

HIV/AIDS in Obstetrics
Obstetric emergencies
Induced Abortion

Unsafe Abortion
• Definition and examples
• Importance
• Prevention

Post-Abortion Care
Activities in post-abortion care

Ectopic Pregnancy
• Definition
• Clinical types: acute and chronic
• Causes
• Diagnosis of ruptured tubal pregnancy: Leading symptoms and signs
Other gynaecological emergencies
Vaginal Discharges
Differential diagnosis, complications and treatment of:
- Bacterial vaginosis
- Candida albicans
- Trichomonas vaginalis

Pelvic Inflammatory Disease
- Definition
- Causes
- Diagnosis: symptoms, signs, investigations
- Complications
- Management: outpatient and in-patient

Sexually Transmitted Infections
- Syndromic approach to STI management

Infertility
- Definitions: Primary & Secondary subfertility
- Causes
- History taking: To determine if infertility exists and to diagnose cause
- Physical examination: To determine if infertility exists and to diagnose cause
- Investigations
- Management/ Treatment (including assisted reproductive technology)

Uterine Fibroids
- Aetiological risk factors
- Histopathology
- Symptoms and signs
- Investigations
- Diagnosis
- Complications
- Management options

Pelvic Organ prolapse

Urinary Incontinence
- Vesico-vaginal fistula
- Other types of incontinence: Stress incontinence, Urge incontinence, Mixed incontinence

Gynaecological Tumours
- Benign tumours
- Malignant tumours
  - Cervix
  - Endometrial
  - Ovary
  - Vulva
  - Choriocarcinoma

HIV/AIDS in Gynaecology

JUNIOR CLERKSHIP LECTURES

Lecture
1. Overview of Obstetrics & Gynaecology
2. Examination of Obst. & Gynae. Patients
3. Review of anatomy of female pelvic organs and the breast
4. Maternal Mortality and Morbidity
5. Review of embryology of female genital organs and the urinary system
6. Prenatal diagnosis (SCD, sex linked disease etc) and Fetal Surveillance
7. Normal Labour and Partograph
8. Problems of Labour. Disproportion,
Deep Transverse Arrest occipito-Posterior Position Trial of Labour
9. Obstetric analgesia and Anaesthesia
10. Mechanism of Labour - Normal and Abnormal Presentation
11. The Puerperium
12. The Third Stage of Labour including Postpartum Haemorrhage and Shock in Obstetrics
13. Anaemia in Pregnancy including Sickle cell disease in Pregnancy
14. Psychiatric and Psychosocial Aspects of O&G
15. Pelvic Inflammatory Disease
16. HIV/AIDS and other Sexually Transmitted Diseases
17. Menstruation and Menstrual disorders
18. Multiple Pregnancy
19. Pre-operative management and Post-operative complications in O & G
20. The Infertile Couple
21. Sex Chromosome Abnormalities and Intersex
22. Ante partum haemorrhage
23. Ultrasound in Obstetrics & Gynaecology
24. Obstetric operations
25. PROM & Preterm Labour & Postdate Pregnancy
26. Natural Family Planning. Contraception (Hormonal and Sterilisation)
27. Contraception (Barrier, IUCD) Emergency Contraception
28. Hypertension, Pre-eclampsia and Eclampsia
29. Utero-Vaginal Prolapse
30. Medical Disorders in Pregnancy (1)
31. Medical Disorders in Pregnancy (2)
32. Incontinence of Urine
33. Obstructed labour and Ruptured Uterus
34. Intra Uterine Growth Restriction
35. Endometriosis, Adenomyosis and Uterine fibroids
36. Abortion, Unsafe Abortion, Post-Abortion Care
37. Premalignant Lesions of the Female Genital Tract
38. Benign and Malignant tumours of the Vulva
39. Gestational Trophoblastic Disease
40. Carcinoma of the Cervix
41. Tumours of the corpus uterus (Benign and Malignant)
42. Tumours of the Ovary (Benign and Malignant)
43. Sexual and Reproductive Health and Rights. (The Rights of Women and children)
   Gender (Gender Equality, Gender Equity and Gender Mainstreaming)
44. Ethical Issues in Obst & Gynae.
45. Course Review

**OBS & GYNAE**

**Required skills**
- Taking an obstetrics history
- Taking a gynaecological history
- Abdominal examination
- Examination of the pregnant uterus
- Bimanual examination
- Gaining intravenous access
- Setting up a IV line
- Performing an episiotomy
- Repairing an episiotomy
DEPARTMENT OF PSYCHIATRY

Objectives
The Course leading to MB CH.B in Psychiatry consists of Junior and Senior Clerkships.

The students are required to have a basic knowledge in the anatomy of the brain and related structures, Neurophysiology and Biochemistry relevant to Neuropharmacology. During the Junior Clerkship, they are also taught how to interact with the mentally ill, how to examine the mental state of the patients, history taking and basic psychopathology.

Students should at the end of the Junior Clerkship be in a position to formulate the patient’s mental or physical problem and plan management of the said patient.

The aim of the Senior Clerkship is to consolidate what the student has already learn in the Junior Clerkship together with common Psychosexual Disorders.

PSYCHIATRY CURRICULUM
(Undergraduates 500 & 700 Level)
1) INTRODUCTION TO PSYCHIATRY
   Definitions of Psychiatry, Psychology and the concepts of mental health and mental illness.

   Concept of mental disorders as “diseases” and their importance in the spectrum of diseases affecting human beings. Ref. To WHO (201) World Health report on importance of Depression and other mental disorders in worldwide disease prevalence overall using DALY concept.

2) PSYCHIATRY IN RELATION TO MEDICINE AND NEUROLOGY
   Neurological disorders and psychiatry including Epilepsy and Psychiatric manifestations of seizure disorders.

3) BASIC PSYCHOPATHOLOGY - Phenomenology
   e.g. Definition of Delusion, Hallucinations e.t.c. Concept of ‘Functional’ and ‘Organic’ Psychoses.

4) THE BRAIN AND MENTAL DISORDERS
   Evidence of the brain as centre of mental disorders.
Use of neuroimaging techniques e.g. CT Scan, MRI, PET, SPECT, BEAM, CBF, EEG e.t.c. in diagnosis of mental disorders and as evidence of brain function and dysfunction.

5) PSYCHIATRIC DISORDERS
   i. The Schizophrenias
      They are one of a group of psychiatric disorders traditionally called the functional Psychoses. The symptoms are divided into positive symptoms (symptoms or signs) and negative symptoms (loss of a previous function).
      Background – Historical overview, Pathophysiological hypotheses, and neurotransmitter theories. Diagnosis – symptoms and categories, DSM-IV/ICD-10 criteria. Other clinical presentations. Epidemiology, integrated aetiological theories and differential diagnosis. Physical examination, course and prognosis.


   ii. Paranoid Psychoses
      Delusional Disorder – An uncommon condition in which patients present with circumscribed symptoms of non-bizarre delusions, but with the absence of prominent hallucinations and no thought disorder, mood disorder, or significant flattening of affect.
      Diagnosing pathological delusions, clinical features, Epidemiology, risk factors, course and prognosis. Assessment and management, differentials and aetiology. DSM-IV subtypes, acute and transient disorder, induced (ICD-10) or shared (DSM-IV) delusional disorder, delusional misidentification syndromes – clinical features, management, course and prognosis.

   iii. Affective or Mood Disorders
      Definition of mood disorders
      Classification of mood disorders DSM-IV and ICD-10
      Diagnosis of major mood disorders
      Mania and Bipolar Disorder
      Recurrent Major Depression
      Use of Cognitive Behaviour Therapy and other Psychotherapies in management of mood disorders.
      Use of treatment including mood stabilizers, antipsychotics and antidepressants
      In acute treatment and preventive care the place of mood stabilizers and antidepressants in Bipolar Disorders and prevention of recurrence.
      Course and Prognosis

   iv. Organic Mental Disorders
      • Acute and Chronic Organic Mental Disorders ‘Delirium’ and ‘Dementia’
      • Cognitive Disorders - classification, causes, principles of investigation and management of cognitive dysfunction cerebral lesions – e.g. space occupying lesions infarcts, bleeds and their psychiatric manifestations.
      Systemic diseases e.g. Thyroid disorders, cardiac, liver, respiratory, renal failure e.t.c. and their psychiatric manifestations. Latrogenic mental illness – from treatment with steroids, antihypertensives e.t.c.

   v. The ‘Neuroses’
      • Somatoform disorders
      Anxiety spectrum disorders (General Anxiety Disorders, Panic Disorders, Phobias, Post-traumatic Stress disorders, Obsessive – Compulsive Disorders
- Conversion Disorders
- Somatoform disorders

Diagnosis and treatment of the various disorders including Behaviour therapies and medications.

vii. **The Major Personality Disorders**
A brief discussion about the concept of ‘normal’ personality. The classification of personality disorders, using DSM-IV and ICD-10. The major personality disorders outlined.
Aetiology, genetics, Neurophysiology, childhood development, psychodynamic theories, cognitive behavioural theories, theories synthesizing cognitive-behavioural and psychodynamic aspects.

viii. **Common Psychosexual Disorders**
Definition of Psychosexual Disorders
Classification of Psychosexual Disorders
Recognition and diagnosis of psychosexual disorders in general medical practice
Psychosexual disorders as a consequence of medical and psychiatric illness, as well as side effects of drug therapy
Socio-cultural and political attitudes to sexual orientation. Scientific studies on sexual orientation and controversies.

ix. **Alcohol and Substance Abuse Disorders**
Concepts of Tolerance, dependence (addiction)
Alcohol use disorders
Cannabis, Amphetaines, Heroin Cocaine
And other substances of abuse
Withdrawal syndromes – Recognitive is general medical practice
Treatment of substance abuse
Detoxification and long term management
Alcoholic Anonymous
(AA) principles of treatment

x. **Child And Adolescent Psychiatry**
Recognising Childhood Psychiatric and developmental disorder
Genetic, prenatal, birth and post-natal factors associated with childhood development and disorders
Diagnosis of Childhood Disorders including use of play therapy e.t.c.
Classification, recognition and management of:
- Mental retardation and Learning Disabilities
- Autistic spectrum Disorders
- Attention deficit, Hyperactivity Disorders
- Effect of family, environment and medical illness on psychological development of the child
- Focus on domestic violence, child abuse, poverty, war e.t.c.
- Chronic illnesses e.g. Sickle cell disease, asthma, physical handicap and mental health
- General principles of management of childhood psychiatric disorders

xi **Psychiatric Aspects of Head Injury and Epilepsy**
Improved medical care has made it more likely that individuals that suffer head injuries will survive, and therefore present to psychiatric services with neuropsychiatric sequelae. Presentation may be with:

- Acute effects – Post-traumatic amnesia (PTA), retrograde amnesia (RTA), acute post-traumatic delirium, and factors associated with increased psychiatric morbidity following head injury.
- Chronic effects – cognitive impairment, personal/behavioural changes, psychoses neurotic disorders, post-traumatic syndromes.
- Factors influencing psychiatric disability and prognosis, sequelae in children, and The 'punch-drunk syndrome'.

The lifetime prevalence of experiencing a seizure is approx. 5%. The prevalence of recurrent seizures (epilepsy) is approx. 0.5-1.0%. Seizures may be generalized or focal. Psychiatric aspects of epilepsy may be related to psychosocial consequences of diagnosis, psychiatric syndromes, and neuropsychiatric effects of medication.

Psychiatric syndromes are best considered in terms of their relationship to seizures – pre-ictal, ictal, post-ictal, and inter-ictal. Other presentations are cognitive deterioration, neuroses, mania, epileptic personality syndrome, and violence.

PRINCIPLES OF PHARMACOLOGY AND THE ADVERSE SIDE EFFECTS OF DRUGS USED IN PSYCHIATRIC PRACTICE
Medication should only be one of the components of treatment used in psychiatric practice. Psychological, behavioural and social therapies also have their place.

Medication Adherence – the importance of adherence, reasons for non-adherence, strategies to improve adherence-education, and sensible prescribing.

The Main Classes of Medications used are:
- Antipsychotics – typical and atypical, also depot preparations
- Anticholinergics
- Antidepressants – Tricyclics, SSRIs, MAOIs, and Others
- Benzodiazepines – Diazepam, and Lorazepam
- Mood Stabilisers – Lithium, Carbamazepine, Valproate, and Lamotrigine
- Anticonvulsants – Carbamazepine, Valproate, Phenytoin, and Phenobarbitone

Discuss the benefits and adverse effects of all the major classes of medication used.

CARE OF PSYCHIATRIC PATIENTS IN THE COMMUNITY
Advantages of community care.
Psychiatry in general medical practice.
Recognition and treatment of psychiatric disorders commonly seen in primary care.
Focus on anxiety and minor depressive disorders, somatoform disorders.
Alcoholism and other substance abuse.

PSYCHIATRIC DISORDERS ASSOCIATED WITH WOMEN
- Pregnancy and post-partum psychiatric disorders and their management.
  Emphasis on need to consider both foetus and mother in treatment.
- Effect of hormonal changes.
- Infertility – psychological effects especially in Ghanaian culture.
- Gender issues in mental health care (lecture).

TRADITIONAL CONCEPTS OF MENTAL ILLNESS
‘Spirit possession’ and other belief systems and their effect on manifestation and treatment of mental disorders.

ECT AND OTHER PHYSICAL FORMS OF TREATMENT IN PSYCHIATRY
Can be a highly effective treatment. It should only be used to achieve rapid and short term improvement of severe symptoms. After an adequate trial of other treatment options.
have proven ineffective and/or when the condition is considered to be life threatening.

Mode of action, indications, contraindications, limitations, side-effects, course of ECT, and maintenance or continuation of ECT. Administration of ECT, effective treatment, and specific problems and psychiatric drugs and ECT.

**PSYCHOLOGICAL AND PSYCHOSOCIAL TREATMENT METHODS**

Psychotherapies
Cognitive And Behavioural Therapies
Rehabilitation

**CLINICAL PSYCHOLOGY**

**Medical Psychology**

*Paradigms in Medical Psychology*

The goal of the lecture is to help students to understand the need for a more comprehensive model than exists in orthodox medicine. Specific topics touch on the importance of paradigm in health care, the strengths and challenges of the bio-medical paradigm, the more inclusive and more comprehensive paradigm of the bio-psychosocial, and relevant psychological and social paradigms. The lecture ends with a new definition of health and the crises in our health care system.

**Common Psychological Problems In Communities**

**Stress and Illness**

The goals of this broad topic is to take students on an exploration of the links between stress and illness and to explore psycho-physiological disorders as an example of the stress – illness link. Thus students discuss definitions of stress and its measurements, the body’s stress reactions, coping styles and concomitantly how maladaptive forms of coping may lead to illness. Biological, social support, cognitive, behavioural and analytic and theories of etiology of illness are explored and a lens is focused on Essential hypertension and coronary heart disease as examples of psycho-physiological disorders. Psycho-social factors in chronic illness. In 2007, a links will be established between the school of Public Health and Medical Psychology to look at this session more in the light.

**How Gender and Unemployment Impact Health**

The goal of this topic is to discuss the impact of gender and unemployment on peoples’ lives in the community. The class discusses the different problem behaviours typically seen in boys and girls and explores the factors which lead to such problems in children. There is also a focus on how men and women experience mental health difficulties differently and there is a discussion on the psychological factors which give rise to these difficulties. As well, there is a discussion on the effects of domestic violence, rape, powerlessness and poverty on mental health.

**Dealing with Special Populations**

The goal of these lectures is to help students understand the special needs of vulnerable groups (see below) and skills needed to give them effective services.

- HIV/AIDS patients
- The mentally challenged
- The physically disabled
- The aged
- Children and adolescents

**Prevention in Community Mental Health**

This lecture discusses broadly the application of concepts of primary, secondary and tertiary prevention to mental health. Students are introduced to the possibility of prevention at different levels of society e.g. individual, family, community and the wider society.

Four broad strategies for intervention at these levels are discussed e.g. crises intervention, mental health education, consultation and the use of non-professional in the community to impact mental health. Students are encouraged to consider what they could do in their own communities to prevent mental health problems.

**Death and Dying**

Issues discussed in this lecture include Kubler Ross’ stages, how to break the news of terminal illness to patients and relatives. A debate is held over whether one should tell or not tell a patient about the terminal nature of their illness.
Emphasis is laid on the impact of the fear of death and its resolution on physician behaviour.

**Stress and Burn Out**
This lecture discusses Stress and Burn Out from the student and physician’s view point. Triggers to stress and burn out are discussed and the management of work and self to minimize or prevent burn out is highlighted. Simple Stress Management skills are taught including the need for professional support as well as individual cognitive and relaxation skills.

**Pain and Pain Management**
This lecture discusses theories of pain, psychological factors in pain, pain clinics and psychological methods that are used alone or as an adjunct to medication in pain management.

**Doctor/Patient Communication**
This lecture highlights communication issues to improve the doctor/patient relationship to improve service provision.
a. Proxemics (rules of personal space, impact of violations of personal space and how to breach personal space without negative impacts).
b. Rules that help with medication compliance.

**JUNIOR CLERKSHIP**

**CLINICAL PSYCHOLOGY SERIES**

**Mood Disorders**
The goal of this one and a half hour lecture is to make students conversant with the psychological assessment of mood disorder, and the psychological treatments of mood disorders, particularly cognitive behaviour therapy for depression. There is an indepth look at the episodic nature of mood disorders, the assessment of cognitive, assumptions underlying the relationship between thought, feeling, and events, patterns and schemas of automatic thoughts and ways of correcting faulty thinking. There is a comparison between effects of cognitive behaviour therapy, and medication.

**Schizophrenia**
Using real life cases as examples, there is an indepth discussion about the different criteria required for diagnosis of schizophrenia in the DSM IV TR. This continues with an indepth look at the ways of assessing these symptoms. Students are then taught psychological therapies in schizophrenia which are mainly behaviourial in nature, and which include the family of patients in order to reduce the strain on family life inflicted by the nature of the illness. Students explore research on behaviour and milieu therapy and their efficacy compared with medication only. The goal of the lecture, apart from teaching assessment and therapy, is to instill empathy for such a debilitating illness as schizophrenia.

**Anxiety**

**Cases Presentation**
In this concluding lecture, students present cases they have seen at the Accra Psychiatric Hospital during this rotation and there is a full exclusive discussion on psycho-therapy specifically tailored to each individual case presented.

**Psychological Assessment**
Broad exposure to psychodignostic testing and concepts of standardization, validity and reliability in testing. Introduction to the tests Ghanaian clinical psychologist use and interpretation of test results.

**Problems Associated With The Medical Psychology Course**
These topics are treated in truncated fashion typically, in broad strokes because of the shortened time. For instance, with the psycho-physiological disorders, we are able to teach hypertension, and a tiny bit on cancers. However, there are diabetes, dermatitis, asthma, seizure disorders, e.t.c., e.t.c. which have a large psychological component and which are eased significantly by knowledge of appropriate psychological interventions. There is also the chronicity of these illnesses and dealing with terminal illness which we gloss over. What is lacking here are any kind of interventions with plastic surgery, with children, parenting, liaising with schools, adolescent mental health e.t.c., e.t.c.

We used to teach all of these in 12-13 sessions, i.e. a full semester. Now we are allocated only 8. The course is now only two thirds time for the same number of topics.

Community Health says that it does not have more time. It is important that the School realizes that its curriculum in behavioural medicine is deficient with respect to detail. As far as we are concerned, Medical or Health psychology is a separate examinable semester long programme in any curriculum. It is not an addendum to community Health. We would like therefore to take this opportunity to review these issues in detail and to find a solution.

**SENIOR CLERKSHIP**

- Behavioural Change In Inpatient Settings

**Year 3**
Introduction to Psychology

**Year 5**
In conjunction with Community Health
Medical Psychology
Includes:
- Psychopathology In The Community
- Psychophysiological Conditions
- Psychobehavioural Aspects of Illness

There is a Project in Research in Psychiatry in the Senior Clerkship. For four weeks, students master the art of conceptualizing psychological and psychiatric variables and how to measure these. They may for instance plan treatment protocols, cost and run them, and assess their efficacy. They may construct questionnaires, test, standardize, and validated them. They may look at systemic issues in psychiatry such as how the outpatient clinics or wards are run and explore ways of making these more efficient, or they may look at the various uses of the psychiatric hospitals. Students work in teams of up to 8 or 10. At the end of the clerkship, they are required to write these up and present them in a student conference at the Medical School. The department is in the process of editing these for publication.

**COURSE OUTLINE FOR INTRODUCTORY PSYCHOLOGY (PSYC 201)**

**LEVEL 200**

**INTRODUCTION**

a. Definitions
b. History of Psychology
c. Divisions of Psychology
d. Research Methods in Psychology

**HUMAN DEVELOPMENT**

a. Genetics and Environment
b. Physical, Social, Cognitive and Moral Development
   1. Childhood
   2. Adolescence
   3. Adulthood
   4. Old Age
   5. Gender & Sexuality

**BRAIN, BIOLOGY & BEHAVIOUR**
a. Biology of Behaviour
b. Sensory, World & reality
c. Reception
d. States of Consciousness

LEARNING, MEMORY & THINKING
a. Conditioning, Learning & Application
b. Theories
c. Thinking & Problem Solving, creativity
d. Intelligence

CRITICAL THINKING

INTERIM ASSESSMENT

MOTIVATION & EMOTION
a. Dynamics and Theories
b. Stress and Coping

ABNORMAL BEHAVIOUR & PSYCHOTHERAPY
a. Psychopathology
b. Therapies

PERSONALITY
a. Dynamics & Theories
b. Theories
c. Assessment

DEPARTMENT OF RADIOLOGY

Objectives
Radiological anatomy taught course consists of basic anatomy relevant to all the common radiological examinations with emphasis on cross sectional anatomy in the axial, coronal, sagittal and where appropriate, oblique planes.

Radiology Tutorials & Demonstrations
The Chest X-ray of the Lings and the Heart
The Mediastinum and Pleura
Oesophagus, Stomach and Duodenum
Duodenum and the Biliary System
Intestinal Obstruction and other commoner Lesions of the Small & Large Intestines

Genito-Urinary System
Skeletal System and Joints I
Skeletal System and Joints II

<table>
<thead>
<tr>
<th>Weeks</th>
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<tr>
<td>7</td>
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<td>Genito Urinary Tract</td>
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<td>9</td>
<td>Intestinal Tact</td>
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<tr>
<td>10</td>
<td>Bones and Joints</td>
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</table>
DEPARTMENT OF SURGERY

Objectives
The Department of Surgery is one of the key pillars in medical education. The department hosts students at different levels of their 3 year clinical training.
In addition the Department hosts a number of elective students from different countries who spend differing periods within the Department throughout the year.
The main objective of the Department is to train well rounded medical students in all aspects of surgical disciplines who can hold their own and function as first-line medical professionals with confidence and the right attitude.
This document summarizes the various areas the student passes through in the Department with a summary of the main objectives to be achieved for each segment of the curriculum.
Every student is warmly welcomed to the Department of Surgery.
By the end of the course in Surgery the Medical Student will have consolidated areas of

A. Skills
B. Knowledge
C. Attitude essential for the confident practice of surgery.

Attitudes
The Department places great importance on attainment of the correct attitudes by the end of the various periods in the Department
The Student should be able to demonstrate:
1. The importance of maintaining the highest standards of professional conduct in the practice of medicine.
2. That they accept medicine as a vocation and dedicate their lives to the care of their patients.
3. Respect for and the responsibility for preserving human life from the time of conception and the need for human beings to live and be treated with dignity and humanity (Hippocratic oath).
4. The importance of testifying only to that which he/she has personally verified.
5. The importance of concealing the secrets entrusted to him/her by his/her patients even after their death and only disclose them with the patient’s consent.
6. An understanding of unremitting responsibility a doctor has towards a patient until he/she has been discharged or properly handed over to another doctor.
7. The importance of team work in the care of patients.
8. That in the care of a patient, it may be necessary to seek other opinions.
9. The importance of keeping accurate medical records
10. The importance of behaving with respect towards his patients, colleagues (both senior and junior), nursing, paramedical and other staff as he would have them behave towards him
11. A sense of responsibility and initiative
12. The importance of the application of basic sciences in the practice of medicine
13. The importance of research in the management of patients an advancement of medical knowledge.
14. The need for and importance of continuing self-education.

