

## **PUBLIC HEALTH BPH COURSE CONTENTS**

### **INTRODUCTION TO BIOLOGY AND CHEMISTRY**

#### **Biology:**

- Introduction to Biology
- Cell Biology: Cell structure; Biological molecules; Enzymes; Cell membranes and transport; and Cell and nuclear division'
- Transport; gas exchange
- Microorganisms: Infectious Diseases; and Immunity
- Photosynthesis
- Energy and respiration
- Genetics and gene regulation: Genomics
- Evolution
- Human reproduction
- Ecology: Biotechnology; and Conservation and crop production.

#### **Chemistry:**

- Applications of analytical chemistry.
- Atoms: Atomic structure; and Molecules
- Chemical bonding
- Chemical energetic
- Electrochemistry
- Equilibria
- Inorganic chemistry
- Organic chemistry
- Periodic table
- Reaction kinetics
- States of matter
- Stoichiometry

### **INTRODUCTION TO MATHEMATICS AND PHYSICS**

#### **Mathematics:**

- Basic concepts in Mathematics: four basic operations (addition, subtraction, multiplication, division)
- Indices
- Distributive law
- Percentages
- Decimals
- Equations
- Graphs and ratios
- Common notations
- Algebra; quadratics; functions
- Coordinate geometry
- Circular measure
- Trigonometry
- Vectors
- Complex numbers
- Series
- Differentiation

- Integration
- Logarithmic and exponential functions

**Physics:**

- Basic concepts in Physics: introduction to Physics; and Physical quantities and units
- Newtonian Physics; Matter
- Oscillations and Waves
- Electricity and Magnetism
- Modern Physics
- Direct sensing; remote sensing
- Communicating information

**GENERAL PRINCIPLES OF SOCIAL PSYCHOLOGY**

- Introduction to Social Psychology: The Social Self; and Attribution
- Attitudes and Prejudice
- Helping Behavior
- Social Influence: Group Dynamics.
- The Environment and Social Behavior
- Introduction to medical anthropology
- Ecology, adaptation and evolution
- Cultural, political, economy, and health: Health transitions
- Nutrition, growth, and child health
- Reproductive health: Every day violence; and Infections and inequalities
- Social inequalities, stress, and disease
- Embodiment: Anthropology and Public Health

**INTRODUCTION TO COMPUTERS AND INFORMATION, COMMUNICATION TECHNOLOGIES**

- Introduction to computers organization, software and hardware
- Computer applications and the social and economic implications: email; video--- conferencing; databases; e---commerce; virtual reality applications; multi---media; and data protection; privacy; hacking; viruses
- Systems life cycle: Systems analysis and design; and Implementation, evaluation, and maintenance
- Problem solution including algorithm design; programming techniques; Algorithm design and testing; Programs, representation of algorithms and documentation; and Logic gates and circuits
- Generic software and the organization of data; Generic software packages; and Data
- Hardware, systems and communication
- Hardware: Computer; micro---computer; input; output devices; and broad classes of processor power
- Systems and communications: Batch; online; multi---access real---time transaction processing; multitasking; network and process---control operating systems; Interfacing; management of files; file directories; peripheral device control and buffers; and Types of system.
- Information and Communication Technologies

## **COMMUNICATION SKILLS AND BUSINESS ENVIRONMENT**

- Introduction: Basic communication process; Purpose of communication skills in Business and profession training; and Relation of Business English and common core English
- Library Skills: Library systems; Locating skills; Documenting sources; Note making; and Listening and reading skills
- Writing Skills: Note making and Note Taking; Information from Visual Sources; Business Correspondence; and Reports
- Business as a system: Business and society; Adaptation; Domain shift; Economic environment and business; Demographic environments and business; Socio---economic environment and business; Chronological/technological environment and business; Natural environment and business; and Political environment and business.
- Business ethics, Social responsibility and legal compliance: Business ethics and ethical approaches; Ethical guidelines for managers; Business and its various publics (Employees and labor unions; and the government and local authorities); Society and Multinational Business; Nature of MNCs; and Benefits and costs of the host nations
- Global problems and expectations

## **INTRODUCTION TO PUBLIC ADMINISTRATION AND POLITICAL EDUCATION**

### **Public Administration**

- Understanding public administration
- Meaning, Nature, Scope and Significance of Public Administration.
- Public Administration as an activity (of government)
- Public Administration as an academic discipline.
- Public Administration and other Disciplines
- Influence of Environment on Public Administration
- Principles, theories and approaches in the study of organization & management
- Classical Theory of Organization: Bureaucracy---Basic Elements, Functions and Dysfunctions
- Classical Theory of Organization: Principles of Administration
- Neo---classical Theory of Organization: The Human Relations Approach.
- Hierarchy, Authority, responsibility, coordination, Delegation, centralization and Decentralization.
- Types of Structures: Line and Staff relationships; Departments; Board; Commissions; public enterprises
- Dynamics in administration
- Leadership in Administration: Approaches and Styles
- Decision making in Administrative Organization
- Motivation in Administration
- Public personnel administration: Definition and functions; Recruitment and Selection; Patronage versus Merit System; Minorities in the Job Market; and Political Claims on the Civil Service

### **Political Education**

- Introduction to state management and administration
- Administering national government: Parliament; The Executive; and The Legal System and the Judiciary
- The nature of politics and Government
- Theories and Roles of the State: Marxist; Non---Marxist; and Pluralist Theories.

- Democracy; democratization and Governance: Conceptual Definitions; Characteristics; Elections and electoral systems; and Constitutions and Constitutionalism.
- Public Policy making process: Policy Design; Policy Decision making; Policy Implementation; and Policy Evaluation.

