GOKHALE INSTITUTE OF POLITICS AND ECONOMICS

Deemed to be University u/s 3 of the UGC Act, 1956
PUNE 411004

(Approved by Board of Studies 26/02/2024 & 28/05/2024; Approved by Academic Council 5-6-2024)

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M.Sc. (Population Studies and Health Economics)

COURSE STRUCTURE & SYLLABUS

Program Outcomes:

Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate /postgraduate program of study.

Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

Critical thinking, Problem solving and Analytical reasoning: Capability to apply analytic thought to a body of knowledge; analyses and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories, philosophies.

Acquiring research-related skills, scientific reasoning and reflective thinking: A sense of inquiry and capability for asking relevant/appropriate questions; ability to recognize cause-and-effect relationships, define problems, formulate and test hypotheses, analyses, interpret and draw conclusions from data; ability to plan, execute and report the results of an experiment or investigation.

Self-directed lifelong learning: Capability to use ICT in a variety of learning situations; ability to work independently, identify appropriate resources required for a project; ability to acquire knowledge and skills, through self-paced and self-directed learning aimed at personal development.

Employability Options: All the programs prepare the students for job profiles that demand numerical, analytical, and problem-solving skills, such as financial management, market research, business planning, budgeting, resource allocation, etc.

The present curriculum goes with Learning Outcome-based Curriculum Framework (LOCF) for all its programs. The approach is envisioned to provide a focused, outcome-based syllabus with an agenda to structure the teaching-learning experiences in a more student-centric manner. The LOCF approach has been adopted to strengthen students' experiences as they engage themselves in the program of their choice. Each program vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. Our students became eligible for all competitive exams like SSC, Indian Administrators, Insurance sector, Data Analyst, Tourism, Environment Management, Bank PO's, Media, MNC, NGO, and to prepare them for start-ups. In short, each program prepares students for sustainability and life-long learning.

Program Specific Outcomes:

- PSO 1: This program is designed to gain in-depth knowledge of Population Studies-dynamics of population change along with its linkages with humanities.
- PSO 2: To apply the understanding of interrelationship of population to different social, economic, health and nutrition phenomena.
- PSO 3: It enables the students to evaluate critically the healthcare systems and services of various healthcare models, basic principles and practices of healthcare.
- PSO 4: The program contributes to the development of health professionals and economists who aspire to make their presence in the highly promising field of Health Economics

Pedagogy of this course:

- Active learning by encouraging discussions in class.
- Inculcating team spirit by providing activities to be done in groups.
- Follow various modes of teaching, to help students adapt to different modes of work they will face post-graduation, to name a few, power point presentations, computer exercises etc.,
- Games and other simulation exercises since working in strategic environment with software packages and languages is inevitable these days.
- Encouraging to do literature review or to write summary of journal articles to keep them afloat with recent developments in the research frontiers.
- