

BACHELOR OF SCIENCE IN COMMUNITY HEALTH AND DEVELOPMENT

1.0 INTRODUCTION

The programme will contribute towards the realization of community health at the grassroots level. It targets health personnel who would like to acquire more knowledge amongst others interested in community health. University will be one of the few institutions offering a degree program in Community Health and Development in Kenya. Graduates from the program could be absorbed by health-based NGOs, research institutions, health facilities and government ministries among others. The curriculum has been prepared in accordance with the World Health Organization (WHO) target for ensuring affordable quality and easily accessible health services for all developing countries where a high percentage of population live below the poverty line.

2.0 OBJECTIVES

The general objective is to prepare students with a strong scientific foundation for continuation into advanced degrees as well as a grasp on community engagement.

At the end of this program, students should be able to:

- a) Apply the necessary skills as community health professionals for local and international careers as managers and policy makers.
- b) Develop skills in scientific research and writing that will enable them to work together with biomedical teams
- c) Demonstrate competence through supported practice in addressing issues in community health and development (e.g., substance abuse, prevention of chronic diseases)

Practical experiences with community-based and research organizations and partnerships will provide opportunities to apply competencies for promoting community health issues in real-world contexts.

3.0 ADMISSION REQUIREMENTS

Candidates must satisfy the minimum university entry requirements of mean grade C+. In addition they should meet the following requirements:

- a) Must satisfy the minimum entry requirements in Biology and Chemistry K.C.S.E or equivalent examinations.
- b) In addition to 3 (1) above applicants must have passes with at least C in Mathematics, Physics, Geography and English at K.C.S.E or equivalent examinations.
- c) The following minimum grades should be attained by the candidates in the respective K.C.S.E subjects. Biology B- , Chemistry B-, Mathematics C.
- d) Holders of KACE with minimum of 2 principals and a credit in O-level.
- e) Holders of relevant diplomas from recognized universities.

4.0 CREDIT TRANSFER

Students may be exempted from selected courses by University on recommendations of the School Board.

5.0 COURSE STRUCTURE AND DURATION

The duration of the Community Health and Development degree program shall normally be extended over a period of 4 academic years of 8 semesters. One semester shall comprise a minimum of 7 units and a maximum of 9 units.

The program course should comprise lectures, laboratory practical, field/industrial/attachment/tutorials as reflected in the course description.

The program is organized as follow:

All candidates must take all the core and required courses including field work, industrial attachment and research project.

Special exemptions may however be given where a candidate has taken equivalent courses elsewhere as may be the case with transfer students.

The program has a multidisciplinary nature and therefore borrows from other biological, physical and social science disciplines

The courses are offered in units, a unit is that part of a subject described by a coherent syllabus and taught normally over a period of a semester. It is designated as a total of 42 hours of study in a semester. For this purpose one 1-hour lecture is equivalent to one 2-hour tutorial or one 3-hour practical or any combination of this as may be approved by the Board of the School of Health Sciences.

6.0 EXAMINATIONS REGULATIONS.

University Senate Examination rules and regulations shall apply.

7.0 COURSE DISTRIBUTION

YEAR ONE SEMESTER ONE

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3111	Introduction to Human Anatomy	28	14	42	1C
HCD 3112	HIV and AIDS	42	0	42	1C
SBI 3112	Invertebrate Zoology	28	14	42	1C
SCH 3111	Physical Chemistry	28	14		1R
SMA 3111	Mathematics I	42	0	42	1C
SCS 3111	Computer Organization and Application	28	14	42	1 R
AFB 3111	Introduction to Food Security	42	0	42	1C
EEL 3115	Communication Skills	42	0	42	1R
	Total	280	56	336	8

YEAR ONE SEMESTER TWO

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3121	Medical Physiology	28	14	42	1C
HCD 3122	Fundamentals of Community Health	42	0	42	1C
HCD 3123	Rural Sociology	42	0	42	1C
SCH 3112	Organic Chemistry	28	14	42	1C
SMA 3112	Mathematics II	42	0	42	1C
CSC 3124	Information, Technology and Society	28	14	42	1C
SLB 3121	Development Studies	42	0	42	1R
ESD 3121	Social Ethics and Integrity	42	0	42	1R
	Total	294	42	336	8

YEAR TWO SEMESTER ONE:

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3211	Community Based Health Care I	42	0	42	1C
HCD 3212	Introductory Virology	42	0	42	1C
HCD 3213	Health Education and Promotion	42	0	42	1C
HCD 3214	Theories, Concepts and Trends in Health and Development	42	0	42	1C
HCD 3215	Environmental Health	42	0	42	1C
HCD 3216	Occupational Health and Safety	42	0	42	1C
SBI 3211	Basic Microbiology	42	0	42	1C
PSP 3214	Geographical Information System	28	14	42	1C
	Total	308	28	336	8

YEAR TWO SEMESTER TWO

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3221	Principles of Epidemiology	42	0	42	1C
HCD 3222	Health Policy and Administration	42	0	42	1C
HCD 3223	Preparedness and Management of Disease Outbreaks	42	0	42	1C
HCD 3224	Community Based Health Care II	42	0	42	1C
HCD 3225	Gender and Health	42	0	42	1C
HCD 3226	Medical Bacteriology	28	14	42	1C
HCD 3227	Medical Entomology	28	14	42	1C
HCD 3228	Medical Mycology	28	14	42	1C
	Total	294	42	336	8