### **GENERAL PRINCIPLES OF PUBLIC HEALTH**

- Introduction to public health: Defining health and public health; Landmarks in the evolution of public health; Vision, mission and values of public health; Core functions of public health; Essential services of public health; and Assessing the health of the population
- Society and health: Definitions and concepts; Factors influencing health service utilization; Provision of healthcare; Components of health care system; and Zambia's health reforms
- Public health assessment: Introduction; Assessing health status; Assessing health needs; and Assessing health impacts on a population
- Concept of community diagnosis: Definition of a community; Definition of community diagnosis; Process of Community diagnosis; and Health indicators

### **LAW AND ETHICS IN PUBLIC HEALTH PRACTICE**

- Public health Act and related legislations
- Public health law enforces mentagencies and authorization
- Ethical issues in public health: What should we be doing? For whom should we be doing it; and at what cost to others? And Who should decide and how?
- Principle so ethical debate and behavior: Autonomy; Beneficence; Non---maleficence; and Justice
- Using framework of ethics in making difficult choices: Evidence of effectiveness; Equity; and Patient choice

### **HEALTH PROMOTION AND EDUCATION**

- Basic concepts in health promotion
- Determinants of health
- Approaches to health promotion: Disease prevention approach; The educational approach; The ecological approach; and the empowerment approach.
- Origin and milestones in health promotion: The Lalonde report; Alma Ata and the primary health care movement; The Ottawa charter; Health promotion conferences; and The Bangkok charter
- Health promotion strategies: Healthy public policy and advocacy; Community development and social mobilization; Health education and behavior change communication; and Organizational change and capacity development
- Infrastructure for health promotion

### **MANAGEMENT OF HEALTH INFORMATION SYSTEMS**

- Introduction to HMIS/DHIS
- Definition of terms: Information; Data; Health information system; District information system; and Quality management and Legal terms of health information.
- Introduction to Management Information system
- Zambia Health Information System (HMIS): Background; Objectives; Rationale; Principles; and Components and National indicator data sets

- District Health Information system: Design and principles

### **Data production**

- Data collection: Introduction to the principles of Information; The Information cycle; and Data handling processes in the information cycle
- Use of tally sheets: Data and information; Data definitions; Sources of data; and Essential data sets
- Production and processing of health data at facility: Introduction; Types of HMIS tools and their purposes; Aggregation of data; and Conditions for efficient and correct data collection
- Indicators: Definition and formulation of indicators; Description of ideal indicators; Classification of indicators; and Indicators for national and international reports

### **Data processing**

- Instruments of data collection: Definition and types of data collation; Functions of the HMIS and DHIS software; and Application of data to the DHIS1.4
- Archive systems for Health Data: Definition of archiving and retrieval of data from archive; Rationale for archiving and retrieval of health data; and Archiving of health data

### **Data analysis**

- Data Analysis: Introduction to data analysis; Terms used in data analyses (Meaning and use); Process of data analysis; Epidemiological concepts in data analyses; Measurement and calculation formulas; and Identify indicators for specific programs
- Presentation of data: Rationale for appropriate presentation of data; Presentation of data in simple tables; Types of graphs to present various types of data; and Design of appropriate graphs for display of data.
- Feedback on Data: Rationale for feedback; Mechanisms for giving and receiving feedback (CRISP); Data flow policy and feedback mechanism; Strategies for appropriate feedback; Presentation of benchmark results; and Feedback and staff motivation.
- Interpretation of Information: Data handling processes for interpretation of data; Factors influencing the interpretation; Preparation for interpretation; Essential ingredients; Interpretation tool in decision-making; and the risks of manipulation

### **Data quality**

- Quality processing---Ensuring data quality: Definition of quality; Importance of good data quality; Standards and standard operating procedures; Mechanisms for assessing data quality; Common problems with data quality; and Corrective actions to common problems.
- Quality of health records: Types of health records; Standards and standard operating procedures; and Supervisory roles to ensure quality of data.

## **EPIDEMIOLOGY**

- Descriptive epidemiology: Person, Time and Place; Counts, ratios, proportions and rates; Incidence measures; and Prevalence measures
- Analytic epidemiology: Hypothesis formulation in epidemiologic studies; Measures of effect (odds ratio, risk ratio, etc.); and Statistical parameters in epidemiologic studies.
- Evaluating associations: Concepts of statistical associations; Chance, bias and confounding; and Validity
- Types of study designs: Cross sectional studies; Cohort studies; Case control studies; and Experimental studies.
- Infectious disease epidemiology: Definitions used in infectious disease epidemiology; Disease transmission and its dynamics; and Outbreak investigation

- Measures of public health importance: Attributable risk; Relative risk; and Disease prevention and control
- Screening: Characteristics of diseases appropriate for screening; Role of screening in the secondary prevention of disease; and Measures of the validity of a screening test (sensitivity and specificity).
- Field investigations: epidemiology in action
- Surveillance
- Modeling
- Student project

## **BIOSTATISTICS**

- Introductions: Introduction to Biostatistics; Uses of Biostatistics; and Types of variables
- Descriptive statistics: Frequency tables; Graphs and histograms; Bar charts and pie charts; and Shapes of frequency distribution.
- Measures of central tendency: Mean, median and mode; and Selection of appropriate measures of central tendency
- Measures of dispersion: Interquartile range; Degrees of freedom; and Variance and standard deviation
- Introduction to probability theory
- Normal distribution: Characteristics of a normal distribution; Uses and applications; and Standard score
- Experimental designs
- Sampling designs
- Design of data collection and sampling instruments
- Data collection in the field
- Qualitative and quantitative methods of data analysis
- Basic statistics computing: Introduction to computers; Statistical software (SPSS, SAS, Epi-Info, STATA); Data entry using Epi-Info; Data processing using SPSS; and Use of other computer software
- Analyze data using statistical software, interpret outputs and present the results:
- Standardized Normal Deviate (SND) Z-test: Z-test for one sample; Confidence interval for population mean; Z-test for two samples; Confidence interval for the difference between population mean; Z-test for two samples; and Confidence interval for the difference between two population mean.
- Student t-test: T-test for one sample; Confidence interval for a population mean; T-test for two independent samples; and Confidence Interval for a difference between two population mean
- Correlation Coefficient and simple linear Regression:
- Measures of correlation: Interpretation of correlation coefficient; Linear regression; Interpretation of regression coefficient; Confidence interval for the slope; Assumptions for Biostatistical testing; Hypotheses testing and confidence intervals; and Tests of significance and post-hoc: ANOVA
- General linear models
- Survival analysis
- Non-parametric tests
- Surveys and sampling

