

Syllabus and scheme of examination

First Year - Semester 1

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| 1.1 Basic Epidemiology I | (60L + 20T) |
| Health and Disease Concept (2L), Aims and Approach of Epidemiology (13L+2P), Rates and Ratios (5L+6P), Measurement of Morbidity and Mortality (15L+8P), Methods of Generalization of Epidemiological measurements (20L+4P), Concepts of Experimental Epidemiological (5L). | |
| 1.2 Epidemiology II: Epidemiology of Communicable and Non communicable | (48L+32P) |
| Basic concepts of Communicable Diseases in terms of Host (5L+2P), Environment and Agent with focus on control and prevention (13L), including investigation and management of outbreak of diseases (5L), their indicators and evaluation (5L+10P). Epidemiology of locally prevalent diseases (5L) | |
| Viral diseases Dengue, Japanese Encephalitis(JE) (5L+2P) | |
| Chronic diseases Tuberculosis (1L+1P), Leprosy (1L+2P), HIV (5L+3P), Cardiovascular (1L+2P), Diabetes and Hypertension (2L+10P). (Their methods of measurement and evaluation) | |
| 1.3 Basic Biostatistics | (48L + 32P) |
| Types of Data Concepts of a Statistical Population and sample from a population, Qualitative and Quantitative data, Nominal and Ordinal data, discrete and Continuous Data Different types of scales - nominal, ordinal, ratio and interval (3L). | |
| Collection and Scrutiny of Data Primary data - designing a questionnaire and a Schedule, checking their consistency (2L). Secondary data - its major sources including some Government publications (2L), Scrutiny of data for internal consistency and detection of errors of recording (1L+1P). | |
| Presentation of Data Construction of tables with one or more factors of classification (2L). Diagrammatic/ Graphical Representation of data. Frequency Distributions, Cumulative Frequency Distributions and their Graphical Representation, Histogram, Frequency Polygon and Ogives. Stem and leaf chart. Box plot (10L+7P). | |
| Analysis of Quantitative Data Univariate data-Concepts of Central Tendency, Location(4L+8P), Dispersion and Relative Dispersion, Skewness and Kurtosis, and their measures including those based on Quantiles and Moments (8L+10P). | |
| Analysis of Categorical Data Consistency of Categorical Data. Independence and association of attributes. Various measures of association for two – three way classified data. (4L+4T). | |

Probability concepts and Probability Distributions, Normal, Binomial, Poisson and Geometrical. Sample Size for different Designs (12L+2P).

1.4 Biostatistics II – Inferential (48L + 32P)

Concepts of sampling vs. population (2L),
Simple random (6L+5P),
Stratified (7P+6P),
Cluster (6L+4P),
Systematic (2L+2T),
Multistage (2L+1T), Inverse (1L+1T),
Non-Probability (quota, purposive) Sampling Techniques (2L+1T),
Including methods of point and Interval Estimations for these Techniques (20L+12T).

Methods in Statistical Inference

Sampling from a distribution (2L), Definition of a random sample - simulating random sample from Standard Distributions (5L+4P),
Concept of Derived Distributions of a function of Random Variables (2L+2P). Concept of a Statistic and its Sampling Distribution (2L+2P),
Point estimate of a parameter(1L),
Concept of bias and Standard Error of an estimate (1L).
Standard Errors of Sample Mean (1L),
Sample Proportion (1L), Sampling Distribution of sum of Binomial (1L),
Poisson (1L) and Mean of Normal Distributions (2L).
Independence of sample mean and variance in random sampling from a Normal Distribution (without derivation) (1L). Statistical Tests and Interval Estimation (2L+1P), Null and Alternative Hypotheses (1L), Types of Errors, p-values (2L+2P), Statement of Chi-square (2L+2P), t test (1L+1P), and F statistics (2L+2P). Testing for the mean and variance of Univariate Normal distribution (1L+1P), testing of equality of two means (2L+1P) and testing of equality of two variances of two univariate normal distributions and related confidence intervals (2L+2P).
Testing for the significance of sample correlation coefficient in sampling from bivariate Normal distribution (1L+1P), equality of means and equality of variances in sampling from Bivariate Normal distributions (2L).

Large sample tests

Use of Central Limit Theorem for testing and interval estimation of a single mean and a single proportion and difference of two means and two proportions (4L+4P),
Fisher's Z transformation and its uses (1L+1P). Pearson's chi-square test for goodness of fit and for homogeneity for standard distributions (4L+4P). Contingency table and test of independence in contingency table (2L+2P).

