1. **Subject Title:** **Applied Epidemiology**

2. **Subject Code:** **HEM-702**

3. **Contact Hours:** **60**
   Self-Study and Assignment 30
   Credit Hours 06

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4. **Subject description and expected learning outcomes**

The objective of this course is to help the students in understanding the application of Epidemiology; it includes estimating risk, dealing with thereat validity and approaches to analysis and interpretation of epidemiological data. This course will also help the students in designing and analysis of case control, cohort and randomized control studies and evaluation of health programmes.

By the end of the course, students will be able to:

- Describe the purpose and use of epidemiology in planning, monitoring, supervision and evaluation of health care
- Explain Epidemiological measures for morbidity and mortality.
- Explain how to estimate risk and dealing with threats.
- Design and analysis of case control, cohort and randomized control studies
- Explain the role of chance, confound and bias in epidemiological studies
- Describe components of disease surveillance also understand to design and management of diseases surveillance
- Know how to evaluate health programmers.
- Describe Surveillance for diseases and evaluation of surveillance programme.

5. **Mode of Delivery**

Lecture / Seminar / Assignments / Presentations

6. **Content**

Week	Hours	Units	Content
	10		Review of Basic Concepts Epidemiology Definition of epidemiology The scope of epidemiology Purpose, Uses, of epidemiology Epidemiology of communicable and non-communicable diseases. Classification of diseases Multiple causation of diseases Strategies of epidemiology
	10		Measures of disease outcomes - Morbidity and Mortality Rate, Ratio & Proportion Tools of Measurement Morbidity Rates – Incidence and Prevalence Rates Mortality Rates- Crude , Specific and Adjusted Rates
	10		Risk Measurement in Epidemiology

Week	Hours	Units	Content
			What is risk & Risk factors Measurement of risk Categories of risk measures Attributable risk Attributable fraction Population attributable risk Percentage population attributable risk Relative risk Measuring of absolute risk Threats to Validity - Bias, Confounding, Effect Modification Approaches to deal with threats to validity
	8		Epidemiological studies methods & their application Observational and Interventional studies Observational: Descriptive Analytical Case control studies Cross sectional studies Cohort studies
	8		Case Control Study Design and analysis of Case Control Studies Selection of cases Selection of control Matching (Comparability between cases and control) Measurement of Exposure Analysis and Interpretation of Case Control Studies Exposure rate Estimation of risk Analysis of bias in case control studies Issues in Design and Analysis of Case Control Studies
	8		Cohort Study Indicator of cohort studies Types of cohort studies Prospective Retrospective Design and analysis of Cohort Studies Frame work of cohort studies Selection of study subject Obtaining data on exposure Selection of comparison group Follow up Analysis of Cohort Studies Incidence Rate Estimation of Risk Relative risk

Week	Hours	Units	Content
			Attribute risk Issues in Design and analysis of Cohort Studies
	8		Interventional study: Randomized Control Trial Design and analysis of Randomized Controlled Trial Protocol designing Selecting reference and experimental population Randomization Follow up Assessment of outcome Issues in Design and Analysis of RCT/Intervention Trials Types of Randomized Control Trial Clinical Trail Preventive Trail Risk Factor Trail Cessation Experiments Evidence based policy and health programme interventions
	8		Analysis of Epidemiological Studies Evaluation the role of chance Evaluation the role of confounding Evaluation the role of Bias
	12		Epidemiology of Select Disease HIV/AIDS Tuberculosis Malaria Leprosy Poliomyelitis Cancer Cardio Vascular Diseases Diabetes Injuries and Accidents
	8		Evaluation of Health Programs - Methods and Approaches HIV/AIDS Tuberculosis Malaria
	8		Disease Surveillance: Design and Management Definition Purpose of Surveillance Elements &Process of Surveillance Analysis of data

7. Assignments:

There will be five class assignments followed by Group Exercises and Presentation in the class.

Assignment: 1

This assignment will assess the student's ability to design and analysis of case- control study they will prepare a study plan, prepare research questions, selecting case and control and do the analysis of risk and outcome.

Assignment: 2

This assignment will assess the student's ability to design and analysis of cohort study they will prepare a study plan, prepare research questions, selecting the cohort, collecting the data on exposure and do the analysis of study.

Assignment: 3

This assignment will test the student's ability to understand the interventional studies and design and analysis of randomized clinical trial they will prepare research questions, selection of study and control group, collect the data on exposure and do the analysis of study.

Assignment: 4

This assignment will be on evaluation of the current health programmes.

Assignment: 5

This assignment will assess the knowledge of students about surveillance process and evaluation of surveillance programme

8. Assessment:

The students will be assessed by a written Examination and assignments. The distribution of marks will be as follows:

Final written examination	70%
Mid-term examination & assignments	30%

9. Readings

- IIHMR course material

Preventive and Social Medicine: K Park.