

Gokhale Institute of Politics and Economics
Deemed to be University u/s 3 of the UGC Act, 1956
Pune 411004

M.Sc. (Population Studies and Health Economics)
Syllabus

About the Institute

Founded in 1930, the Gokhale Institute of Politics and Economics (GIPE) is one of the oldest institution for economics teaching and research in India. Though mainly a research Institute, from its inception the M.A. and Ph.D. degrees offered by GIPE were recognized by the University of Bombay. With the establishment of the University of Poona (1949), GIPE became a constituent recognized institution of that University. In 1962, recognizing its contribution to research in agricultural economics, the University Grants Commission (UGC) selected the Institute as a Centre of Advanced Study in Agricultural Economics. The scope was broadened two years later when the UGC declared GIPE as a Centre of Advanced Study in Economics. In 1993, Keeping in view its professional standing and scope for further development, the Government of India declared GIPE as 'Deemed to be a University'.

The Institute is located in the premises of the Servants of India Society, established in 1905 by the great Indian nationalist leader **Gopal Krishna Gokhale (1866-1915)**. On the Fergusson Hill behind the Institute lies the spot where Gokhale took the vows of the Society – poverty, obedience, and service to nation - and administered them to three others. It has become a landmark because of the erection of a column there. Gokhale's bungalow still stands in the precincts of the Society. So does a massive banyan tree under which Gokhale and M.K. Gandhi used to discuss political issues. Gandhi regarded Gokhale as his 'political guru'. The Gokhale Institute was established in 1930, incorporating the Servants of India Society library.

Gokhale Institute of Politics and Economics has a legacy in research in Population and Health, whilst Economics is the mainstay of both research and training here. This thus becomes the ideal institute for the study of Population and Health Economics.

Course – M. Sc. PSHE

This course is designed to impart in-depth knowledge of Population Studies- dynamics of population change along with its linkages with humanities. It is primarily for understanding the interrelationship of population with different social, economic, health and nutrition phenomena. Introduction of Health Economics completes the missing link of the courses on Population and Health. This gap is bridged here, considering importance of functioning of health system, healthcare delivery and utilization along

with health financing and health insurance. This course is expected to shape scholars interested in Population, Public Health and Health Economics.

Eligibility Criteria

Admission to this courses is open to all those with a Bachelor's degree of a recognised University (recognised by UGC) with minimum 55% marks or equivalent grade in Economics, Sociology, Psychology, Anthropology, Social Work, Geography, Mathematics, Statistics, Health and allied sciences.

Selection Criteria

Selection of candidates will be on the basis of entrance test.

Reservation for candidates will be considered as per GOI norms.

Number of Seats

For this course 40 students will be admitted.

Duration of the Course

The course, M.Sc. PSHE, is a two-years, four semester course.

Number of Papers

Every student has to complete minimum 20 papers (16 Compulsory Papers and 4 Elective Papers) for completion of the course. Students can select some elective papers, after discussing with the Co-ordinator of the course and concerned faculty members.

M.Sc. (Population Studies and Health Economics)
Course Structure

Sr. No.	Compulsory Papers	Page Nos.
Semester-I		
Paper 1.1	Population, Size and Structure	4
Paper 1.2	Fertility	6
Paper 1.3	Mortality and Morbidity	7
Paper 1.4	Introduction to Principles of Economics	8
Paper 1.5	Biostatistics (Statistical Methods)	10
Semester-II		
Paper 2.1	Migration and Urbanization	12
Paper 2.2	Population and Development, Population Projections	13
Paper 2.3	Public Health and Epidemiology	15
Paper 2.4	Health Economics – I	17
Paper 2.5	Research Methodology – I	18
Semester-III		
Paper 3.1	Population and Health Policies and Programmes	19
Paper 3.2	Health Economics – II	21
Paper 3.3	Population and Health – I	22
Paper 3.4	Research Methodology - II	24
Paper 3.5	Actuarial Methods for Health and Life Insurance	26
Semester-IV		
Paper 4.1	Population and Health – II	28
Paper 4.2	Applications of Statistical Software	30
Paper 4.3	Health Economics – III	32
Paper 4.4	Term Paper (In consultation with the Faculty)	34

<u>Elective papers:</u>		
Paper E1	Behavioural Economics	35
Paper E2	Social Exclusion and Inclusive Policy	37
Paper E3	Academic Writing - (Swayam Platform) https://onlinecourses.swayam2.ac.in/cec20_ge29/preview	39
Paper E4	Accountancy And Financial Statement Analysis	41
Paper E5	Business Analytics	43

Compulsory Papers

Semester 1

Paper 1.1 - Population, Size and Structure

This is a course on fundamentals of population studies and nature of population. Objective of the course to enrich knowledge of the students about nature and scope of population studies, population growth and distribution around the world and India, and selected theories of population.

Unit 1

- Interdisciplinary nature of Population studies
- Components of population change - Fertility, Mortality, Migration, and their interrelationships
- World population size and growth
- Indian population size and growth - by regions
 - Growth and Population momentum
 - Growth rate of population – decadal, annual

Unit 2

Sources of Population data

- Population Census
 - History of Census taking in India
 - Housing Data – Assets and amenities
 - Population Data – Individual information
 - Uses of Census data
- Sample Registration System
- Vital registration System
- National Sample Survey
- Large sample demographic Surveys-National Family Health Survey

Unit 3

- **Characteristics and Structure**
 - Housing – Assets and Amenities
 - Age structure - Age pyramids - Population ageing
 - Demographic window of opportunity
 - Population sex ratios and its variation; Child sex ratio, Sex ratio at birth, Sex ratio of elderly
 - Factors affecting age and sex structure
 - Changing patterns of sex ratio in India, North-south divide, ‘Missing women’
 - Literacy and education

- Work force participation
- Religion, Scheduled caste and Scheduled Tribe population

Unit 4

- **Population Theories**

- Malthusian Theory: Theme and Criticism.
- Optimum population theory,
- Mathematical and Biological theories
- Demographic Transition

Paper 1.2 – Fertility

This paper presents the different features of fertility and nuptiality as well as theories of fertility. The course also enables students to understand different aspects of fertility and nuptiality and its correlates. It provides knowledge about various concepts of fertility and nuptiality, measures of fertility and nuptiality, factors affecting fertility and nuptiality along with levels and trends of fertility and nuptiality and socio-economic theories of fertility.