## **HEALTH SYSTEMS RESEARCH AND PROJECTS**

- Identification of the research problem: Formulation of the Title; and How to write the introduction/background
- Review of literature: The main purpose of reviewing literature; How to search for literature; and Reference and referencing
- Justification/rationale
- Statement of the problem and hypothesis formulation
- Objectives: Main objectives; and Specific objectives
- Methodology: Study design; Site; Sampling; Sample size; Data collection techniques; Data management and Analysis; Time line and Research ethics
- Budgeting
- Proposal writing
- Develop a research proposal that should deal with a single subject under one of the following headings related public health:
  - Food (e.g. food prosecution, food poisoning)
  - Housing (e.g. unfit individual dwelling house)
  - Environmental management (e.g. Action taken on nuisance, prosecution, ISO14000)
  - Health and safety (e.g. Investigation of accidents and prosecution)
  - Student under BPH 410 will be expected to display (in the presence of mentor or supervisor) evidence of vocational competence in the discipline of public health to a small group of their peer or examiners

## **COMMUNICABLE DISEASES**

- Introduction: Definition of terms used in communicable diseases; Dynamics of disease transmission; International Health Regulations; and Listing diseases, which are notifiable in Zambia as per Public Health Act CAP 295 and other policy documents
- Common communicable diseases in Zambia
- Describe the epidemiology aetiology, basic manifestations and course, public health impact, prevention, detection and available treatment of the following:
  - Communicable diseases involving faecal contamination of water, food and other vehicles of transmission: Poliomyelitis, Dysentery, Amoebiasis, Cholera, Typhoid, Paratyphoid, Giardia intestinalis, Salmonellosis, Ascariasis, Enterobiasis, and Ancylostomiasis.
  - Communicable diseases caused by ingestion or contact with animals or their products: Rabies Tetanus Brucellosis, Ebola, Taeniasis, Anthrax, Bovine Spongiform Encephalopathy (BSE) and Weil Disease.
  - Airborne or droplet communicable diseases: Tuberculosis, Whooping cough, Diphtheria, Measles, Mumps, Meningitis 'Chickenpox, Smallpox, SARS and other virus infections.
  - Communicable diseases involving invertebrate vectors as hosts: Malaria, Bilharzia and Sleeping sickness, Tick fever and other arthropod borne diseases.
  - Sexually transmitted infections: Gonorrhoea, Syphilis, Chancroid, Trichomonas vaginalis, Lymphogranuloma venereum and Acquired Immune Deficiency Syndrome
  - Contagious communicable diseases: Ringworm, Scabies, Leprosy, Trachoma and Conjunctivitis
- Control of communicable diseases:
  - Control strategies: The agent (disinfection, treatment); The transmission route; The host & community (treatment, isolation, quarantine, immunization); and the environment
  - Cleaning and disinfection: Types of disinfectants: Gaseous, liquid, physical, natural and heat; and Methods used in disinfecting premises, different materials and equipment.

## **NON---COMMUNICABLEDISEASES**

- Epidemiology of non---communicable diseases (NCDs)
- Importance of NCDs
- Risk factors for NCDs
- Burden of NCD
- Diabetes: Prevalence, cause, general symptoms, management, available tests, community diagnosis and control schemes
- Hypertension: Prevalence, general symptoms, predisposing factors, cardiovascular diseases routine screening, life style and management
- Cancers: Prevalence, incidence, prevention and control of Cervical, Breast, Liver, Prostate cancers
- Tobacco: Tobacco use epidemic, Tobacco and diseases; economic burden of smoking; second hand smoke; smoking cessation/control strategies.
- Obesity: Description, incidence, health implications, dietary principles and control, life style and social factors

## **MENTAL HEALTH**

- Introduction to Psychology: Definitions; Psychology and Behavior
- Attitudes: Importance of psychology in community health work; and Interpersonal relationships with others in the community and Attitudes
- Mental Health and Common Psychiatric Conditions
- Introduction to mental health
- Definitions: Mental health; Mental ill health; Mental illness; and Mental disorder
- Psychiatry:
- Causes of mental ill health; and Precipitating factors of mental ill health
- Signs and symptoms of minor and major mental illness
- Management of minor and major mental illness
- Mental health and HIV
- Alcohol and substance abuse
- Epilepsy
- Management of mental illness: History taking; Use of medicines; Counselling; Home based care; and Home visit
- Role of CHA in the rehabilitation of mental health patients: Discharged patients; Alcohol related cases; Epileptic patients; and HIV related cases on treatment
- Introduction to Sociology
- Definitions: Sociology; Population; Society; Community; and Culture and traditions
- Norms and beliefs
- Health beliefs, practices and their influence on health
- Social systems: Culture; Religion; Legal; Political; and Social---economic situation
- Family and community
- Family: Definition of family; Types of families; and Marriages
- Community: Definition of community; Organization of the community; and Types of communities---Rural, Urban
- Social services
- Socialization: Primary; and Secondary



## **FOOD TECHNOLOGY AND HYGIENE**

- Quality control and principles of Hazard Analysis Critical Control Point (HACCP)
- Quality control: Definition; principles of quality assurance and purpose of quality control programme; setting standards; adulteration of foods; external quality control activities; importance of food standards and legislation; sensory assessment of foods and analysis of results; and Quality assurance systems and Good Manufacturing Practice/Good Hygienic Practice (GMP/GHP)
- Preparing for HACCP: Management, personnel, training and prerequisites; baseline audit and gap analysis in relation to: time and temperature; cleaning and disinfection; personal hygiene; pest control and prevention of cross-contamination
- Development of HACCP plan: What is HACCP plan, describe the product and flow diagram, critical control points, control limits, monitoring requirements and corrective actions.
- Implementation of HACCP: Implementation requirements and team training, monitoring system, record keeping, facilities and equipment, confirmation and verification that implementation plan complete.
- Maintaining HACCP plan: Verification through audit, data analysis, keeping abreast of emerging hazards, updating
- Band amending HACCP plan, ongoing training programs
- Practical food inspection
- Conduct inspections on food premises and report on: Food markets; hotels; restaurants; dairies; bakeries; butcheries; cold rooms; tearooms; food processing plants; abattoir; bars and taverns
- Visit to dairy farms, milk and milk product processing plants, dairy laboratory, milk shops and ice cream shops
- Participate in the disposal of condemned foodstuff
- Draw foodstuff samples and interpret results for bacteriological and chemical analysis
- Identify diseases or types of defects on each of the following: Poultry, eggs, fish, game meat, canned foodstuff, cereals and vegetables
- Investigate and report on complaints related to food