Semester – 2

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| 2.1 Epidemiology Analytical - III | (48L + 32P) |
| Application of Basic Principles and Methods (as covered in previous Semester) in the design and conduct of Epidemiologic studies (10L + 10P). | |
| Ecological/Geographical Studies Uses and Interpretation of Ecological Studies, Advantages and Disadvantages of Ecological Investigation, Ecological Fallacy and Ecological Bias (5L + 2P) Cross-sectional, Case Series Studies, Case Control Studies, Retrospective, Prospective (Longitudinal), Nested Study Designs (20L + 10P) Cohort Studies (Retrospective and Prospective) (5L+5P) | |
| Intervention Studies and RCTs Characteristics, Confounding and bias, Randomization Migrant studies: Design Strategies (8L + 5P) | |
| 2.2 Biostatistics III - Multivariate Analysis | (48L + 32P) |
| Regression Analysis Bivariate Data (1L), Scatter Diagram (1L+1P), Product Moment Correlation Coefficient and its Properties (2L+1P). Coefficient of Determination (1L). Concepts of Error in Regression (1L). Principle of Least Squares (1L). Fitting of Linear Regression and Related Results (3L+2P). Fitting of Curves Reducible to Polynomials by Transformation (2L+2P), Rank Correlation — Spearman's and Kendall's Measures (2L+1P), Multivariate data, Multiple regression (6L+4P), Multiple Correlation and Partial correlation in three variables, their measures and related results (2L+2P). Logistic Regression (3L+3P), Survival Analysis (4L+2P), Path Analysis (2L+2P), Multicollinearity and Discriminant Analysis (2L+2P), Factor Analysis with its uses, including their utility in Health and Disease (3L+2P). | |
| Demography-I | (48L + 32P) |
| Population Censuses World and India (6L), Concepts of Population Evolution (2L), Population Change (13L+10P), Population Structure including their stability and its measures (12L+10P), Methods in Population Projections and its utility in health and Human Resource Management (15L+12P). Concept and Measures of Fertility | |
| Demography-II – Geriatrics, Sociology/ Psychology/ Anthropology | (48L + 32P) |
| Concept and Measures of Mortality (8L+4P), Life tables (5L+5P), Urbanization (4L+4P), Migration (4L+4P), Education (3L+3P)(including their utility in health), Population Genetics (20L) | |

Year two - Semester – 3

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| 3.1 Epidemiology IV – Clinical/ Applied/ EBD | (48L + 32P) |
| Clinical Epidemiology including Utility Hospital Based Studies (15L+10P), Epidemiological Measures used in Clinical Epidemiology; (10L+10P) Clinical Trials and Experimental Designs (13L+10P) Concepts of EBM and converting Epidemiological Studies in to EBM Tools (10L+2P) | |
| 3.2 Hospital Statistics – ICD Concept/ Health Informatics | (48L + 32P) |
| Medical Records Management and its Statistical Measures: Indoor and Outdoor admissions Statistics (6L+4P), Bed Occupancy, Average Stay, Bed Turnover Rate (10L+10P), Including Generating Evidence Based Medicine using service data (10L+5P). International Classification of Diseases: Concepts, Certification of birth and death, Generation of reports (20L+12P), Notifiable diseases (2L+1P). | |
| 3.3 Research Methodology | (48L + 32P) |
| Concepts and Definitions (5L), Formulation of Objectives (4L+4P), Study Designs and basic Analytical Methods for their Analysis (7L+5P), Relevant Sampling Techniques (5L+4P), Importance of Sampling size, Feasibility, Drawing Conclusions (6L+5P), Critical Appraisal of Published Articles (8L+4P), Methods of Data Collection (5L+4P), Questionnaire Development and Pre-Testing of Questionnaire (4L+4P), Internal & External Validity of Questions (4L+2P). | |
| 1.4 Dissertation | |
| Writing synopsis, Seminars to finalize Synopses, Preparation of Questionnaire, Pre-testing and Finalizing of Questionnaire, Data Collection | |

Semester – 4

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| 4.1 SPSS/ EXCEL/EPI info | (48L + 32P) |
| Introduction to Computers, Hardware, Softwares (2L), EPI info | |
| Working with Software Packages MS-Excel (2L+1P), SPSS (2L+1P), Classification (4L+2P), Tabulation and Frequency Tables (2L+1P). Bar Graphs, DOT Diagram and Histogram, Stem-and-Leaf Plots, Box Plots (6L+4P). Summary Statistics Two-way tables and plots (4L+1P). Product Moment Correlation Coefficient, Rank Correlation Coefficient (2L+1P). Curve fitting by Method of Least Squares: Exponential and Polynomial (4L+3P). Regression Analysis(4L+4P), Correlation ratios, multiple and partial correlation coefficients (4L+2P). Regression equations (6L+4P). Rank and Inverse of a Matrix Solution of set of Linear Equations (2L+2P). Fitting of Binomial, Poisson, Negative Binomial, Normal and Gamma Distributions (6L+6P). | |
| 4.2 Epidemiology V | (48L + 32P) |
| Applied Nutrition Nutritional Deficiency Disorders their Control and Prevention in Community Nutritional Assessment and its Analysis (20L+16P) MCH with indicators, Analysis and Determinants (15L+10P) | |
| Geriatrics Health Profile Registry, Social Economic implications and management of Geriatric Population (6L+6P) Population Policy, Health Policy including their utility in Health (5 L), Human Resource Management(2L), | |
| 4.3 Dissertation | |
| Analysis, writing, submission and publication | |