Unit 1

- Importance of the study of fertility
- Physiology, concepts and definitions of basic terms – fecundity, fertility, conception, contraception, pregnancy, abortion, still- birth, menarche – menstrual cycle, menopause, family size
- Marriage, widowhood, divorce, separation, sources of data and limitations.
- Concepts and measurements of cohort and period fertility
- Fertility levels and Trends in the World - Developed and Developing countries scenario
- Fertility Levels, trends and differentials in India

Unit 2 – Measures of fertility

- Crude birth rate, child-women ratio, children-ever born, childlessness, general fertility rate, age-specific fertility rate, total fertility rate, marital fertility rate, rates specific for parity and duration of marriage, parity progression ratios, closed and open birth intervals, cohort fertility, gross reproduction rate, net reproduction rate
- Indirect estimation of fertility
- Family planning

Unit 3 - Nuptiality

- Concept and analysis of marital status
- Measurements of Nuptiality: Singulate mean age at marriage, Synthetic cohort methods
- Trends in age at marriage and its significance, Age at marriage and fertility
- Demographic, physiological, social, cultural, economic and psychological factors affecting nuptiality and fertility

Unit 4 - Theories of fertility

- Social and Economic Theories of Fertility: Social capillarity theory, Theory of change and response, Fertility transition theory, Threshold hypothesis, Wealth flow theory. Micro economic theories of fertility (theories by Liebenstein, Becker and Easterlin).
- Davis-Blake intermediate variables framework
- Bongaart's proximate determinants of fertility

Paper 1.3 - Mortality and Morbidity

This paper enables assumes importance on the background of Population Studies as also Health Economics; primarily because efforts are usually to control morbidity and mortality with respect to available resources. This would make students basic concepts and measures of mortality and morbidity along with burden of disease, life table and cause of death.

Unit 1

- Concepts and measurement of mortality, Importance of the study mortality, Sources of data and limitations
- Basic measures of mortality: Crude death rate; age, sex, marital status, Specific and standard death rates.
- Levels, trends and determinants of mortality in modern times, Developed and Developing countries scenario - Levels and trends, Indian scenario – Levels, trends and Differentials
- Determinants of mortality

Unit 2

- Importance of the study of infant and childhood mortality, infant mortality rate; neonatal, post- neonatal and peri-natal mortality rate
- Reasons for high IMR in India and prospects of decline, Maternal mortality rate, ratio, levels and trends, Maternal mortality – Estimates. Trends, Importance of indicator
- Differentials and trends in developed and developing countries and in India,
- Major child survival initiatives, Healthcare utilization

Unit 3

- Definition of morbidity, incidence and prevalence of disease.
- WHO classification of causes of death, changing patterns of causes of death;
- Epidemiological transition, Health transition
- Non-communicable diseases, Global burden of Diseases
- Undernutrition and Over nutrition

Unit 4 - Life tables

- Concepts, definitions of columns
- Current and cohort life tables
- Complete life tables and abridged life tables
- Construction of life tables
- Model life tables

Paper 1.4 - Introduction to Principles of Economics

This course is an attempt to develop the understanding of theoretical structure of microeconomics and macroeconomics which are necessary for the understanding of Population studies and health economics. The objective of this course is to develop an understanding of the basic principles of economics. It is intended to improve student's analytical skills and ability to solve problems, which will be useful in several other areas of the program. The topics have been chosen in a way that it should match the basic spirit of the program. By the end of this course the student is expected to be familiar with basic concepts of microeconomics and macroeconomics and acquire analytical skills to analyze problems of economic policy. Examples and exercises would be covered to provide a flavour of various applications. It does not require any previous knowledge of economics. Familiarity with calculus and optimization theory will be helpful.

Unit 1 - Theory of demand and supply:

- Theory of demand and supply, theory of production and cost, brief introduction of neo-classical utility theory, revealed preference theory, brief introduction to behavioural Economics, Nudge theory, experimental economics, concept of supplier induced demand and concept of merit good here

Unit 2 - Theory of Market

- Perfect Competition, Monopoly, and Monopolistic Competitions, oligopoly, short run and long run market equilibrium. Efficiency and welfare. Monopoly: Monopoly power, Equilibrium output and prices, Effect on welfare, Price discrimination – first, second, and third degree, Quality choice under monopoly. Monopolistic Competition, mergers and acquisition, economics of regulations and competitions oligopoly and economic theoretical models, externalities and market failures, missing markets

Unit 3 - Macroeconomic Measurement

- An overview of National Accounting, Conventions about National Accounting Sectors, Concept of value added by production, National Product at market price and factor cost, Gross and Net Production
- Methods of Income Estimation - The Product Approach, The Expenditure Approach, The Income Approach
- Accounting for environmental and Social Dimensions, Physical quality of life index and Human Development Index, Environmentally Adjusted Net Domestic Product, Accounting of healthcare expenditure

Unit 4 - Public Expenditure Theory

- Pure theory of public expenditure- Empirical evidence on public expenditure theories. Public Sector Pricing- Pricing of Public Utilities. Public expenditure management and control, Social infrastructure and financing of human development. Growth, nature and composition of public expenditure in India, Sustainability issues of Centre and State expenditure in India, Concept, measurement and magnitude of subsidies, Issues related to subsidies in India

Unit 5 -

- Taxation and Distribution
- Transfer Program Economies of the elderly

Paper 1.5 - Biostatistics (Statistical Methods)

This is to enable the students to understand the theoretical aspects of basic statistical methods and its applications. After completing this courses students will understand the use of basic statistical methods including descriptive statistics – various measures, probability theory and distributions, testing of hypothesis, nonparametric tests and correlation and regression.

Unit 1 - Use of statistical methods

- Description of data
- Types of measurements: Nominal, ordinal, interval and ratio scales.
- Frequency distributions: Raw data, frequency distributions, histograms and frequency polygons, relative frequency distributions, cumulative frequency distributions, ogives, frequency curves.

Unit 2 - Descriptive Statistics

- Measures of Central tendency – Arithmetic, Geometric, Harmonic mean, weighted mean, median, mode
- Measures from grouped data
- Measured of location; quartiles, deciles and percentiles.
- Measures of dispersion; mean deviation, quartile deviation, standard
 - deviation, variance, computation of these measures from ungrouped and grouped data, co-efficient of variation, standardized variables and scores.