Methods for Achieving the Objectives of the Department
The Department employs several methodologies for achieving its objectives in teaching.
These are:
1. **Lectures:**
It is the aim of the Department to reduce didactic lectures to the barest minimum.

2. **Tutorials:**
The student is encouraged to search for information on tutorial subjects and prepare adequately. Emphasis is placed on the fact that a tutorial is not a mini-lecture but an interaction between the tutor and the student to help reinforce and consolidate the self knowledge acquired by the student.

3. **Bedside Teaching:**
It is the main method by which the student acquires clinical skills and learns how to solve and manage clinical problems. It is essentially problem-solving oriented and every patient is regarded as a clinical. It also teaches team work in medical care.

4. **Outpatient Teaching:**
It also helps students to acquire clinical skills and learn how to solve clinical problems.

5. **Students’ Grand Rounds:**
Students present cases to their peers under the observation of their teachers. These take place during the subinternship. They provide a useful interaction between students and help in building self-confidence in presenting cases and thinking and arguing logically.

6. **Case Dissertation:**
Students, after presenting cases to illustrate an assigned topic to their peers, then give a discourse on the topic. This helps students to read widely around topics. They are supervised by a Faculty member.

7. **Operating Sessions:**
The Student assists at or observes operations on his patients. He experiences the most important part of surgical treatment. He is exposed further to team work in surgery.

8. **Essay Writing:**
This is done during the sub internship and helps students to practice essay writing and read around some selected topics.

9. **Examination:**
At the end of each rotation, an examination whose format may vary but generally consisting of a theory paper, orals and clinicals is held. The results are discussed individually with the students. Students are also given the opportunity to evaluate their rotation and the teaching in the Department and make suggestions for improvement. Evaluation of the student’s performance during the rotation is also done by the teachers of his unit and communicated to the students.

**Introductory Course (1st Clinical Year)**
This is a 4 weeks introduction to basic Surgery

**Course Objective:-**
At the end of the course, the student should be able to do the following:
1. Describe anatomical land marks essential to the practice of surgery.
2. Comport themselves on the wards in a manner respectful of patients and other medical staff with whom they will be working.
3. Discuss the steps in the examination of superficial swellings required to make a diagnosis.
4. Diagnosis and differentiate thyroid swellings from other swellings of the neck.
5. Recognize and diagnose an acute abdomen in a presenting patient.
6. Discuss the differences between different causes of inguino-scrotal swellings.
7. Understand the steps required to perform a satisfactory musculo- skeletal examination.
8. Discuss the pathophysiology of breast swellings

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<tr>
<th>LECTURES</th>
<th>DEMONSTRATIONS</th>
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<tr>
<td>Introduction to Surgery/Basic surgical principles</td>
<td>Anatomical landmarks</td>
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<td>Superficial swellings</td>
<td>Superficial swellings</td>
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<tr>
<td>Thyroid and neck swellings</td>
<td>Thyroid and neck swellings</td>
</tr>
<tr>
<td>Acute abdomen</td>
<td>Acute abdomen</td>
</tr>
<tr>
<td>Inguino-scrotal swellings</td>
<td>Inguino-scrotal swellings</td>
</tr>
<tr>
<td>Musculo-skeletal examination</td>
<td>Musculoskeletal examination</td>
</tr>
<tr>
<td>Breast swellings</td>
<td>Breast swellings</td>
</tr>
</tbody>
</table>

At the Introductory level, the end of rotation assessment comprises 25 questions of 5 stem T/F, are part of MCQ’s assessment set in collaboration with the Department of Medicine for the course. The assessment counts towards the overall continuous assessment mark in Surgery for the Final MB ChB examination.

**Coordinated – Course (2nd Clinical Years)**

This is termed a “Junior Clerkship” in Surgery.

Objectives of the course are that by the end of the Course the student should be able to do the following:

1. Take a history pertinent to the presenting complaint of a surgical patient.
2. Examine all surgical systems adequately to arrive at logical differential diagnosis for Surgical conditions.
3. Discuss the differential diagnosis of presenting surgical complaints.
4. Present a logical management plan for the diagnosis (es) arrived at.

The syllabus includes the following, which expose the student to all the Specialties of Surgery-in-General

**PRINCIPLES OF SURGERY**

1. Shock
2. Fluids & Electrolyte Therapy
3. Wound Healing
4. Infection in Surgical Practice

**PAEDIATRIC SURGERY**

1. Intestinal Obstruction in Childhood
2. Congenital Hypertrophic Pyloric Stenosis
3. Fluids and Electrolyte Balance in Paediatric Surgery
4. Acute Paediatric Surgical Pulmonary Problems
5. Acute Intestinal Obstruction in the Newborn
6. Oesophageal Atresia
7. Other Surgical conditions of Childhood

**UROLOGY**

1. Genito Urinary Tract
2. Urological Investigations
3. Lithiasis and Colics
4. Lower Urinary Tract
5. Haematuria
   1. Symptoms of urological disease
   2. Signs of urological disease
   3. Urological Investigations
   4. Urological Infections
   5. Trauma of the Urinary Tract
   6. Lower Urinary Tract Obstruction
   7. Upper Urinary Tract Obstruction
9. Tumours of the Urinary Tract (Urothelial)
10. Tumours of the Urinary Tract (Non-Urothelial)
11. Renal Transplantation
12. Urolithiasis
13. Renal Failure
14. Erectile dysfunction

ORTHOPAEDIC
1. Bones and Joints

GENERAL SURGERY
1. Surgical Treatment of Peptic Ulcer and Its Complications
2. Acute Intestinal Obstruction
3. Inguinal Canal/Femoral Canal
4. Gastrointestinal Tract
5. Dysphagia
6. Dyspepsia
7. Gastric Outlet Obstruction
8. Abdominal Injuries
9. Pre-and Postoperative Care
10. Post Operative Complications

NEUROSURGERY
1. Head Injuries
2. History taking in the neurological patient
3. Basic neurological examination
4. Knowledge of the anatomy of the brain and Spinal cord.
5. Neurological investigations including imaging studies.
6. Examination, diagnostics and management of the unconscious patient
7. Assessment of head Injuries, including the Glasgow Coma Scale.
8. Cause pathophysiology and management of increased intracranial pressure.
9. Spinal cord injuries and care of the paralysed patient
10. Assessment and management of seizure Disorder.

PLASTIC SURGERY
1. Burns

VASCULAR SURGERY
1. Peripheral Vascular Disease
2. Lymphoedema
3. Gangrene of the Lower Limb
4. Leg Ulcer

CARDIOTHORACIC
1. Chest Injuries
2. Cardiac Arrest
The assessment at the end of the rotation also includes a theory paper, orals and clinical exams and contributes to the CA for the Final examination.

Specials I – (2nd Clinical Year)
During this course, students spend a total 8-week block covering the following Specialties
- Ear, Nose and Throat
- Ophthalmology
- Dermatology
- Psychiatry
Objectives of the course are that by the end of the Course, the student should be able to do the following:
1. Describe the clinical anatomy of the Eye and Ear, Nose and Throat
2. Describe the clinical presentation of common conditions of the Eye, Ear, Nose and Throat
3. Discuss the management of these conditions.

ENT SYLLABUS
1. Basic Applied Anatomy of the Ear
2. Disease of the Auricle (Pinna)
3. Disease of the External Ear
4. Injury of the Tympanic Membrane
5. Acute Otitis Media
6. Chronic Otitis Media
7. Complications of Middle Ear Infection
8. Secretory Otitis Media
9. Causes of Otalgia
10. Causes of Vertigo
11. Otosclerosis
12. Causes of Hearing Impairment
13. Facial Nerve Palsy
14. Disease of the Inner Ear (Menieres Disease, Labyrinthitis, Vestibular Neuritis
15. Ototoxicity
16. Tinnitus
17. Tumours of the Middle and Inner Ears
18. Adenoids Tissue
19. Tonsils and Pharynx
20. Infections of the Adenoid, Tonsils and Pharynx
21. Complications of Tonsillar and Pharyngeal Infections Indications for Adenoidectomy
22. Foreign Bodies of the Oropharynx
23. Basic Applied Anatomy of Larynx
24. Congenital Anomalies of the Larynx
25. Injury of the Pharynx and Larynx
26. Acute Infections of the Larynx
27. Hoarseness: Causes and Diagnosis
28. Stridor: Causes and Diagnosis
29. Vocal Cord Paralyses
30. Foreign Bodies of the Larynx, Trachea and Bronchi
31. Tumours of the Larynx
32. Indications for Tracheotomy
33. Complications and Post Operative Care
34. Basic Applied Anatomy of Oesophagus
35. Symptoms and Signs of Oesophageal Disease (Dysphagia, Odynophagia Regurgitation, Haematemesis etc
36. Congenital Malformations of the Oesophagus
37. Injury to Oesophagus
38. Foreign Bodies of the Oesophagus
39. Basic Applied Anatomy of Nose and Paranasal
40. Sinuses Foreign Bodies of the Nose and Paranasal
41. Sinuses Injuries of the Nose and Paranasal Sinuses
42. Epistaxis
43. Maxillary Sinusitis
44. Frontal Sinusitis
45. Etmoidal and Sphenoidal Sinusitis
46. Nasal Allergy
47. Nasal Polypi
48. Choanal Atresia
Each subspecialty organizes an end of rotation exam which mark contributes towards the final CA for the Final exam.

SENIOR CLERKSHIP 3rd CLINICAL YEAR

During this course, the students are expected to perform at the Sub-intern level, consolidating their knowledge and understanding of the surgical principles already learnt as well as learning/discussing in more detail the surgical condition including their management, which they have previously been exposed to.

By the end of this course they student should be able to do the following
1. Function as sub interns or student house officers
2. Be able to perform specified simples ward procedures.
3. Discuss in detail the clinical management of a full range of surgical conditions.
4. Document professionally and competently surgical cases encountered.
5. Discuss the use of a full range of laboratory options in the management of surgical cases.

The details of the syllabus are as below:
1. Surgical instruments – name recognition and description of use.
2. Radiology – Full recognition and interpretation of various radiological tools.
3. Revision of essential surgical anatomy
4. Revision of essential surgical physiology.
5. Basis of Chemotherapy and its clinical uses
6. Basis of Radiotherapy

GENERAL SURGERY
1. Gallstones
2. Acute Pancreatitis
3. Surgical Treatment of Peptic Ulcer
4. Carcinoma of the Large Bowel
5. Tumours of the Thyroid
6. Peripheral Vascular Diseases
7. Carcinoma of the Breast
8. Diabetes and Surgery
9. Deep Vein Thrombosis and Pulmonary Embolism
10. Abdominal Injuries
11. Obstructive Jaundice
12. Anterior Abdominal Wall and Incision
13. Anatomy of Inguinal Canal and Femoral Hernia
15. Metabolic Response to Trauma
16. Absorption of Food in the GIT and Various Disease States

PLASTIC SURGERY
1. Burns
2. Lymphoedema
3. Ulceration of the leg
4. Basics of Radiotherapy

MAXILLOFACIAL
1. Carcinoma of the Tongue and Lip
2. Jaw Swellings

NEUROSURGERY
1. Review of neurological assessment
3. Recognition and management of spinal cord compression.
5. Intracranial infections/Brain abscess, investigations and management
7. Presentation and management of common brain tumours.
8. Cerebral Abscesses/Cerebral Tumour
9. Head Injuries

PAEDIATRIC SURGERY
1. Oesophageal Atresia and Tracheo Oesophageal Fistula
2. Congenital Pyloric Stenosis
3. Common Tumours in Childhood
4. Neonatal Intestinal Obstruction
5. Anorectal anomalies
6. Other surgical conditions in Childhood

CARDIOTHORACIC SURGERY
1. Chest injuries
2. Fractured ribs
3. Pneumothorax
4. Haemothorax, Pleural effusion
5. Lung Collapse
6. Lung Abscess
7. Secondary Metastases
8. Pneumonia
9. Bronchogenic carcinoma
10. Contusion of lung
11. Ruptured diaphragm
12. Tuberculosis

**Specials II – 3rd Clinical Year (Level700)**
This comprises a rotation in Anaesthesia, Orthopaedics and Trauma, Urology and Radiology. Eight (8) weeks are spent in Orthopaedics and Urology.

The course objectives are:
1. To enable the students understand the principles of diagnosis and management of conditions in the different sub-specialties
2. To enable students gain confidence in performing simple procedures required in those disciplines.

**UROLOGY SYLLABUS**
1. Symptoms and signs of urological disease
2. Urological Investigations
3. Pyonephrosis
4. Trauma of the Urinary Tract
5. BPH and Urethral Strictures
6. Upper Urinary Tract Obstruction
7. Haematuria
8. Bladder Tumour
9. Carcinoma of Prostate
10. Testicular Tumours
11. Inguino-scrotal swellings
12. Urolithiasis and colics
13. Renal Failure
14. Erectile dysfunction
15. Renal Function Tests and Renal Failure

**III. Uro-radiology Sessions**
1. Plain X-rays
2. Intravenous Urograms
3. Retrograde Urograms
4. Ultrasonosgraphy

**Orthopaedic and Trauma**
1. Principles of Fracture Management
2. Resuscitation of the Severely Injured
3. Hand Injuries/Wrist Injuries
4. Fractures of the Humerus
5. Fractures Shaft of Femur
6. Tibial Condylar Fractures
7. Fractures of Tibia and Fibula
8. Complications/Associated Injuries of Fractures
9. Management of Compound/Open Fractures
10. Fractures of the Forearm
11. Dislocations of the Shoulder
12. Fracture of the Scapula and Clavicle
13. Injuries around the Elbow
14. Supra-condylar
15. Femoral Fractures
16. Fractures of Patella
17. Spinal Injuries
18. Care of the Paralysed
19. Missile Injuries
20. Disaster Triage
21. Internal Derangement of the Knee
22. Management of Backache
23. Amputation
24. Fractures of Ankle, Foot Injuries
25. Septic Arthritis
26. Maxillofacial Injuries
27. Skin Flaps and Grafts in Trauma
28. Poliomyelitis
29. Peripheral Nerve Injuries

At the end of each rotation, each discipline organizes an end--of--rotation examination which may take the form of theory papers, a form of clinical examination including OSCE. All the assessments count toward the final CA of the Final examination.

**SCHOOL OF NURSING**

**INTRODUCTION**
Nursing is a dynamic and challenging profession which serves to promote, maintain and restore health. The changing trends in health needs, health technology and the expectations of clients require that the graduate nurse acquires knowledge and skills of the highest standard to meet the challenges of modern day nursing. It is against this background that the School of Nursing has improved upon its programme to meet the current needs of the job market in Ghana and abroad.

This four-year degree programme will have Level 100 counting towards graduation. Nurses who hold University of Ghana Diploma in Nursing will enter the programme at Level 200. Students will be awarded BSc Nursing with one of the following options: General Nursing, Paediatric Nursing, Midwifery, Community Health Nursing and Mental Health Nursing.

**PROGRAMME STRUCTURE**

**LEVEL 100**

**FIRST SEMESTER**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>NURS 101</td>
<td>Human Anatomy I</td>
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<tr>
<td>NURS 103</td>
<td>Human Physiology I</td>
<td>2</td>
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<tr>
<td>NURS 105</td>
<td>Introduction to Community Health Nursing</td>
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<tr>
<td>NURS 107</td>
<td>Introduction to Mental Health Nursing</td>
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<td>NURS 109</td>
<td>Nursing Perspectives</td>
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<td>NURS 111</td>
<td>Trauma and Emergency Nursing</td>
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<tr>
<td>UGRC 110</td>
<td>Academic Writing I</td>
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<td>UGRC 120</td>
<td>Numeracy Skills</td>
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**SECOND SEMESTER**

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<td>NURS 104</td>
<td>Human Physiology II</td>
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<td>NURS 108</td>
<td>Fundamentals of Mental Health Nursing</td>
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<td>NURS 114</td>
<td>Psychology for Nurses</td>
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<td>NURS 116</td>
<td>Obstetric Anatomy and Normal Pregnancy</td>
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<td>NURS 118</td>
<td>Fundamentals of Nursing</td>
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<td>NURS 122*</td>
<td>Nursing Practical I</td>
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<td>UGRC 130-</td>
<td>Understanding Human Societies</td>
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<tr>
<td>UGRC 150</td>
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**Long Vacation Practicum**

NURS 122* will be offered partly during the semester and continued for six weeks in the long vacation.

**LEVEL 200**

**FIRST SEMESTER**  
(Diploma holders will enter at this point)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>NURS 231</td>
<td>Principles and Practice of Health Assessment</td>
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<td>NURS 233</td>
<td>Medical Microbiology and Parasitology</td>
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<tr>
<td>NURS 235</td>
<td>Normal Labour and Puerperium</td>
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<td>NURS 237</td>
<td>Theoretical Foundations of Nursing</td>
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<td>NURS 239</td>
<td>Pharmacology</td>
<td>3</td>
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<td>NURS 241</td>
<td>Foetal and Child Development</td>
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<td>NURS 243</td>
<td>Prevention and Control of Communicable Diseases</td>
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<td>NURS 245</td>
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<td>UGRC 210</td>
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* Students who entered the programme as diploma holders will offer UGRC 110: Academic Writing I in addition.

**SECOND SEMESTER**

Core

<table>
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<th>Course Title</th>
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<tbody>
<tr>
<td>NURS 232</td>
<td>Medical conditions of Integumentary, Gastrointestinal and Endocrine systems</td>
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<tr>
<td>NURS 234</td>
<td>Surgical Conditions of Integumentary, Gastrointestinal and Endocrine systems</td>
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<tr>
<td>NURS 236</td>
<td>Abnormal Pregnancy, Labour and Puerperium</td>
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<tr>
<td>NURS 238</td>
<td>Classification and Management of Mental Disorders</td>
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<tr>
<td>NURS 242</td>
<td>Medical and Surgical Conditions of the Newborn and the Child</td>
<td>2</td>
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<tr>
<td>NURS 244</td>
<td>Management of Child Welfare Clinics</td>
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<tr>
<td>NURS 246*</td>
<td>Nursing Practical III</td>
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<td>NURS 248</td>
<td>Nutrition and Dietetics</td>
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<tr>
<td>NURS 252</td>
<td>Pathology</td>
<td>3</td>
</tr>
<tr>
<td>UGRC 220-238</td>
<td>Introduction to African Studies</td>
<td>3</td>
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</table>

**Long Vacation Practicum**

NURS 246* will be offered partly during the semester and continued for six weeks in the long vacation.

* Students who entered the programme as diploma holders will not do UGRC 220-238: African Studies but will offer UGRC 130: Understanding Human Societies and UGRC 150: Critical Thinking and Practical Reasoning at this level.
LEVEL 300
FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>NURS 331</td>
<td>Medical Conditions of Respiratory, Cardiovascular and Genitourinary Systems</td>
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<tr>
<td>NURS 333</td>
<td>Surgical Conditions of Respiratory, Cardiovascular and Genitourinary Systems</td>
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<tr>
<td>NURS 335</td>
<td>Community Health Service Organisation and Participation</td>
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<td>NURS 337</td>
<td>Nursing Practical IV</td>
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<td>NURS 339</td>
<td>Reproductive Health</td>
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<td>NURS 341</td>
<td>High Risk Neonate</td>
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<tr>
<td>NURS 343</td>
<td>Principles of Psychiatric Nursing</td>
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<tr>
<td>NURS 345</td>
<td>Nursing Research</td>
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- Students who entered the programme as diploma holders will offer UGRC 120: Numeracy Skills in addition.

SECOND SEMESTER

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>NURS 332</td>
<td>Medical Conditions of Nervous and Musculo-skeletal Systems and Sensori-Neural Organs</td>
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<td>NURS 334</td>
<td>Surgical Conditions of Nervous and Musculo-Skeletal Systems and Sensori-Neural Organs</td>
<td>2</td>
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<tr>
<td>NURS 336</td>
<td>Occupational and Community Health Services</td>
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<td>NURS 338*</td>
<td>Nursing Practical V</td>
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<tr>
<td>NURS 342</td>
<td>Medical and Surgical Conditions in Childhood</td>
<td>2</td>
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<tr>
<td>NURS 344</td>
<td>Management of Major Psychiatric Disorders</td>
<td>1</td>
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<td>NURS 346</td>
<td>Proposal Development and report writing</td>
<td>2</td>
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<tr>
<td>NURS 348</td>
<td>Gynaecological Nursing and Obstetric/Gynaecological Operations</td>
<td>2</td>
</tr>
<tr>
<td>NURS 352</td>
<td>Advanced Clinical Nursing I</td>
<td>2</td>
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<td><strong>Total Credits</strong></td>
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- Students who entered the programme as diploma holders will offer UGRC 220-238: Introduction to African Studies in addition.

LEVEL 400
FIRST SEMESTER

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>NURS 400**</td>
<td>Project Work</td>
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<tr>
<td>NURS 451</td>
<td>Tools and Methods of Teaching Nursing</td>
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<tr>
<td>NURS 453</td>
<td>Principles of Management in Nursing</td>
<td>2</td>
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<tr>
<td>NURS 455</td>
<td>Biostatistics</td>
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<tr>
<td>NURS 457</td>
<td>Nursing Practical VI (Specialty option)</td>
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<tr>
<td>NURS 459</td>
<td>Advanced Clinical Nursing II</td>
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<td>NURS 461</td>
<td>Nursing Seminar</td>
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Options (Select 3 credits)

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<tr>
<th>General Nursing</th>
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<tbody>
<tr>
<td>NURS 463</td>
<td>Peri-Operative and Critical Care Nursing</td>
<td>3</td>
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</tbody>
</table>

Paediatric Nursing

| NURS 465              | Integrated Management of Childhood Illnesses | 3        |

Community Health Nursing

| NURS 467              | Community Health Nursing Administration | 3        |

Midwifery

| NURS 469              | Advanced Midwifery Practice | 3        |

Mental Health Nursing

| NURS 471              | Theoretical Frameworks of Mental Health Nursing | 3        |

Total credits: 19

SECOND SEMESTER

Core

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NURS 452</td>
<td>Curriculum Development in Nursing Education</td>
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<td>NURS 454</td>
<td>Administration of Nursing Services and Schools</td>
<td>2</td>
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<tr>
<td>NURS 456</td>
<td>Teaching Practice</td>
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<tr>
<td>NURS 458*</td>
<td>Nursing Practical VII (Specialty option)</td>
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Credits: 13

Options (Select 3 credits)

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<th>General Nursing</th>
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<tbody>
<tr>
<td>NURS 462</td>
<td>Palliative Care and Hospital Emergency Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Paediatric Nursing

| NURS 464              | Childhood Chronic and Life Threatening Diseases      | 3        |

Community Health Nursing

| NURS 466              | Home-Based Nursing and National Health Programme      | 3        |

Midwifery

| NURS 468              | Domiciliary Midwifery                                 | 3        |

Mental Health Nursing

| NURS 472              | Advanced Practice in Mental Health Nursing            | 3        |

Total credits: 16

Long Vacation Practicum

NURS 458* will be offered partly during the semester and continued for six weeks in the long vacation.

- NURS 400** is a six credit course, three credits allocated to each semester.
- The option chosen in first semester should be continued with its corresponding course in the second semester.

COURSE DESCRIPTIONS

NURS 101: Human Anatomy I
This course is designed to help students appreciate the normal structure of the human body and apply this knowledge in nursing. The students will be exposed to the cell structure, embryology, the circulatory, respiratory and digestive systems. Students will also be exposed to preserved body structures to aid understanding. Diagrams of anatomical structures will also be presented as part of the course. There will be concurrent practical sessions.