YEAR THREE SEMESTER ONE

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3311	Epidemiology of HIV/AIDS, Cancer, Tuberculosis and Malaria	42	0	42	1C
HCD 3312	Health Communication and Information Systems	42	0	42	1C
HCD 3313	Health Economics and Financing	28	14	42	1C
HCD 3314	Community Based Health Education	42	0	42	1C
HCD 3315	Maternal and Child Health	42	0	42	1C
HCD 3316	Medical and Veterinary Parasitology	28	14	42	1C
PSP 3314	Spatial Data Analysis in Planning	28	14	42	1C
BEP 3315	Entrepreneurship	42	0	42	1R
	Total	294	42	336	8

YEAR THREE SEMESTER TWO

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3321	Community Based Counseling	42	0	42	1C
HCD 3322	Health System Development and Management	42	0	42	1C
HCD 3323	Demography and Health	42	0	42	1C
HCD 3324	Community Water Supply and Sanitation	42	0	42	1C
SBI 3324	History and Philosophy of Biology	42	0	42	1C
SBI 3325	Research Methods	28	14	42	1C
SBI 3326	Biostatistics I	42	0	42	1C
SBI 3327	Helminthology	28	14	42	1C
	Total	306	28	336	8

YEAR THREE SEMESTER THREE:

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3331	Industrial Attachment		480	480	
	Total		480	480	

YEAR FOUR SEMESTER ONE

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3411	Preventive Medicine	42	0	42	1C
HCD 3412	Reproductive and Sexual Health	42	0	42	1C
HCD 3413	Community Health Law	42	0	42	1C
HCD 3414	Control and Prevention of Communicable and Non-Communicable Diseases	28	14	42	1C
HCD 3415	Project I	14	28	42	1C
SBI 3411	Bioinformatics and Computational	28	14	42	1C

	Biology				
SBI 3415	Biostatistics II	42	0	42	1C
	Total	252	42	294	7

YEAR FOUR SEMESTER TWO:

COURSE CODE	COURSE TITLE	Contact hours			Weight (Unit)
		Lecture	Practical	Total	
HCD 3421	Mental Health	42	0	42	1C
HCD 3422	Community Health and Nutrition	42	0	42	1C
HCD 3423	Negotiations and Peace Building	42	0	42	1C
HCD 3424	Programme Monitoring and Evaluation	42	0	42	1C
HCD 3425	Environmental Toxicology and Health Care	42	0	42	1C
HCD 3415	Project II	14	28	42	1C
SBI 3443	Parasitology	42	0	42	1C
	Total	266	28	294	7

C: Core course, which is central to the discipline of study

R: Required course, which is supportive or beneficial to the programme

8.0 COURSE DESCRIPTION

8.1 YEAR ONE SEMESTER ONE:

HCD 3111: Introduction to Human Anatomy

42 Hours

Introduction to regional and surface anatomy of man; tissues and structures: skin, subcutaneous tissues, deep fascia, tendons, raphes, cartilage, muscle, bone, joint, mucous membranes, blood vessels, lymphatic and lymphoid tissues; nervous system: neurons and nerves, general principles of nerve supply, nerve supply to abdominal wall and limbs; segment innervations of skin and muscle; upper limb, lower limb, thorax, abdomen, head, neck, spine; osteology of the intact skull, skull bones and hyaloids bone; regional and surface anatomy in relation to medical imaging techniques for disease diagnosis and other purposes.

Human anatomy: regional and applied	Chaarasia BD	CBS
Human anatomy	Carola et al	McGraw-Hill
Human anatomy & physiology		McGraw-Hill
Anatomy & human movement: structure and function	Palastanga et al 1998	Butterworth & Heinemann
Principles of human anatomy 8th ed.	Tortora GJ	John Wiley & Sons
Principles of anatomy & physiology 8th ed	Tortora GJ & Grabowski SR	HarperCollins College publishers

HCD 3112: HIV and AIDS

42 Hours

Introduction; historical background and magnitude of HIV and AIDS, general organization of the human body, reproduction, immune system and other factors; sex and sexuality; the biology of the human immunodeficiency virus and viral transmission; stages of infection and the development of HIV and AIDS; opportunistic infections; HIV and AIDS prevention and infection control; peer education for HIV; treatment options and vaccine development; blood transfusion and HIV and AIDS; management of HIV and related infections; legal and Ethical Issues in HIV and AIDS; Factors that influence the spread of HIV and AIDS in Africa; case studies in selected countries in Africa; HIV and AIDS as a national disaster impacts; myths and emerging issues on HIV and AIDS.

HIV & AIDS-The Pandemic	Njambi L	Jomo Kenyatta Foundation
Legal aspects of HIV/AIDS: a guideline for policy & law reform	World Bank	
The World Bank's commitment to HIV/AIDS in Africa: agenda for action 2007	World Bank	
Journal of social aspects of HIV/AIDS; Vo2, July 2007		
HIV/AIDS, nutrition & food security: what we can do	World Bank	

SBI 3112: Invertebrate Zoology**42 Hours**

Introduction to Zoological nomenclature (ICZN). Principle of Zoological nomenclature. The course explores the invertebrates with emphasis on selected phyla: Sarcomastigophora, Potifora, Cnidaria, Ctenophora, Platyhelminthes, Nematoda, Spinculida, Mollusca, Enchiura, Annelida, Anthropoda, Chaetognata and Echinodermata; their classification, biology, external structure, locomotion, Nutrition, excretion, Nervous system, reproduction , embryology and economic importance.