Unit 3 – Probability Distributions

- Definition of probability, conditional probability
- independent and dependent events, mutually exclusive events.
- Random variables
- Discrete and continuous probability distributions.
- Mathematical expectation.
- The binominal distribution, the Poisson distribution, the normal distribution properties,
- Fitting theoretical distributions to sample data.

Unit 4 -Testing of Hypothesis

- Concepts of statistical hypothesis,
- Decision rule, critical region
- Level of significance
- Type I and type II errors
- Large and small sample tests for means and proportions

- One sample test, two sample tests, one-way ANOVA
- Introduction to multivariate analysis

Unit 5 - Correlation and Regression

- Concept of correlation
- Pearson correlation coefficient and its properties
- Linear / Bivariate regression
- Multiple linear regressions
- Logit and Probit regression
- One-way Analysis of Variance

Unit 6 - Non-Parametric Tests

- What is non-parametric tests
- One-Sample tests
- Paired sample test
- Independent sample test
- Chi-Square test

Semester II
Paper 2.1 - Migration and Urbanization

Migration of population is one of the parameters of population change. This paper is for understanding of distribution of population and movement of population - migration and as a consequence, urbanization. Students will study spatial distribution of population, concept and measurement of migration, migration theories and also urbanization.

Unit 1 - Spatial Distribution of Population

- Importance of the study and Measures of density or concentration
- Factors affecting the spatial population distribution and temporal changes
- Population distribution in the World and in India.

Unit 2 - Migration

- Importance of the study of migration, Basic concepts and definitions
- Sources of data and limitations
- Types of migration: internal, international, temporary and refugee,
- Trends and differentials in internal migration in India and its states
- Causes and consequences of migration

Unit 3 – Measures of migration

- Measuring Migration: Place of Birth, Place of Last Residence, Duration of Stay and Combinations of the three
- Indirect methods of estimating Migration: Growth Rate method, Vital Statistics method, Life Table and Census Survival Ratio methods

Unit 4 - Theories of Migration

- Theories of migration: pull and push factors, Ravenstein's laws of migration, Lee's theory of migration

Unit 5 - Urbanization

- Basic concepts and importance of study, Sources of data
- Concept of urban and its definitional change in the Indian censuses
- Land Use, Urbanisation and its impact of Environment, Land use pattern theory
- Measures of degree, tempo and concentration of urban population
- Levels and trends of urbanization in developed and developing countries and India
- Process of urbanization and suburbanization, and rural urban continuum; Smart cities
- Problems associated with and policies and programmes affecting urbanization in India

Paper 2.2 – Population and Development, Population Projections

This paper includes population and development as well as population projections. It is about various aspects of development and its inter-relationship with different aspects of population. Students will understand about basic concepts of development, especially in relation to Demography. Population projections is a requirement for planners so the thought and techniques of population projections are necessary.

Unit 1 - Basic Concepts in Development

- Concept and Indicators of Economic Development
- Classical and Harrod - Domar Models of Economic Growth
- Approaches to Development
- Changing Concept of Development
- Emphasis of Distributive Aspect, Social Aspects,
- Physical Quality of Life Index (PQLI) and Human Development Index (HDI)
- Population Growth and Development: Effects of Change in Population Size and Structure, and Composition on Economic and Social Development, and vice-versa, Sustainable Development Goals

Unit 2 - Demographic Aspects of Development

- Development and Modernization
- Population and Natural Resources
- Factors of Production, Socio-economic and Demographic factors influencing Capital Formation
- National Income, Per Capita Income, Savings and Investment

Unit 3 - Manpower and Labour Force

- Economic Structure of Labour Force
- Manpower Demand and Utilization, Unemployment and Underemployment
- Factors Influencing Manpower Supply and Patterns
- Effects of Factor Pricing and Factor Proportions on the Labour Market

Unit 4 - Labour Force in India

- Measurement of Labour Force Participation in India, Census and NSS Data,
- Changes in the Concept, Structure, Levels and Trends in Labour Force Participation
- Economic Development and Labour Force Participation
- Labour Force and Migration, and Brain Drain

Unit 5 – Population Projections

- Population Projections: Importance of population projections, Issues and principles
- Methods of population projections: Component method of population projection, Age-disaggregated method, Projection of fertility, mortality and migration, Ratio method of population projection, Projection of population at the sub-national level, Methodology of projecting total population, age-wise population,

Paper 2.3 - Public Health and Epidemiology

This paper is for the introduction of concept and system of public health. It is about methods of prevention and health promotion. This is to understand determinants and measures of health / morbidity. Along with it the paper includes Epidemiology to familiarize students about science, methods and applications of epidemiology in public health decision making

Unit 1- Concepts and definitions of Public Health and its components

- Health, its determinants
- Public health, The science and practice of public health, History of public health
- Public Health Structure in India
- Disease, its measures and prevention (Communicable and non-communicable)

Unit 2- Measurements and Evolution of Public Health initiatives

- Measures of disease in population
- Global health and epidemiological transition
- Sources of global health data
- Evolution of global public health initiatives: primary health care, selective primary health care, MDGs, SDGs

Unit 3 - Healthcare Systems and Policy

- Health systems – goals, elements and characteristics, multi-levels of operations, interactions and interrelationships
- Health systems frameworks: six building blocks of health systems – Governance, Financing, Human resource
- Health Care Systems in India: health care system includes many sectors or subsystems, types of service providers, sources and methods of financing, and regulations
- Model of health care system in India
- Health system development and strengthening
- Challenges in Public health delivery system: with ref to delivery, performance, effectiveness, efficiency, and equity
- Discussion about the sources of problems and potential solutions
- Health Policy and analysis – policy actors, focus and forms of policy analysis – policy analysis triangle

Unit 4 - Fundamentals of Epidemiology

- Historical aspects, evolution, definition, aim and uses

- Tools of epidemiology: measuring disease frequency (prevalence, incidence, mortality rates morbidity rate etc.)
- Define exposure variables, outcome variables
- Commonly used health measures such as relative risk, attributable risk, and odds ratio; appropriate methods for estimating such measures
- Epidemiological study designs (observation research, experimental research and qualitative research)
- Bias, confounding and interaction, measurement issues
- Causal association
- Definition and understanding- Natural history of disease
- Survey methodology including census procedures and sampling
- Principles of measurement
 - Types of measures (Morbidity and Mortality: Incidence, Prevalence, Age-adjustment and survival analysis, Use of Morbidity and Mortality)
 - Details of reliability validity and accuracy
 - Questionnaire construction
 - Diagnostic tests
 - Disease Surveillance

Paper 2.4 – Health Economics – I (Health, Development and Related Issues)

This course basically discusses on basics of health economics like its scope, subject matter and the micro and macro issues in health care. At the end of the course students are expected to have knowledge of what is health economics and under that what is health expenditure, quality and disability adjusted life years, cost-benefit analysis of health care, equity and efficiency in health care etc. Basic knowledge of microeconomics and macroeconomics are desirable for better understanding.