NURS 102: Human Anatomy II
This course is a continuation of NURS 101. The course will help students recognise the normal structure of the body and apply this knowledge in nursing. The students will be exposed to preserved body structures to aid better understanding. Descriptions of anatomical structures of the genito-urinary system, the reproductive systems, nervous systems, endocrine and musculo-skeletal systems are provided. There will be concurrent practical sessions.
NURS 103: Human Physiology I
This course is designed to give students in-depth knowledge in the general function and physiological processes of the normal human body. Students will study the functions and specific biophysiochemical properties of organs in the circulatory, respiratory and digestive systems as well as metabolisms. There will be concurrent practical sessions.

NURS 104: Human Physiology II
This course is a continuation of NURS 103. It is designed to introduce students to the physiological processes involved in the normal functioning of the musculoskeletal system, endocrine system, urinary system, nervous system, reproductive system and special sensory organs. Students are expected to study specific biophysiochemical properties of these systems. There will be concurrent practical sessions.

NURS 105: Introduction to Community Health Nursing
This course introduces students to the history, processes and methods of community health nursing. Students will also discuss the concept of health, personal and environmental health. They will develop competencies in promoting health in the community and managing home accidents. Students will be expected to select a community or group and examine its environmental health practices.

NURS 107: Introduction to Mental Health Nursing
This course is designed to introduce students to the basic concepts in mental health care. It consists of various concepts used in psychiatric/mental health nursing which would be useful to students in understanding the behaviour of clients. The course will be useful to students who are preparing to care for patients with biopsychosocial needs in a variety of clinical settings. It will also assist students to appreciate developments in psychiatric/mental health care over the years and stimulate them to develop interest in mental health care.

NURS 108: Fundamentals of Mental Health Nursing
This course is designed to equip the student with knowledge of the theoretical basis for psychiatric mental health nursing. It includes the processes of assessment, admission and discharge of various categories of people with mental health problems, as well as the legal and ethical issues involved in these processes. This knowledge will guide the student to identify clients’ problems, determine and respect clients’ rights in psychiatric nursing practice.

NURS 114: Psychology for Nurses
The course is designed to help students appreciate the behavioural characteristics of humans. The course will examine theories underlying human behaviour. The physical, cognitive, and psychosocial factors influencing human responses to illness will be explored. Students will be introduced to appropriate mechanisms that can be used in meeting the needs of individuals with negative response to illness.

NURS 116: Obstetric Anatomy and Normal Pregnancy
This course is designed to introduce students to obstetric anatomy and physiology, and management of normal pregnancy.

NURS 118: Fundamentals of Nursing
This course is to introduce students to the basic concepts and techniques in nursing. Students will acquire knowledge and skills to carry out basic nursing procedures through the use of the nursing process and infection prevention practices. It will offer students opportunity to demonstrate skills acquired and to properly document all nursing care
given to patients.

**NURS 122: Nursing Practical I**
This course will expose students to clinical and field experiences in emergency and trauma care, primary health care and mental health. The purpose of the placement is to enable students gain skills in basic nursing within the different clinical areas. It will be offered partly during the semester and continued as a six week long vacation course. During the long vacation, students will be placed in medical/surgical units of selected hospitals for two weeks. They will also work in polyclinics and psychiatric hospitals for two weeks respectively.

**NURS 231: Principles and Practice of Health Assessment**
The course is designed to equip students with knowledge and skills in carrying out comprehensive health assessment. Students will be taken through the physical assessment of the human body in relation to the various body systems. They will gain competency in determining normal and abnormal functioning of organs and systems. The course will consist of classroom teaching and skills demonstration.

**NURS 232: Medical Conditions of Integumentary, Gastrointestinal and Endocrine Systems**
This course introduces students to medical conditions of the integumentary, gastrointestinal and endocrine systems. The conditions will be discussed with reference to definition, types, prevalence, aetiology, pathophysiology, clinical manifestation, diagnostic investigations, differential diagnosis and management. The framework for nursing management will be Betty Neumann’s prevention concept and Virginia Henderson’s nursing components.

**NURS 233: Medical Microbiology and Parasitology**
This course is designed to give students knowledge about microbial organisms. It will also examine the way infections and infestation are transmitted and how to disinfect and sterilize materials. The course has a practical component to enable students view micro-organisms using the light microscope. The aim is for students to apply the knowledge gained to the prevention of cross infection.

**NURS 234: Surgical Conditions of Integumentary, Gastrointestinal and Endocrine Systems**
The course will focus on surgical conditions of the integumentary, gastrointestinal and endocrine systems, and their surgical interventions. Neoplasms will also be discussed. The conditions will be discussed with reference to definition, types, prevalence, aetiology, pathophysiology, clinical manifestation, diagnostic investigations, differential diagnosis, and conservative/surgical management. The framework for nursing management will be Levine’s conservation principles and the nursing process.

**NURS 235: Normal Labour and Puerperium**
This course is designed to introduce the student to the stages and management of normal labour and normal puerperium. Students are expected to gain competencies that will enable them to give appropriate care during labour and puerperium. It will also involve skills demonstration and clinical placement.

**NURS 236: Abnormal Pregnancy, Labour and Puerperium**
This course is designed to enable the student midwife diagnose and manage abnormalities associated with pregnancy, labour and puerperium.

**NURS 237: Theoretical Foundations of Nursing**
This course is designed to provide nursing students insight into the multiple nursing theories. The course will focus on theory and practical application of the concepts discussed. It will consist of presentations and applied exercises. The students will be given the opportunity to critically analyze some of the existing nursing theories and equip them to meet professional and social expectations.

**NURS 238: Classification and Management of Mental Disorders**
This course will focus on the classification of mental disorders, developmental, behavioural and anxiety disorders. Students will be introduced to assessment and management of these conditions.

**NURS 239: Pharmacology**
This course is designed to equip students with knowledge in basic concepts of pharmacology. Students will be introduced to the principles of drug administration, effects of drugs as well as excretion of drugs from the body. The different classes of drugs and their effect on the various body systems will be discussed. Various side effects of
drugs will also be analyzed.

**NURS 241: Foetal and Child Development**
This course offers students knowledge on conceptual and foetal development, growth and development of the child.

**NURS 242: Medical and Surgical Conditions of the Newborn and the Child**
This course is designed to equip students with knowledge and skills to manage the newborn and the child. It will enable students manage medical and surgical conditions in the newborn and the child.

**NURS 243: Prevention and Control of Communicable Diseases**
The course is designed to equip students with knowledge and skills in prevention and care of individuals/families with communicable diseases. Students will be introduced to theory of disease, epidemiology, control principles and methods, control strategies and organization of diseases of public health importance. Disease notification and health regulations in public health will also be emphasized.

**NURS 244: Management of Child Welfare Clinics**
This course is designed to enable students develop competencies in community health practice. Students will be taken through the nursing process as applied in community health nursing, organization of child welfare clinics and immunization. They will carry out home visits and conduct a study on a problem family.

**NURS 245: Nursing Practical II**
This practical course is designed to enable students gain competencies in medical/surgical and paediatric nursing. The focus will include assessment of patients, admission and discharging of patients, administration of medication and care of patients using the nursing process. There will be practical examination at the end of the session. Students are expected to continue with practical experience during the inter-semester break.

**NURS 246: Nursing Practical III**
The course aims at giving students the opportunity to apply the nursing process in caring for patients with conditions affecting integumentary, digestive and endocrine systems. Students will also gain skills in the management of pregnant women during antenatal, labour and puerperium. There will also be placement in the community and psychiatric hospital. There will be practical examinations at the end of the session.

**NURS 248: Nutrition and Dietetics**
This course is designed to help students appreciate the value of nutrients in health and illness. The student will be introduced to the different types of food nutrients, their functions and sources. The effects of over-nutrition and under-nutrition will be stressed. The concept of convalescent diet, special diet and planning meals for ill patients will also be examined. The nutritional requirements for specific disease conditions will be discussed. Students will also be introduced to how to assess the nutritional status individuals.

**NURS 252: Pathology**
This course is designed to expose students to pathological processes that occur in the human body. Students will be taken through cellular basis of disease, inflammatory processes and healing of wounds and fractures. The concepts of immunology and development of neoplasm will be discussed. There will be concurrent practical sessions to expose students to pathological tissues macroscopically and microscopically.

**NURS 331: Medical Conditions of Respiratory, Cardiovascular and Genitourinary Systems**
This course is designed to enable students develop competencies in managing patients with medical conditions of the respiratory, cardiovascular and genitourinary systems. The conditions will be discussed with reference to description of the condition, types, prevalence, aetiology, pathophysiology, clinical manifestation, diagnostic investigations, differential diagnosis and management. The framework for nursing management will be Betty Neuman’s prevention principles and the nursing process.

**NURS 332: Medical Conditions of Nervous and Musculo-Skeletal Systems and Sensori-Neural Organs**
The course will expose students to medical conditions of the nervous, musculo-skeletal system and sensori-neural organs. The conditions will be discussed with reference to definition, types, prevalence, aetiology, pathophysiology, clinical manifestation, diagnostic investigations, differential diagnosis and management. The framework for nursing management will be Betty Neuman’s prevention principles and the nursing process.
NURS 333: Surgical Conditions of Respiratory, Cardiovascular and Genitourinary Systems
The course is designed to enable students develop competencies in managing patients with surgical conditions of the respiratory, cardiovascular and genitourinary systems. The conditions will be discussed with reference to definition, types, prevalence, aetiology, pathophysiology, clinical manifestation, diagnostic investigations, differential diagnosis and management. The framework for nursing management will be Levine’s conservation principles and the nursing process.

NURS 334: Surgical Conditions of Nervous and Musculo-Skeletal Systems and Sensori-Neural Organs
The course is designed to help students develop competencies in managing surgical conditions of the nervous and musculoskeletal system and sensori-neural organs. The conditions will be examined based on the definition, prevalence, aetiology, pathophysiology, clinical manifestation, diagnostic investigations, surgical and conservative management. Levine’s conservation principles and the nursing process will be the framework for discussing nursing interventions.

NURS 335: Community Health Service Organization and Participation
This course will equip students with the requisite knowledge and skills relating to community health practice. Students will be taken through community diagnosis, mobilization, organization and participation. The sources of community data, measurement of morbidity and mortality, and health indices will also be discussed. Students will be assigned in groups to carry out a community study as part of the course.

NURS 336: Occupational and Community Health Services
The course is aimed at assisting students to develop competencies in providing school, occupational, outreach and reproductive/adolescent health services. The problems of the school child, care of the physically/psychologically impaired and the aged will also be discussed. Students will be put in groups to undertake school health and health outreach services.

NURS 337: Nursing Practical IV
This course offers students the opportunity to apply knowledge and skills acquired in performing various nursing procedures. They will be placed on selected wards. There will be practical examinations at the end of the session. Students are expected to continue with practical experience during the inter-semester break.

NURS 338: Nursing Practical V
This course is designed to provide students with knowledge and skills in managing patients pre-, intra-, and post-, operatively. They will be placed in general and specialized theatres during the semester. Students will have psychiatric, obstetric and gynaecological nursing experiences during the long vacation.

NURS 339: Reproductive Health
This course is designed to give students insight into physical and emotional maturity of adolescents and associated problems, adolescent sexuality and associated risks. It will also expose students to basic principles of population dynamics and family planning.

NURS 341: High Risk Neonate
The course is designed to provide students with knowledge and skills to identify and manage the high risk neonate, recognise emergency conditions and take appropriate actions.

NURS 342: Medical Surgical Conditions in Childhood
The course is designed to provide students with knowledge and skills in managing medical and surgical conditions in children. Conditions affecting the endocrine, renal, gastrointestinal tract as well as tumours, genetic disorders and congenital malformations will be discussed.

NURS 343: Principles of Psychiatric Nursing
The course introduces students to the principles of psychiatric nursing. Students will be exposed to the knowledge and skills in assessing and managing clients with major psychiatric disorders.

NURS 344: Management of Major Psychiatric Disorders
This course is a continuation of NURS 313. It will assist students to plan and deliver care that will stabilise the
individual client’s health status to facilitate reintegration of the client into the community.

NURS 345: Nursing Research
This course is designed to introduce students to the use of the scientific process in identification, study and solution of problems. Students will be introduced to the principles and techniques of the research process. It will stimulate critical thinking and promote evidence-based practice.

NURS 346: Proposal Development and Report Writing
The course is designed to build on NURS 315 and assist students to be able to identify health and nursing problems in the course of their work and design simple but appropriate research projects to solve those problems. Students are expected to develop competencies in writing research proposals and report. It will also create in students the need for dissemination and utilization of research findings. They will be assigned supervisors to guide them through the research process.

NURS 348: Gynaecological Nursing and Obstetric / Gynaecological Operations
The course is designed to equip the student with knowledge on the various disorders of the female reproductive system, and manage clients with gynaecological problems, and in obstetric and gynaecological operations.

NURS 352: Advanced Clinical Nursing I
This course will enable students develop competencies in preparing patients for diagnostic procedures, setting trays and trolleys for various therapeutic procedures. Procedures of the integumentary, cardiovascular, respiratory, gastrointestinal and genitourinary systems will be discussed. There will be a component on practical skill demonstrations.

NURS 400: Project Work
This course is designed to test students’ ability to identify a health and nursing problem and design appropriate research into that problem. The course is aimed at testing the ability of students to search for literature, collect quality data and produce a standard scientific project work. The student is expected to present the research problem for approval and carry out the research under the supervision of lecturers. At the end of the second semester, two copies of typed work will be presented for assessment.

NURS 451: Tools and Methods of Teaching Nursing
This course will introduce nursing students to the theory, philosophy, and principles in teaching and learning. It aims at equipping nursing students with the knowledge and skills that the nurse educator requires in order to translate curriculum objectives into measurable outcomes. This course also introduces students to the major teaching and learning strategies. It aims at equipping the student with skills in facilitating active student learning and critical thinking.

NURS 452: Curriculum Development in Nursing Education
The course introduces students to basic concepts and the application of curriculum development process to nursing education in particular. Factors influencing curriculum development and learning are examined in relation to nursing education. Students will study and critique nursing curricula at various levels.

NURS 453: Principles of Management in Nursing
This course presents the basis of the theory and science of management, and the management of the national health system. It emphasizes the essentials of management that are pertinent to the effective work of nurses while maintaining their human relation skills gained from nursing practice and sustaining the values that originally attracted them to nursing.

The functions of management – planning, organizing, staffing and leading, and controlling will provide the conceptual framework for nurses to understand the contemporary challenges nurse managers face with management of the workforce, health financing, budgeting, ethical decision-making, technology management, health information systems and emerging workplace issues. This course lays the groundwork for an understanding of the nature and importance of managing and of management as a developed and important science for managing health service organizations.
NURS 454: Administration of Nursing Services and Schools
The present day concept in nursing service administration is to demonstrate administrative functions that will provide therapeutic and satisfying situations for patients and personnel. The course is designed to prepare student/nurse administrators for working in dynamic health care environments with acute, long-term, community orientations and school of nursing. The course provides practical approaches for applying leadership and management skills.

NURS 455: Biostatistics
This course is designed to equip students with skills in basic statistical methods used in health research. In particular, students will learn methods of describing data and how to interpret and use confidence intervals and significance tests, the most common methods of allowing for random variation in research results. The presentation and comparison of proportions and means will be covered. As part of this course, students will learn to make practical use of a statistical computer package.

NURS 456: Teaching Practice
This course is a practical component of NURS 401 which exposes students to a variety of methods suitable for teaching. It aims at equipping the student with teaching skills. Students are expected to have practice teaching in the classroom setting where they will be evaluated by their lecturers and peers.

NURS 457: Nursing Practical VI (Specialty Option)
This course gives students the opportunity to undertake nursing practicum in child health, maternal health, adult health, community health and mental health depending on their specialty options.

NURS 458: Nursing Practical VII (Specialty Option)
The course gives the student the opportunity to continue with nursing practicum in their specialty option.

NURS 459: Advanced Clinical Nursing II
This course is a continuation of NURS 322 which aimed at assisting students to develop competencies in preparing patients for diagnostic procedures, setting trays and trolleys for various therapeutic procedures. Medical and surgical procedures of the endocrine, neurologic, reproductive systems and sensori-neural organs will also be discussed. Students will also be exposed to ward management and nursing records. There will be practical demonstrations and return demonstration.

NURS 461: Nursing Seminar
This course is designed to provide students the opportunity to discuss events and issues that influence health in general and/or nursing in particular. Students are expected to identify topics of interest to them and make presentations to the class for discussion and critique.

NURS 462: Palliative care and Hospital Emergency Management
The course is designed to enhance students’ knowledge and skills in managing medical emergencies. They will also be introduced to managing clients / families with life threatening illnesses.

NURS 463: Peri-Operative and Critical Care Nursing
The course will equip students with the knowledge and clinical skills needed to provide care for adult patients requiring surgery and critical care. It consists of classroom teaching and practical sessions in peri-operative nursing and critical care.

NURS 464: Childhood Chronic and Life-Threatening Diseases
The students will acquire knowledge and skills to enable them manage children with life-threatening illnesses through the application of palliative care. Students will also develop competencies in managing children with chronic illnesses that are not life-threatening and children on life support.

NURS 465: Integrated Management of Childhood Illnesses
The course is designed to provide the student with knowledge and skills in the use of a more integrated approach to manage sick children to achieve better outcomes.
NURS 466:  **Home-Based Nursing and National Health Programme**  
This course prepares students for community and home-based nursing. There will be discussions on the changing policies and practice in National Health programmes.

NURS 467:  **Community Health Nursing Administration**  
This course will enable students build their knowledge and skills in health care systems management, occupational health and safety, regenerative health, school health and port health. They will also be involved in disease surveillance and control, special immunization programmes and public health administration.

NURS 468:  **Domiciliary Midwifery**  
The course is designed to help the student acquire knowledge to carry out domiciliary midwifery services in the community. The student will also manage clients and families in the community during pregnancy, labour and puerperium and compile the care given into a written document.

NURS 469:  **Advanced Midwifery Practice**  
This course is designed to enable the student midwife diagnose and manage various abnormalities associated with pregnancy, labour and puerperium. There will be demonstration and clinical components. The student is also expected to present patient / family maternity care study.

NURS 471:  **Theoretical Frameworks in Mental Health Nursing**  
This course is designed to introduce the student to theoretical frameworks used in mental health care. Learners will also examine family development structure, process and concepts and review their theoretical underpinnings from family theory. It is also designed to enable students to be abreast with trends emerging in mental health care and also to appreciate the relationship between social behaviour and health. The learner will also learn to plan to care for specific mental disorders.

NURS 472:  **Advanced Practice in Mental Health Nursing**  
This course is designed to help students develop an understanding of the complexity, rewards and challenges of working in various specialty areas in the context of primary health care delivery system. Aging and developmental processes will be learnt. The student will understand the significance of the family and loved ones in planning care for the various categories of disorders. Students will be placed in chosen specialty area to carry out and present a project work.

**UNIVERSITY OF GHANA SCHOOL OF PHARMACY**

**SCHOOL OF PHARMACY**

1.0  **STUDENTS’ ADMISSION, PROGRESSION AND GRADUATION**

1.1  **GENERAL REGULATIONS**

1.1.1  The University runs a modular course structure. Under this structure, the University’s academic programme has been organized into a semester system, and instruction takes the form of courses evaluated in terms of credits. Units of courses are examinable at the end of every semester and, if passed, a student shall earn credit(s) for the Units. The courses are coded and arranged in progressive order of difficulty, or in levels of academic progression.

1.1.2  Each department shall provide detailed information about the structure of courses leading to the award of Bachelors’ degree.

1.1.3  It is the responsibility of each student admitted to the University of Ghana, to be familiar with the specific requirements of the degree as well as the rules, regulations and policies of the University.
1.1.4 Each student is responsible for ensuring that the courses in which registration is effected satisfy the programme requirements of the Bachelor’s degree sought; advice and/or counselling for all who need assistance is freely available.

1.1.5 It is also understood that every student, by the act of registering, agrees to abide by all rules, regulations and policies of the University of Ghana and of the Faculties or Departments in which that student is registered.

1.1.6 Each student is expected to be familiar with the General Information outlined in this Handbook as well as the information pertaining to the School of Pharmacy. Students shall therefore be held liable for any lapses. When in doubt, students may consult their Heads of Department in writing with a copy to the Dean asking that advice be given in writing.

1.1.7 Exemption from any of these General Regulations may be granted only by the express permission of the Academic Board on the recommendation of the Board of the School of Pharmacy.

1.1.8 The University reserves the right to change rules, regulations and policies, as well as programme and course requirements given in this Handbook without prior notice.

1.2 ADMISSION TO THE SCHOOL OF PHARMACY
1.2.1 Further to the General Regulations regarding admission into the University of Ghana, admission to the School of Pharmacy for the B. Pharm Programme shall be direct into Level 100
   a) From the Senior Secondary School (using the WASSSE results) and must meet the following requirements:
      i. Core subjects
         * Passes in three subjects, namely, English, Mathematics and Integrated Science
         * Additionally, candidates shall be required to pass core Social Studies at least at Grade E.
      ii. Elective subjects
         Passes in three Elective Subjects shall be required namely Biology, Chemistry and either Physics or Mathematics.
   b) Other qualifications include International Baccalaureate (IB), International General Certificate of Secondary Education (IGCSE), General Certificate of Education (GCSE), the American Grades 12 and 13 examinations and other external qualifications which have equivalencies to the Senior Secondary School Certificate of Education (SSSCE) and the General Certificate of Education (GCE).

1.3.1 ACADEMIC YEAR / STRUCTURE
1.3.1 The Academic Session shall comprise two semesters.
1.3.2 Duration of Semester
   A semester shall be of 17 weeks duration and be structured as follows:
   14 weeks of Teaching
   1 week of Revision
   2 weeks of Examinations.
1.4 **DEFINITION OF COURSE UNIT**
A course unit shall be defined as follows:
(i) One-hour lecture = 1 Unit
(ii) One-hour tutorial = 1 Unit
(iii) One, two/three-hour practical session = 1 Unit

1.5 **DEFINITION OF COURSE CREDIT**
A credit shall be defined as follows:
(i) One-hour lecture or tutorial/week/semester
(ii) One two/three-hour practical/week/semester.

1.6 **GRADING SYSTEM FOR COURSES & SUBJECTS**
1.6.1 Student performance in a subject/course shall be graded as follows:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Marks</th>
<th>Grade Point</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80 – 100</td>
<td>4.0</td>
<td>Outstanding</td>
</tr>
<tr>
<td>B+</td>
<td>75 – 79</td>
<td>3.5</td>
<td>Very Good</td>
</tr>
<tr>
<td>B</td>
<td>70 – 74</td>
<td>3.0</td>
<td>Good</td>
</tr>
<tr>
<td>C+</td>
<td>65 – 69</td>
<td>2.5</td>
<td>Fairly Good</td>
</tr>
<tr>
<td>C</td>
<td>60 – 64</td>
<td>2.0</td>
<td>Average</td>
</tr>
<tr>
<td>D+</td>
<td>55 – 59</td>
<td>1.5</td>
<td>Below Average</td>
</tr>
<tr>
<td>D</td>
<td>50 – 54</td>
<td>1.0</td>
<td>Marginal Pass</td>
</tr>
<tr>
<td>*E</td>
<td>45–49</td>
<td>0.5</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>F</td>
<td>0 – 44</td>
<td>0</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Note: *Although this is a failure grade, it may still be accepted as fulfilling prerequisite for other courses.*

**Other Grades**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Interpretation</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Fail</td>
<td>0</td>
</tr>
<tr>
<td>Z</td>
<td>Disqualification</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete</td>
<td>0</td>
</tr>
<tr>
<td>Y</td>
<td>Continuing</td>
<td>0</td>
</tr>
<tr>
<td>AUDI</td>
<td>Audit</td>
<td>0</td>
</tr>
</tbody>
</table>
1.6.2 Grade Point (GP): Each grade is assigned an equivalent grade point as indicated above. The number of (grade) points earned by a student, for each course completed, is computed as the product of the number of credits for the course and the grade point equivalent of the grade obtained in that course.

1.6.3 Cumulative Grade Point Average (CGPA): The student’s cumulative grade point average is calculated by dividing the total number of grade points obtained, up to any specified time, by the total number of credits of all courses for which the student has registered up to that time.

