M.Sc.,(EPIDEMIOLOGY) - SYLLABUS

PAPER I – PRINCIPLES OF EPIDEMIOLOGY AND BIOSTATISTICS

I. 1. FUNDAMENTALS OF EPIDEMIOLOGY

- Tools of Epidemiology: measuring disease Frequency (Prevalence, incidence, morbidity rates, attack rates etc.
- Historical aspects of Epidemiology and evolution
- Definition and understanding - Natural history of disease
- Survey methodology including census procedures and Sampling

2. **PRINCIPLES OF MEASUREMENTS**:-

- Types of measures
- Reliability
- Validity
- Accuracy
- Questionnaire construction
- Index construction and scaling
- Observe variation
- Diagnostic tests
- Measurement issues
- Evaluating sources of data.

3. **STUDY DESIGNS:** -

a) Observational Studies

- Cross Sectional Studies
- Descriptive Studies
- Cohort Studies
- Case Control Studies
- Before – after Studies
- Historical Prospective Studies
- Making international comparisons

b) Experimental Studies

- The Randomized Control trial
- Allocation alternative
- Maneuver
- Measurement including blinding
- Compliance, contamination, co intervention
- Adverse events

- Stopping rules
- Analysis
- Diagnostic tests
- Measurement issues

c) qualitative research

- Mixed designs
- Ecological Studies
- Space time cluster studies
- Familial aggregation studies

4. **FUNDAMENTAL OF RESEARCH METHODOLOGY**

- The measurement loop and the Critical Appraisal cube
- Defining the question/posing the problem
- Selecting the study design
- Sample selection
- Sample size
- Events, outcome measures, dropouts
- Analysis and reporting
- Ethics

II. BIO-STATISTICS

(i) Introduction to Biostatistics

Definition – Collection and Classification of Data – Diagrammatic and Graphical Representation of data – Types of Variables – Scales of Measurement.

(ii) Measures of central tendency and dispersion

- mean, mode and median- variance standard deviation & co-efficient of variation, H-Spread.

(iii) Probability Theory

(iv) Probability Sampling

- Sampling Techniques

(v) Probability Distribution

- Binomial, Poisson, Normal- Standard normal curve

(vi) Estimation of population parameter from sample

- standard error- confidence interval

(vii) Direct and indirect standardization

(viii) Sample size calculation

- for estimation & for comparison

(ix) Tests of significance

- Parametric (t-test, test of proportion, test for difference of means)
- Non parametric (Mann – Whitney, Wilcoxons, Kruskal Wallis Chi-square)

(x) Analysis of variance

- One way ANOVA- Two way ANOVA

(xi) Correlation and Regression

(xii) Generalized linear models

- linear, loglinear and logistic models

(xiii) Survival Analysis

- Life table (construction and uses)

(xiiv) Times Series Analysis

PAPER II – EPIDEMIOLOGY OF DISEASES OF PUBLIC HEALTH IMPORTANCE AND DISEASE CONTROL

1. Epidemiological aspects of diseases of national importance

- ARI
- Diarrhea
- Vaccine preventable disease
- Tuberculosis
- Visual impairment/blindness
- Malaria
- Filariasis
- HIV
- STD
- Coronary Heart disease
- Malignancy
- Diabetes mellitus
- Injuries
- Internal
- Leprosy
- Hypertension
- Mental Health

2. Infectious disease Epidemiology.

3. Chronic disease Epidemiology

4. Epidemiological aspects of diseases - Non-Communicable

5. Emerging and Re- Emerging Diseases

6. National Programmes related to Communicable and Non Communicable diseases

7. Dengue, Swine Flu, Chikungunya

PAPER –III EPIDEMIOLOGICAL METHODS IN HEALTH MANAGEMENT

1. National health programmes

- Nutritional Disorders related National Health Programmes
- MCH and Demographic related National Health Programmes
- Advocacy

2. Monitoring and evaluation health programmes
3. Roles of Genetic and Environmental Factors in Disease Causation

- . 4. Health Economics

- Principles of Health Economics - Cost benefit, cost Effectiveness and cost utility including costing.
- Efficacy effectiveness and efficiency
- Evaluation needs and methods
- Public health laboratory utilization of services

i. DEMOGRAPHY

1. Age sex distribution of population

- Population pyramid
- Sex ratio, dependency ratio
- Factors affecting demographic profile (fertility, mortality and migration)

2. Measures of fertility

- Crude birth rate, child woman ration, general Fertility rate, age specific fertility rate, total Fertility rate, gross reproduction rate, not Reproduction rate

- Preparation of Educational materials
- The role of the tutor on small group tutorials
- Small group tutorials and group dynamics
- Workshop organisation
- Principles of learning

3. Factors affecting fertility

4. Measures of mortality
   - Crude death rate
   - Age specific death rate
   - SMR

5. Sources of demographic data
    - Registration of vital events
    - Sample surveys
    - Census

6. Demographic transition

    - Rate of natural increase
    - Malthusian theory
    - Doubling time & projections

ii) <u>ENVIRONMENTAL HEALTH</u>

- Environmental factors than can affect health

    - Physical
    - Chemical
    - Biological

- Measurement of exposure to physical and chemical agents

- Prevention of environmental pollution

- Injury control in working environment

- Epidemiology of red traffic accidents

iii**) <u>BEHAVIORAL SCIENCES</u>**

- Formation and structure of a society
- Cultural practices and the effect on health and and illness behavior
- Life styles and the effect on health
- Communication
    - Methods
    - Barriers
    - Health education
- Effect of social changes on health states

Decision Analysis
- Decision tree
- Test Strategies
- Multiple tests
- Sensitivity analysis