Unit 1 - Economic Development and Health,

- State and Scope of Health Economics, Normative economics and health
- Difference between health and health care, Equity and Efficiency

Unit 2 - The Macro Scenario

- Cross Country comparison
- Health Care Cost Growth
- Pattern of Health expenditure in India: Public and private
- Quality and Sustainability
- Organization and Management of Public Health Institution.

Unit 3 - Measurements of Health

- Morbidity and Mortality, Burden of Diseases
- Concepts of DALY and QALY, Epidemiology and Morbidity Transition
- Budget management
- Cost-effective analysis, Cost-benefit analysis, Cost-Utility analysis and Efficiency analysis
- Health Technology assessment and real world evidence
- Economic analysis- reporting for projects, interpretation of finding of report on economic evaluation

Unit 4 - The Micro Scenario: Issues related to Health Care Utilization

- Preventive and Curative Health care
- Public Health and political economy
- Socio-economic determinants of health

Unit 5 -

- Health and Education
- Health and Nutrition
- Setting Priorities in health care

Paper 2.5 - Research Methodology –I

This paper enables students to understand basics of research methods, concepts and types of research. It also includes various research designs and steps in research. It familiarizes students about quantitative techniques of data collection and its actual process. Understanding the importance methodology in overall research can be understood.

Unit 1 – Scientific Methods of Research

- Definition of Research
- Aims, objectives and scope of social research, Assumptions, Operations and Aims of Scientific Research
- Steps in research, Formulation of a research problem, framing objectives and hypotheses.
- Operationalisation of concepts
- Research Process: conceptual, Empirical and Analytical Phases of Research, Essentials Criteria of Scientific methods.

Unit 2 - Research Designs

- Definition and need of research design
- Experimental research design: Pre experimental, True experimental and Quasi experimental research design, RCT
- Non-experimental research design: Descriptive, exploratory, Explanatory and Monitoring and Evaluation

Unit 3 – Measurement and Logic

- Level of measurement: Nominal, Ordinal, Interval and Ratio
- Reliability- Inter-coder reliability, stability. Validity- Face, content, construct, convergent, concurrent, and predictive validity
- Inductive and deductive reasoning
- Non-random and random errors, Scaling and composite indices
- Ethics in research

Unit 4 – Data collection – Quantitative

- Survey methods and their application to public health research, Conceptual framework
- Mixed-method design
- Survey design and planning, sampling
- Construction of questionnaire
- Data collection and analysis
- Large sample surveys – Techniques

Semester III

Paper 3.1 - Population and Health Policies and Programmes

This paper highlights the various aspects of population policies, programmes and evaluation. It facilitates students to learn the different policies and programmes, and evaluation of family planning programmes along with other schemes, cash transfer schism for maternal and child health with special reference to India. It is a look at the budget through the gender lens. It is not a separate budget for women, but an analysis of the budget to examine its gender-specific impact, and to translate gender commitments into budgetary operations.

Unit 1

- Family Welfare Programme Implementation
- Organization set up of Family Planning (Welfare) programme at National, State, District, and Primary Health Centre (PHC) levels in India
- Approaches:
 - Cafeteria, Extension, Camp, Incentives and Disincentives
 - Target Setting
- Programme Expenditure
- Evolution of population policy in India – the shift in policy from population control to family welfare, to women empowerment
- Coercion versus cooperation as elements in population policy
- Contraceptive Prevalence Rate
- Characteristics of acceptors of contraception
- Reproductive and Child Health Approach
- National Rural Health Mission. National Urban Health Mission

Unit 2 - Population Policy

- Population Policy, Definitions, Policy goals and Types of policies; Overview of population policy in; Developed and Developing countries
- World Population and Health Conferences: Bucharest, Alma Ata, Cairo and Beijing
- History of Population Policy in India, National Population Policy 2000
- Policies and/or Legal measures related to Age at Marriage and Health
- Evaluation of population policy programmes, Indicators of evaluation, Evaluation on ethical ground

Unit 3

- Medical and non-medical benefits of reproductive health services to the individual, family, and community
- National Health Policy

Unit 4

- Other Health and population related Programmes (Social Protection)
 - Integrated Child Development Services-This is not a scheme rather the oldest program to monitor child growth.
 - Conditional cash transfer schemes- like JSSK
 - Mid-day meal
 - Jananai Surksha Yojana- Janani Shishu Suraksha Karyakram
- Impact of these schemes and programmes

Unit 5 - Gender budgeting

- Overview and Introduction, Gender Budgeting in India, Institutional Mechanism and Tools, Needs Assessment, Experiences of different countries in gender budgeting, Monitoring and Evaluation Issues, Gender Audit, Case Studies.

Paper 3.2 - Health Economics-II (Health Care Market, Health Policy)

The objective of this course is to deliver a detailed understanding of demand for and supply of health care. As we know the health care market is characterized by asymmetric information to a large extent, it is extremely important to understand the underlying economics to analyse the behaviour of different agents in health care market. This course also intends to impart knowledge on health care services and health care delivery system in India.

Unit 1 - Health Care market and Demand for health care

- Health care as an input in health
- Notion of need, Supplier Induced demand
- Ex-ante and Ex-post Moral Hazard

Unit 2 - Providers of health care

- Hospitals, Physician
- Pharmaceutical Industry, Alternative Medicine

Unit 3 - Quality of Health Care

- Measurement of quality of care
- Measurement of health state utilities
- QALYs and its alternatives- different approaches of valuing health
- Multi-attribute utility instruments and their development

Unit 4 - Issues related to Health Care Reform, Policy and Health Care Finance

- Experiences of health care reform, Impact of reform
- Financing health services-current spending in developing countries, correct level of funding, inadequacy of tax based funding
- Capital investment
- Changes in Health Care Finance
- Public and private finance and provision - Public Private Partnership
- Economics of Mental Health

Unit 5 - Health Care Services and Health Care Delivery Systems in India

- Health care services and Healthcare Delivery System in India: Primary, Secondary, and Tertiary level
- Issues in Healthcare Delivery System: Accessibility, Efficiency, Equity, Affordability, Quality and Sustainability, Organization and Management of Public Health Institutions
- Economic Evaluation of National Health Programme

Paper 3.3 – Population and Health - I

This paper is to familiarize students to the linkages between population and health and understanding of the data sources. It also demonstrates different aspects of population, health and nutrition education and their importance. It familiarizes students, health issues of specific sub-groups of the population. These sub-groups have different needs and visualizing that various efforts taken by the public health system would be understood. It also to understand the role of nutrients in the physiological processes and identify public health nutrition interventions.