## **WATER SANITATION AND MANAGEMENT**

### **Waste disposal --- Sanitation:**

- Introduction: Excreta-borne diseases; Impact of excreta disposal on the environment; Social and economic consideration; Health education in relation to sanitation; and the Nitrogen cycle.
- Conservancy sanitation: Types and merits of various designs of excreta disposal systems related to soil conditions; Water availability and economic and social standards including temporary latrines for workmen and military maneuvers: Bucket systems; Middens; Improved pit latrines; Pour-flush toilets; Aquap rivies; and Septic tanks
- Health hazards associated with effluent and waste water reuse: Effluent and waste water quality; Water related and water-borne infections; Irrigation and fish-farming; and Water quality and related public health problems

### **Water supplies:**

- Importance of water supply: Household and community needs; and Water-borne and water related diseases
- Sources of water: Natural water cycle; Surface water (ponds, lakes, dams, rivers and streams); Under-ground water (springs, wells, boreholes); and Rainwater catchment and desalination
- Ground water resources: Aquifers and their protection from excessive draw down and pollution; and the impact of mining on groundwater

- Water supply schemes: Planning, operation, maintenance and management (including financing) of water supply schemes in urban and rural communities; Waste prevention; Demand management; Prevention of pollution and vandalism; and Social and costing factors
- Water treatment: Natural purification (oxidation, filtration and storage); Artificial purification (storage, sedimentation, coagulation and filtration); Micro---strainers (slow and filters, rapid sand filters and rapid pressure filters); and Disinfection(chlorination) and sterilization
- Water Quality: Standard parameters of fitness for human consumption; Sampling for physico---chemical and bacteriological parameters; Interpretation of bacteriological and chemical analysis reports; and Effects of deficiencies or excess levels of fluorides, iodine, nitrates, arsenic, sulphates, calcium and industrial contaminants)
- Maintenance and use of equipment
- Equipment: Pipes; Storage tanks; Reservoirs and pumps including displacement; Lift pump and centrifugal pumps; and Airlift pump and hydraulic ram
- Water supply and Sanitation programmes: Programme context and content: Base---line surveys; Assessment of health risks; Economic and social considerations; and Maintenance and management planning.

## **TOXICOLOGY AND DRUGS**

- Discovering new drugs with a special focus on current and emerging approaches for the rational design of drugs that are both effective and safe.
- Absorption, distribution, biotransformation, elimination, calculation of dosages, variability in drug response, adverse drug reactions and special interest topics.
- Biological action of drugs on membranes, enzymes, receptors, neural and hormonal systems, transmission and modulation.
- Systems pharmacology: Concepts of the properties of drugs and chemicals; their interaction with living systems; and their constituent parts
- Mechanism of action and pharmacological properties of drugs acting on: Autonomic and central nervous systems, cardiovascular, renal respiratory, gastrointestinal, immunological; and endocrine systems
- Endogenous compounds: antimicrobial and anti---inflammatory drugs; and chemo therapy and special topics in pharmacology.
- Toxicological problems encountered in animals and humans: Biochemical mechanisms and clinical factor soft toxicological models of drug---related diseases;
- Modern experimental techniques currently utilized in toxicology: Experimental design and the analysis of pharmacological and toxicological data
- Toxicology of herbal medicines: Effects that pharmaceuticals and chemicals have in society; examining traditional and contemporary problems in toxicology.
- Management of vector control chemicals: Classification of chemical products; and Classification of agro and public health chemicals
- Environmental toxicology and ecotoxicology: Environmental hazards and risk due to chemicals spraying equipment
- Types of pesticides, their formulation and concentration: Wettable powders, dusting powders and emulsifiable concentrations,
- Fumigation and types of insecticide resistance: How to combat them; Methods of spraying residual insecticides; and Disposal of pesticides and insecticides and their containers.

## **ARTHROPODS OF MEDICAL IMPORTANCE**

### **Part one: Vector control**

- Introduction to entomology
- Anatomy and ecology of arthropods.
- Relationships between man and arthropods.
- Arthropods of public health concern and their control: Classification, identification, breeding habit, habitats, life cycle, dissemination, medical importance (diseases transmitted), impact assessment and control measures, economic importance and environmental management of:
- Flying insects: Mosquitoes (Anopheles, Culex and Aedes), tsetse fly, housefly, sand fly, putsi, blister beetles, buffalo gnat, blowfly, maggot fly, cockroaches and reduviid bug (assassin or kissing bug).
- Ecto parasitic insects: Lice, fleas (rat flea, jigger flea and cat flea), ticks and mites.
- Other insects of public health concern: Bed bugs, crickets, bees, ants, tumbu fly, wasps, silver fish, green beetles, weevils and moths.

### **Rodents and their Control**

- Classification of rodents in relation to family: Genus, sub---genus and species.
- Identification: Rattusnorvegicus, Rattusrattus and Musmusculus and others.
- Description: Breeding habits, behavior of miceandrats and the economic importance.
- Common diseases transmitted by rodents: Plague, Leptospirosis, Trichinosis, Murine typhus, Poliomyelitis, Rat bite fever, rickettsia pox, Food poisoning, Rabies, Amoebic dysentery, Typhoid and Foot and mouth disease.
- Control of rodent infestation: Investigation, toxic effects of pesticides, methods of treating pests and control methods.