Offered from the School of Biological and Physical Sciences

SCH 3111: Physical Chemistry**42 Hours**

The structure and properties of matter, origin of elements, evolution of living organisms from chemical systems, bond formation and molecules. Laws of thermodynamics, Steady state kinetics, Reaction kinetics, various functional groups of organic molecules and their biological roles. Carbohydrates ;Structure and properties of mono-, di- and polysaccharides.

Offered from the School of Biological and Physical Sciences

SMA 3111: Mathematics I**42 Hours**

Elementary set theory. Mappings and functions: Definitions, domains, codomains, range and inverses and composition of functions. Trigonometry: Functions, their graphs, inverses, degree and radian measure, sine and cosine formulae, trigonometric identities and equations. Algebra: Quadratic equations. Surds, logarithms and indices. Series: Arithmetic and geometric progressions, Permutation and combinations. Binomial theorem and applications such as approximations, simple and compound interest. Remainder theorem applications to solutions of factorials polynomials. Statistics: Collection and representation of data. Measures of central tendencies and variability. Graphical and axiomatic approaches to probabilities. Tree diagrams. Probability: Definition, axioms, tree diagram.

Offered from the School of Mathematics & Actuarial Sciences

SCS 3111: Computer Organization and Application**42 Hours**

Organization: Introduction to the computer and the notion of a programmable machine. The basic organization based on the von Neumann model. Functional components (CPU, memory, I/O) and their logical organization. Number systems and internal data representation. Concept software and types of software. Components of contemporary personal computer systems from end-user perspective

Application: Classical and contemporary applications of computers. Proficiency in basic computer usage and productivity/office automation applications including word-processing, spreadsheets, e-mail, web, etc. Basic first level security and maintenance issues. Ethical and societal issues.

Offered from the School of Informatics and Innovative Systems

AFB 3111: Introduction to Food Security**42 Hours**

An introduction to the food industry in Kenya, Africa and the world with respect to consumer and industrial perspective; Human nutritional requirements; Sources of food; Attributes of food quality; Principles of handling, processing and preservation of food; Traditional foods and diets; Influence of culture and civilization on food consumption in Kenya; Implications of population growth to the food industry.

Offered from the School of Agriculture, Food Security & Bio-diversity

EEL 3115: Communication Skills**42 Hours**

Study skills; planning study time, making references, filing notes; preparing for examinations. Library Skills: organization; classification, shelving; using reference books, listening in lectures, speeches and instructions, understanding lectures, note taking, speaking skills, asking and answering questions in lectures and seminars, making and defending arguments, agreeing and disagreeing, explaining points clearly, academic reading skills, skimming and scanning, understanding footnotes and bibliographical references.

Offered from the School of Business and Legal Studies

YEAR ONE SEMESTER TWO:**HCD 3121: Medical Physiology****42 Hours**

Central nervous system: spinal reflexes, sense organs, autonomic nervous system; water and osmotic regulations; Renal function; digestive and associated glands; food and energy; neuroendocrine control of physiological processes; Principle of neurology and fundamentals of brain structure in relation to behaviour patterns and sensory organs; Neurotransmission and neuronal networks; Reproductive and exercise physiology; physiological base of aging process; approaches in measurement of physiological parameters in man in health and disease: blood volume, cardiac output, total peripheral resistance, blood pressure, lung function and renal function etc including description of equipment and medical devices used for such measurements.

Human biology 8 th ed.	Mader SS	McGraw-Hill
Human physiology: the basis of medicine 3 rd ed.	Beock G & Richards CD	OUP
Principles of human anatomy 8 th ed.	Tortora GJ	John Wiley & Sons
Principles of anatomy & physiology 8 th ed	Tortora GJ, Grabowski SR	HarperCollins College publ.

HCD 3122: Fundamentals of Community Health**42 Hours**

Principles of community health; theories and methods of disease control; Major disease threatening public health; poverty-related health problems and health systems in low, middle and high income societies ;actors and disciplines involved in public health; epidemiological measures of disease frequency and risk ;preventive strategies; public health impact; cultural aspects of public of public health. Health promotion, role of public health worker.

Introduction to public health	Ayah R	
Essentials of epidemiology	Rao BS	AITBS Publisher
Health education: an essential text for schools	Nyamwayi & Oduol	AMREF
Participatory monitoring & evaluation for community projects	Mulwa FW	Paulines Publication Africa

Demystifying participatory community development	Mulwa FW	Paulines Publication Africa
Community strategy for delivery of level one services 2006	MoH-Kenya	

HCD 3123: Rural Sociology

42 Hours

Fundamental concepts in rural Sociology, rural society, rural organization, rural people and culture, elements in the structure of culture, nature and importance of social institutions - with particular reference to the rural agricultural and environment system, and the sociological implications in extension work

SCH 3112: Organic Chemistry

42 Hours

Introduction to amino acids: Proteins- primary, secondary, tertiary and quaternary structures. Protein denaturizing, introduction to lipids, neutral lipids, polar lipids. Fatty acids: structure, properties and nomenclature. Steroids and terpenes. Chemistry of bacterial and plant cell walls.