Unit 1 – Linkages of Population, Health and Health system

- Introduction to population and health: definition and scope
- Sources of health data: Population census, DHS, National Family Health Survey (NFHS), WHO-Sage, LASI, Health Management Information System (HMIS), National Sample Survey (NSS) etc.
- Effect of fertility, mortality and migration on health
- Health Care Systems in India
- Types of service providers
- Challenges in Public health delivery system: with reference to delivery, performance, effectiveness, efficiency, and equity
- Problems and potential solutions
- Traditional, Complementary and Integrative Medicine
- Indian traditional medicine - AYUSH Systems: Ayurveda, Yoga, Unani, Siddha, Sowa Rigpa, Naturopaathy, Homeopathy, Herbal medicine and health traditions

Unit 2 – Reproductive, Maternal and Child Health

- Burden of reproductive ill-health: unintended pregnancies, unsafe abortions, MTP act, non-sexually transmitted infections, infertility, violence against women,
- Evolution of the concept of reproductive health and Rights and its implications
- Maternal morbidity and mortality; levels and causes of maternal mortality
- Adolescent Health
- Common morbidities among young children; lower respiratory tract infections, diarrhoea
- Immunization; coverage, factors

Unit 3 - Urban Health

- Urban population
- Changes in urban physical and social environment and their consequences for health
- Determinants of urban health - locating and understanding health disparities using data, housing, segregation, built environment, food insecurity, violence and crime

- Urbanization and health outcome: emerging public health issues associated with rapid growth of urban population overcoming health inequities in urban settings
- Health services in urban areas, public health care access and other issues, inadequacy of public health services

Unit 4 - Tribal Health

- Overview of territorial distribution and classification of tribes in India
- Tribal health issues
- Tribal health programmes, strategies, initiatives and schemes
- Poverty, Nutrition and Food Security in tribal regions
- Tribal development, displacement, rehabilitation and its impact on health

Unit 5 - Public Health Nutrition

- Introduction to public health nutrition
- Inter relationship between food, nutrients and health.
- Common terms related to nutrition
- Nutrition Transition: Demographic, economic transition, poverty alleviation, food consumption patterns
- Undernutrition: global and Indian prevalence of undernutrition, risk factors consequences
- Micronutrient deficiency disorders: prevalence, risk factors, Interventions that worked globally, lessons learnt.
- Over nutrition: Evolutionary principle, Obesity: prevalence and risk factors: Physical activity and inactivity, screening of those at nutritional risk, Life-style diseases: Interventions that worked globally, lessons learnt.
- Guidelines for prevention of non- communicable diseases
- Food Security: Factors affecting food security, economics food security and community development, Food security bill

Paper 3.4 – Research Methodology - II

This paper acquaints students to qualitative techniques of data collection and analysis along with its purpose. Various software for data collection and analysis are introduced in this paper. Introduction of research communication, important aspect of any research, makes this course extremely important.

Students will write a research grant or fellowship application including ethical guidelines and other regulatory requirements.

Unit 1 - Qualitative Research Methodology

- Types of research, steps in conducting research, approaches in qualitative research
- Research Designs: Ethnography, Grounded Theory, Historical research
- Introduction to Qualitative data collection methods: In Depth Interview, Focus Group Discussion, Observation, Case Study, Participatory methods, KII
- Sampling in qualitative research: Sample size, sample selection techniques
- Quality Control of qualitative data: setting standards, judging quality, validity and credibility
- Analytic approaches, methods, and techniques
- Principles of analysis, Steps in analysis; thematic analysis, content analysis, narrative analysis

Unit 2 – Communication

- Scientific writing, Writing report, Writing papers, Writing manuals, Writing Research Brief, Presentation
- Plagiarism
- Literature review, Reference writing

Unit 3 – Proposal Development

- Select a topic
- Conduct a literature review
- Identify a research gap
- Frame research questions, Develop objectives and hypothesis
- Select a study design
- Write the detailed methodology
- Develop the analysis format
- Write entire proposal for grant

Unit 4 - Monitoring and Evaluation

- Principles of Monitoring & Evaluation: Introduction to M&E – roles and uses; Results paradigm: inputs, activities, outputs, outcomes and impact/goal; M&E in Project Cycle; Stakeholder Analysis – who, needs and roles.
- Project Design: Situation and problem analysis; Objectives and strategy analysis; Dissection of logical frameworks and logic models; Derivation of log frame narrative summary from project objectives; Risk assessment – categories, description, probability, impact, score, ranking, controls
- M&E Indicators: Information requirements – organization, stakeholders; Indicators selection – characteristics, verifiability; Indicators verification – data source, means
- M&E Study Design: Planning for M&E; Baseline, evaluation and impact study designs
- M&E Frameworks: LFA; Logic model; Results frame; M&E plan in general
- Theory of Change: Theory of change – project design, M&E frame Knowledge & Skills for efficiency and productivity in development
- Evaluation Designs: Evaluation techniques; Information requirements – stakeholders, purpose, timing, responsibility; Data collection instruments – qualitative, quantitative; Participatory evaluations; Communicating M&E findings meaningfully – stakeholder learning
- Quantitative Impact Evaluation: Estimation of Counterfactual – Theoretical concept; Descriptive comparison - Why simple difference is insufficient; Difference in Differences (DiD); Regression Discontinuity Design (RDD); Propensity Score Matching (PSM)

Paper 3.5 – Actuarial Methods for Health and Life Insurance

This paper basically focuses on actuarial methods for insurances, measurement and management of risk and uncertainty. It will give detailed understanding of risk premium, annuity, pricing of health care product, life insurance products etc. At the end of the course the student is expected to learn pricing and forecasting methods and models used by actuaries.