1.6.4 Final Grade Point Average (FGPA): The FGPA is the CGPA for all courses under consideration calculated up to the end of a student’s academic programme.

1.7 DEFINITION OF GRADES
1.7.1 Pass Grades: Grades A to D+ (not less than 1.5 GPA) constitute Pass grades in a course and also a subject.

1.7.2 Failure Grades: Grades D, E, F, X, Z constitute Failure grades in a course and also in a subject.

1.7.3 Continuing: A grade Y, denoting Continuing shall be awarded at the end of a semester to any student who is taking a course, which continues into the next semester.

1.7.4 Non-Completion of Course:
(i) A grade I, denoting Incomplete, shall be awarded to a student who is unable to complete a course for reasons adjudged by the Board of Examiners as satisfactory. Such a student shall be expected to complete the course the very next time the course is available.

(ii) A grade X shall be awarded to a student who is unable to complete a course for reasons adjudged by the Board of Examiners as unsatisfactory.

1.7.5 Disqualification:
(i) A grade Z denotes Disqualification from an examination as a result of an examination malpractice or offence, and shall be awarded whenever it is established that a candidate had attempted to gain an unfair advantage in an examination, be it in a Principal subject or an Ancillary or any other paper.

(ii) A candidate awarded a grade Z may be debarred from taking a University Examination for a stated period, or indefinitely, or may be expelled from the University.

(iii) A grade Z may be awarded only by the Board of Examiners.

1.7.6 Student in Good Standing
A student in good standing shall be one whose Cumulative Grade Point Average (CGPA) is at least 1.50 (Grade D+).

1.8 DEFINITION OF COURSES AND SUBJECTS
1.8.1 Core Pharmacy Course
A core pharmacy course is any course in a pharmaceutical discipline that is offered as part of the B.Pharm programme.
1.8.2 Non-Pharmacy Course
A non-pharmacy course is a course in a non-pharmaceutical discipline that is offered a part of the B.Pharm programme.

The non-pharmacy courses currently offered in the B.Pharm programme are:
- PHAR 121 Mathematics for Pharmacy I
- PHAR 122 Mathematics for Pharmacy II
- PHAR 141 Human Anatomy and Physiology
- PHAR 143 Human Anatomy and Physiology (Practical)
- PHAR 142 Basic Biochemistry
- PHAR 144 Basic Biochemistry (Practical)
- PHAR 151 Computer Literacy I
- PHAR 152 Computer Literacy II
- PHAR 251 Biostatistics
- PHAR 253 Entrepreneurial Skills (Practicals)
- UGRC 110 Academic Writing I
- UGRC 150 Critical Thinking and Practical Reasoning
- UGRC 210 Academic Writing II
- UGRC 220-238 Introduction to African Studies

1.8.3 Core Pharmacy Subject
All core pharmacy courses in a particular pharmaceutical subject area shall constitute a subject in pharmacy.

The core pharmacy subjects currently offered in the B.Pharm Programme are:
- I. General Chemistry: PHAR 111; PHAR 112; PHAR 113; PHAR 114
- II. Principles of Pharmacy: PHAR 123; PHAR 125
- III. Pharmaceutical Microbiology I: PHAR 124; PHAR 126
- IV. Pharmacognosy: PHAR 131; PHAR 133
- V. Behavioural Pharmacy: PHAR 153; PHAR 154
- VI. Organic/Medicinal Chemistry I: PHAR 211; PHAR 212; PHAR 213; PHAR 214
- VII. Pharmaceutical Microbiology II: PHAR 221; PHAR 223
- VIII. Physical Pharmacy: PHAR 222; PHAR 224
- IX. Drugs of Plant Origin I: PHAR 232; PHAR 232
- X. General/Autonomic Pharmacology: PHAR 241; PHAR 242; PHAR 243; PHAR 244
- XI. Biostatistics & Pharmacoepidemiology: PHAR 251
- XII. Chemical Pathology: PHAR 252; PHAR 254
- XIII. Drug Analysis: PHAR 311; PHAR 313
- XIV. Medicinal Chemistry II: PHAR 312; PHAR 314
XV. Pharmaceutical Technology: PHAR 321; PHAR 323

XVI. Principles of Immunology: PHAR 322; PHAR 324

XVII. Drugs of Plant Origin II: PHAR 331; PHAR 333

XVIII. Endocrine & Immunopharmacology: PHAR 341; PHAR 343

XIX. Systems Pharmacology I & Toxicology: PHAR 342; PHAR 344; PHAR 346

XX. Clinical Pharmacy: PHAR 351; PHAR 353

XXI. Pharmacy Practice: PHAR 352; PHAR 354

XXII. Drug Quality Assurance: PHAR 411; PHAR 412

XXIII. Applied Pharmaceutics & Immunology: PHAR 421; PHAR 422

XXIV. Phytotherapy & Herbal Medicine: PHAR 431; PHAR 432

XXV. Systems Pharmacology II & Chemotherapy: PHAR 441; PHAR 442

XXVI. Pharmacotherapy & Disease Management: PHAR 451; PHAR 452

XXVII. Final Year Project: PHAR 410; PHAR 420; PHAR 430; PHAR 440; PHAR 450

1.8.4 Non-Pharmacy Subject

All non-pharmacy courses in non-pharmacy but related disciplines shall constitute subjects in a non-pharmacy category.

Non-pharmacy subjects currently offered in the B.Pharm programme are:

I. Mathematics for Pharmacy: PHAR 121 and PHAR 122

II. Human Anatomy and Physiology: PHAR 141 and PHAR 143

III. Basic Biochemistry: PHAR 142 and PHAR 144

IV. Computer Literacy: PHAR 151 and PHAR 152

V. Biostatistics and Entrepreneurial Skills: PHAR 251 and PHAR 253

VI. Academic Writing: UGRC 110 and UGRC 210

VII. Social Studies: UGRC 150 and UGRC 220-238

1.9. PROBATION AND WITHDRAWAL

1.9.1 A student who fails to obtain a grade point average of 1.50 (55%) in a subject shall be eligible for the Supplementary Examinations.

1.9.2 A student who fails to obtain the requisite pass in a subject after the Supplementary Examinations shall be asked by the Dean to repeat the year and the course, provided that not less than 2 courses shall be taken in the repeated year.

1.9.3 A student who fails to obtain the requisite pass in the subject after repeating the year shall be asked by the Dean to withdraw from the School of Pharmacy.
1.9.4 A student can proceed to the next stage of the programme if and only if he/she has passed all the courses of the preceding level, or has failed not more than one course.

2.0 B.PHARM DEGREE PROGRAMME

2.1 DURATION OF PROGRAMME
2.1.1 The minimum period for the B.Pharm Degree shall be 8 semesters and the maximum period shall be 12 semesters. These minimum and maximum periods are calculated from the date of first registration.

2.1.2 A candidate who is unable to complete his/her programme within the maximum period allowed shall lose all credits accumulated. Such a candidate shall not be allowed to re-apply for admission into the B.Pharm degree programme.

2.2 INTERRUPTION OF STUDY PROGRAMME
2.2.1 A student may break his/her study programme but may not break for more than 4 continuous semesters, so however that the maximum period allowable for the completion of the programme is not exceeded. Such a student shall be allowed to continue the programme from where he/she had left off.

2.2.2 A student who wishes to interrupt his/her course of study shall apply in advance to the Dean of the School of Pharmacy, stating reasons why he/she wants to interrupt his/her study programme, and permission duly granted before he/she leaves the University. The decision of the Dean shall be communicated to the applicant before he/she leaves the University.

2.2.3 A student who breaks his/her studies for more than 4 continuous semesters shall be deemed to have lost any accumulated credits. Such a student may be allowed to re-apply for admission to the School of Pharmacy.

2.2.4 Where the ground for interruption of studies is medical, the Head of the Medical School Clinic/Director of Health Services, University of Ghana shall be required to advise the Dean on the propriety and length of period of interruption. The Dean shall cause the Head of the Medical School Clinic to investigate any medical report reaching his office from any health delivery facility outside the Medical School Clinic/University Hospital and advise accordingly.

2.3 SCHEME OF EXAMINATION FOR B.PHARM DEGREE
2.3.1 A final (end-of-semester) examination shall normally be required as a part of every course. An examination schedule showing time and place of examination for each course shall be published each semester.

2.3.2 The marks obtained in the end-of-semester examination shall contribute 70% of the grade for the course while continuous assessment shall contribute the remaining 30% (except for practicals or other courses which may be assessed entirely by continuous assessment).

2.3.3 Time allotted to examination papers shall be as follows:
   - 1-Credit Course - 1 hour
   - 2-Credit Course - 2 hours
   - 3-or more Credit Course - 2 to 3 hours.

2.4 ELIGIBILITY FOR EXAMINATIONS
2.4.1 A student shall attend all such lectures, tutorials, seminars and practicals and undertake all other assignments as approved by the University.
2.4.2 Each Department shall, with the approval of the Academic Board, determine the requirements for the subjects they offer.

2.4.3 Further to 2.4.1 above, a student shall attend lectures, tutorials, practicals and other activities prescribed for the courses/subjects for which he/she has registered, and execute all assignments given.

2.4.4 A student who does not fulfill the requirements for any course/subject shall not be allowed to take the examination for that course/subject.

2.4.5 In any case, a student who is absent for a cumulative period of 21 days from all lectures, tutorials, practicals and other activities prescribed for any subject in any semester shall be deemed to have withdrawn from the course/subject. Such a student shall not be permitted to sit for the semester examination.

2.5 REGISTRATION FOR EXAMINATIONS

2.5.1 Registration for a School of Pharmacy Examination shall require endorsement of the Registration Form by the Head of Department to the effect that the candidate has pursued satisfactorily the approved course(s) of study being offered over the prescribed period, and has attended at least 85% of lectures, tutorials, practicals and other activities prescribed for the course(s)/subjects. A candidate’s registration shall not be valid unless it is so endorsed.

2.5.2 Endorsement as in (2.5.1) above shall be withheld if a candidate is not deemed to have followed satisfactorily the approved course of study (as in Section 2.4).

2.5.3 In any event of the withholding of an endorsement, the Head of Department shall request the confirmation by the Board of the School of Pharmacy.

2.6 SUPPLEMENTARY EXAMINATIONS

2.6.1 The Examiners’ Board shall decide whether a student who fails in any course shall be allowed to re-write the examination in the failed course as a Supplementary Examination (to be held in the Long Vacation). If he/she re-writes and passes that examination, he/she shall be awarded the full grade earned on that occasion. The student’s transcript will show the number of occasions the candidate took the examination for that particular course and the grades earned on all such occasions.

2.6.2 Supplementary Examinations shall not include continuous assessment marks.

2.6.3 Supplementary Examinations shall be held six weeks after the main examination.

2.6.4 A student shall be allowed to take not more than 5 courses in all subject areas at any one time as the Supplementary Examinations.

2.6.5 A student who would be required to re-write University Examinations in more than 5 courses in all the subject areas shall repeat the year.

2.6.6 See also Regulation 1.9 (Probation and Withdrawal)

2.7 Deferment of Examination

2.7.1 On Grounds of Ill-Health: A student who has satisfied all the requirements as specified in Section 2.5, but is unable to take the main (end of semester) examination on grounds of ill health, shall, on application to the Dean, and on provision of a Medical Certificate issued or endorsed by the Head of the Medical School Clinic/Director of Health Services, Legon, be allowed to take supplementary examination as his/her main examination. He/she shall be credited with the grade obtained in the supplementary examination.

2.7.2 Subsequent application for deferment, on grounds of ill-health, shall be subject to a Medical Certificate issued by a properly constituted Medical Board.
2.7.3 **On Grounds other than Ill-Health:** In cases of deferment on grounds other than ill-health, the Dean of the School of Pharmacy shall invite the applicant for interview. It shall be the student’s responsibility to satisfy the School of Pharmacy beyond reasonable doubt why he/she wishes to defer the examinations.

2.7.4 In all cases of deferment of examinations, the applicant(s) shall obtain written responses from the Dean before leaving the School.

2.8 **EXAMINERS’ BOARD**
2.8.1 There shall be Examiners’ Board for the main and supplementary examinations which shall comprise the following:
- Dean - Chairman
- Vice Dean
- Heads of Department
- Internal Examiners for the various courses
- Senior Assistant Registrar (AA) - Secretary

2.8.2 Examiners’ Board shall receive, consider and determine the results of the respective examinations.

2.8.3 The Board shall be required to make appropriate recommendations on any candidate based on his/her performance and also on any aspect of the examination as it deems fit.

3.0 **DECLARATION OF RESULTS**
3.1 Results of semester examinations, taken at the end of each semester shall normally be published by the Dean on the School Notice Board before the commencement of the next semester.

3.2 A results slip indicating the student’s performance in the examination shall be made available to the student.

3.3 **ELIGIBILITY FOR THE B.PHARM DEGREE**
3.3.1 The B.Pharm degree shall be awarded to a candidate who has been properly admitted to the University, has followed the approved courses of study over the prescribed period and has satisfied the conditions as stated in Regulations 3.3.2 and 3.3.3 below.

3.3.2 **UNIVERSITY REQUIREMENTS**
- (i) Evidence of regular enrolment in the degree programme
- (ii) Discharge of all obligations owed to the University
- (iii) A pass in all University required courses
- (iv) Satisfactory performance in the appropriate University Examinations.

3.3.3 **FACULTY/DEPARTMENTAL REQUIREMENTS**
Satisfactory discharge of such requirements as may be prescribed for the degree.

3.3.4 **REQUIREMENTS FOR GRADUATION**
3.3.4.1 A candidate shall be deemed to have:
- (i) Satisfied all General University and Faculty requirements;
- (ii) Obtained at least 55% in each course featured in the examinations;

3.4 **CONFIRMATION OF AWARD OF DEGREE**
3.4.1 A list of candidates who are deemed eligible as in Regulations 3.3 and 3.4 shall be laid before the Academic Board of the University for approval as soon as practicable.
3.4.2 No award shall be confirmed unless the Academic Board of the University is satisfied that the candidate has satisfied all the conditions for the award of a degree.

3.5 CANCELLATION OF AWARD
3.5.1 Notwithstanding previous confirmation of an award of a degree as in Regulation 3.4, the Academic Board of the University may at any time cancel an award even with retrospective effect if it becomes known that:
(i) A candidate has entered the University with false qualifications
(ii) A candidate has impersonated someone else
(iii) A candidate has been guilty of examination malpractice for which a grade Z would have been awarded

There are other reasons that would have led to the withholding of confirmation of the award in the first place.

1.5.2 In any such event, the decision of the Academic Board of the University shall be published on the University Notice Boards and the candidate notified. Such cancellation and the reasons for it shall be entered on the candidate’s transcript.

3.6 TRANSCRIPT OF ACADEMIC RECORD
At the end of a student’s programme, the University shall, on the payment of an appropriate fee, issue to the particular student a complete transcript of his/her academic record. This transcript shall be marked Student’s Copy and shall record all courses attempted and all results obtained.

3.7 CLASSIFICATION OF DEGREE
The end-of-semester examination results from Level 100 except specified University and Faculty required courses shall be taken into account in the computation of the Final Grade Point Averages (FGPA) for the classification of the bachelor’s degree.

3.7.1 The GPA at Levels 100, 200, 300 and 400 shall be weighted in the proportions 1:2:2:2.
3.7.2 In the determination of the FGPA, a weighted average of all repeat courses shall be used, as for instance, a 3-credit course with a ‘D’ at first attempt and an ‘A’ at the second attempt shall attract a total of 6 credits in the computation of the grade Point Average of that particular course.

3.7.3 The FGPA for FIRST CLASS shall be 3.60 or better.
3.7.4 The full scheme of classification shall read as follows:

<table>
<thead>
<tr>
<th>Classification</th>
<th>FGPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class</td>
<td>3.60 or better</td>
</tr>
<tr>
<td>Second Class (Upper)</td>
<td>3.25 – 3.59</td>
</tr>
<tr>
<td>Second Class (Lower)</td>
<td>2.50 – 3.24</td>
</tr>
<tr>
<td>Pass</td>
<td>1.50 – 2.49</td>
</tr>
<tr>
<td>Fail</td>
<td>Below 1.50</td>
</tr>
</tbody>
</table>

3.7.5 University and Faculty required courses shall continue to remain ancillary subjects and a pass in every subject shall be required by all undergraduate degree students for the award of a Bachelor's degree; marks obtained shall be entered on the student’s transcript, but shall not count towards the classification of the degree.

3.8 UNIVERSITY OF GHANA REQUIRED COURSES
(i) Academic Writing I & II (UGRC 110 & UGRC 210)
(ii) Critical Thinking and Practical Reasoning (UGRC 150)
(iii) Introduction to African Studies (UGRC 220-238)
3.9 **SCHOOL REQUIRED SUBJECTS**

i) Mathematics for Pharmacy

ii) Human Anatomy and Physiology

iii) Basic Biochemistry

iv) Computer Literacy.

3.10 **NAME OF AWARDING INSTITUTION**

University of Ghana

3.11 **NAME OF DEGREE**

Bachelor of Pharmacy (Honours) degree

3.12 **ELIGIBILITY FOR POSTGRADUATE DEGREES**

3.12.1 Eligibility for Pharm.D, MPhil and PhD degrees shall be determined when the Departments are fully operational.

4.0 **EMPLOYMENT PROSPECTS OF STUDENTS**

The Pharmacy programme is structured to ensure that upon successful completion the graduates from the School will satisfy the current requirement of the Pharmacy Council of Ghana for entry into the pre-registration training programme for registration as pharmacists in Ghana. They will thus be eligible to practice as clinical pharmacists, community pharmacists, regulatory pharmacists, industrial pharmacists or, after appropriate post-graduate training, as pharmaceutical scientists in academia and research establishments.

5.0 **CURRICULUM OF COURSES**

In developing the curricula and syllabuses for the School the aims and objectives of academic programmes of the School were established.

5.1 **AIMS**

The purpose of the degree programmes of the School of Pharmacy is to produce pharmacy graduates who:

- Are committed to life-long learning

- Having a sufficient understanding of the principles and techniques of pharmaceutical sciences (and after appropriate internship) are able to communicate and deliver pharmaceutical care in the community and hospital settings;

- Are able to take professional responsibility in pharmaceutical industry for the manufacture and testing of medicinal products

- Are able, after appropriate postgraduate training, to pursue careers in academia and research establishments.
Special attention is focused on the development of skills that will enable the graduate to produce therapeutic substances of plant origin. This is intended to accelerate the scientific development of herbal medicine in Ghana.

5.2 Objectives
At graduation the student will:

(i) Understand how medicines are developed, manufactured and made available for pharmaceutical care

(ii) Have a basic understanding of medicine formulation and the capability to prepare extemporeaneously any medicine for which this would be regarded as the normal means of provision of pharmaceutical care

(iii) Be able to supply medicines in accordance with pharmaceutical knowledge, legislation and codes of professional conduct and practice

(iv) Have sufficient academic knowledge to interpret and evaluate prescriptions and other orders for medicines and to underpin a role in advising patients and other health care professionals about medicines and their usage

(v) Be able to recognize common disease states and make appropriate interventions to presented symptoms

(vi) Have an appreciation of the principles of medicinal products, quality assessment and quality assurance mechanisms in all aspects of scientific and professional activities

(vii) Have an appreciation of research methodologies relevant to natural, clinical and social sciences.

6.0 COURSE MODULES
6.1 LEVEL 100: YEAR ONE

SEMESTER 1

<table>
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<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
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</thead>
<tbody>
<tr>
<td>PHAR 111</td>
<td>General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>PHAR 113</td>
<td>General Chemistry I (Practical)</td>
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### 6.2 LEVEL 200 YEAR TWO

#### SEMESTER 3

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**TOTAL CREDITS** 18

#### SEMESTER 4

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**TOTAL CREDITS** 21
### 6.3 LEVEL 300: YEAR THREE

#### SEMESTER 5

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<td>Clinical Pharmacokinetics and Bioavailability</td>
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<td>PHAR 353</td>
<td>Pharmacoepidemiology and Pharmacoeconomics</td>
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**TOTAL CREDITS** 19

#### SEMESTER 6

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**TOTAL CREDITS** 19

### 6.4 LEVEL 400: YEAR FOUR

#### SEMESTER 7

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<td>PHAR 421</td>
<td>Applied Immunology</td>
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<td>PHAR 423</td>
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<td>PHAR 431</td>
<td>Plant Poisons and Pesticides</td>
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**TOTAL CREDITS** 17

* Students are eligible to select only one project
### SEMESTER 8

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**TOTAL CREDITS**: 14

Add 6 Credits for Project 20

### 7.0 COURSE DESCRIPTIONS (B. PHARM)

#### 7.1 Department of Pharmaceutical Chemistry

**PHAR 111 General Chemistry I (3 Credits)**
Students will be expected to appreciate the relevance of chemistry to pharmacy practice with focus on chemical structure, bonding and shape (classical model of the atom), Bohr’s models, quantum mechanics and Schrödinger equation, relation to atomic structure, Aufbau, Hund’s and Pauli’s exclusion principles: MO and VB approaches to bonding, shapes of atomic and molecular orbitals and Hybridization of atomic orbitals. The Periodic Table, Equilibria in Electrolytes, Acids and Bases, Buffers, Handerson - Hasselberg equation. Topics in bio-inorganic chemistry will include metals in the body, electrolytes and transition metal roles in biological functions, identification, assay and uses of metals in pharmacy. Organic chemistry will cover introductory aspects of organic chemistry and alkanes, cycloalkanes, alkenes with a focus on nomenclature, structures, preparations, reactions, tautomerism and acidity.

**PHAR 113 General Chemistry Practical (1 Credit)**
Students will develop the ability to identify laboratory equipment. The course will enable students to develop practical skills for the preparation of stock solutions, weighing techniques and calibration of a burette, perform basic volumetric analysis, acid/base, double indicator and back titrations, redox titrations, permanganate and iodine/thiosulphate titration and complexometric titrations.

**PHAR 112 Organic Pharmaceutical Chemistry I (3 Credits)**
In this course students will acquire the ability to classify organic compounds into groups, predict their chemical and physical properties, method of synthesis, the reactions they undergo and their significance to pharmacy and medicine. Functional group Chemistry including: Benzene and its aromaticity, Arenes: Organometallic compounds including Grignard reagents and the reactions, Alcohols, Alkyl halides: preparation and reactions; Aryl halides: Glycols: Ethers and epoxides, Aldehydes and ketones, their properties, preparation and reactions; Carboxylic acids; Amines; Diazonium salts;

**PHAR 114 Organic Pharmaceutical Chemistry Practical (1 Credit)**
Students will acquire practical skills for basic techniques in simple synthesis, basic and limit tests, determination of melting points and boiling points, recrystallization, solvent extraction and reduced pressure evaporation.
PHAR 211 Physical/Analytical Chemistry (3 Credits)

PHAR 213  Physical Chemistry Practical (1 Credit)
In this course the student will be trained to use basic laboratory equipment such as polarimeter, conductimeter and refractometer. By the application of physical chemistry principles the student will be enabled to identify and analyse given compounds and solutions.

PHAR 212  Organic Pharmaceutical Chemistry II (3 Credits)
Students will be exposed to the Chemistry of Biologically important macromolecules and their interactions. Review of functional group Chemistry, Dicarboxylic acids, Condensation polymerization, Keto acids and esters, Hydroxy acids, lactides, lactones, Stereochemistry, Optical isomerism; Heterocyclic compounds (Pyrrole, Furan, Thiophene, Pyridine Fused ring heterocyclics including Quinoline, isoquinoline, purines etc), properties, synthesis and their reaction Alicyclic compounds and Carbohydrates, Amino acids, peptides proteins including 1°, 2°, 3° & 4° structures and their synthesis, Nucleosides, nucleotides and Nucleic acids including RNA, DNA, their replication and protein biosynthesis.