SMA 3112: Mathematics II

42 Hours

Coordinate geometry and equations of straight lines. Matrices: definitions, matrix algebra, determinants, transpose, adjoints, inverses and solutions of systems of linear equations using matrix method. Limits, continuity. Differentiation and integration of algebraic, trigonometric, exponential functions. Applications of differentiation and integration to rates of change, maxima, minima. Area under curve. 1st order D.E and their application.

CSC 3124: Information, Technology, and Society

42 Hours

Introduction to the basic concepts and applications of computer and Internet-related information technology and its impacts on individual users, businesses, groups, organizations, and society. Topics include access, evaluation, and use of digital information, ethical and security implications of information use and storage; human-computer interactions; social aspects of information systems; economic and legal issues; Ethical use and dissemination of health information, and professional presentation and communication of information. Information literacy skills that promote lifelong learning are developed through exposure to various existing

and emerging technologies, including information resources, communication methods and technology.

SLB 3121: Development Studies

42 Hours

Development studies as an autonomous discipline; the concept of development; an overview of the theories and paradigms of development; the relationship between economic growth and development; science and technology in development; developed and developing countries; issues in development: Social, economic and political; actors in development: The state, national and international NGO's, bilateral and multilateral institutions, multinational corporations (MNC's) and social movements.

ESD 3121: Social Ethics and Integrity

42 Hours

Definitions and concepts; categories of ethics; national cohesion; integrity; unity; structural injustices; ethnicity: positive ethnicity, negative ethnicity; peace: peace making, peace building, peace transformation; stake holders in national cohesion.

YEAR TWO SEMESTER ONE:

HCD 3211: Community Based Health Care I

42 Hours

Meaning, nature and role of community participation/involvement in health service provision; critical and /or catastrophic illness, HIV and AIDS, cancer, support mechanism for community involvement in health care; positive living with terminal illness; the concept of home-based care and support; self care for people with terminal illness; assessing learning needs for home-based care givers and patients; participatory monitoring and evaluation for home-based care; Voluntary Counseling and Testing(VCT); preparation for test results; breaking bad news and giving factual information; client reaction; post-test counseling; patient information and education; behavior change; Prevention of Mother to Child Transmission of HIV(PMTCT); Antiretroviral Therapy in HIV.

HCD 3212: Introductory Virology

42 Hours

Virus structure and architecture; Classification and nomenclature of viruses: DNA, RNA viruses and bacteriophages; Viral genetics and replication processes; Viral infections: epidemiology, prevention and control; Infection processes and interaction of viral particles with host cells; Viroids, prions and chronic debilitating diseases of undermined etiology; Techniques used for propagation, assays, identification and characterization of Viruses; Current trends in antiviral chemotherapy.

HCD 3213: Health Education and Promotion

42 Hours

Health promotion in the context of community health, The sociology of health promotion, The psychology of health promotion, Theories and models of health promotion, Health promotion strategy and policy formation, Equity and health promotion, Qualitative needs assessment and participatory research, Community and organisation development, Health promotion in action, Health promotion planning, research and evaluation, The role of health impact assessment in health promotion, Evaluation and skills inventory.

HCD 3214: Theories, Concepts and Trends in Health and Development 42 Hours

Definition of health, development and sustainable development; relationship between health and development. Definition of well being, standard of living and dignified livelihood. Factors affecting health status and healthcare; health sector reform, role of civil society in health development, poverty and health, policies in health and development. Donor relationships, trends and conditionality.

HCD 3215: Environmental Health

42 Hours

Environmental pollutant system and definition of poisons, drugs and toxins and principle of environmental epidemiology and clinical ecology, inorganics, organics, photochemical oxidants, pesticides, insecticides, nicotinoids, retinoids, fungicides rodenticides, acaricides, herbicides and radioactive materials; risk and hazards includes health risks chronic and lethal effects and impacts on ecosystem, toxicokinetics: half life and disappearance rates; relationship between dose and effects; breakdown and metabolism; environmental partitioning, transport and distribution in natural system. Routes of exposure and accumulation in organism and elimination in human and environment; Nutrient retention and transfer, techniques currently used in

assessment of environmental health and toxicology including quantitative, qualitative, molecular chemical, biochemical and biological test and assay for impact assessment; Principle of toxic waste management, environmental health; toxicology, and the law.

HCD 3216: Occupational Health and Safety 42 Hours

Studies on environmental and work hazards, their interactions with human health and their relevance to the effective maintenance and promotion of public health. Principles of occupational health, hazard and accidents. Risk assessment, human susceptibility and interaction with occupational and environmental exposures, housing and human health accident control and safety management policies and legislation.

SBI 3211: Basic Microbiology 42 Hours

Introduction to the science of microbiology; brief descriptions of nature and types of micro-organisms; prokaryotic and eukaryotic micro-organisms, introduction to bacteria, fungi, protozoa and viruses. Isolation, culture, staining microscopic examination techniques Sterilization methods, identification and classification of selected microbial groups e.g. bacteria and fungi. Microbial growth and nutrition. The effects of environmental factors on microbial growth and survival. Ecological relationships of microorganisms. The structure and replication of bacteriophage. Control of micro-organisms and chemotherapeutic agents.

PSP 3214: Geographical Information System 42 Hours

Analysis of digital geographic information using modern spatial data processing. Types include conceptual models of geographic data, database development, integration of remote sensing with GIS, elementary spatial analysis and functions and applications of geographic information systems. Types of simulation. Building simulation models, Conceptual models, Diagrammatic models. Statistical models GIS data integration and modeling; Vector data and its uses. Raster data and its uses. Modelling processes, Spatial models, Building models using GIS, Digital elevation models, Field data validation of models Limitation of models.