Unit 1 - Life Assurance and Annuity Contracts

- Pricing of life insurance contracts, equations of value, allowance for investment income, present value random variable, expected present value, variance of the present value random variable for life assurance contracts; life assurance benefits payable immediately on death; claim acceleration approximation; life annuity contracts: immediate annuity; annuity-due; temporary annuity; temporary annuity-due; deferred annuities; deferred annuities-due; and continuous annuities

Unit 2 - Mathematical Theory of Life Contingencies

- Advance Problems in mathematical theory of life contingencies; force of mortality; laws of mortality; premiums and reserves for insurance and annuities based on a single life-sums and integrals for mean and variance of present value of benefit payments; annuities payable in advance and in arrears; temporary and deferred and whole lifetime annuities; net premiums and reserves-prospective and retrospective reserves; Gross and net premium reserves; profit contracts

Unit 3 - Joint Life Probabilities

- Joint life probabilities, annuities and insurances; cash flow dependent upon death or survival of either or both of two lives; competing risks; transition intensities for given dependent probability

Unit 4 - Health and care Products:

- Demonstrate an understanding of health and care product design, principles by which health and care insurance contracts are designed and the interest of the various stakeholders in the process, suitable design for a product in a given situation, relative merits of different product designs, Different sources of risk to a health and care insurance company: • data • claim rates • claim amounts • investment performance • expenses and inflation • persistency • mix of new business • volume of new business • guarantees and options • competition • actions of management • actions of distributors • counterparties • legal, regulatory and tax developments • reputation • internal audit failures/fraud • physical risks • aggregation and concentration of risk • catastrophes • non-disclosure and anti-selection

Unit 5 - Multiple-Decrement Theory and Pension Fund Mathematics

- Multiple decrement theory; pension fund mathematics-techniques of discounting emerging cost, for use in pricing, reserving and assessing profitability for all contract types and for pensions; expected cash flow dependent upon more than one decrement; expected cash flow contingent upon risks other than human risks

Unit 6 - Principal Forms of Heterogeneity within a Population

- Variations in mortality and morbidity; main forms of selection-temporary initial selection, time and class selections, spurious and adverse selection, different mortality tables for different lives; risk classification of life insurance, genetic information of risk classification in life insurance, directly and indirectly standardized mortality rates

Semester IV

Paper 4.1 - Population and Health – II

Unit 1 - Disability

- Disability and public health: issues of definition and ethics
- Data sources and estimating disability: global and national level
- Trends in disability in developed and developing countries and India

Unit 2 – Elderly Health

- Demographic trends and epidemiological description of the major health problems and issues for older populations
- Implications of elderly health for public health
- Theories of ageing and biology of ageing
- Components of usual versus successful aging, behavioural, social and environmental factors that influence successful ageing
- Health care services for older adults: strategies to prevent diseases and promote health in elderly
- Policy and programmes for elderly – India and World

Unit 3 – Mental Health

- Introduction to Mental Health- Global mental health, trends in global mental illness, underlying drivers, burden of mental health globally and at national level)
- Community Mental Health- Sociocultural determinants of mental health
- Marginalization and human rights
- Mental health care act
- Mental health care policy- Programme and legislative framework for mental health- research development in mental health policy, mental health care systems
- Counselling and therapeutic interventions
- Cost of mental health services, health financing and economic evaluation-complexities of applying economic techniques to mental health care
- Understanding of mental disorders and their treatment –
 - Historical perspective on mental disorders
 - Current Understanding of the main types of mental disorders
 - Broad knowledge of diagnosis and causes, of mental disorders
 - Current views of mental disorder treatments and care of persons with mental disorders
 - Disability burden of mental disorders

- Direct and indirect economic costs of mental disorders
- Social costs of mental disorders
- Access to mental healthcare- To develop an understanding of how mental health legislation can promote the right to health, the right to live independently and be included in the community and improve access to quality mental health care.
 - Financial resources for mental health care
 - Integration of mental health services into general health services
 - Promoting services in the community and de-institutionalization
 - Allocating resources to underserved populations
 - Access to medications and psychosocial interventions
 - Access to health (and other) insurance

Unit 4 - Gender and Health

- Concept of gender, distinguish sex from gender
- Gender as determinant of health
- Role of biology and sociology in health and health care
- Gender and health inequities
- Gender and disability
- Gender perspective in public health in India
- Gender, Sexuality, and HIV/AIDS— social and structural contexts of HIV vulnerability

Paper 4.2 - Applications of Statistical Software

This paper is a focus on data management and analysis. The subsequent sections of the paper include the topic on data management software tools (Quantitative and qualitative), secondary data analysis considering reusing secondary data, reading and reflecting on data collected by others, meaning and use of documentation and other contextual materials. Additionally, this paper focus on the strategies for secondary data analysis, as well as topics on critiquing and assessing rigour in quantitative and qualitative research and presenting qualitative analysis in health research reports.

Unit 1- Basic understanding of different type of data set

- Structure of Demographic Health Survey Data (DHS)
- Structure of National Sample Survey Data (NSS)
- Any other data source

Unit 2- Getting started with quantitative software

- Introduction of the software and its interface
- Basic commands of the software
- Import and export of data file

Unit 3- Data Manipulation

- Creating new variables, Recode and replace, Keep and drop variables, Append, merge the data files
- Converting string variable into numeric and vice versa, Combining and dividing variables
- Graphical presentation of data (bar, histogram, line, scatter, box plot etc.)

Unit 4- Working with a secondary dataset

- Data entry
- Writing the syntax file
- Restructure/reshaping the data
- Extraction of DHS and NSS data

Unit 5 – Basic Statistical Analysis with the help of statistical software

- Generating the Univariate and bivariate tables
- Measure of central tendency
- Chi-square and ANOVA test

Unit 6 - Multivariate technique with the help of statistical software

- Linear regression

- Multiple linear regression
- Logistic regression
- Survival Analysis

Unit 7 - Working with qualitative data software

- Data organization and exploration: Import and organise data in a project, manage a literature review, Explore textual data, Links to external information, Memoing's one research
- Data coding and comparison: Autocode structured data, generate codes inductively, manage a coding scheme, Generate / falsify hypotheses, Visualise the coding process, Work with cases and variables
- Data analysis and visualisation: Search tools, Prepare the analysis with sets, run coding and matrix queries, Present findings with visualisations, Generate summary reports, Export data and findings

Unit 6- Working with mapping and spatial analysis software

- ArcGIS- Display map features, add data to your map, edit geographic data, work with data tables, query and select geographic features, create a summary graph. lay out and print a map. Discrete data: point, and polygon data, Raster and vector data, layouts preparation. Geocoding and basics of digitization in ArcGIS.