PHAR 214  Organic Pharm. Chemistry II Practical (1 Credit)
In this course students will develop the practical ability to carry out synthesis, extraction, purification and re-crystallization to obtain pure compounds. Volumetric analysis of organic compounds and related pharmaceuticals. Determination of elements and functional groups in organic compounds.

PHAR 311  Medicinal Chemistry I (3 credits)
Introduction to Medicinal Chemistry. Physicochemical principles of drug action. Drug metabolism including bio-transformation and conjugation, mechanisms and therapeutic significance. The Pharmacodynamic and miscellaneous agents to be encountered in this course will include Analgesics (Narcotic and non-narcotics), anti-pyretics, anti-tussives; central nervous system depressants; psychotherapeutic agents; drugs acting on the cardiovascular, renal and haematopoietic systems; hormonal and related drugs e.g. steroids, peptides, phospholipid metabolites; autonomic nervous system agonists and antagonists; Neurotransmitters in the adrenergic and cholinergic systems.

PHAR 313  Medicinal Chemistry I Practical (1 Credit)
The practical skills acquired in course PHAR 214 will be used for standardization of selected solutions; iodimetric assay of penicillin by the BP method; Assay of selected drugs by BP methods; synthesis, purification and analysis of selected drugs and pharmaceutical products.

PHAR 312  Drug/Spectroscopic analysis (4 Credits)
Introduction to spectroscopy will cover spectroscopic methods of analysis and structural determination of drugs. Topics will include flame photometry and atomic absorption spectroscopy; instrumentation, underlying processes and applications in the pharmaceutical industry; interpretation of spectra and identification of compounds using spectroscopic techniques. Techniques involving UV and Visible spectroscopy (including fluorimetry), Infra-Red Spectroscopy, Nuclear Magnetic Resonance, Proton & Carbon 13 NMR, Mass Spectroscopy and X-ray crystallography will be considered. Correlation of these
methods and techniques for structure elucidation will also be considered. Preparation of monographs. Chromatography in Pharmaceutical analysis (GLC and HPLC). Review of titrimetric methods for quality assurance of drugs. Non-aqueous titrations, acid/base titrations, oxidation-reduction titration etc.

**PHAR 314 Drug Analysis Practical (1 Credit)**
This course will enable students to assay, identify and estimate the purity of drugs and other pharmaceutical products using basic equipment like UV and IR spectrophotometers. Students will learn techniques involving titrimetric, gravimetric, potentiometric, chromatographic and spectroscopic methods of analysis of drugs.

**PHAR 411 Medicinal Chemistry II (3 Credits)**
Students will be required to demonstrate ability to relate chemistry of medicinal compounds to their physicochemical properties, structural features, stability, assay and mode of action. They will also be able to relate stereochemistry to biological activity. The course will provide approaches to synthesis of medicinal compounds and the chemistry of chemotherapeutic agents such as: antimalarials, trypanocides, antischistosomal agents, amoebicides, trichomonocides, leishmanicides, filaricides and anthelmintics. Also included are drugs acting against infectious diseases; commonly used antibiotics and related agents of clinical importance, antineoplastic and anti-viral agents.

**PHAR 410 Pharmaceutical Chemistry Project (6 Credits)**
In the final year of the B.Pharm degree programme students will be assigned one research project to be undertaken in both Semesters 7 and 8. The project will be designed to enable the students to demonstrate the scientific skills they have acquired in the preceding three years. A problem of relevance in pharmaceutical science or pharmacy practice which will require literature search, choice of appropriate methodology, experimental design and execution, data generation or collection, compilation, analysis and discussion of results using acceptable statistical methods will be assigned to students. Upon completion of the project, which will be carried out under the mentorship of an academic supervisor, the student will present a seminar and a final bound report for assessment.

**PHAR 412 Drug Design, Development and Quality Assurance (4 Credits)**
In this course, students will appreciate principles of drug development including drug design concepts; the significance of drug quality in pharmacotherapy. – (QSAR); appropriate formulation; case study - illustration of design and development of specific drugs in selected class; theory and practice of quality assessment of drugs and pharmaceutical products - Good Manufacturing Practices, Quality Assurance, Quality Control.; Laboratory methods -techniques;

**7.2 Department of Pharmaceutics and Microbiology**

**PHAR 121 Mathematics for Pharmacy I (1 Credit)**
This course will establish the relevance of mathematics in pharmacy. Application of mathematical concepts in pharmaceutical systems and phenomena will be made clear. The topic of differentiation will be treated and will cover- limits, definition, product, quotient, function of a function, implicit differentiation, stationary points, turning points, and points of inflection and as well as function sketching. The treatment of Logarithmic Plots will cover Exponential and logarithmic functions, semi-logarithmic and logarithmic plots. Integration Methods will discuss parts, algebraic substitution and partial fractions. First-order Rate Processes will cover the definition, different physical processes obeying the Law (e.g. radioactive decay, chemical reaction, microbial growth, and elementary pharmacokinetics), half-life and semi-logarithmic plots.
PHAR 122  **Mathematics for Pharmacy II (Prerequisite PHAR 121) (1 Credit)**
This course is designed to enable students appreciate the importance of mathematics and its application in the pharmacy. Discussions will cover zero, second and third-order reactions focusing on rate equations, their solutions and half-life. Discussions will include triangular charts such as graphical representation of three component systems; partial differentiation touching on functions of several variables, first and second partial derivatives, geometric interpretation. Partial differential equations, the unsteady state diffusion equations. Fick’s Law of Diffusion. Other topics will include integration with a focus on definite integrals, area under the curve, infinite limits, approximate integration methods (trapezoidal rule). Differential equations focusing on solution of ordinary differential equations by separation of variables and integrating factor methods will also be treated.

PHAR 123  **Introduction to Principles of Pharmacy (3 Credits)**
This course will explain the fundamental principles of pharmacy as the procurement, storage and delivery of medicines in accordance with the ethics and laws of pharmacy practice. The course will provide students with the knowledge of the theory and practice of pharmacy by the following processes: Formulation, compounding and extemporaneous preparation of various dosage forms of medicines. Dispensing and counselling in a comprehensive pharmaceutical care delivery system.

PHAR 124  **Pharmaceutical Microbiology I (3 Credits)**
This course will expose students to bacteriology, virology, mycology and parasitology. Bacteriology will cover the historical; classification and nomenclature; structure and function; culture media; growth requirements, dynamics of growth; mode of reproduction; simple identification procedures; Gram staining and important biochemical diagnostic methods. Virology will cover structure of a viruses, bacteriophage cultivation techniques; assays; mode of replication of animal virus and bacteriophage; virulent or avirulent form; lysogeny; transduction and recombination interference. Mycology will cover the basic principles; yeasts and moulds; morphological characteristics, growth requirements, multiplication and reproduction; isolation, cultivation and microscopic examination; and economic importance. Parasitology will focus on morphology, life cycles and classifications of human and animal parasites; parasite infections of humans e.g. nematodes, trematodes, cestodes and protozoa.

PHAR 125  **Principles of Pharmacy Practical (1 Credit)**
Introduction to dispensing prescriptions – labelling, sources of information, pharmaceutical compounding, posology and dosage calculations, pharmaceutical calculations, measurements and weighing. Pharmaceutical dosage forms; Routes of administration, Basic incompatibilities in dispensing; colouring and flavouring agents, pharmaceutical solvents, diluents, antioxidants and buffers, common waxes, oils and fats. Precision and accuracy in dispensing. Various calculations used in dispensing. Preparation of percentage solutions, aromatic solutions, mixtures, emulsions, suspensions, syrups, lotions creams and suppositories.

PHAR 126  **Pharmaceutical Microbiology I Practical (1 Credit)**
This course seeks to provide students with practical skills in microbiology through the following sources of micro-organisms: soil, atmosphere, water bodies, humans and pharmaceutical containers, etc. Microscopic examination of prepared slides – fungi, bacteria etc. Staining techniques: simple, differential (Gram) stain, spore and motility. Culture media; Liquid/Solid; aerobic/anaerobic media; routine and diagnostic media (include Mcintosh Fields’ Jar, Anaerobic Jar). Isolation of micro-organisms: Serial dilution, pour plate, streaking, spreading etc. Bacterial and Fungal enumeration: Total count turbidometrics microscopic count, viable count, pour plate, roll tube, over dried (Miles and Misra) agar plate techniques. Statistical evaluation of counting techniques.

PHAR 221  **Pharmaceutical Microbiology II (2 Credits)**
This course will make students aware of the significance and implications of microbial contamination of pharmaceutical products and the need for disinfection and sterilization. Methods of Sterilization will
cover dry heat; moist heat (autoclave-various types); Heating with a bactericide (HWAB); Filtration (various types); High efficiency particulate air filters (HEPA filters); Testing of filters. Gaseous sterilization, ethylene oxide sterilization. Radiation sterilization. Monitoring of sterilization efficiency by physical, chemical and bacteriological methods. The course will also cover Principles of Disinfection and discuss types of disinfectants; dynamics of disinfection; factors influencing efficiency of disinfection process; evaluation of disinfectant activity. The topic of Preservation will be covered and will cover the basic principles; types; reservation of sterile pharmaceutical products.

PHAR 222 Physical Pharmacy (3 Credits)
This course provides for an understanding of the physical concepts applicable to pharmacy. The course deals with the following characteristics of matter pertaining to pharmacy:
States of Matter – liquid, solid, gaseous states, polymorphism, intermolecular forces such as phase equilibria and phase rule; surface and interfacial phenomena; liquid state (liquefaction of gases, aerosols, vapour pressure of liquid, boiling point); solid and crystalline state: crystalline solids, X-ray diffraction, polymorphism, crystallization, efflorescence. Solid and Liquid Equilibrium. Surface and Interfacial phenomenon -viscosity and rheology. Disperse Systems – Suspensions and emulsions will be covered in detail including stabilization processes. Reaction Kinetics and drug stability.

PHAR 223 Pharmaceutical Microbiology II Practical (1 Credit)
In this course, students will become familiar with the types of equipment used for sterilization and disinfection in formulation and manufacture of sterile pharmaceutical products. Students will acquire hands-on practical experience with the formulation and preparation of the following sterile pharmaceutical products: parenteral products, ophthalmic solutions, occulenta, (in single and multiple dose forms); surgical dressings. Students will learn aseptic techniques applicable to the preparation of thermolabile sterile products. Students will learn biochemical characteristics of micro-organisms; perform antibiotic sensitivity tests and sterility testing protocols.

PHAR 224 Physical Pharmacy Practical (1 Credit)
This course will provide students with an understanding of the practical aspects of the relevance of the following phenomena in pharmacy: Thermodynamics; solutions and phase Equilibria. Ionic solutions and Electrolytic Equilibria; Reaction kinetics; Disperse Systems and Rheology. Other areas which will be covered include degradation pathways of drug formulations and drug stability studies.

PHAR 321 Pharmaceutical Technology (3 Credits)
In this course students will learn the theoretical basis of processes employed in the pharmaceutical industry for the manufacture and quality assurance of pharmaceutical products. The course will cover good manufacturing practices in general, and specifically, the following processes: Bioavailability and Bioequivalence Testing; Separation; Packaging; Stability of products. Quality Assurance and Control. The following product types will also be considered: Solutions, Emulsions, suspensions, and Extractives; Powders; Oral solid dosage forms; coated dosage forms; sustained-release drug delivery systems.

PHAR 322 Principles of Immunology (3 Credits)
This course will provide an awareness of the immunological basis of disease and an understanding of immunotherapy as an aspect of pharmaceutical science. The course will involve a consideration of: the immune system-characteristics of antigens and antibodies, Humoral immunity, cellular immunity; Tumor immunology; Immunogenetics; Immunological deficiencies; Types of immunity and hypersensitivity reactions. Active Immunization: Vaccines, Toxoids. Passive Immunization: Human immune sera, Animal immune sera

PHAR 323 Pharmaceutical Technology Practical (1 Credit)
This course will enable students acquire practical skills necessary for small and medium scale manufacture of pharmaceutical products in the laboratory. In addition, students will be exposed to real
industrial conditions of pharmaceutical product manufacture through supervised industrial attachments. Students will become familiar with various industrial equipment and obtain operational experience in their use. Students will be given practical manufacturing exercises to enable them develop competencies in pharmaceutical technology applicable to: Tableting, Capsuling, Rheology, Solubilisation, Particle size analysis, drug stability assessment etc.

**PHAR 324  Principles of Immunology Practical (1 Credit)**
In this course students will learn practical aspects of the production of immunopharmaceuticals. These will include: Biologic Immunogens for Active Immunity-vaccines and Toxoids; Biologic Immunogens for Passive Immunity-Human Immune Sera (Homologous Sera) and Animal Immune Sera (Heterologous Sera). Students will also learn the clinical conditions for use and the criteria for storage of these products.

**PHAR 420  Pharmaceutics Project (6 Credits)**
This final year project will be designed to enable the students to demonstrate the scientific skills they have acquired in the preceding years. A problem of relevance in pharmaceutical science or pharmacy practice which will require literature search, choice of appropriate methodology, experimental design and execution, data generation or collection, compilation, analysis and discussion of results using acceptable statistical methods will be assigned to students. Upon completion of the project, which will be carried out under the mentorship of an academic supervisor, the student will present a seminar and a final bound report for assessment.

**PHAR 421  Applied Immunology (3 Credits)**
This course will highlight aspects of the applications of immunology in pharmacotherapy. Students will apply the basic principles of immunology studied in the previous years. Students will appreciate the immunological basis of the use of immunodiagnostic drugs, immunosuppressant drugs, immunostimulant drugs and immunoassay of drugs. The phenomenon of drug induced allergy will also be part of this course.

**PHAR 423  Principles of Pharmaceutics (Prerequisite PHAR 123) (2 Credits)**
In this course, the student will appreciate the principles of drug design as outlined in pre-formulation and formulation studies. The course will highlight various techniques in drug formulation studies including micro and nano-formulations, biotechnology, as well as methods of testing the quality of the formulations. The course will cover all dosage forms, and also consider medicated topical applications and aerosols.

### 7.3 Department of Pharmacognosy and Herbal Medicine

**PHAR 131  Pharmacognosy (2 Credits)**
In this course students will study the following: Plant morphology, plant cell types and structure, organized cell inclusions, introductory taxonomy, isolation techniques for tissues and cells. In addition students will study the history and scope of pharmacognosy and classification of crude drugs. Students will appreciate the pharmacognostical features of powders of natural origin, fibres and surgical dressings, plant physiology, basic plant physiology, basic plant metabolism and secondary plant metabolites.

**PHAR 133  Pharmacognosy Practical (1 Credit)**
This course will introduce students to the structural and functional features of the light microscope and its accessories. Students will use the microscope to examine unicellular products of pharmaceutical interest. Cell contents to be examined will include: calcium oxalate, silica carbonate crystals, starch and aleurone grains. Microscopic techniques will be applied using chemo-microscopic reagents to identify cell wall constituents such as lignin, lipids, carbohydrates etc. Students will acquire practical skills in the
techniques of microscopical analysis, measurements in microscopy and in the preparation of permanent microscope slide mounts. Students will be enabled to identify the descriptive features of plant parts.

PHAR 232  Phytochemistry (2 Credits)
This course will introduce students to medicinal plants and their secondary metabolites as potential therapeutic agents. Students will be enabled to identify active chemical constituents of medicinal plants in terms of their structure and biological characteristics. The pharmaceutical significance of the active constituents will be emphasized. The occurrence, extraction, detection and physico-chemical characterization of the following classes of plant constituents will be considered: complex carbohydrates; glycosides; saponins; alkaloids; lipids; volatile oils and related substances; phenolic compounds; benzopyrans and enzymes.

PHAR 234  Phytochemistry Practical (1 Credit)
In this course students will apply standard phytochemical tests to establish the chemical identity and evaluate the pharmaceutical potential of medicinal plant products. Students will be enabled to perform standardisation and quality assessment of natural products of plant origin. Students will learn techniques of extraction, separation and isolation of plant constituents.

PHAR 331  Natural Drug Production and Evaluation (2 Credits)
This course will ensure appreciation and understanding of factors which influence cultivation, collection, preparation and storage of medicinal plants and also the scientific and technological processes of analysis of natural drugs of plant origin. The course will consider the following: Crude drug production: Endogenous and exogenous factors affecting cultivation and preparation of plant drugs; collection, processing and storage of natural drugs. Adulteration: Forms of adulteration, choice of adulterants and their detection in natural drugs. Evaluation of natural drugs: Methods of evaluation, Separation techniques: and their application in isolation of compounds in plant extracts.

PHAR 333  Natural Drug Production and Evaluation Practical (1 Credit)
In this course students will acquire practical skills for the evaluation, standardization and quality assessment of natural drugs of plant origin. The course will entail the application of microscopy, quantitative microscopy, fluorescence phenomena and chromatography. Students will develop ability to assay natural drugs by the use of standard assay procedures.

PHAR 430  Pharmacognosy/Herbal Medicine Project (6 Credits)
(As for PHAR 410, PHAR 420)

PHAR 431  Plant Poisons and Pesticides (3 Credits)
In this course students will be made aware that plant products are not only potentially therapeutic in humans but can also be toxic to both humans and animals including pests. The course will inform students to recognize biological sources, physico-chemical characteristics and toxicity profile of plant products that are poisonous (including poisonous mushrooms), allergenic, carcinogenic, hallucinogenic, teratogenic and pesticidal. Students will be enabled to appreciate the need for identification and care in handling such plant products to ensure personal safety and also to propose antidotal measures in cases of accidental contamination or ingestion.

PHAR 432  Advances in Phytotherapy and Herbal Medicine (3 Credits)
Students will be made aware of recent developments in phytotherapy and herbal medicine. Selected medicinal plants and herbal preparations will be used for illustrations. Students will appreciate advantages and disadvantages of both orthodox and traditional medicine. Homeopathic, chiropractic medicine and acupuncture will be considered. The course will highlight the use of traditional medicine by WHO in Developing Countries. Current trends in plant medicine research and the role of research in promoting
Traditional Medicine will be emphasized. Socio-cultural implications of the use of Traditional Medicine will be considered. Provision will be made for students to interact with practitioners of traditional medicine.

7.4 Department of Pharmacology and Toxicology

PHAR 141 Human Anatomy and Physiology (2 Credits)
Appreciation of the action of drugs in human subjects requires a sound knowledge and understanding of the structure and functions of the body at the cellular, tissue, organ and system levels. In this course students will learn the micro-anatomical features and physiological functions of cells, tissues and organs in the following systems of the body: musculo-skeletal system, blood and cardiovascular systems, renal system, endocrine system, reproductive system, digestive system, respiratory system and the nervous system. Details of the structure and function of these systems will be presented and treated in a manner that would ensure that students can recognize the normal state and be able to detect deviations that constitute disease.

PHAR 142 Basic Biochemistry (3 Credits)
Biochemistry and biochemical concepts form an important basis for an understanding of the mechanisms of drug action. This course will therefore provide the essential biochemistry base for the development of the principles of pharmacology and toxicology. Students will study and gain understanding of the structure and molecular properties of the following biomolecules: amino acids, proteins, enzymes, simple and complex carbohydrates, fatty acids, lipids, nucleotides, RNA and DNA. The course will further provide a basis for understanding: The principles of metabolic pathways. Students will develop an appreciation of biological information transfer and molecular biology.

PHAR 143 Human Anatomy and Physiology Practical (1 Credit)
Students will be exposed to experimental methodology to enable them acquire skills for defining the structure (histological features) of various tissues and organs and appreciating the functional characteristics of skeletal and cardiac muscle. Further skills will be developed in observing the various organ functions. E.g. Cardiovascular system: Frog heart model (in situ contractions) – effect of acetylcholine and adrenaline; blood pressure measurements before and after exercise; effect of change of posture on blood pressure. Respiratory system: Spirometry-measurement of lung capacities; the Forced Expiratory Volume (FEV$_r$).

PHAR 144 Basic Biochemistry Practical (1 Credit)
In this course students will acquire practical skills in biochemistry and appreciate biochemical concepts. The course will entail the following laboratory exercises: isolation of glucose from fruits and urine; determination of lactose content of cow’s milk; tests for vitamin A and Thiamine; paper chromatography of amino acids; characterization of pigments in leaves; passive transport; simple demonstration of the activity of dehydrogenases; Urine analysis – determination of protein in urine, glucose in urine, abnormal constituents of urine; glucose tolerance test; cholinesterase stability test.

PHAR 241 General Principles of Pharmacology (3 Credits)
In this course students will be introduced to fundamental concepts pertaining to drug action. Historical development of pharmacology will be addressed. Students will gain appreciation and understanding of the following: Basic pharmacological and toxicological terminology – definitions; Pharmacokinetics – administration, absorption, distribution, biotransformation and elimination of drugs; pharmacodynamics – drug receptor theory, mechanisms of drug action, relationship between drug concentration and effect; measurement in pharmacology (quantitative aspects of pharmacology); Factors influencing response to drugs; Principles of toxicology; Pharmacogenetics.
PHAR 242  Autonomic Pharmacology (3 Credits)
Students will acquire understanding of the structure and function of the autonomic nervous system. This will form the basis of appreciation of the pharmacological significance and therapeutic application of the following: cholinoceptor–activating and cholinesterase- inhibiting drugs; cholinoceptor-blocking drugs; adrenoceptor-activating and other sympathomimetic drugs; adrenoceptor antagonist drugs and centrally acting sympathoplegic agents.

PHAR 243  General Principles of Pharmacology Practical (1 Credit)
In this course students will acquire experience in basic principles of experimental pharmacology. Students will become familiar with laboratory equipment, materials, methodology and techniques in experimental pharmacology. Simple experiments will be designed to illustrate routes of administration of drugs, dose-response relationships, agonists and their sites of action, the phenomenon of antagonism (types, qualitative and quantitative aspects), biological assay (types and presentation-graphical or mathematical).

PHAR 244  Autonomic Pharmacology Practical  (1 Credit)
Students will acquire the ability to perform simple experiments to illustrate concepts of autonomic pharmacology. Experiments will demonstrate pharmacology of cholinomimetic and sympathemimetic agents, antagonists acting on cholinoreceptors and adrenoceptors, enzyme inhibitors and their effects on drugs acting within the autonomic nervous system. Experiments will involve the use of intestinal smooth muscle of the rabbit and guinea-pig (isolated tissues) and the respiratory system of the guinea-pig (bronchodilators and bronchoconstrictors in the whole animal).

PHAR 341  Endocrine and Immunopharmacology (3 Credits)
This course will ensure an understanding of the pharmacology of the following: Autacoids – histamine, 5-hydroxytryptamine (serotonin), vasoactive peptides, the eicosanoids; Nonsteroidal anti-inflammatory drugs; Disease-modifying antirheumatic drugs; Drugs used in gout; Drugs used in allergy and antagonists of autacoids. Immunomodulators: immunostimulants and immunosuppressive agents. Endocrine drugs; hypothalamic and pituitary hormones, thyroid and antithyroid drugs, adrenocorticosteriods and adrenocortical antagonists, pancreatic hormones and antidiabetic drugs, agents that affect bone mineral homeostasis.

PHAR 342  Systems Pharmacology I (3 Credits)
Students will acquire understanding of drugs acting on the following systems: Cardiovascular and renal system - antihypertensive agents, vasodilators and antiangina agents, drugs used in heart failure, agents used in cardiac arrhythmias, diuretic agents. Gastrointestinal system, Respiratory System – drugs used in the treatment and management of asthma, mucolytics, antitussives, respiratory stimulants. In the study of all these drugs students will be expected to know the mechanism of pharmacological action, undesired side effects, clinical indications and clinically significant interactions with other drugs.