## **APPLIED ENVIRONMENTAL HEALTH AND POLLUTION**

- Environmental pollution
- Introduction:
- Definition of the following terms (Environment, and Eco---system)
- Physical, Social and Economic environments
- Environmental systems
- Definition of pollution
- Categories of pollutants
- Types of Pollution
- Types of Pollution:
- Soil Pollution (Definition of soil pollution, Potential causes of soil Pollution, Effects of soil pollution, and Mitigation measures)
- Air pollution (Definition of our pollution, Potential causes of air pollution, Effects of air pollution, Methods of measuring air pollution, Mitigation measures, and International conventions)
- Water Pollution (Definition of water Pollution, Importance of aquatic life, Surface and underground water resources, Potential causes of water Pollution Effect sofwater Pollution, and Mitigation measures)
- Noise Pollution (Definition of noise pollution, causes of noise Pollution, Effects of noise pollution, Methods of detecting and measuring noise pollution, and Mitigation measures).
- Radiation Hazards and Nuclear Energy:
- Definition of radiations; Radiation rays and types of radiations; Use of radiation rays;
- Nature and properties of radiations; and Hazards associated with radiations

- Definition of ozone layer; Use of ozone layer; Definition of ozone depletion; Causes of ozone depletion; and Mitigation measures.
- Environmental Education: Definition of Environmental Education; and the role of environmental education in environmental management.
- International Conventions and Agreements: Rotterdam convention; Stockholm convention; and Basel Convention.
- Environmental Law: Environmental Pollution and Protection Control Act, CAP204.
- Environmental impact assessment
- Description of the following: Environmental impact assessment; Environmental risk management; and Environmental project brief
- Purpose of environmental impact assessment
- Participants of environmental impact assessment
- Procedure of environmental impact assessment
- Contents of environmental impact assessment
- Social, economic, political, physical and environmental benefits
- Adverse effects of social, economic, political, physical and environmental effects
- Mitigation measures to adverse effects
- Public hearing
- Final decisional letter

## **OCCUPATIONAL HEALTH AND ERGONOMICS**

- Occupational Health and safety
- Introduction: Definition of the following terms (Occupational health, Occupational safety); Aims of occupational health; Functions of occupational health; Importance of occupational health; and How people's health is affected by their work.
- Diseases Associated with occupations: Diseases in agricultural industry; Mineral dust diseases and Effects of smoking.
- Dust, Gases and Vapours: Effects of dusts; Effects of gases; and Effects of vapours.
- Occupational health risks: Agents; Chemical agents; Physical agents; Infective agents; Mechanical agents; and Psycho---social agents.
- Controlling Pollution in Work Places: Elimination of occupational health hazards; Controlling pollution in work places; Ventilation; and Hygiene.
- Ergonomics
- Definitions of Working Position: Standing; Sitting; Visual condition; Strenuous work; Lifting; Panels and controls; and Tools.

## **OCCUPATIONAL ACCIDENTS AND DISEASES**

- Principles of accident prevention and investigation: Introduction; Causes of accidents; Analysis and classification of accidents (by type, nature of injury, bodily location); Serious accidents, minor accidents and near accidents;
- Analysis of accidents (statistics, frequency and severity rates, presentation of data); Factory design, construction and layout; and Machine guarding
- Good order and good housekeeping; Personal protection equipment (goggles, safety shoes, gloves, hard hats, aprons, face mask, and ear protection); Use of safety colors, notices, signs and labels;

- The loss problem (death economic loss)
- Investigation of accidents (procedure and reporting); and Management responsibilities
- Practical application of accident prevention principles: Machinery safety; Electrical safety; Pressure unit's safety; Fire safety; Construction safety; Handling and safety storage of explosives; and Major hazards and accidents control
- Establishment of emergency response procedures in a work place: Introduction; Procedures to be followed in the event of an accident or emergency; The information to be given to emergency services; Identification of local organization qualified to give First Aid Training; and Explanation and discussion of occupational health issues
- Occupational diseases and hazards: Occupational eye injuries and control; Occupational peripheral nerve damage; Occupational pulmonary diseases and control (Pneumoconiosis; silicosis, Asbestosis, Occupational bronchitis and emphysema, occupational asthma, byssinosis, extrinsic allergic alveolitis)
- Zoonoses: Anthrax, brucellosis, rabies and leptospirosis; Occupational dermatosis and prevention; Personal hygiene, protective clothing and barrier creams; and Relationship between employment and non---occupational diseases (HIV/AIDS)
- Definition, causes, mode of infection, symptoms and myths of HIV/AIDS: Impact of HIV/AIDS on family, enterprise and development. Factors which impact on HIV/AIDS such as poverty and work place hazards.
- Prevention, information, education and training.
- Precautions and first aid. Voluntary counseling, confidentiality, testing and investigations on discrimination.
- Preventive occupational medicine: Occupational health screening programmes; Determination of fitness to work; Biological monitoring; Medical screening; Disability assessment and workers compensation; Surveillance system for early detection of disease; Vaccination and immunization; Care of special working groups (young, HIV/AIDS, handicapped, pregnant women); and Education and propaganda

## **CLIMATE CHANGE AND PUBLIC HEALTH**

- Climate change: key data and facts; Impacts of climate change on health; and Extreme heat
- Natural disasters and variable rainfall patterns
- Patterns of infections
- Measuring the health effects and at---risk populations
- Responses to the impacts of climate change

## **HEALTH MAPPING AND GIS**

- Introduction to GIS in Public Health: Spatial data; and Spatial data base for public health
- GIS background and ArcGIS: Spatial Databases for Public Health; and Mapping Health Information
- Mapping Health Information: Lab 1: GIS Background and ArcGIS; and Analyzing Spatial Clustering of Health Events
- Analyzing Environmental Hazards: Analyzing Risk; and Spread of Infectious Diseases
- Introduction: Project Proposal; Exploring the Ecology of Vector--- Borne Disease; and Analyzing Access to Health Services
- Spatial Analysis for Public Health: Locating Health Services
- Spatial Statistics for Public Health: Neighborhood and Health; GIS and Community Health; and Prevalence estimates and Spatial statistics
- Project Presentations

## **INDUSTRIAL FIELD ATTACHMENT I**

- Students will choose a public health work place to which they will be attached for a specified time.
- During this time, and together with academic staff, the students will adhere to a specified work program.
- The student will document all the activities they will undertake under a designated mentor or supervisor.
- Academic staff will visit students in the field.
- At the completion of the fieldwork, students will write and submit a scientific report to the University and the place of attachment.