Paper 4.3 - Health Economics-III (Insurance, Actuarial, Health and Ecology)

One of the objectives of this course is to impart the knowledge on economics of health insurance in detail to make the students understand how health insurance market actually works. The economic consequences of critical illness and prolonged illness also will be covered. Another extremely important intake from this course will be two entirely devoted modules on health and ecology and the interlinkages between health and environmental policy.

Unit 1: Economics of Health Insurance

- Competitive health insurance and risk adjustment, standard and sub-standard risk
- Demand and supply of health insurance, asymmetric information and agency, market insurance, Market Failures, Asymmetric information, Adverse selection within health insurance, the market for lemons, full coverage, partial coverage, moral hazard, Incidence of a Tax Theory Applied to Employer-Sponsored Health Insurance, Target Effectiveness and Target Efficiency Applied to Covering the Uninsured, Social insurance
- Pricing Health Insurance Product
- Self-insurance and protection, employment based insurance, health insurance in India
- Health insurance in India: Private insurance, community-based insurance schemes

Unit 2: Economics of critical illness, prolonged illness, chronic disease

- The economic consequences of chronic disease, critical illness, prolonged illness
- The rationale for public policy intervention
- Cost effectiveness of intervention
- Effectiveness of Insurance

Unit 3: Ecology and Health

- Health production function
- Exposure, dose and response
- Indoor and outdoor air pollution; effects of air pollution on children, adults
- Effects of climate variability and climate change on mortality and morbidity
- Environmental toxicology; environmental carcinogenesis;
- Water-borne diseases; municipal, industrial and hazardous waste – health implications
- Prevention and Control of Environmental Occupational health issue-Food safety, food contamination-Waste management, POET variables- Population, Organisation, Environment and Technology.

Unit 4: Health and Environmental Policy – Inter-linkages

- Global policy initiatives: national environmental and health action plans

- Health impacts from Air and water pollution;
- Variations in the weather and impact on mortality
- Disease incidence;
- Economic and health effects of weather related disturbances
- Environmental health
- Global changes in environment and the third world

Paper 4.4 - Term Paper

This will be in consultation with the Faculty

Elective Papers

Elective 1. Behavioural Economics

This course introduces the concepts of behavioural economics and their importance in economic decision-making in case of risk, uncertainty and strategic interactions. It particularly tries to explain economic choices which deviate from predictions of neo-classical economics. It also attempts to incorporate insights from sociology, institutions, evolutionary psychology to understand human behaviour and offer directives for better developmental outcomes. It also discusses standard research methods of the subject viz. laboratory and field experiments to understand their contribution to the advancement of the subject.

Unit 1: Introduction: decision-making theories

- Neo-classical economics – rationality assumption, optimization
- Origin of Behavioural economics - Bounded Rationality, Rationality in Psychology and Economics by H. Simon
- Dual System theory, Prospect theory

Unit 2: Decision-making under risk and uncertainty

- Heuristics and Biases programme- Representativeness, Availability, Anchoring and adjustment, mental accounting
- Biases: Overconfidence, Confirmation bias, Framing, Status Quo Bias, Endowment Bias, Self-Control Bias
- Fallacies: conjunction and disjunction fallacies, gambler's fallacies

Unit 3: Inter-temporal choices

- The discounted utility model, exponential discounting
- Hyperbolic discounting

Unit 4: Strategic interactions

- Fairness, trust, cooperation, reciprocity, altruism
- Norms and Culture

Unit 5: Applications of Behavioural Economics

- Introduction to Behavioural Labour Economics, Behavioural Finance
- Taxation and the contribution of Behavioural Economics
- Choice architecture: The role of nudging
- Public Policies: Psychological and social perspectives on policy in the area of Poverty, Health, Climate Change

Unit 6: Research methods for behavioural economics

- Survey: hypothetical choices, self-reported perceptions & biases
- Laboratory experiments – Precepts of laboratory experiments, internal and external validity
- Field experiments – Randomized Control Trails

Elective 2. Social Exclusion and Inclusive Policy

Indian society is characterized by a highly entrenched system of social stratification. This created the hindrances and denied the access to economic, cultural and educational resources to the disadvantaged groups of the society particularly, the scheduled castes, scheduled tribes, women, minorities, physically challenged and old aged groups. To understand their problems, we need to study the components of social exclusion and to formulate policy paradigms for their inclusion in the economy. This course is designed to give basic understanding of the phenomenon of 'social exclusion'. It will make possible to create awareness about the social excluded people from an economic and social policy perspective as well as to analyze social inclusive policy for them.

Unit 1: Understanding Social Exclusion

- Conceptualizing Social Exclusion, Origin and Basis of Social Exclusion; Forms of Social Exclusion:
- Religion, Race, Caste, Gender, Ethnicity, Region, Culture, Language, Disability, Migrants and
- Refugees; Excluded Groups and Socio- Economic Disparities: Scheduled Castes, Tribals, Minorities, Women, Old Aged and the Physically Challenged; Contemporary Discussions on Social Exclusion

Unit 2: Theoretical Perspectives on discrimination

- Economics of Discrimination; Marxist and Liberal Perspective; Capability Approach and Theories of Poverty; Economic Justice, Economic Freedom and Welfare; Social Choice and Human Rights Approach

Unit 3: Social Exclusion of Caste, Tribe and Minority

- Indian society: Social Order in Caste, Tribe and Minority; Caste System as an Institution of Exclusion; Exclusion of Tribes: Nation-State Formation, Industrialization, Urbanization, Globalization etc.; Dimensions of Exclusion for Marginality: Development, Issues of Identity and Human Rights Violation

Unit 4: Dimensions of exclusions and inclusive policy perspectives

- Scheduled Castes, Minorities and Affirmative Action; The Question of Reservation and Affirmative Action – Constitutional Provisions and Contemporary Debates with reference to the Mandal Commission Report and the Sachar Committee Report; Labour Market Discrimination, Wage Differentials, Problems of Employability, Social Security and Pension; Access to Finance, Micro Finance and Financial Inclusions of the Excluded People

Unit 5: Physically challenged and Old Aged Social Exclusion

- Physically Challenged and Social Exclusion: Constitutional Provisions, National and State Policies and Social Security Policy; Community Support, Awareness and Assimilation Activities; Aging: Social and Economic Exclusion; Gerontology Outlook in Policy Framework: Government Laws and Welfare Programmes

Unit 6: Institutions and Inclusive Policies

- Inclusive Policy Agenda: United Nations Organization, Constitutional Provisions, Nodal Government Agencies and Planned State Interventions; Human Rights Framework, Affirmative Action and Reservation Policies; Designing Innovative Strategies for Inclusive Policies

Elective 3 - Academic Writing - (Swayam Platform)

https://onlinecourses.swayam2.ac.in/cec20_ge29/preview

Course Objectives

1. To differentiate between various kind of academic writings.
2. To identify and avoid the plagiarism.
3. To practice the basic skills of performing quality literature review.
4. To practice the basic skills of research paper, review paper and thesis writing.
5. To target the research work to suitable journal and communicate for publication
6. To practice the Time and team management.
7. To practice digital writing or develop Open Educational Resources (OER).
8. To write research proposals, conference abstract and book chapters/ book proposals.