YEAR TWO SEMESTER TWO:

HCD 3221: Principles of Epidemiology 42 Hours

Concepts, and principle of public health and epidemiology; Epidemiological approaches Descriptive epidemiology, analytical epidemiology; concepts of disease and health in human communities; patterns of occurrence and determinants of communicable and communicable disease in human population; measurements of disease frequency and association; samples and surveys; records and registers; epidemiological type of infectious disease and epidemics including emerging and reemerging infectious; experimental epidemiology; epidemiological data and their interpretation and statistics; principles of molecular epidemiology and their applications and disease control; modeling and development of predictive parameters as indices for disease outbreak and computer application including health information; concepts of control of communicable and Non communicable diseases; Screening, prevention and immunization, treatment Including control of hospital acquired infections and pharmaco-epidemiology; Integrated approaches of disease control as public health procedures

HCD 3222: Health Policy and Administration

42 Hours

Different theoretical approaches and concepts used in policy analysis. The political system within which policies are made and the contextual factors that lead to policy change; the different arenas involved in health policy, the actors within these arenas, and the key features of processes of policy identification, formulation, and implementation; how to use in research and/or decision-making policy analysis framework introduced during the module.

HCD 3223: Preparedness and Management of Disease Outbreaks 42 Hours

Poverty related health problems and health care provision in developing countries; analysis of the most widespread disease and how they impact on specific regions with variable income; recruitment, training and development of health workers in a global setting, remuneration, equality of opportunity and redundancy; legal rights of both employees and employers in a variety of international settings. Management of disasters such as refugees, epidemics, pandemics, famine, prevention and coping mechanisms

HCD 3224: Community Based Health Care II 42 Hours

Analysis of local resources, nutrition surveys and other factors affecting development in various communities. Programme design and implementation for selected communities. The technical and public health issues of Reproductive Health; Fundamentals of Pregnancy, Contraception, Abortion. Sexually transmitted diseases; nutritional determinants of health and disease; Family planning and maternity care; family centered community based health care; primary problems of children and adolescents; issues in human lactation and breastfeeding promotion; Growth and development; Prenatal and School age childhood; infants at risk and children with disabilities; Maternal Child Health (MCH) programmes and policies; control of non-communicable diseases.

HCD 3225: Gender and Health 42 Hours

Social and cultural constructions of gender and effect on health outcomes via influences at individual, household, community and health service level; important differentials in mortality and morbidity profiles of men and women in developing and developed country settings; description of the multiple gender-health linkages for at least one major health outcome (options will include: HIV/AIDS, TB, CVD, depression, and lung cancer); importance of integrating gender concerns when: analysing the magnitude and causes of different health problems; determining priorities for health investment; developing policies for health promotion; and designing and evaluating health interventions; familiarity with some of the gender-analysis tools for healthcare planning and evaluation; existence of divergent policy/programme approaches to addressing sex differentials, and gender influences, in health and controversy surrounding these issues.

HCD 3226: Medical Bacteriology**42 Hours**

Classification and characteristics of pathogenic bacteria; occurrence, morphology, physiology, growth requirements cultural characteristics, antigenic structure, immunology, diagnosis, chemotherapy and immunity of pathogenic bacteria infection processes, attachment and interaction of bacteria to host tissues: surface molecules, toxins and other virulence factor including molecular and genetic bases of bacterial pathogenicity; agents for control of pathogenic bacterial infections: bacteriostatic and bactericidal substances, modes of actions and spectrum of activity; methods of identification of pathogenic bacteria; prevention and control of bacterial infections.

HCD 3227: Medical Entomology**42 Hours**

Introduction to arthropod biology and vector sciences and the concept of host of disease causing organism, distribution, anatomy, physiology, life circle, medical and economical importance of arthropods; Identification, recording, labeling and preservation of arthropods and other vector of medical importance. Control of insects and other arthropods that serve as vectors of disease-causing organism and those that cause tissue damage in man including relevant pathological factors; Emphasis on mosquitoes, tsetse flies, culicoides, acarines, fleas, lice, bedbugs, etc; Phlebotomus, myiasis causing flies, tabanides, similium; Non arthropod disease vectors including snails and crustacean organism.

HCD 3228: Medical Mycology**42 Hours**

Characteristics and classifications of medically important fungi. Diseases caused by fungi: Dermatophytes, Yeast infections: candidiasis, cryptococcosis. Pulmonary mycosis: Coccidioidomycosis, Histoplasmosis, Blastomycosis, paracoccidioidomycosis. Inoculation mycosis: Sporotrichosis, Chromoblastomycosis, Mycetoma. Opportunistic fungus diseases: Aspergillosis, zygomycosis.