PHAR 343  Experimental Pharmacology I Practical (In vitro) (1 Credit)
In this course students will gain hands-on experience with the following isolated tissues and organs: Intestinal smooth muscle (Rabbit duodenum), Guinea-pig tracheal chain preparation, Isolated Phrenic-nerve-hemidiaphragm preparation of the rat, Rat isolated uterus preparation and the frog rectus abdominis muscle preparation to perform a bioassay (STTS assay) of acetylcholine. Students will be expected to acquire practical skills in isolating tissues and organs and preparing them in appropriate experimental conditions for various types of study. Emphasis will be placed on the choice of experimental tissue or organ and the maintenance of suitable ambient conditions for the experiment.
**PHAR 344  Principles of Toxicology (2 Credits)**
This course will seek to provide knowledge of fundamental concepts of toxicology to students. Aspects of toxicology to be treated will include: introduction to Toxicology: occupational and environmental; heavy metal intoxication and chelators; antidotes in poisoning; Tissue and organ manifestations of chemical poisoning; characteristics of acute and chronic poisoning. Management of toxic situations will also be highlighted.

**PHAR 346  Experimental Pharmacology II Practical (in vivo) (1 Credit)**
This course will provide the student with skills in pharmacological experimentation in whole or intact subjects as opposed to isolated tissues and organs. The student will acquire techniques in preparing the subject for the study. The course will include the following: The human eye, the anaesthetized cat, The conscious guinea-pig, sleeping time in rats and neuro-behavioural experiments, Sulphonamide metabolism in man - determination of urinary output of a sulphonamide after oral ingestion in man, clinical implications.

**PHAR 440  Pharmacology Project (6 Credits)**
(As for PHAR 410, PHAR 420)

**PHAR 441  Systems Pharmacology II (3 Credits)**
This course will consider drugs that affect central nervous system (CNS) Functions and Disorders. Students will be expected to acquire understanding of the classification, general pharmacological properties, including pharmacokinetics, pharmacodynamics, clinical uses and contraindications and undesirable side effects of CNS drugs. The course will provide a broad pharmacological knowledge of the following: Chemical transmission and drug action in the central nervous system; sedative-hypnotic drugs; the alcohols; anti-eizeure drugs; general anaesthetic agents; local anaesthetics; skeletal muscle relaxants; pharmacologic management of parkinsonism and other movement disorders; antipsychotic agents; antidepressants; opioid analgesics and antagonists and drug and substance abuse.

**PHAR 442  Chemotherapy and Anti-infective Agents (3 Credits)**
In this course students will be expected to develop knowledge and understanding of the classification, general pharmacological properties including pharmacokinetics, pharmacodynamics, clinical uses, contraindications and undesirable side effects of the drugs. The course will deal with the following: basic principles of chemotherapy; cancer chemotherapy; antibacterial agents; antiviral drugs; antifungal drugs; antiprotozoal drugs; anthelminthic drugs; drug resistance.

7.5  Department of Pharmacy Practice and Clinical Pharmacy

**PHAR 151  Computer Literacy I (1 Credit)**
This course provides students with fundamental knowledge by way of introduction to informatics. This will include the following: Basic parts of a computer system - hardware and software of computer system; how the computer system works; computer networks. Students will also be introduced to basic computer applications – word processing, computer graphics, calculations and simulations e.g. Spreadsheet, statistical software and data representation; information management, search algorithms and databases; Global information infrastructure – structure and organization of the world wide web (www), www browsers, information search in www, search engines educational resources in www, pharmaceutical resources in www, molecular and bioinformatics.

**PHAR 152  Computer Literacy II  (Prerequisite: PHAR 151) (1 Credit)**
The course will provide students with the requisite knowledge that would enable them develop further computer literacy skills. The course will prepare students to develop competence to describe the structure and functions of an operating system and apply software in the practice of pharmacy and healthcare
delivery. Application software vs. system software (operating system) with suitable examples will be discussed. The learning opportunities in this course will include robotics and automation in pharmacy; integrated healthcare information systems; legal and ethical aspects of information technology; commercial applications of information technology and the use of computer technology in drug information and pharmaceutical error prevention.

**PHAR 153 Orientation to Pharmacy (2 Credits)**
In this course students will be introduced to pharmacy as a discipline in Science, as an industry, as a profession in healthcare delivery and as a social service to the community. Students will be expected to understand and appreciate the scope, evolution of pharmacy globally and in Ghana, the ethics of the profession, the branches of Pharmacy: Hospital Pharmacy, Community Pharmacy, Industrial Pharmacy, Academic and Research Pharmacy and Regulatory Pharmacy. Students will be made aware of career opportunities and responsibilities in the job market and the requirements for training and registration for practice.

**PHAR 154 Psychology and Behavioural Science (2 Credits)**
In this course students will learn the relevance of psychology in pharmacy practice. The role of the pharmacist in getting patients to accept pharmaceutical care will be emphasized. The course will entail: definition, brief history and scope of psychology, illness behaviour, understanding the patient, effective counselling to ensure therapeutic confidence and patient compliance. Students will be enabled to appreciate the significance of good inter-personal relationships in healthcare delivery. Aspects of behavioural science and industrial and social psychology will be considered.

**UGRC 110 Academic Writing I (3 Credits)**
The main objective of Academic Writing I is to equip students with the language skills that will enable them to read and write effectively. Students will be taken initially through fundamental issues in grammar and composition in order to consolidate their language skills in these areas. Subsequently, reading and writing skills relevant to university work will be introduced. These will include the structure of the essay, unity, completeness and coherence in essay writing; summarizing as a skill basic to exposition, writing from sources, referencing skills and avoiding plagiarism. The course will be taught in small groups and class activities are characterised by group work, oral presentations and extensive practical assignments.

**UGRC 150 Critical Thinking and Practical Reasoning (3 Credits)**
An essential element in the training of social studies and humanities students is providing a corrective and diagnostic skill set that enables students to discriminate logically between: rhetorical ploys that give *motives* vs. arguments providing *good logical reasons* for believing an assertion. Students need to recognize the contrast between inductive and deductive reasoning and the different types of support yielded by each, to evaluate the quality of evidence confirming an empirical hypothesis about human conduct, to maintain individual professional and scholarly discretion in the face of peer pressure and mob mentality. Those enrolled in this course will be provided the vocabulary and techniques to employ critical thought and practice within the academic arena and beyond.

**PHAR 251 Biostatistics (2 Credits)**
This course will help students to acquire knowledge in the principles of statistics as they apply to analysis and evaluation of biomedical systems including pharmacotherapy. Evaluation of pharmaceutical interventions in public health issues, using appropriate statistical methods, will be given prominence. Course will emphasize on presentation of sample data; Measures of central tendency and dispersion; Probability distribution; Sampling procedures; Estimation – application of Student’s t Test, the Chi-Square Test, Analysis of Variance (ANOVA) and Experimental Design; Hypothesis testing; Fitting a line; Regression theory; Correlation and Contingency tables. Students will be expected to develop
competencies in the application of these statistical principles for the assessment of pharmacotherapy in the management of diseases. The significance of biostatistics in health care delivery systems will be emphasized.

PHAR 252  Chemical Pathology (2 Credits)
An awareness of the nature and extent of deviation from normal values and features of physiology, biochemistry and micro-anatomy in disease is an essential pre-requisite for effective pharmaceutical care. This course will provide the necessary knowledge in chemical pathology for determining remedial measures to be taken. Students will acquire an understanding of normal and disease – related changes in biochemical and physiological parameters occurring in tissue and body fluids, cells and tissues, organs and systems of the body. Students will be expected to know relevant terminology and pharmaceutical mechanisms underlying procedures that are employed to restore normalcy to these parameters.

PHAR 253  Entrepreneurial skills (Practical) (2 Credits)
This course will enable students to acquire skills as entrepreneurs in pharmacy practice particularly in a highly competitive technological and economic environment. Students will be expected to develop the ability to: Recognize and assess their entrepreneurial potential; Appreciate the need to be creative, effective communicators, and innovative in their profession. Students will also develop the ability to apply basic concepts and tools involved in the creation and functioning of a new and profitable technology- based venture. The course will entail: Evaluation of opportunities, assessment and acquisition of resources; development of a business plan and Assessment of the implications of prevailing business climate and economic and professional environment for establishing a new enterprise.

PHAR 254  Chemical Pathology Practical (1 Credit)
This course deals with the practical aspects of PHAS 252. Students will gain practical experience in methodology for measuring parameters in chemical pathology. Students will be expected to be familiar with equipment, reagents and histopathological techniques employed in chemical pathology. Diagnostic value and clinical significance of changes in the biochemical and physiological parameters will be discussed.

UGRC 210: Academic Writing II
Academic Writing II is a follow-up to Academic Writing I and builds upon the skills acquired in the first year. Students will be required to read and critique a variety of academic essays in their areas of study. Writing activities will derive from these reading tasks and students will be guided to develop their writing through process writing which involves: pre-drafting, drafting, re-writing and revising. In this broad context, students will revise and consolidate their grammar through proof reading and editing activities. The course will also involve training students to write from multiple sources as a preparation for doing research-based writing. Activities will be geared towards getting students to develop the skills of extracting and sorting information from multiple sources and synthesizing them into coherent arguments in an essay. Students will be required to write such a synthesis essay for assessment. Subsequently, students will be introduced to academic presentation skills.

PHAR 351 Clinical Pharmacokinetics and Bioavailability (3 Credits)
This course is designed to equip students with the appreciation of patient-based clinical pharmacotherapy. Although an overview of basic concepts of pharmacokinetics will be reviewed, their clinical applications will remain the main thrust. Hence, upon completion of the course, students should be able to explain compartmental models given their clinical correlates and describe the principle of superposition and how it applies to multiple drug dosing. Define the model-independent pharmacokinetic parameters. Students should be able to determine appropriate drug regimen of patients receiving aminoglycosides, vancomycin, theophylline, phenytoin and digoxin and construct plasma drug concentration versus times curves of
typical patients and use properties of the curve to determine patient’s pharmacokinetic parameters and calculate alpha ($\alpha$), beta ($\beta$), and intercepts A and B for a drug conforming to a two compartment model.

**PHAR 352 Social and Behavioural Pharmacy (3 Credits)**
This course will provide students with knowledge of the principles involved in pharmacy practice. Students will be expected to understand the legal and ethical principles of the practice of pharmacy. They will be expected to acquire full knowledge of the provisions of the Pharmacy Act 489, 1994, its Legislative Instrument and the Food and Drugs Law 1992, and its amendments. Students will be introduced to the code of Ethics of the Pharmaceutical Society of Ghana: Professional ethics, professional characteristics and responsibilities. Students must be conversant with; institutional patient care, ambulatory patient care, long-term patient care facilities, public health issues, behavioural determinants of the patient, patient communication, drug education and information, patient compliance, the prescription, drug interactions, clinical drug literature, and National Health Insurance Scheme.

**PHAR 353 Pharmacoepidemiology and Pharmacoeconomics (2 Credits)**
Pharmacoepidemiology is the discipline that seeks to understand the use of and the effects of medicines in large numbers of people. Pharmacoepidemiological studies quantify the risks and benefits of drug treatment in different populations. Pharmacoeconomics entails evaluation of ways and means of applying limited resources to provide the best pharmacotherapy. In other words, the study encompasses analysis of costs and outcomes associated with the use of pharmaceutical products and services. It is closely related to outcomes research which is the scientific measurement of the impact of antecedent health care. Upon completion the student will: Appreciate the role of the statistical concepts and methods in drug development, drug use, drug safety monitoring and drug safety research; compare and contrast cost-effectiveness, cost-minimization, cost-utility and cost-benefit analyses; obtain clinical and humanistic outcomes data; compare and contrast the decision-analytic and statistical methods of modelling a disease intervention; calculate an expected cost and an expected outcome using a decision tree.

**PHAR 354 Community Pharmacy Practice Practical (1 Credit)**
In this course students will be exposed to real life situations of Community Pharmacy Practice. The School will link up with selected Community pharmacies where students will be assigned short periods of professional mentorships under identified pharmacists. The School will set up a Model Community Pharmacy for teaching in an actual professional setting. Students will be expected to gain supervised experience in the Model Pharmacy practice. Students will present written reports of case studies assigned to them.

**PHAR 450 Pharmacy Practice Project (6 Credits)**
(As for PHAR 410, PHAR 420)

**PHAR 451 Pharmacotherapy and Disease Management (3 Credits)**
In this course students will learn the general application of drugs to the treatment of diseases. The course will entail identification and recognition of pathophysiology of diseases; factors influencing the choice of appropriate pharmacotherapeutic intervention; medication implications e.g. drug interactions, adverse drug events and iatrogenic effects; patient compliance issues; patient counselling issues; therapeutic outcomes; and follow-up pharmaceutical care.

**PHAR 452 Patient Treatment Assessment (4 Credits)**
In this course students will be given access to selected patients on drug treatment on ward rounds and at the OPD Pharmacy. Students will have opportunity to determine the patient’s response to therapy. This will be done in consultation with health-care providers. Subsequent to this, students will be expected to evaluate the merits and demerits of the treatment given in the context of the broad principles of pharmacotherapy.
1.0 Background
The Bachelor of Public Health programme was developed in collaboration with the Ministry of Health and Ghana Health Service. The programme was planned to run for FIVE years in the first instance. In the first five years only candidates with diploma certificates who are already working in the health service are considered and admitted to Level 200. This undergraduate programme is to offer opportunities for middle level health professionals to upgrade themselves and promote continuing professional development. The programme content is designed with the view to developing capacity to improve the implementation of public health programmes and interventions. It is intended to help develop mid-level public health practitioners who will work at the district and programme levels in the Ghana Health Service and its Allied institutions. The first batch of students was enrolled in October of the 2010/2011 academic year.

1.1 Programmes Available Under the Bachelor of Public Health
The programme options available are:
1. Public Health Nursing
2. Nutrition
3. Applied Environmental Health Sciences
4. Disease Prevention and Control
5. Health Information Systems
6. Health Promotion
7. Population Mental Health

1.2 Fieldwork
Field practice in June – August is mandatory every year for students at level 300. Students are required to participate in a field practicum of at least 8-10 weeks duration. Experiences to be gained include: community diagnoses, report writing, developing implementation strategies, and presenting reports at community meetings.

During this period, students are given the opportunity to work at a district or health department. Students will then develop papers relevant to their practicum experience, into a project.

The student will be provided with an opportunity to take a principal role in the development and conduct of a project within a community or a health department. The student will apply the principles learned in the classroom to planning, implementation, analysis and interpretation of the project. The project is to be completed within one academic year. The amount of time the student will spend at the agency or health department is expected to vary according to the needs of the project. The student will generally be expected to spend a greater time conducting background research, collecting and analysing data, writing up results and interpretation for the final report. Examples of field work projects could include programme evaluations, needs assessments, surveys, intervention implementation and analysis of existing data. Each student will conduct this field work under the direction of a faculty member.

1.3 Deployment of Bachelor of Public Health Programme
Candidates with diplomas will have their diploma coursework evaluated and admitted into Level 300 if it is found out that they have undertaken all the Level 200 courses offered in the programme and credited with those courses, otherwise they would be admitted into Level 200.
3.0 THE BACHELOR OF PUBLIC HEALTH PROGRAMME

2.1 ADMISSION REQUIREMENTS
The general University Admissions regulations and requirements shall apply in addition to the following:

2.1.1 DIPLOMA
Candidates with Diploma in health or related sciences who satisfy the requirements for admission shall enter at Level 200 (the second year of the 4-year bachelor’s degree programme). Students admitted to Level 200 may be given exemption for some courses based on previous studies.

2.1.2 Credits for Courses undertaken.
Candidates who have taken prescribed level 200 courses at the Diploma level will be credited with such courses.

The Requirements:
(i) Candidates with Diplomas awarded by University of Ghana, Institutions recognized by or affiliated to the University of Ghana and Institutions under the Ministry of Health shall require an FGPA of 3.2 or better/equivalent and shall attend a selection interview.

(ii) Diplomas awarded by institutions other than those indicated in (i) above may be considered eligible on recommendation by a special committee to be appointed by the Dean.

The committee shall assess the candidate’s transcripts and the course content of the diploma to determine the suitability of his/her previous training and make recommendations accordingly, to the Dean.

Shortlisted candidates shall be required to sit an entrance examination and attend a selection interview.

2.2 ACADEMIC SESSION/STRUCTURE
The academic year shall be two semesters. The First Semester session covers the period of August – December and the Second Semester runs from January – May. Each Semester is structured as follows:
13 weeks of Teaching
1 week of Revision
3 weeks of Examination

2.2.1 REGISTRATION
For a student to obtain credits in any course, he or she must be admitted into the School and must be properly registered for that course during the official registration period at the beginning of each semester. The student shall plan his/her courses in consultation with his/her course Advisor.

2.3 INTERNSHIP TRAINING
Students shall be affiliated to relevant institutions for their internship training during the long vacation of Level 300.

2.4 DURATION OF PROGRAMME
The duration of the Bachelor of Public Health Programme for individuals entering at various levels shall be as follows:
Level 100 entrants: Minimum of 8 semesters and maximum of 10 semesters
Level 200 entrants: Minimum of 6 semesters and maximum of 8 semesters
Level 300 entrants: Minimum of 4 semesters and maximum of 6 semesters
A Student who is unable to complete the programme within the stipulated maximum period shall forfeit all
accumulated credits and lose his/her studentship. Such a student may however re-apply for admission into the University. The minimum and maximum periods are calculated from the date of first registration.

2.5 STUDY PROGRAMME FOR THE BACHELOR’S DEGREE
The Total Study Programme for the BSc. Public Health shall comprise the following:
(i) General University Requirement
(ii) Faculty Requirement
(iii) Core Courses as determined by the school
(iv) Elective Courses as determined by the School/Department

2.5 General University Requirement
1. UGRC 220-238 - Introduction to African Studies
2. UGRC 110 - Academic Writing I
3. *UGRC 210 - Academic Writing II
4. UGRC 150 - Critical Thinking and Practical Reasoning
5. *UGRC 130 - Understanding Human Societies

These are requirements for graduation by all students irrespective of their level of entry.
*Note: UGRC 130 - Understanding Human Societies will be replaced by GSPH 106 - Health Behaviour and Society and UGRC 210 - Academic Writing II will be replaced by GSPH 214 - Writing for Public Health.

2.6 MINIMUM AND MAXIMUM WORKLOAD PER SEMESTER
2.6.1 A full-time student shall be required to carry a minimum workload of 18 credits per semester and a maximum of 21.

2.6.2 Under special circumstances, a student may, with the approval of the Dean of Faculty, be allowed to carry a workload outside these limits, provided that the minimum workload will not fall below 15 credits per semester.

3.0 EXAMINATIONS
3.0.1 Continuous Assessment
There shall be a continuous assessment of each course taken and marks obtained shall contribute 30% towards the final grade while the end of semester examination contributes 70% of the final mark. (Except for practicals or related courses which may be assessed entirely by continuous assessment).

3.0.2 Long Essay/Project Work
Long Essay/Project Work shall be submitted for assessment before the start date of lectures for the second semester. In default the candidate shall be asked to submit the Long Essay/Project Work the following semester and shall be treated as a Repeat Examination, with all its implications.

3.0.3 End of Semester Examinations
(i) Each course, with the exception of a Project, shall normally be completed in one semester.

(ii) A final (end-of-semester) examination shall normally be required as a part of every course. An examination schedule showing time and place of examination for each course shall be published each semester.

(iii) The time allotted to the examination papers shall be as follows:
1 – Credit Course - 1 hour
2 – Credit Course - 2 hours
3 or 4 - Credit Course -2 to 3 hours
3.1 ELIGIBILITY FOR EXAMINATION
(i) A student shall attend all such lectures, tutorials, seminars and practicals and undertake all other assignments as are approved by the University.
(ii) Further to (3.1(i)), a student shall be expected to attend lectures, tutorials, practicals and execute all assignments given.
(iii) Each Department shall, with the approval of the Academic Board, determine the requirements for the course they offer. A student who does not fulfil the requirement shall not be allowed to take the examination for that course.
(iv) In any case, a student who is absent for a Cumulative Period of 25% from all lectures, tutorials, practicals and other activities prescribed for any course in any semester shall be deemed to have withdrawn from the course. Such a student shall not be permitted to sit for the semester examination.

4.0 Credit Hours Required to Graduate
4.1 Requirement
A candidate shall be deemed to have:
(a) Satisfied all General University and School requirements;
(b) Obtained passes in all courses and subjects;
(c) Accumulated all the credits for all the courses at Levels 100, 200, 300 and 400 as appropriate for the candidate’s level of entry.

Entry into Level 100
i. Students can take a maximum of 142 credits hours and pass at least 132 credits hours including all core courses.

Entry into Level 200
ii. Students can take a maximum of 118 credits hours and pass at least 102 credit hours including all core courses.

4.2 Eligibility
(a) A Bachelor’s Degree appropriately designated shall be awarded to a candidate who has been properly admitted to the University, has followed the approved courses of study over the prescribed period and has satisfied the conditions.
(b) University requirements:
   i. Evidence of regular enrolment
   ii. Discharge of all obligations owed to the University
   iii. A pass in all University required courses
   i. Satisfactory performance in the appropriate University Examination.
(c) School/Department Requirement(s)
   Satisfactory Discharge of such requirement(s) as may be prescribed for the degree.