## **FOOD CHEMISTRY AND NUTRITION**

- Introduction to nutrition: Global perspectives of nutrition; and National goals and policy guidelines
- Evolution of malnutrition
- Food composition: Food nutrients: Carbohydrates, proteins, fats and oils, minerals, vitamins, fibre and water; Chemical bonding, reactions, acids and bases; Food additives; Contaminants and adulteration of food; and Sampling and Statistical Methods
- Biochemical compounds, bioenergetics and enzymes: Biophysical chemistry; Biochemical macromolecules; Bioenergetics; Enzymes; Nutritional biochemistry; and Body fluids
- Food chemistry: Hydrocarbons (Alkanes, Alkenes, Alkynes, Halogen derivatives); Alcohols (Methanol, Ethanol etc.); Carboxylic acids (Acetic acid, Propanoic acid, Butyric acid etc.); and Esters (Aldehydes, Amines, Ketones, Amino acids etc.)
- Dietary requirements: Measurement of dietary intake; and Energy and protein requirements
- Nutrition anthropometry: Classification and definition of malnutrition; Nutritional indices; and Growth monitoring
- Maternal nutrition: Nutrition and infection; Micronutrient deficiencies; Child feeding; and Nutrition surveillance.
- Introduction to community nutrition: Nutrition; Health and culture
- Health disparities: Determinants of nutrition---and health---related behaviors; and Cultural food presentations
- Food Guidance System: Dietary Guidelines; Needs assessment and nutritional epidemiology; Community nutrition programs; National nutrition monitoring; Designing community nutrition interventions; Community nutrition and public policy; and Creating educational materials for low literacy audiences
- Social marketing: Herbal supplements; Food insecurity and hunger; and Promotion of community nutrition
- Current issues: Obesity and diabetes; Tools of the Trade (RDAs/RDIs); Food labels; Health, Disease, & Socioeconomic Factors; School Nutrition and Wellness Policy; and Healthy People.
- Practical
- Demonstration of macro and micro nutrients
- Food analysis demonstration
- Food standards data interpretation and report

## **HUMAN RESOURCE MANAGEMENT**

- Human Resources Management and Development
- Introduction to Human Resource Management and Development
- The concept of Human Resource Management and Development
- Division of functions and tasks among the various levels of the health delivery system
- Human resource management and development challenges faced by health managers at the district level and their linkage to National Human Resource Plan for the Public Health Sector.
- Strategies to respond to human resource challenges at the district and hospital levels
- Performance Management:
  - Definition of concepts; Performance appraisal system and process; Overview of performance management package (PMP) in the public service;
  - Annual performance Appraisal system (APAS); and Manager as facilitator coach, counsellor and mentor.
- Human Resources training and development:
  - Definition of concepts; Determining training and development needs and priorities; and Preparing training and development plans
  - Developing objectives for specific training and development programme; and Implementing training and development programmes
  - Planning, developing and implementing continuing education training programmes; and Monitoring and evaluating training programmes
- Retention and motivation of human resources:
  - Definition of concepts, motivation and retention; Overview of motivation theories and process
  - Human resources crisis: Brain drain factor; Types of pay and remuneration in the public service; Pay roll management (PEMEC); Strategies for attracting and retaining human resources
- Discipline and Grievances:
  - Definition of concepts; Overview of professional codes of conduct of various cadres; The role of disciplinary and appointments committees
  - Principles of discipline; Types of disciplinary action; Disciplinary procedures; Grievance handling; Appeals procedure; and Arbitration

## **RISK ASSESSMENT AND DISASTER MANAGEMENT**

### **Risk Assessment and Management**

- Definitions of concepts in risk management terminology
- Sources of information
- Benefits and costs of risk management
- Overview of environmental risk assessment process
- Problem formulation
- Analysis: Sources, pathways, exposure features, Direct and indirect measures, Exposure modelling, dose response assessment, exposure assessment;
- Risk characterization/classification: Risk ranking, populations at risk qualitative and quantitative approaches;
- Risk communication: Reporting systems for fatalities, accidents and dangerous occurrences, stakeholder and public participation.
- Practical illustrations of risk and hazard analyses: Natural disasters; Fires; Explosions; and Chemical leakages
- Management Options: Best Available Technology (BAT); Standard setting, Policy formulation and implementation; and Voluntary Standards (e.g. ISO, HACCP).
- Disaster management

- Definition of the following terms: Disaster; Hazards; Risk; and Vulnerability.
- Environmental hazards: Definition of environmental hazards; Typology of hazards; Types of hazards; Hydrological hazards; Drought hazards; and Adjustments to hazards.

#### **Disasters:**

- Environment and disasters; Characteristics of a disaster; Kinds of disasters (Natural disaster, and Human disasters); Natural disasters {Floods, Droughts, Cyclones, and Earthquake); and Human Disasters;
- Managing disasters (Ethics in handling disasters, Planning or disaster management, ---Pre--- disaster planning (Leadership and decision making in crisis), Disaster preparedness, Response, Recoveries, Rehabilitation, and Reconstruction);
- Future and background trends in disaster management
- Mitigation measures and programmes for disaster management plans.

### **COMMUNITY HEALTH SERVICE**

- Introduction:
- Definitions: Basic health services; community health services; and the primary health care model
- Concepts: Accessibility, coverage, availability,
- Determinants of health in a community: Health issues; Role players in community health; and Developing local community health status indicators
- Components of community health services: Community Sensitization; Community Screening; Community diagnosis; and Community Public health interventions.
- GIS and Community health services delivery: National system for community health services
- Factors affecting community health services delivery
- Role of public health in community health services delivery

### **PUBLIC HEALTH INFORMATICS**

- Introduction to Public Health Informatics: Concepts and categories of informatics; and Basic informatics principles
- Foundation of Health Information System:
- The information system architecture in public health
- Structure and model
- Essential information skills and abilities
- Security and confidentiality issues and the future of health care and informatics
- Computer---based health information systems
- Decision Support Systems and information retrieval systems
- Advantages, capabilities and limitations of information technologies when applied to health
- Computer mediated Health Education and Health Promotion
- Applications of Public Health Informatics:
- Introduction to data base management: Creation, updating and data formation; and Access, CSPRO and EPIDATA
- Introduction to computer based statistical analytical tools using SPSS: How to navigate using menu-based SPSS; and How to carry out basic analyses so as to generate information for policy in programming
- Research project