Course Duration 15 week - Credits: 04

Week 1

Academic & research writing: Introduction; Importance of academic writing; Basic rules of academic writing

Week 2

English in academic writing I & II; Styles of research writing

Week 3

Plagiarism: Introduction; Tools for the detection of plagiarism; Avoiding plagiarism

Week 4

Journal Metrics

Week 5

Author Metrics

Week 6

Literature review: Introduction, Source of literature; Process of literature review

Week 7

Online literature databases; Literature management tools

Week 8

Review Paper Writing, I & II

Week 9

Research paper writing I, II, III

Week 10

Referencing and citation; Submission and; Post submission

Week 11

Thesis Writing I, II & III

Week 12

Empirical Study I, II & III

Week 13

Challenges in Indian research & writing; Team management (mentor and collaborators); Time Management

Week 14

Research proposal writing; Abstract/ Conference Paper/ Book/ Book Chapter writing; OERs: basic concept and licenses

Week 15

Open Educational Resources (OERs) for learning & Research; OERs development I & II

Elective 4 - Accountancy and Financial Statement Analysis

The course aims at providing basic understanding of various essential concepts of accountancy and preparation of accounting statements, introduction to accounting standards and IFRS framework of accounting.

Unit 1: Basic Principles

- Financial Accounting & Accounting Standards- Accounting Equations - Users of Accounting Statements, Importance - Objectives and Principles - Accounting Concepts and Conventions - Principle of Double Entry Book Keeping, Trends in Accounting principles, GAAP, IFRS, IAS

Unit 2: The Accounting Process

- Preparation of Books of Original Records: Journals - Subsidiary Book - Problems on Cash Book and Petty Cash Book - Ledgers & Trial Balance - Classification of Capital and Revenue Expenses - Final Accounts with Adjustments

Unit 3: Preparation of Final Accounts/Statement

- Sole traders with Basic Adjustments Preparation of Final Accounts / Statement of Companies (Both Horizontal & Vertical Form of Financial Statements) - Brief Introduction to Partnership Account- Accounting for small, medium and large companies

Unit 4: Statement of Changes in Funds

- Funds Flow Statement - Cash Flow Statement - Problems with Basic Adjustment on FFS and CFS - Statement of Changes in Working Capital - Funds from Operations - Paid Cost and Unpaid Costs - Distinction Between Cash Profits and Book Profits - Preparation and Analysis of Cash Flow Statement and Funds Flow Statement.

Unit 5: Depreciation & Inventory Valuation

- Concepts & Methods of Depreciation - Problems on Straight Line & WDV Methods - Inventory - Concepts & Methods - Problems on LIFO, FIFO and Weighted Average - Valuation of Fixed Assets- Current and Non-current assets and liabilities- Tangible v/s Intangible assets - Depreciation of Fixed Assets and Methods of Depreciation - Inventory Valuation: Methods of Inventory Valuation and Valuation Of Goodwill - Methods of Valuation of Goodwill.

Unit 6: Analysis of Companies' Annual Reports

- Provisions of the Companies Act 1956 - Provision Affecting Preparation - Presentation & Analysis of Audit Reports & Directors' Reports.

Unit 7: Financial Analysis of Financial Performance of a Firm

- Different Tools - Ratio Analysis - Different Types of Ratio's - Inter-Relation Between Ratio's - Due-point Analysis - Common Size Statement of Inter Firm and Intra Firm - Internal Revenue Code-Interpretation of Financial Statements From Investor and Company Point of View - Horizontal Analysis and Vertical Analysis of Company Financial Statements - Liquidity, Leverage, Solvency and Profitability Ratios - Du Pont Chart - A Case Study on Ratio Analysis

Unit 8: Accounting of Foreign Currency Transactions

- Accounting of Foreign Operations, Process and Translation Risks, Consolidation of Foreign with Domestic Financial Statements, IFRS and Accounting of International Transactions

Elective 5 - Business Analytics

This Learning path enables participants to gain three critical skills: data analysis and problem solving framework, the ability to perform descriptive analytics and visualization, and the expertise to build and implement the most widely used data science and machine learning algorithms in use today, with R

Unit 1 - The need for Analytics and Understanding Analytics

- Decision Making – Heuristics and Biases
- The need for analytics
- Impact of analytics on business
- Being analytically competitive
- The difference between analytics and BI
- Introduction to the business Analytics model
- Types of analytics
- Models and algorithms in Analytics
- The Analytics Methodology

Unit 2 - Tool and Tech Landscape

- A review of technology used in data storage, data processing, and data science
- Popular tools used in Data Science and when to use each

Unit 3 - Descriptive Analytics with excel and Tableau

- An introduction to Tableau
- Using descriptive statistics in analysis and reporting
- Advanced reporting with Tableau

Unit 4 - R programming

- An introduction to R
- Importing and exporting data in R
- Data Manipulation with R
- Advanced Data Manipulation with R
- Data Visualization with R

Unit 5 - Data Pre-processing

- Data Exploration and Assessment for Data Science
- Identifying and dealing with noise in Data
- Preparing data for Data Science Modelling

Unit 6 - Predictive Models in R

- Linear Regression Models and their applications
- Logistics Regression Models and Their applications
- Time Series Forecasting

Unit 7 - ML Models in R

- Clustering Algorithms and application
- Decision Tree Algorithms and applications
- Random Forest Algorithms and applications

Unit 8 - Storytelling with Data

- Communicating data science results
- Effective presentation skills
- Using Data visualizations for storytelling