4.3 CLASSIFICATION OF BACHELOR’S DEGREE
4.3.1 All end-of-semester examination results from Level 200 shall be taken into account in the computation of the Final Grade Point Averages (FGPA) for the classification of the bachelor’s degree.
4.3.2 The GPAs form Levels 200 to 400 shall be of equal weighting.
4.3.3 In the determination of the FGPA, a weighted average of all repeat courses shall be used, as for instance, a 3-credit course with a ‘D’ at first attempt and an ‘A’ at the second attempt shall attract a total of 6 credits in the computation of the Grade Point Average of that particular course.
SUMMARY OF COURSES FOR THE B. PUBLIC HEALTH PROGRAMME.
The study programme for the B. Public Health will comprise the following

a. General University requirements  
b. Core Courses  
c. Prescribed Electives

**General University Requirements**
UGRC 110 Academic Writing I  
UGRC 150 Critical Thinking and Practical Reasoning  
UGRC 220-238 Introduction to African Studies

*UGRC 130 Understanding Human Societies will be replaced by GSPH 106 Health Behaviour and Society and UGRC 210 Academic Writing II will be replaced by GSPH 214 Writing for Public Health.*

**COURSES FOR LEVEL 100 AND 200**
All Courses at levels 100 and 200 are Core (compulsory)

**Level 100**  
**Semester 1**  
<table>
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<td>Anatomy &amp; Physiology</td>
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<tr>
<td>GSPH 103</td>
<td>Basic Science</td>
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<td>GSPH 105</td>
<td>Basic Concepts in Food and Nutrition</td>
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<td>GSPH 109</td>
<td>Basic Concepts in Medical Sociology I</td>
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<td>Academic Writing</td>
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<td>GSPH 106</td>
<td>Health Behaviour and Society</td>
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<td>GSPH 112</td>
<td>Introduction to Psychology</td>
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<td>Human Growth and Development</td>
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<td>Community Entry and Organisation</td>
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<td>Medical Anthropology: Cultural Foundation for Health and Illness</td>
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<td>Introduction to Biostatistics</td>
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<td>Introduction to Microbiology</td>
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<td>Introduction to Pharmacology</td>
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<td>GSPH 213</td>
<td>Introduction to Public Health Ethics</td>
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<td>GSPH 215</td>
<td>Basic Principles of Environmental Health</td>
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<td>Population, Health and Development</td>
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<td>Introduction to Research Methods</td>
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### COURSES AT LEVEL 300 AND 400

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<td>GSPH 309</td>
<td>Primary Health Care System</td>
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<td>GSPH 311</td>
<td>Environmental Health and Sanitation</td>
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<td>GSPH 313</td>
<td>Monitoring and Evaluation of Health Programmes</td>
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<td>Child Survival Programme: Expanded Programme of Immunization</td>
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<td>GSPH 303</td>
<td>Reproductive Health: Maternal Health Care</td>
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<td>GSPH 319</td>
<td>Neglected Tropical Diseases</td>
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<td>Introduction to Health Policy</td>
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<td>GSPH 321</td>
<td>Zoonotic Infections</td>
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<td>Environmental Quality and Sanitary Inspection</td>
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<td>Municipal Sanitary Services and Amenities</td>
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<td>Hygiene of Food Processing and Handling</td>
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<td>Database System Management I</td>
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<td>Contemporary Issues in Health Promotion</td>
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<td>Research Methods in Social and Behavioural Sciences</td>
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### Level 300

**Semester 2**

#### CORE COURSES FOR LEVEL 300 (All Options)

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<td>Management and Leadership of Health Services</td>
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<td>GSPH 314</td>
<td>Health Management Information Systems</td>
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<td>Child Survival: Management of the Sick Child</td>
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<td>Family Planning Methods and Practice</td>
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<td>School Health Services I</td>
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<td>GSPH 318</td>
<td>Introduction to Occupational Health and Safety</td>
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<td>GSPH 326</td>
<td>Global Climate Change and Health Effects</td>
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<td>Control of Emerging and Re-emerging Diseases</td>
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<td>Integrated Disease Surveillance Systems</td>
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<td>Geographic Information Systems I</td>
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<td>GSPH 336</td>
<td>Water Supply and Treatment</td>
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<td>Solid Waste Management</td>
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<td>System Analysis and Design</td>
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<td>Data Analysis and Presentation (HMIS) I</td>
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<td>Life style and Nutrition</td>
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<td>GSPH 358</td>
<td>Behaviour Change Communication</td>
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<td>GSPH 362</td>
<td>Mass Communication in Health Education and Public Health</td>
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### Level 400

**Semester 1**

#### CORE COURSES FOR LEVEL 400 (All Options)

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<td>GSPH 410</td>
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<td>GSPH 413</td>
<td>Scientific Communication including Report Writing</td>
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### ELECTIVES (Level 400)

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<td>Reproductive Health IV – Comprehensive Care for HIV/AIDS</td>
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<td>Introduction to Gender and Health Care</td>
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<td>GSPH 407</td>
<td>School Health Services II</td>
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<td>GSPH 409</td>
<td>Reproductive Health and Culture</td>
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<td>Health problems of infants and children</td>
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<td>Database Management II</td>
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<td>Public Health Surveillance of Chronic Diseases</td>
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<td>Emergency/Preparedness and Outbreak Investigation</td>
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<td>Domestic and Industrial Waste Water Disposal</td>
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<td>Health Aspects of Housing</td>
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<td>Gender and Environmental Health</td>
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<td>Public Health Legislation, Regulation and Enforcement</td>
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<td>Human Excreta and Sewage Disposal</td>
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<td>Introduction to Field Epidemiology</td>
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<td>Clinical Data Classification and Coding I</td>
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<td>Electronic Health and Data Systems</td>
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<td>Data Base Systems and Management II</td>
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<td>Communication for Nutrition and Healthy Lifestyle</td>
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<td>Nutrition Transition in Ghana</td>
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<td>Intervention Strategies for Health Promotion</td>
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<td>GSPH 461</td>
<td>Principles and Practice of Community Organisation</td>
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<td>Psychological Influence on Health</td>
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<td>School Based Nutrition Education</td>
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### Level 400 Semester 2

**CORE COURSES FOR LEVEL 400 (All Options)**

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**Core**

8 (-4)

**Electives**

10-13

**Total**

18-21
ELECTIVES (Level 400)

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<td>Health Care for Aged and Elderly</td>
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<td>Mental and Social Health Care</td>
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<td>Monitoring and Evaluation of Health Programmes II</td>
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<td>Health Promotion and Disease Prevention</td>
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<td>International Health Regulations</td>
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<td>Global Health Security</td>
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<td>Medical Records and Management</td>
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<td>Public Health Programme Planning and Evaluation</td>
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<td>Clinical Data Classification and Coding II</td>
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<td>Nutrition Rehabilitation Programmes</td>
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<td>GSPH 442</td>
<td>Food Laws and Regulations</td>
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<td>Nutrition Seminar</td>
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<td>Change Interventions for Chronic Disease</td>
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<td>Rights for the Health of Women and Children</td>
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<td>Reproductive Health in Developing Countries</td>
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<tr>
<td>GSPH 454</td>
<td>Mental Health as a Public Health Issue</td>
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COURSE DESCRIPTIONS

LEVEL 100 COURSES

GSPH 101 Anatomy & Physiology

Definition and the scope of anatomy; organization of the body systems, the cell, embryology, body cavity and its contents; digestive, respiratory and circulatory system the nervous system; human metabolism other physiological processes.
The various organs of the body, their functions in health and illness; The various body systems such as the blood system, the lymphatic system, the nervous system, the cardiovascular system etc. Normal values of the body functions and their relationship to health and illness.

GSPH 103 Basic Science

Mechanics (Laws of motion, levers and pulleys, work energy and power), Optics (law of reflection, real and virtual images, reflection and refraction, dispersion of light, lenses and lens aberrations, optical instruments eg human eye, magnifying glasses, microscopes and telescopes), electricity and radioactivity.
The students will be introduced to measurements, conversion factors, atoms and elements, electronic configuration, the periodic table. Discuss chemical bonding, ionic and covalent bonds, bond polarity. Electrolytes and non-electrolytes, acids and bases, ionization of water, pH scale, buffers. Solutions, water as solvent, nature of solute-solvent interactions, concentration of solutions, structure and oxidation of alcohols, aldehydes and ketones. amino acids, protein structure denaturation of proteins by temperature, enzymes and their effects on reactions in the body, nucleic acids, DNA and RNA, base pairing.
Basic concepts in genetics, Sickle cell disease, thalassemias and related genetic diseases, genetic screening, principles of parasitism, parasitic groups and their relation to disease, insects of medical importance, principles of pest control.
GSPH 105  Basic Concepts in Food and Nutrition
Agriculture, food storage, food systems and food security; food preservation, food development and sensory
characteristics; nutrients and food sources; carbohydrates, proteins, vitamins and minerals; cultural economic and
traditional factors that shape food habits

GSPH 109  Basic Concepts in Medical Sociology
This introductory course will examine the basic concepts of medical sociology with particularly focus on the
perspective on health and illness and health care systems. The course will assess the social aspects of health
including the problems addressed by health care institutions, societal response to disease and sickness and
institutional and organizational setting of health care systems.

LEVEL 100.
SEMESTER 2
GSPH 102  Introduction to Public Health
Definition of public health; the dimensions of public health, preventive medicine, social medicine, community
health, and community medicine; three levels of prevention, primary, secondary and tertiary; key public health
functions. The enter relationship between human beings and their total environment

GSPH 104  Computing in Public Health
Basic concepts of the computer and the peripherals, web structure and email. Introduction to Epi info, data base
structure, questionnaire development, data collection, data screens and data entry, data cleaning and basic data
analysis.

GSPH 106  Health Behaviour and Society
Define health, society, social groups, illness, sickness, health care, mental illness. Interface of social system and
culture, levels of social change, social dimension of healthcare system meaning for the individuals and institutions.
The functions and structures of politics and religion and its effects on society and individuals will also be examined.

GSPH 112  Introduction to Psychology I
Define social psychology, basic concepts of symbolic interactionism, cognitive basis of role making and role taking
related to health situations, establishing horizontal and vertical linkages deviance and identity. Theories biological
foundations of behavior, sensation and perception, basic principles of learning, information processing, memory,
language, intelligence, motivation, emotion, personality, social behavior, mental disorders and therapies.

GSPH 114  Human Growth and Development
Birth of human being, inherited and environmental factors, changes in adolescence, adults, family systems and
lifestyle. Challenges of adulthood, Ageing, death and dying,

GSPH 116  Community Entry and Organization
The course content includes: Community structure and governance, community resources, community organization,
Community entry and needs assessment; Communication channels, advantages and disadvantages; Health
education/promotion; Community participation; gender roles in community organization and communication.

GSPH 118  Public Speaking and Presentation
Introduction to public speaking, the process of communication; models of communication, knowing your audience,
performing audience analysis, listening, adapting to an audience –the goal statement, organising a speech, selecting
and narrowing ideas for presentation, beginning and ending a presentation, difference between oral and written style,
supporting ideas with arguments, informative speaking, persuasive speaking, speaking in groups.
LEVEL 200
SEMESTER I
GSPH 203: Epidemiology: Principles and Methods
Measures of disease frequency, rates, ratios; descriptive studies, analytic studies geographic comparisons, temporal comparisons; survey sampling; epidemiological study design; surveillance

GSPH 205: Medical Anthropology: Cultural Foundation for Health and Illness
This course will help the student to understand the societal and cultural determinants of health. The content of the course will include the definition and concept of culture and health; the practice of medical anthropology; Social structures and conceptions of disease; treatment and outcome; influence of culture and religion on behavior in relation to health and diseases; health decision making, modern and traditional systems for health care and culture and social epidemiology.

GSPH 207: Introduction to Biostatistics
Descriptive statistics; sampling techniques, summary measures, measures of central tendency, measures of dispersion, normal distribution, data presentation, measures of association.

GSPH 209: Introduction to Microbiology
Foundation and overview of microbiology, the structure and functioning of fungi, bacteria and viruses, the methods used to culture, control and study these organisms in the laboratory, Isolation, Classification and Identification of Microbes.

GSPH 211: Introduction to Pharmacology
General principles of pharmacology; mechanism of drug action; classification, drug metabolism and pharmacokinetics, introduction to toxicology, principles of adverse drugs reactions; poisoning including insecticides and agrochemicals. Reactions to common domestic chemicals including corrosives and heavy metals such as in the digestive, neurological, cardiovascular systems. Introduction to safety monitoring.

GSPH 213 Introduction to Public Health Ethics
Traditions and values in public health, social determinants of health, ethical analysis and decision making, ethics and pandemic power, participation and disparities, research with human subjects, professional ethics, cross-cultural ethics

GSPH 215 Basic Principles of Environmental Health
The course will include the following: 1. Definitions: Environment, health, environmental health, environmental health hazards. 2. Classification of the elements of the environment (physical, biological, chemical, radiological). 3. Sources of environmental health: waste materials (human, industrial, etc) and support media (food, water, soil, air). 4. Methods of transmission of environment hazards from source to objects at risk. 5. Impacts of environmental hazards on man, animals and the environment. 6. Methods of control of environmental hazards. 7. Applications of concepts and principles.

LEVEL 200
SEMESTER 2
GSPH 202 Ecological Approach to Health
Environment and human biology, climate, chemical pollution, food production, food conservation; poisons and toxic agents, organic pollution of water; effects of environmental degradation: greenhouse effect of ozone layer depletion, desertification
GSPH 204  The Health Care System in Ghana
This course will cover the concepts of health systems and public health, national health systems, historical development of Ghana’s health system, challenges and strategies for health systems. Measures to meet challenges of the health system.

GSPH 208  Population, Health and Development
Factors affecting population distribution, implications of population distribution, Components of population change, factors in historical decline and mortality and morbidity, general overview of demographic analysis, vital registration, population growth and distribution, mortality measurements, fertility measurements; population policies and programmes in Ghana.

GSPH 212  Introduction to Research Methods
The course will introduce the formulation of research questions, research objectives, describe the qualitative methodology, purposive sampling, sample size determination, Construct variables, and discuss the generalization, validity and reliability. Data analysis including thematic and network analysis and presentation.

GSPH 214  Writing for Public Health
Writing readable health messages, summarizing, important points, write lists, choosing a style that is easy to follow; using the active voice; defining difficult words by context clues.

LEVEL 300  SEMESTER 1
GSPH 301  Child Survival Programme: Expanded Programme on Immunization
Global and national immunization strategy; types of vaccines; vaccine management, maintenance of the cold chain system, organization of immunization sessions, improving access and coverage of immunization; community mobilization for vaccination programmes, monitoring and supervision of immunization activities; immunization surveillance, vaccination coverage survey.

GSPH 303  Reproductive Health: Maternal Health Care
Maternal health care: antenatal care, labour and postnatal care; emergency obstetric care strategies, appropriate technologies for monitoring pregnancy and labour; Definitions of maternal death, identifying maternal deaths, facility based maternal deaths review, verbal autopsy for maternal death, epidemiology of maternal mortality in Africa; near miss obstetric events. Issues relating to reproductive morbidities in women.

GSPH 305  Principles of Disease Control
Burden and trends of infectious diseases, Determinants of infectious disease, natural history of infectious disease, management and control strategies, problems and challenges, specific interventions for selected infectious diseases.

GSPH 307  Public Health Nutrition
Various food groups, carbohydrates, proteins, fats, vitamins, trace elements; specific micronutrient deficiencies, Vitamin A deficiency, iron deficiency and anemia, iodine deficiency disorder; nutritional requirements of pregnant and lactating women, infants and children; obesity and related conditions; growth monitoring and promotion; under-nutrition; community based nutrition programmes; nutritional surveillance, growth monitoring and promotion. Retrieval of medical data, develop and modify questionnaires.

GSPH 309  Primary Health Care System
Definition of primary care and history, common health problems, maternal and child health care, including family planning, nutrition, immunization, safe water supply, basic sanitation, locally endemic diseases and what can be done to prevent and control them. Treatment of common diseases and injuries. Preventive, promotional, and
rehabilitative services for the individual, family and community. Community involvement in the formulation and implementation of health care activities. Discussion on continued dialogue with the community and health care professional. The role of primary care in the National health care system.

GSPH 311 Environmental Health and Sanitation
The course will introduce students to the basics of environmental health and sanitation and will cover environmental epidemiology, toxicology, policy and regulation. Students will have the opportunity to study various agents of environmental diseases- including zoonotic and vector-borne diseases, toxic mental and elements, pesticides and other organic chemicals. Students will also be introduced to the application of environmental health and sanitation in the area of water and air quality, food safety, solid and liquid water and occupational health.

GSPH 313 Monitoring and Evaluation of Health Programmes
Formative evaluation research, project monitoring-process evaluation; evaluation-effectiveness evaluation, framework for evaluation-inputs, outputs, outcome and impact, programme indicators, data collection methods, types of analysis, key elements of evaluation plan, scope of the evaluation, methodological approach, implementation plan, dissemination and utilization of results

ELECTIVES (LEVEL 300)
GSPH 315 Research Methods
The course introduces the basic concepts of research including a historical perspective. Discusses the scientific method for research, advantages and disadvantages, describes the research process and explains the various components of the research process. It explores several methods of formulating a research question. It introduces the formulation of general objectives and specific objectives. The courses address the formulation of research hypothesis and it relations with the research question.

GSPH 317 Introduction to Health Policy
Factors influencing public social policy development, Environmental context of reform, the role of different players within the policy process, effective use of modern tools in policy making, forging consensus in policy making research., Agenda setting, Policy design factors, policy background, policy process variables, policy participation, policy implementation

GSPH 319 Neglected Tropical Diseases
Burden of neglected tropical diseases, prevalence of trachoma, soil transmitted helminthes, schistosomiasis lymphatic filariosis, treatment of neglected tropical diseases. Prevention of NTDs and global effort to control and eliminate NTDs.

GSPH 321 Zoonotic Infections
The burden of zoonotic diseases, prevalence and control of zoonotic diseases, surveillance and control of emerging and re-emerging diseases and the challenge of veterinary public health, global trends in emerging infectious diseases, wildlife and zoonoses.

GSPH 323 Non-Communicable Diseases
Definitions, Types of non-communicable diseases and the burdens especially those relevant to Ghana. Risk factors and their management and strategies for prevention and control. Non-communicable diseases; cancer registers and other registers used in disease control.

GSPH 325 Environmental Quality and Sanitary Inspection
Concepts of environmental quality (hygiene);Practice at community level (prevention of contamination of land, premises and infrastructures and pollution of water infrastructures (roads, drainage systems, parks, etc.) and the
pollution of water bodies (beaches, river banks, etc). Identification of environmental hygiene problems at premises level (residential, commercial, industrial, institutional), public places (markets, lorry parks, beaches, river banks, lagoons, stadia, and open undeveloped lands).
Legislation: Role of legislation in environmental quality (hygiene) promotion; procedures for the making and review of national and local legislation; practices in Ghana. Sanitary Inspection: Environmental hygiene monitory by Sanitary Inspection; hygiene education; compliance enforcement and procedures. Institutional Arrangements: Institutional and development concept and principles; structure of appropriate department/units; sanitary inspection in Ghana. Identification of the sources of air pollution both indoor and outdoor.

**GSPH 327 Municipal Sanitary Services and Amenities**
Concept of provision of municipal sanitary services and amenities. Elements of municipal services: Public cleansing (streets, drains, markets, lorry parks, stadia, etc); maintenance of hygienic conditions at waste storage and disposal sites; pest control (mosquitoes, flies, rodents).
Elements of Municipal Amenities: Litter bins; waste storage site/containers and final disposal; Sites and facilities; public urinals and toilets; cemeteries; food and meat markets; public spots (parks and seats); developed beaches.
Strategies for Financing Municipal Programmes (financing, modernization, maintenance, expansion, etc). Standards of design operation and maintenance.
Institutional arrangements for the municipal programmes.

**GSPH 329 Hygiene of Food Processing and Handling**
Definitions: Food-borne Diseases, Food hygiene, food infection, food intoxication. Principles: Food and nutrition; food-borne diseases: classification of diseases (infection, intoxication), causative agents, transmission mechanisms, manifestation; incriminating food; preventive measures.
Food and Safety Practices: (i) Raw food and meat (prevention of contamination, meat hygiene) (ii) Primary processing (hygienic practices, milling, packaging, storage, etc) (iii) Prepared foods (hygiene in preparation, storage, serving, etc)
Food establishments: Approval of sites, facilities, design of layout, display equipment, permits and certificates of operation. Food Inspection and Hygiene Education: (i) establishment of departments/units (ii) design of appropriate educational programmes.
Legislation: National and local; permits/certificates, enforcement of legislation (notices, prosecution, sanctions). Institutional Arrangements: Roles of government, business association, etc; department/unit of local authority; mechanisms for inter-agency coordination and collaboration.

**GSPH 331 Introduction to Population and Health**
Basic concepts of population growth and socio-economic development, rates and ratios, sources of demographic data, data evaluation, age-sex composition, ideal family size, fertility preference, measures of infant, foetal and perinatal mortality, construction of crude and adjusted mortality rates, demographic transition and Hoover theory.

**GSPH 333 Database Management System I**
The evolution of database systems, early database management systems, overview of database management system components, the storage manager, the query manager, the client server architecture. Introduction to Data Protection, overview of storage technology, backup and restore, remote copy and replication, basic security concepts, storage system security, policy based data protection, Information lifecycle management.

**GSPH 335 Health Data Management**
Collection, organization, analysis and presentation of health care data; vital and public health statistics; calculation of health care specific statistics, hospital utilization; mortality rates, autopsy rates, outpatient statistics; preparation of statistical reports; methods of ensuring data quality-accuracy, timeliness, completeness and validity.
GSPH 337 Information Security
Information security management; information security culture; misuse and abuse of computer systems; computer ethics and security; authorization and access control; malicious software in ubiquitous computing; statistical database security; copy protection system; information security culture; security governance and compliance; data warehousing, data mining and security

GSPH 339 Nutrients and their Metabolism
Nutrient utilization: digestion, absorption and metabolism, metabolic relationships among carbohydrate, protein and fat in the major tissues of the body

Reading List

GSPH 341 Assessment of Nutritional Status
Study the techniques used in assessing nutritional status of individuals and communities during health and disease using dietary, biochemical, and clinical and anthropometric measurements. Methods of measuring the dietary intake of individuals and communities; anthropometric measurements of individuals and communities and how to do them; biochemical assessments of individuals and communities; clinical and functional appraisal of nutritional status and vital statistics and nutritional surveillance as well as growth monitoring.

GSPH 343 Malnutrition and Food Security

GSPH 345 Contemporary Issues in Health Promotion
The course will deal with contemporary issues in promoting health and exploring concepts of health, wellness – illness continuum, levels of prevention, culture and values, sources of community information, health as a value, folk healing and professional care system. It will also introduce students to the communication process and ethics, barriers to effective communication, health care ethics, screening: advantages and disadvantages and sources and effects of stress.

GSPH 347 Health Communications Theory and Practice
Communicating is key to the implementation of public health programmes. The course will introduce students to the various communication theories including theories of communication impact on behavior, various cognitive theories, social process theories, emotional response theories and mass media theories. The course will also provide students the opportunity to learn various frameworks for designing and producing communication strategies and how to introduce such strategies into intervention programmes and evaluate them.

GSPH 349 Research Methods in Social and Behavioural Sciences
The course will introduce students to research methods to improve knowledge, theory and practice in the field. It will provide students the epistemological and theoretical framework to both quantitative and qualitative research methods in the social sciences. The course will assess the principles and applications of both quantitative and qualitative methods. It will cover sampling methods, questionnaires, structured and unstructured interviews, ethnography, participant observation, participatory action research and ethical issues of research.

GSPH 351 Information Technology Application in Health Management II
Managerial-oriented approach to the use of IT in organizations to improve quality and productivity. Case studies highlight new technology and applications, including fuzzy logic, neural computing, and hypermedia, problems many district teams encounter.
LEVEL 300
SEMESTER II
GSPH 302 Infant and Young Child Feeding
Nutritive needs of infants and young children, Breastfeeding and its challenges, Supplementary and complementary feeding, International code for breastfeeding, feeding of the low-weight-birth infant, weaning practices, effects of early feeding on later life. Goals of nutritional management of infant and young children.

GSPH 304 Fundamentals of Public Health Surveillance
Historical development of surveillance; planning a surveillance system, sources of health related information, collecting surveillance data, analyzing and interpreting surveillance data, use of surveillance data for public health action. Evaluating public health surveillance system.

GSPH 306 Child Survival: Management of the Sick Child
Define IMCI, Improving case management skills of health-care staff, Improving overall health systems, Improving family and community health practices, algorithms for diagnosis and treatment of Acute respiratory Infections, Diarrhoea, malaria, ear infection, malnutrition and vaccination status. Community IMCI.

GSPH 308 Family Planning Methods and Practice
Description of various contraceptive methods, mechanisms of action, failure rates, safety issues and warnings, barriers to increased use, a management of unsafe abortion, emergency contraception, approaches to delivery conducting situational analysis, family planning and HIV positive women.

GSPH 312 Management and Leadership of Health Services
This course will cover the nature of management, different management skills, roles in the management model, planning and the planning process; organizing, division of work, delegation and coordination; leading and understanding and managing conflict for health services. The importance of leadership, the leading process, and leadership treats and styles. Interpersonal conflict, beneficial and dysfunctional aspects of conflict, sources of conflict, managing and resolving conflict.

GSPH 314 Health Management Information Systems
The course will aim at introducing students to the general concepts of health management information systems. Description of various health management information systems used at all levels of the health system and their linkage will be made.

GSPH 316 School Health Services I
School Health service, including role of the school teachers and parents, Child growth and development, basic hygiene including oral hygiene, sanitation, nutrition including common foods, fruits and their nutrient value. Physical exercise and health.

GSPH 318 Introduction to Occupational Health and Safety
Pre-placement screening; Occupational lung diseases, silicosis, asbestos-related diseases, occupational asthma, and byssinosis; health monitoring and investigation of a hazard; use of protective clothing; sickness absence, measuring absence, basic statistics and misconceptions, factors known to influence sickness absence; rehabilitation and settlement at work; principles of toxicology

GSPH 322 Research Methods II
The course will introduce proposal writing from formulation of research questions, research objectives, design of the study, data collection, analysis, discussion and presentation of results. Principle of ethical conduct of research, Grant writing and sourcing of funding to conduct research
GSPH 324 Public Health Seminar I
Global public health diseases affecting developing countries; control measures in place for global public health diseases affecting developing countries.

ELECTIVES (Level 300)

GSPH 326 Global Climate Change and Health Effects
Variety of effects associated with climate change in different regions on health, malaria, contamination of water bodies, pollution adaptations of human communities to climatic change.

GSPH 328 Control of Emerging and Re-emerging Diseases
Emerging infections in historical context, geographical spread of infections, human demographics and behavior, climate and weather, international travel and commerce, war and famine, technology and industry, microbial adaptation and change, economic development and land use, development of multiple-resistant bacterial pathogens, emerging issues in blood borne infections, resurgent vector borne diseases.