## **ORGANIZATION THEORY AND BEHAVIOUR**

- The nature of organizational behavior: Meaning of organizational behavior; The importance of the study of organizational behavior; Culture and organizational behavior; and Management theory
- Nature of organizations: Characteristics of organizations; Formal and informal organizations; and Organizational goals and objectives
- The role of the manager: The nature of management; Managerial behavior and effectiveness; Nature of leadership; and Styles of leadership
- Nature of work motivation: The meaning of motivation; Needs and expectations at work; and Theories of motivation
- Teams: The meaning and importance of teams; Team work; and Characteristics of effective teams
- Improving organizational performance: Management control and power; Organizational development; and Management development and organizational effectiveness

## **HEALTH SERVICES MANAGEMENT AND POLICY**

- Management of health services:
- Nature of organization and structure; and Delivery of health services
- Planning of health services
- Health service integration; and Health sector reform.
- Organization of health services:
- Nature of organizations and organization structure
- The district health system
- Decentralization of health services; and Levels of healthcare
- Delivery of health services:
- Roles of the health centre and hospital;
- Public/private provision of health services;
- Equity in health service delivery; and
- Priority setting in health.
- Quality of health services: Key principles; Structure, process and outcome; Quality improvement; Total quality management; and Quality assurance.
- Leadership:
- Introduction to communication, management styles and organization culture
- Team building and group dynamics; Providing and receiving feedback; Managing a meeting
- Negotiation skills, including analysis of power structures in meeting
- Conflict management with emphasis on staff conflicts
- Management of change.
- Planning:
- General introduction: Concepts of planning, planning cycle and planning tools; Priority setting, using CEA and participatory techniques;
- Introduction to Health Financing; and Steps in analyzing district/hospital plans
- Introduction to Costing and Budgeting
- Monitoring and Evaluation.
- Financial Management:
- Introduction to FAMS;
- Accounting: basic concepts of financial management and accounting;
- Procurement procedures and tenders;
- Management of stores; buildings and equipment; and transport planning and management;
- Contracts and Formulation of Contracts.
- Hospital Administration: Modern concepts in the administration of rural and urban hospitals; and private and public hospitals.
- Health policies:

## **HEALTH ECONOMICS AND FINANCING**

- Introduction to economics and health economics
- Definition of terms (economics, health economics, microeconomics, macroeconomics)
- Why health economics?
- Concept of development and scarcity
- Basic tools of economic analysis
- Demand, need, supply, costs and opportunity costs.
- Economic efficiency and effectiveness
- Markets and market failure price distortions and externalities.
- Government intervention in markets
- Production function, inputs and outputs
- Economic evaluation: Cost utility analysis; Cost benefit analysis; Cost effective analysis; and Cost analysis
- Financing healthcare
- Financing of health care: Resource mobilization; Cost sharing; User charges; Community financing; Prepayment schemes; Social health insurance; Private insurance; and Out-of-pocket payment
- Resource allocation; and Equity

## **HEALTH SYSTEMS DEVELOPMENT AND MANAGEMENT**

- Analytic frameworks and strategies for health care system development
- Policy levers, immediate outcomes, ultimate ends
- Health care value chain
- Zambia's health care system.
- Setting infrastructure for health care delivery---issues and challenges:
- Logistics and supply systems of drugs, vaccines, and contraceptives
- Supply chain management: Materials management systems in public health care; organizational setup; management of materials; and Policies and procedures; operational problems and information systems.
- Role of sector players: pharmaceutical, biotechnology, medical devices and equipment, outsourced providers, hospitals, health insurance industry and medical tourism.
- Funding: Domestic and foreign investment; Corporate chain ownership and strategic alliances; Public---private partnerships; Competition; and Social/ cultural/ demographic /economic contexts.
- Access and innovation:
- Innovations in health care delivery systems
- Comparative health systems development analysis.

## **FIELD ATTACHMENT II AND FINALISATION OF DISSERTATION**

- The industrial training assessment will consist of one assignment:
- Conduct a case study that should deal with a single subject under one of the following headings:
- Public health
- Food (e.g. food safety)
- Management related to health issues
- Pollution control
- Occupation Health and safety (e.g. investigation of accidents and prosecution)
- Student should display (in the presence of mentor or supervisor) evidence of vocational competence in the discipline of public health to examiners through a research report.

## **STRATEGIC MANAGEMENT AND HEALTH PLANNING**

- Fundamental principles
- Concepts and analytical techniques of strategic planning and management
- Principles of governance and how they relate to strategic management
- Systems thinking develop a view of strategic management as a Systematic, continuous decision-based process on strategic orientation.
- Importance of external forces on any organization and its strategic direction
- The basic principles of marketing and the role it plays in strategic management
- Importance of the ambiguity of real-world decision-making in strategy
- Development and the importance of anticipation in management
- Gain insight into the reasons that strategic plans can fail in implementation
- Project management

## **REPRODUCTIVE, MATERNAL AND CHILD HEALTH**

### **REPRODUCTIVE HEALTH**

- Introduction
- Concepts and definition of terms
- The Cairo Declaration of 1994
- Reproductive health national policy and goals
- Theory and principles of reproductive health
- Programme implementation and reproductive health status in Zambia
- Gender and reproductive health: Cultural perspectives of gender; and Gender based violence
- Reproductive health Components
- Safe motherhood models of care
- Routine antenatal activities
- Routine postnatal care activities
- Danger signs in pregnancy
- Sexual health
- Definition and concepts
- Global perspectives of sexual health
- Determinants of sexual health
- Sexually transmitted infections
- Infertility
- Cancers and their screening: Prostate cancer; Cervical cancer; and Breast cancer

### **MATERNAL AND CHILD HEALTH**

- Overview of maternal and child health (MCH)
- History of MCH
- Contemporary MCH issues and trends
- Community care
- The family and culture
- Women's health issues:
- Health Assessment
- Violence against Women
- Reproductive system concerns
- Sexually transmitted and other infections
- Contraception and abortion
- Mental health disorders and substance abuse.