YEAR THREE SEMESTERS ONE

HCD 3311: Epidemiology of HIV and AIDS, Cancer, Tuberculosis and malaria

42 Hours

Epidemiology of HIV infection and AIDS, transmission and status of infection in different age group population with reference to Kenya and the great lakes region; screening, surveillance, counseling and programme evaluation; emergence of tuberculosis and its association with HIV/AIDS, investigation of outbreak and drug resistance; causes and natural history of cancer; geographical distribution; cancer screening in public health; epidemiology of malaria and episodes of vector population increases; predictive indices for disease outbreaks

HCD 3312: Health Communication and Information Systems 42 Hours

Definitions of communication and information systems; print electronic and folk media; health belief model; risk relationships and social community-based health information ,education and communication systems; changing social norms, attitudes and values; the role of mass media in behavior change communication and disease prevention; evaluating health promotion and communication materials and programs; content, audience, channel, reach, frequency; producing health communication and promotional materials; analyzing the situation and setting program objectives, segmenting audience, determining the message, determining the channels of communication, implementing plan; building networks of support through social mobilization, social marketing and media advocacy; measuring success

HCD 3313: Health Economics and Financing 42 Hours

Concepts, impacts of a healthy population in an economy. Effect of health-care on health and the role of insurance. Demand and supply of health care. Behaviour of the physician. General market organization of the health industry. Examples of health financing in specific countries such as UK, USA, Kenya

HCD 3314: Community Based Health Education**42 Hours**

The concept and principles of community based education, learning needs assessment, curriculum development, implementing and evaluating a training program, lesson planning and presentation, development and use of learning aids, adult education.

HCD 3315: Maternal and Child Health**42 Hours**

Historical roots and contemporary structure of maternal and child health services. Major health problems of mothers and children and their key determinants. Programmatic and policy interventions developed to address the major health problems of mothers and children

HCD 3316: Medical and Veterinary Parasitology**42 Hours**

Ecological and epidemiological concepts: symbiosis, mutualism, commensalisms and parasitism (endo-, ecto-, obligate, facultative, accidental, temporary, hyper). Evolution of parasitism. Morphology and life cycle of some phyla: Protozoa – Amoeba (*Entamoeba histolytica*), Flagellates (*Giardia*, *Trypanosoma*), Sporozoa (Coccidia; *Plasmodium*, *Eimeria*, *Toxoplasma*), Platyhelminthes and Aschelminthes: Trematodes (*Fasciola*, *Schistosoma*), Cestoda (*Taenia*, *Echinococcus*), Aschelminthes/Nematodes (intestinal, blood and tissues types). Zoonotic diseases. Arthropods: Arachnids (ticks, mites), Insects (lice, fleas, bugs, flies, myiasis, parasitic hymenoptera), Crustaceans (copepods). Epidemiology, diagnosis, pathogenesis, immunology, treatment and control of the diseases caused by the parasites mentioned above.

PSP 3314: Spatial Data Analysis in Planning**42 Hours**

Spatial analysis: network, raster and surface, Contour interpolation. Point interpolation, Kriging estimation, Pattern analysis, spatial autocorrelation, directional and compositional data Fractals. spatial data management. Spatial data analysis: overlay operations, neighborhood and connectivity operations.

BEP 3315: Entrepreneurship**42 Hours**

Definition of Small and Medium Enterprise (SME); Theory and philosophy of entrepreneurship; Production efficiency, factor resource intensity, large vs. small enterprises, and justification for small enterprises; Understanding entrepreneurship: Starting a SME, creating and managing the venture; Sources of capital in venture creation; Consumer-entrepreneur relationship: role of product quality, innovation and skill in product quality; Marketing of SME product; Competitiveness; Scaling up; institutional arrangements; standards and quality; Barriers to SME development; role of SME in economic development; Case studies of successful SME: Indicators, vertical integration.

YEAR THREE SEMESTER TWO:**HCD 3321: Community Based Counseling****42 Hours**

Overview of the principles and practice of guidance and counseling; basics of counseling in different situations e.g. group counseling, pre-test and pre-surgery counseling, and counseling people with HIV/AIDs and other diseases and disorders, the principles of psychotherapy and determination of psychosomatic conditions. Goals of counseling and guidance. Skills in counseling.

HCD 3322: Health System Development and Management**42 Hours**

History of personal health services and Public Health, Health service systems: Methods of organizing and funding health services and their relative merits, Approaches to the assessment of needs for health care services, Evaluation of health services and strategies to maintain quality (including clinical governance, audit), Models and Organizational theory, Management theory, Management of change, Leadership, motivational theory, professional behavioral change, Negotiation and conflict management, Planning theory

HCD 3323: Demography and Health**42 Hours**

Techniques used in demographic analysis for the measurement of fertility, mortality, and population structure and change, including migration in human populations; steps in interpreting basic demographic data; usefulness of a demographic approach for the study of population and health issues; how different types of demographic information may be collected.

HCD 3324: Community Water Supply and Sanitation**42 Hours**

Sources of water; the nature of water; health issue related to water; diseases and condition related to water; water handling practices in various communities; water pollution and impurities in water; methods of water treatment and use ; the importance of sanitation; sanitation related diseases; methods of human waste and refuse disposal; socio-cultural factors that influence sanitation practices; socio-cultural/economic predisposal factor to health problems to various communities; methods of initiating a health education (sanitation) programme, sanitation related health problem; the concept of septic tank; the use of water borne sewerage as a sanitation option;

SBI 3324: History and Philosophy of Biology.**42 Hours**

History: the growth of biological thought from the ancient Greeks to the present day. Re-transmission to the West and the rise of Western science in the 12th and 13th centuries. The classical microHCDpists. The early taxonomists to Linnaeus. The overthrow of spontaneous generation theory: Redi, Spallanzani and Pasteur; modern ideas of the origin of life. Organic evolution: Buffon, Larmack to Darwin and Wallace; modern controversies. Mendel and modern genetics. The new synthesis. Watson and Crick and molecular biology. Philosophy: the presuppositions of science. The nature of scientific law and the meaning of scientific explanation. The hypothetico-deductive method. Scientific proof: verificationism and falsificationism. Reductionism in science. The unity and diversity of scientific methods. Role of concepts and their refinement in biological explanation. Science and Religion. Topical issues in science ,technology and medicine today: Gene technology in crop production and medicine.