GSPH 332 Integrated Disease Surveillance Systems
Overview of surveillance, importance of surveillance, standard case definitions, standard methods for reporting priority diseases district–level indicators for monitoring quality of surveillance and response at the health facility, community–based surveillance, alert thresholds, information flow in integrated disease surveillance, developing public health bulletin, IDSR contribution to epidemic preparedness.

GSPH 334 Geographic Information Systems I
Definition of geographical information system; spatial data; database management; data input and editing; data analysis; data editing; data quality issues; GIS project editing and management, use of GISs in surveillance and monitoring vector-borne diseases, environmental health, children and pedestrian.

GSPH 335 Health Data Management
Analysing public health data; validity of ICD 10 Hospital discharge data, applied spatial statistics for public health data, analysis of hospital data of chronic diseases such as cancer, diabetes.

GSPH 336 Water Supply and Treatment
Definition: Water resources, source of supply, portability, safeness etc.
Sources of Water Supply (Water resources): Sources: Surface water (rivers, lakes, dams, ponds, lagoons, sea water); Ground water (springs, water table); Rain water.
Uses of Water Resources: Human physiological requirement; Domestic (personal hygiene, food preparation, waste disposal); Industrial and commercial (manufacturing, food and drink services); Agricultural (irrigation, crop watering, etc); Public cleansing (drain cleansing); Fire fighting.
Water Associated Diseases: (i) Water’s role in disease transmission (ii) Classification of water-associated diseases (water-borne, water-based, water-washed, water-related)
Water Purification: Purpose: Provision of safe water for drinking; production of water meeting industrial standards.
Methods of Source Protection: Protection of sources of supply (springs, rivers, etc); Household methods (boiling, cloth filtration, chemical disinfection, etc); Conventional water treatment
Drinking Water (Quality) Standards: Parameters (Bacteriological, physical, chemical, radiological); Indicators and limit setting.
Water Supply Development: Classification of schemes: Rural Water Supply (sanitary wells, bore-hole supply, springs); small town supply (limited pipe-borne distribution; Urban supply (pipe-borne supply).
GSPH 338  **Solid Waste Management**
The course will examine the following: Definition: Waste, refuse, rubbish, recycling, waste management. Classification of solid wastes by characteristics and source. Sources of solid waste generation: domestic, commercial, industrial, agricultural, hospital, institutions, etc. Waste generation: Individual, community. Hazards of solid waste accumulation in the community (health, land, degradation, property devaluation, etc) Methods of Storage, collection, transportation, treatment and final disposal. Financing and tariff systems for solid waste management. Types of legislation and bye-laws needed for solid waste management. Institutional arrangements: Central, regional, district and town level organizations, human resource development.

GSPH 339  **Nutrients and their Metabolism**
Nutrient utilization: digestion, absorption and metabolism, metabolic relationships among carbohydrates, proteins and fat in the major body tissues, differences in digestibility of foods and physiologic implications, influence of food and non-nutrient food components, nutrient–nutrient interactions in foods, effects of macronutrients and fiber.

GSPH 342  **Pest and Vector Control**
Definitions: Pest, vector, vector control, pesticide, insecticide, larvicide, adulticide, biolarvicide, etc. Importance of pest and vectors: Agents of disease transmission Causes of nuisance (biting, irritation, itching. Droppings, odour, etc); General Control Principles: Identification and morphological characteristics Biology (Life cycle, behavior, resting place, dispersal, ecology, food, etc) Public health importance: Diseases: Nuisance (irritation, biting, itching, droppings, odours, etc); Pest/Vectors and Disease: Pesticide Classification, Formulation and Use Regulation of Pesticide Use: Legislation to control import and export, labeling, packaging, storage, transportation, safe use, etc. Institutional Arrangements: Central government (Agriculture, Health and Environment) Ministries, districts and local authorities; private sector (importers/retailers, pest control, service providers).

GSPH 344  **Environmental Exposure Assessment**
Environmental exposures to chemicals and biological contaminants; study design issues relating to air water sediment and soil sampling, water protection inspection, water management and protection of water quality, monitoring air quality, measures for the protection of farmland quality

GSPH 346  **Systems Analysis and Design**
The course will include the following: Basic definition-systems, systems analysis, information system, General overview of systems development, systems theory and relevance to information system, systems life cycle (SLDC)-preliminary investigation, the analysis phase, the design phase, development stage, implementation, systems evaluation. System design tool-systems flow charts, Entity relationship diagrams, data flow diagrams, Hipo chart, Warnier Orr diagram, decision tree, pseudo code, data dictionary, application of systems analysis/design, systems management, systems professionals, systems engineers, analysts, designer, architect, owner, developer user.

GSPH 348  **Data Analysis and Presentation (HMIS) I**
Review of the database structure, the Ministry of Health HMIS, coding system, the basic indicators and their definition, analysis of defined dataset from the HMIS, generate basic indicators and presentation of data.

GSPH 352  **Applied Nutrition**
Structure of nutritional programmes, mode of implementation and evaluation; effects of socio-economic factors on nutrition; how urbanization affects nutrition; mode and objectives of nutrition education to the public and methods of delivery and the role of local and international organizations in combating hunger and malnutrition.
GSPH 354  Nutritional Surveillance

GSPH 356  Lifestyle and Nutrition

GSPH 358  Behaviour Change Communication
The course will introduce students to definition of principles and concepts such as behavior, communication and behavior change communication. It will also deal with the various steps to behavior change, health communication in cultural context, the challenges and considerations of behavior change communication.

GSPH 362  Mass Communication in Health Education and Public Health-3 credits
The course content will include mass communication theory and practice; community entry processes, media use as a health promotion/health communication strategy; use of radio, television, and the internet for health promotion; media use in health promotion campaigns (HIV prevention campaigns; malaria prevention campaign, tobacco campaigns); marketing and unhealthy advertising (alcoholic beverages); television and children's health; marketing and social marketing; working with the media and writing media releases; Writing for the print media; cross cultural communication; communication with people with disability; pre-testing developed media materials; health sponsorships; coalition building, political lobbying and media advocacy for health.

LEVEL 400
SEMESTER I
GSPH 401  Biostatistics for Public Health
The course focuses on basic statistical concepts especially on types of measurement in public health. Basic concepts in data analysis, presentation of data and reports. The course will be very practical using data from Ghana Health Service reports to illustrate the concepts and provide analysis of reports in public health

GSPH 403  Reproductive Health: Comprehensive Care for HIV/AIDS
Prevention of HIV transmission, HIV counseling and testing, opt out screening, prevention of mother to child transmission, antenatal couple counseling; anti retroviral therapy and prevention, perception of HIV risk; “3 by 5” initiative

GSPH 405  Introduction to Gender and Health Care
Health and social construction of gender, gender stereotypes, health beliefs and behaviors: resources for constructing gender, the social construction of disease, medical Institution and its construction of gender and health, gender and utilization of health services, gender and responses to symptoms

GSPH 407  School Health Services II:
Basic cause of common childhood diseases such as malaria common cold, HIV/AIDS, TB, helminthes infection, cuts and wounds, and methods to prevent them. Alcohol use and smoking and their effects on health. Local foods and fruits and their nutrient value and use. Monitoring and evaluation of school health programmes.

GSPH 409  Reproductive Health and Culture
Define reproductive health, cultural context of sexuality, cultural factors & determinants of use of family planning, sexual violence, female genital mutilation, Reproductive tract infections, and treatment, effects of contraception and
health of mothers and children, adolescent fertility and contraception

**GSPH 410  Project Work**

**GSPH 411  Health problems of infants and children**
Definition of the childhood morbidity and mortality; causes of perinatal and neonatal mortality, prematurity and low birth weight; childhood diseases of public health importance.

**GSPH 413  Scientific Communication Including Report Writing**
Definition of scientific communication; writing a scientific paper; when to begin writing; preparing the text, abstract preparation, introduction, materials and methods, results, discussion, acknowledgments, citation of references, ethics in scientific publishing; The publishing process, conference communications, oral presentation, poster presentation, scientific style.

**GSPH 414  Public Health Seminar II**
Global public health diseases and developing countries, Poverty and health, measurements of poverty and health; indicators of the Millennium Development goals

**GSPH 415  Public Health Ethics**
Traditions and values in public health, social determinants of health, ethical analysis and decision making, ethics and pandemic power, participation and disparities, research with human subjects, professional ethics, cross-cultural ethics.

**ELECTIVES (Level 400)**

**GSPH 417  Database Management II**
Database concepts-database files, types, records field, advantages and disadvantages of DBMS, types of database organization, features of data-query, report data dictionary, utilities systems recovery, database application development; overview of storage and indexing; database profession, new developments in database management, data service delivery, diagnosis, health information management and administration, ethics of using databases, health database systems, features of application software, developing databases for health systems.

**GSPH 421  Public Health Surveillance of Chronic Diseases**
The course content will include the new public health priorities, characteristics of chronic disease surveillance, reporting of chronic disease surveillance, behavioural determinants of health and disease, determinants of population health, global burden of disease approach, risk factors for cardiovascular and cerebrovascular diseases. The epidemiology and prevention of diabetes mellitus, Neoplasms, HIV/AIDS and Tuberculosis will be reviewed.

**GSPH 423  Emergency/ Preparedness and Outbreak Investigation**
The course will investigate the steps in outbreak investigation and the importance of team work in the investigation of outbreak and the role of Laboratory in the disease outbreak investigation.

**GSPH 427  Domestic and Industrial Waste Water Disposal**
GSPH 429  Health Aspects of Housing
Definitions: Housing, premises, workplace, ventilation, illumination, town planning, zoning, building code, building permit, etc; Health problems attributed to housing (diseases, injuries, nuisance, etc); Town planning (physical planning) principles for development of communities (layout, zoning, etc) Criteria for assessing healthfulness of housing: Fundamental physiological needs; Protection against contagion (diseases); Protection against accidents; Legislation: Building Code, permits, building inspection and enforcement of code; demolition; Institutional Arrangements: Establishment of department/unit for regulation of building construction; human resource development; logistics.

GSPH 431  Gender and Environmental Health Care
This course introduces students to the construction of gender and sex and gender as a theoretical concept. It also looks at the historical, international, and domestic perspectives of gender, the social structures that affect the development of individual and society’s health, and how gender influences the construction of public health in different societies. The course will provide some understanding into societal patterns of health, disease, and well-being, and the socio-cultural determinants that affect people’s experiences and expectations of health. This course examines some health issues where gender plays an important role: reproductive health, sexual health, health policy etc.

GSPH 433 Public Health Legislation, Regulation and Enforcement
Role of Legislation: Establish governmental institutions and agencies (eg. Local Government Administration, Food and Drugs Board, etc); Regulations, Standards and tariff systems.
Pressures that initiate legislation: Problems with public cooperation, revenue mobilization, demand for projects and services, etc.
Relevant legislation for Environmental Health (i) National (e g. Environmental Health Policy of Ghana, Environmental Protection Agency), (ii) Local (e.g. District Assembly bye-laws on sanitation), Procedures for Enactment of Legislation Monitoring and Enforcement: Establishment of department/office/unit for monitoring and enforcement; provision of appropriate courts (e.g. Sanitary courts); mechanisms for inter-agency coordination and collaboration.

GSPH 435 Human Excreta and Sewage Disposal
Definitions: Human excreta, night soil, sanitary waste, degradability and sewerage.

GSPH 437 Introduction to Field Epidemiology
Definition of field epidemiology, operational aspects of epidemiologic investigations, conducting a field investigation, surveys and sampling, using a computer for field investigations, analyzing and interpreting data.

GSPH 439 Geographic Information Systems II
Definition of geographical information system; spatial data; database management; data input and editing; data analysis; data editing; data quality issues; GIS project editing and management, use of GISs in surveillance and monitoring vector-borne diseases, environmental health, children and pedestrian
GSPH 441 Clinical Data Classification and Coding I
History and development of disease classification, the structure and conventions of the International Classification of Diseases and Related Health Problems; tenth Revision, Basic coding principles, retrieval of relevant information from health records for the classification of diseases and procedures in medicine.

GSPH 443 Electronic Health and Data Systems

GSPH 445 Data Base Systems and Management II
Database concepts-database files, types, records field, advantages and disadvantages of DBMS, types of database organization, features of data-query, report data dictionary, utilities systems recovery, database application development; overview of storage and indexing; database profession, new developments in database management, data service delivery, diagnosis, health information management and administration, ethics of using databases, health database systems, features of application software, developing databases for health systems.

GSPH 447 Food and Nutrition Policy
The course is designed to help students know the role of policy in food and nutrition programming at the national level. The course will engage the students in discussing how policies are developed and evaluated.

GSPH 449 Communication for Nutrition and Healthy Lifestyle
The premise of this course is that nutritional and life styles problems are caused by human behavior and have long-term implications. To address and create long-term solutions to these problems, behavior needs to change. This course provides students with a practical introduction to the strategies, methods and tools of nutrition and health life styles communication that effectively leads to changes in behavior. The field-based skills gained through this course will provide students the skills of communicating nutritional and health life styles messages for changing behaviors. The course will focus on nutritional and healthy life styles and social marketing strategies to ensure desired changes in behavior.

GSPH 451 Nutrition Transition in Ghana
The concept of nutrition transition, obesity trends in the developing world, biological factors, genetic factors, ecological factors, food availability and dietary intake; obesity and cardiovascular diseases.

GSPH 453 Diet and Disease
Nutritional measurement, chronic diseases, epidemiology of chronic diseases, relationship between nutrition and chronic diseases, public health impact of nutrition in chronic diseases.

GSPH 455 School Feeding Programmes
History of school feeding, school health and nutrition recovery, school feeding as a nutrition intervention, school feeding to improve child cognitive development, school feeding and short and long term –food and security, designing school feeding programmes, evaluating school feeding programmes.

GSPH 457 Food Safety and Hygiene
Principles, science and technology of Food preservation, Food deterioration, food additives; food toxins, bacterial
contamination. Food quality and acceptance; quality characteristics of foods and their measurement
Development of specifications and standards of quality, sampling for quality control;
Policies and guidelines for regulating and monitoring public food safety and hygiene; HACCP, Codex; Personal
hygiene in food safety regulation; Pest management in food storage and transport; Food poisoning; epidemiology of
food contamination
Health effects of eating spoiled foods; toxins in food; Food chain and bioterrorism
Agencies involved in food safety and hygiene control: FDB, Standards board, Port Health

GSPH 459  Intervention Strategies for Health Promotion
Health promotion interventions have become important aspect of health care provision in recent years. A number of
health promotion programmes have failed to achieve their intended goals due to the fact that appropriate strategies
were not put in place regarding the broader environment within which such programmes were implemented. Sometimes the effectiveness or ineffectiveness of a strategy is dependent upon time and season the intervention is implemented.
The course will deal with the following: Introduction to intervention strategies, definition of terms; (health
promotion, intervention, strategy), strategic frameworks for health promotion, the Need for health promotion
interventions, past and present health intervention strategies (planning, implementation, monitoring, sustainability,
partnership building, evaluation), factors that determine the choice of strategies and communication as a strategy for
intervention.

GSPH 461  Principles and Practice of Community Organization
Community involvement in the implementation of health interventions has become an important part of intellectual
discourse. This course aims at providing a general understanding of the basic principles behind community
organization for health. It is also intended to expose students to community entry processes towards community
organization for health. It will deal with the following: definition of terms and concept (Community, organization,
community entry, community organization), the concept of community, types of community (geographical,
professional, etc), principles of community organization, steps in community organization (stages of community
organization), community analysis (strengths, weaknesses, available resources, potentials, etc), major stakeholders
in the community (governmental and nongovernmental agencies, traditional institutions, youth, religious and other
identifiable groupings), importance of community entry for health intervention (identification of community and
group leadership, social marketing.

GSPH 463  Psychological Influence on Health
Health Psychology is an area that studies the social, behavioural, cognitive and emotional factors that influence the
maintenance of health, development of illness and disease, course of illness or disease and client/patient as well as
family’s response to illness and disease. Generally, understanding how social factors relate to the promotion and
maintenance of good health/wellness gives way to an appreciation of the causation, prevention and treatment of
illness.

GSPH 465  School Based Nutrition Education
Nutrition, health and academic performance. The School as a vehicle for nutrition interventions. School-based
nutrition interventions as a component of school health program. School-based nutrition education, nutritional status
assessment of school age children, school feeding policy, program implementation and monitoring. Pre-school age
feeding. Food choice and preferences of school-age children. School feeding dietary quality. Costs and benefits of
school-based nutrition interventions.

GSPH 467  Adolescent Health: Social and Behavioral Perspective
This course is designed to assist students to learn about adolescent social and behavioral environmental of
adolescent health using theoretical frameworks based on contemporary theories and strategies. Students will
examine how adolescent behavior impacts their health within the context of individuals, groups and communities
and its
Public health implication of adolescent health. It will also cover key issues that concerns adolescents including adolescence sexuality and sexual health, contraception, teenage pregnancy and abortion, peer influence, substance abuse, adolescent friendly programmes and recreational activities.

**CORE COURSES FOR LEVEL 400 (All Options)**

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**LEVEL 400 SEMESTER II ELECTIVES (Level 400)**

**GSPH 402 Health Promotion and Education**
The course will equip the student with basic knowledge on the theories and principles of health promotion and education. It will enable students to understand the complex and dynamic nature of health promotion processes, and how to relate these to underlying themes of social and health inequalities and to a broader societal values and practices. The course will provide a multidisciplinary approach to health promotion from a sub-Saharan Africa and an international perspective.

**GSPH 404 Health Care for Aged and Elderly**
The course will introduce students to major public health problems (both communicable and non-communicable diseases) of the aged and elderly which include; food borne diseases; emergence of antimicrobial resistant bacteria; sexually transmitted diseases; vector borne diseases; vaccine preventable diseases on the one hand and Diabetes mellitus, obesity, high blood pressure, hypertension, stroke on the other hand. Students will be introduced to the provision of palliative care for people with chronic conditions and complex care needs and provision of primary health care for the aged and elderly. The course will also deal with nutrition and healthy eating, health promoting physical activity and promoting healthy weight.

**GSPH 406 Mental and Social Health Care**
The course will deal with the theories and principles of medicine, mental health and the socio-culture context of seeking care for mental health. In recent times, mental health has become an important public health issue. Student will get the opportunity to acquire the skills of taking history and assessing individual status of mental health. In addition to this, the course will teach students the various forms of mental health conditions including depression, mania and cyclic mood change, anxiety, psychosis, dementia and mild cognitive impairment and substance abuse and dependence. The course will stress on how to manage such conditions at the community level.

**GSPH 408 Monitoring and Evaluation of Health Programmes II**
Framework for monitoring and evaluation of programmes; structure and responsibilities of the monitoring and evaluation systems of various control programmes; data collection, collation and management, Methodological frameworks for evaluating health programs, Health evaluation categories & indicators, Typologies of indicators for evaluation of public health services, Research designs for evaluative studies, How to quantify effects of health programmes, Reporting health evaluation.

**GSPH 412 Health Promotion and Disease Prevention**
The key challenge facing illness prevention today is how to effectively communicate public health messages to the population at risk of getting certain diseases. This course will seek to introduce students to health promotion theories and principles that will equip them to effectively communicate public health issues to the general population. Students will be given the opportunity to plan and implement community based health promotion activity and involve the mass media in the activity. Particular attention will be paid to communicable (malaria, tuberculosis,
HIV/AIDS) and non-communicable diseases (heart disease, cancer, and diabetes). Issues relating to adopting responsible and health behaviors to avoid ill-health will be addressed.

**GSPH 416   International Health Regulations**
Definition of International Health Regulations; Purpose and scope, principle and responsible authorities; information and public health response; points of entry; public health measures; communicable disease control; health documents; general provisions; core capacity requirements for surveillance and response; core capacity for designated airports, ports and ground crossings; international cooperation; legislation.

**GSPH 418   Global Health Security**
Definition of global health security, tropical infectious diseases, bioterrorism, trafficking of illicit drugs, smuggling of people, illegal weapons sale, dumping of unsafe and ineffective pharmaceuticals, food security

**GSPH 422   Environmental Health Promotion and Education**
This subject will provide students with an opportunity to identify, develop and evaluate practical applications of health promotion with particular in environmental health. The subject introduces the principles and theory of health promotion within environmental and community development framework. Principles that guide education for health and planning education sessions will be critically examined.

**GSPH 424   Institutional Development and Sector Management for Environmental Health**
Definition: Institution, sector, vision, mission statement, management; development; Institutional development process: stages of development, pressures for institutional developments, etc.; Diagnosis (assessment) of institutional strengths and weaknesses and management of change; Sector organizational development: Constraints to sectoral performance; pressures for sectoral change, etc; Framework for assessing sectoral organization; sector institutions and their roles;Special topics: Decentralization principles; local government system in Ghana; private sector participation.

**GSPH 426   Environmental Epidemiology**
Environmental epidemiology and assessment of chemicals and biological contaminants; study design issues relating to air water sediment and soil sampling, water protection inspection, water management and protection of water quality, monitoring air quality, measures for the protection of farmland quality, statistical methods for environmental epidemiology.

**GSPH 432   Medical Records and Management**
Evolution and the development of the health record; the context of health records management; the principles and practices of health records management; appraisal; storage and access issues; confidentiality and security issues; organization and management of health records service: patient identification and registration procedures, indexes and registers, filing and retrieval systems, admission and discharge procedures.

**GSPH 434   Public Health Programme Planning and Evaluation**
The course will involve introducing students to the history of health program planning, planning and evaluation cycle, public health pyramid, use of public health pyramid in programme planning and evaluation, defining community, community needs assessment, sample construction, sample size and ethics and evaluation.

**GSPH 436   Clinical Data Classification and Coding II**
Structure and applications of internal classification of health interventions: structure and application of the international classification of diseases for oncology (ICD-O); General principles and guidelines for the development of disease registry; Role of disease registry in health care delivery and research; specific development and implementation of registry system for non-communicable diseases such as cancers, development of communication and presentation skills.
GSPH 438  Nutritional Rehabilitation Programmes
Protein-energy malnutrition in young children, under-nutrition, nutritional marasmus and kwashiorkor; hospital based rehabilitation of severe malnutrition, acute phase, rehabilitation phase, catch-up growth, methods to detect cases of severe malnourished children in the community, distribution of supplement foods to children,

GSPH 442  Food Laws and Regulations
International and national laws, regulations, policies and conventions related to processing, packaging, marketing, distribution, and usage of foods. Food standards and quality. Emphasis on public protection and safety aspects of food laws and regulations. Role of international and national level agencies in the application, enforcement and monitoring of food laws (WHO, FAO, Codex, WTO, FDB, GSB). Food laws and public safety advocacy.

GSPH 444  Nutrition Seminar
The course will attempt to expose students to the role nutrition plays in healthy living and longevity. It will provide students the opportunity to review and learn from both international and national research work on nutrition and health.

GSPH 446  Change Interventions for Chronic Disease
The course focuses on understanding theory-based chronic and lifestyle interventions at different levels of change (individuals, networks/groups, organizations and communities). The course will deal with research aspects of change interventions and this will take students through formative (qualitative) research, Community-based participatory research, intervention Design and evaluation. Key theories that students will be introduced to will include transtheoretical model, social cognitive theory, theory of reasoned action/Planned behavior, health belief model, social networks and social support, mass communication, social marketing

GSPH 448  Rights for the Health of Women and Children
The rights for the health of women and children in Ghana; laws and legislations for women and children’s rights ; lapses in the legislations on the rights and health of women and children; enforcement of legislations on the rights for the health of women and children, design and implementation of programmes to promote women and children health rights.

GSPH 452  Reproductive Health in Developing Countries
Healthy sexuality, sexual violence, reproductive tract infections, family planning including long term methods and services, pregnancy and child bearing, interventions to reduce maternal mortality. Organizational issues for reproductive health programmes.

GSPH 454  Mental Health as a Public Health Issue
The course will cover emerging and contemporary debates in mental health. mental health challenges facing both younger and older people, the influence of the life-course and life events on mental health alongside the development and significance of personality, the wider implications and possibilities for mental health services, the use of alternative and complementary approaches.