- Preconception through postpartum issues:
- Anatomy and Physiology of pregnancy
- Conception and fetal development
- Maternal and fetal nutrition
- Childbirth and perinatal education
- Labor and birth processes.
- Complications in pregnancy:
- Assessment of risk factors
- Hypertensive disorders in pregnancy
- Antepartum hemorrhagic disorders
- Endocrine and metabolic disorders
- Labor and birth complications.

**Newborn care:**

- Care of the newborn
- Acquired problems of the newborn
- Newborn nutrition and feeding
- High risk newborns

**Child health:**

- Overview
- Early growth and development
- Well childcare
- Children with special needs
- Childhood diseases
- Vaccinations.

**PROJECT PLANNING, MONITORING AND EVALUATION**

**Project Planning:**

- Concept of project and project cycle
- Concept of project planning and project planning cycle
- Generation of project idea
- Environment scanning for project idea
- Sources of project ideas
- Preliminary screening of project ideas
- Project rating index.

**Project Feasibility analysis:** Economic and financial feasibility; and Technical and managerial feasibility --- environmental feasibility.

**Project Planning and Design Process Logical Framework Analysis (LFA)**

- Concept of LFA--Stakeholder Analysis--Problem Tree and objective tree analysis
- Analysis of strategies
- Fixing project output and activity
- Assumptions and risks
- Monitoring and evaluation indicators.

## **Project Appraisal Concept Process**

Appraisal Techniques

Discounted and non-discounted cash flow techniques

Social-cost benefits analysis

Analysis of risk.

## **Project Implementation Planning:**

Concept

Need

Pre-requisites for project implementation

Process of project implementation planning

Networking techniques for project implementation, development of project network --- PERT and CPM model

Project review and control.

## **Concepts**

**Monitoring:** Participatory Monitoring

**Evaluation:** Participatory Evaluation

**Terms of reference:** Management Information System

## **Monitoring:**

Need for project monitoring

Indicators of monitoring

Process and outcome monitoring

Designing a monitoring system

Project management information.

## **Evaluation**

**Types of evaluation:** Internal, External, Self-process, Outcome and impact evaluation

**Approaches to evaluation:** Developing indicators measuring costs–Evaluation benefits.

## **Participatory Monitoring and Evaluation**

Need for participatory Monitoring and Evaluation

Difference between conventional and Participatory Evaluation

Monitoring and Evaluation Methods and Tools

Designing Participatory Monitoring Systems and Evaluation Framework

## **Field Study and Reporting**

Developing a format for project monitoring and evaluation

Monitoring of a non-going project

Evaluation of a completed Projected

## **PUBLIC HEALTH MPH COURSE CONTENTS**

### **PRINCIPLES OF PUBLIC HEALTH**

- UNIT 1: Introduction to Public Health
- UNIT 2: Essentials of Public Health
- UNIT 3: Determinants of Health (Psychosocial Behaviour And Environmental)
- UNIT 4: Health Promotion and Behavioural Change Communication
- UNIT 5: Control of Communicable and Non- Communicable Diseases
- UNIT 6: Health Informatics' Systems

### **GENDER AND HEALTH STUDIES**

- UNIT 1: Introduction to Gender Studies: Concepts and Approaches
- UNIT 2: Historical Evolution of Feminism and Gender
- UNIT 3: Discussing Reproductive Health and HIV, Health Inequalities  
Discrimination and Biases
- UNIT 4: Sex differences and Gender effects in Health (Determinant of Health and  
Disease)

### **EPIDEMIOLOGY**

- UNIT 1: Basic Concepts in Epidemiology
- UNIT 2: Measurements in Epidemiology
- UNIT 3: Epidemiological Methods
- UNIT 4: Outbreak Investigation
- UNIT 5: Monitoring and Surveillance
- UNIT 6: Epidemiological Health Information Systems
- UNIT 7: Globalization and Epidemiology

### **BIOSTATISTICS**

- UNIT 1: Biostatistics & Basic Measurement in Disease Frequency
- UNIT 2: Mean and Standard Deviation
- UNIT 3: Populations and Sample
- UNIT 4: Statements of Probability and Confidence Intervals
- UNIT 5: Differences Between Means: Type I And Type II Errors and Power
- UNIT 6: Differences between Percentages and Paired Alternatives
- UNIT 7: The 't' Tests

- UNIT 8: The  $X^2$  Tests
- UNIT 9: Probability Test
- UNIT 10: Rank Score Tests
- UNIT 11: Correlation and Regression
- UNIT 12: Survival Analysis
- UNIT 13: Study Design and Choosing a Statistical Test

### **HEALTH ECONOMICS**

- UNIT 1: Discussing Health Economics
- UNIT 2: Discussing the Law of Supply and Demand
- UNIT 3: Discussing and Measuring the Price Elasticity of Demand and Supply
- UNIT 4: Discussing Health Production and Cost
- UNIT 5: Application of Health Insurance and Funding Issues

### **HEALTH SYSTEMS MANAGEMENT**

- UNIT 1: Introduction to Health Systems
- UNIT 2: Principles and Fundamentals of Management of Health Systems
- UNIT 3: Health Systems Strategic Management
- UNIT 4: Health Services Delivery and Quality Impact Assessments
- UNIT 5: Strategic Leadership and Management
- UNIT 6: Emergency Planning and Disaster Management
- UNIT 7: Monitoring and Evaluation in Health Systems

### **PUBLIC HEALTH POLICY**

- UNIT 1: Describing Overview of Health Policies in Zambia
- UNIT 2: Identifying Major Components and Issues in the Delivery of Health Policies
- UNIT 3: Major Components and Issues in the Delivery of Health Policy
- UNIT 4: Policy Process and Operationalization
- UNIT 5: Zambian Public Health Laws and Regulations

### **FINANCIAL MANAGEMENT**

- UNIT 1: Describing Financial Management for Health Professionals
- UNIT 2: Explaining Public Responsibility and Financial Planning
- UNIT 3: Preparing and Analyzing Financial Statements of Different for Health Sector

## **PUBLIC HEALTH POLICY ANALYSIS**

## **APPLIED HEALTH RESEARCH PAPER**