SBI 3325: Research Methods.**42 Hours**

Philosophical aspect of scientific research and innovation and the methods and nature of science, including their application in biological science; preliminary review of state of scientific knowledge and literature survey of sample topics in biological science; different types of biological studies: Cross-sectional, vertical or prospective and follow up, retrospective cohort, time-series, case-report, case-series, case-control, controlled exposure, monitoring and surveillance. Research proposal formulation including generation of hypotheses, study objectives

and laying out research plans and questionnaires; Resources required: personnel, budgeting and seeking for research funds support and collaboration; units of measurements and scientific calculation used in biomedical research and practice. Data analysis, interpretation, reporting, publication and references. Seminar presentation and analysis.

SBI 3326: Biostatistics I

42 Hours

Introduction to Basic concepts; notation, tables and charts and Organisation of Data. Measures of location: Mean Median, Mode and Percentile for grouped and ungrouped data and Graphical estimation. Measures of dispersion: ranges, mean, deviation, variance and standard deviation skew ness and kurtosis. Probability, probability distributions, random variables and the normal distribution.

SBI: 3327: Helminthology

42 Hours

The morphology, life cycles, physiology, biochemistry and medical/economic importance of helminth and schistosome parasites infections. Epidemiology, diagnosis, treatment and control of helminthic and schistosome infections. Immunology of helminthic and schistosome infections.

YEAR THREE SEMESTER THREE

HCD 3331: Industrial Attachment

480 Hours

Students will be attached to biological science based research institutions for a period of 12-14 weeks (between the end of year 3 and beginning of year 4) in line with their chosen options for year 4; during the industrial attachment students will be expected to acquire first hand impressions and experience of practical activities through personal participation and involvement; academic member/s of staff will visit each student at their place of attachment at least twice for on-the-spot evaluation; each student will submit their report within the first 30 days of the 4th year semester one.

YEAR FOUR SEMESTER ONE

HCD 3411: Preventive Medicine

42 Hours

Development and testing of vaccines; administration of immunization; formulation of vaccine policy; strategies for prevention of nutritional diseases; community based control of vector borne

diseases ;biological and socio-cultural determinants of nutritional status; behavioral approaches to interrupt disease transmission; management of large vaccine trials; travel medicine, immigrant health and emergency medicine.

SCH 3412: Reproductive and Sexual Health 42 Hours

Review of reproductive system, introduction to sexuality, contraception, pregnancy, abortion and reproductive sexual health; screening and diagnosis of reproductive diseases; structural and functional basis of infertility, Ethical aspect of infertility and associated reproduction, Sexually transmitted disease and their control; sex awareness HIV/AIDS; Community health education for prevention of HIV/AIDS and other sexually transmitted diseases

HCD 3413: Community Health Law 42 Hours

Overview of the public health legislation. includes historical case studies, types of public health law, process of law enactment and enforcement, interpretation of public health laws., Laws of torts, international law and health.

**HCD 3414: Control and Prevention of Communicable and Non-Communicable Diseases
42 Hours**

An overview of communicable and non-communicable diseases; life cycles of specific infections: leishmaniasis, filariasis, trypanosomiasis. Transmission and control; groups and types; transmission and control of bacteria and rickettsial-salmonellosis, cholera, plague and pneumonia. Control strategies; pathogen and epidemiological aspects of viral infections in man and their control strategies; influenza, yellow fever, hepatitis, measles and poliomyelitis. Zoonotic infections of public health importance; investigations and control. Skin and eye infections; diagnosis, treatment, control significance to the health community. Communicable diseases immunology; host and agents immune reaction mechanism. Emerging and re-emerging diseases; hemorrhagic fevers. The economic, social, policy and epidemiological aspects of disease control.

HCD 3415: Project I 42 Hours

Project will be captured in a thesis that will be a detailed written report on a research carried out independently by individual students over a period of two semesters. Project titles are selected

with reference to the research interest and capabilities of staff. Main objectives – use of literature, learning of research techniques, an appreciation of the nature of biological problems and their solution - devising appropriate experiments and/or planning sets of interventions, requiring careful observation, data collection, analysis, discussion and drawing of appropriate conclusions. Projects should preferably be professionally relevant and demand-driven to enhance individual employment prospects. This first aspect will dwell on the objectives of the proposed project, literature review and materials and methods.

SBI 3411: Bioinformatics and Computational Biology 42 Hours

The basics of computational biology and bioinformatics including intelligent systems, cybernetics and their applications in biomedicine; Resources, sequence databases and information retrieval systems; Windowed analysis, statistics and dot matrix plot; Homology and introduction to alignments and data searches including evaluation of scoring systems: FASTA,BLAST, etc, Probability models and Bayes theorem; genetic algorithms and evolutionary computing; gene modeling, resources and ontologies; computer based modeling systems for macromolecular analysis and crystallography; phylogenetics, multiple alignments and trees; Gene and protein families, and motifs; gene and protein structural properties, homologies, and use of computational biology and bioinformatics in functional genomics and proteomics.

SBI 3415: Biostatistics II 42 Hours

Central ideas of estimation, confidence intervals and hypothesis tests. To perform sensible statistical analyses using the computer package SPSS and to report the results of analysis effectively. Large sample estimation; large sample tests of hypothesis; small sample tests. Hypothesis tests (including test of association for tables). Experimental design and Analysis of Variance. Regression and Correlation. Multiple regression. Discrete distributions. Tackling non-standard problems (including data transformations). Overview and tips on writing statistical analyses.

YEAR FOUR SEMESTER TWO:

HCD 3421: Mental Health 42 Hours

Classification of major mental disorders. Evidence on aetiology and treatment of mental disorder; public health significance of mental illness; application of epidemiological research methods to the study of mental health; influence of historical, cultural, socio-economic, and discrimination on mental illness and mental health service delivery; how mental health policies are made; how mental health issues are related to and can be integrated with public health priorities, such as reproductive health, conflict and primary health care.

HCD 3422: Community Health and Nutrition

42 Hours

Focuses on basic principles of nutrition and their role in community health. Link between diet, nutrition and health; Nutrition and metabolism: the basic chemistry of food, the cell and body composition, the digestion, absorption and assimilation of nutrients within the body; Major metabolic pathways and patterns of fuel consumption; Energetic and biochemical concepts that underpin nutritional recommendations; Physiological need for vitamins; Changes in human dietary patterns and the origins of unhealthy eating in society; Dietary factors that relate to diseases and their dietary management; Derivation and interpretation of population based. Quantitative nutrient goals and strategies for prevention of dietary related diseases by population based dietary changes; Anthropometric measurements in assessing and storage; Nutritional status of individuals in a population; Quality control and food hygiene, sanitation, and storage Nutrition interventions in emergency situations; Maternal and child nutrition Etiology, pathophysiology, management and functional consequences of nutrition and management of severely malnourished and obese individuals

HCD 3423: Negotiations and Peace Building

42 Hours

Key issues; peace, conflict, negotiation, peace building, conflict resolution. Rational for peace building and negotiation, Conflict transformation, resolution, prevention and management, Strategies for conflict resolution, prevention and resolution, human rights and international conventions on refugees. Health as a source of conflict in society (resource allocation, distribution and management, inequality, social provisioning). The principles of negotiation; The common purpose (expected outcomes). The five significant elements. Hindering factors to peace negotiations. The role of a community health worker in peace negotiation processes

HCD 3424: Program Monitoring and Evaluation**42 Hours**

Defining monitoring and evaluation; Role of monitoring in program evaluation; Comparing research and evaluation in development projects; Characteristics of monitoring projects; Types and purpose of evaluation; The process of evaluation; Designs of evaluation: participatory, survey and secondary data; Comparing monitoring and evaluation approaches; managing feedback and utilization of evaluation results; Case studies in monitoring and evaluation in development projects.

Steps in designing Health and Information Systems and Management Information Systems (HIS/MIS). Quality assurance, Developing and Implementation plan, Mobilization of resources, Monitoring and evaluation, Merits of a functional HIS/MIS, Problems associated with functioning of HIS/MIS, Emerging issues in information technology

HCD 3425: Environmental Toxicology and Health Care**42 Hours**

Chemical and biochemical principles governing toxicity of environmental pollutants; route of entry, absorption metabolism, excretion, cellular action, host susceptibility ,responses, waterborne pathogens as contaminants in drinking water; water as habitat for arthropod vectors of diseases; contamination of water sources and habitats of diseases of water catchment areas; water sanitation and strategies in prevention of waterborne diseases; water hyacinth as a health problem; food safety; food borne infections and intoxications.

HCD 3426: Project II**42 Hours**

Project will be captured in a thesis that will be a detailed written report on a research carried out independently by individual students over a period of two semesters. Project titles are selected with reference to the research interest and capabilities of staff. Main objectives – use of literature, learning of research techniques, an appreciation of the nature of biological problems and their solution - devising appropriate experiments and/or planning sets of interventions, requiring careful observation, data collection, analysis, discussion and drawing of appropriate conclusions. Projects should preferably be professionally relevant and demand-driven to enhance individual employment prospects. The report should be submitted two weeks before the end of the semester.

SBI 3443: Parasitology**42 Hours**

Ecological and epidemiological concepts: symbiosis, mutualism, commensalisms and parasitism (endo-, ecto-, obligate, facultative, accidental, temporary, hyper). Evolution of parasitism. Morphology and life cycle of some phyla: Protozoa – Amoeba (*Entamoeba histolytica*), Flagellates (*Giardia*, *Trypanosoma*), Sporozoa (*Coccidia*, *Plasmodium*, *Eimeria*, *Toxoplasma*), Platyhelminthes and Aschelminthes: Trematodes (*Fasciola*, *Schistosoma*), Cestoda (*Taenia*, *Echinococcus*), Aschelminthes/Nematodes (intestinal, blood and tissues types). Arthropods: Arachnids (ticks, mites), Insects (lice, fleas, bugs, flies, myiasis, parasitic hymenoptera), Crustaceans (copepods). Epidemiology, diagnosis, pathogenesis, immunology, treatment and control of the diseases caused by the parasites mentioned above.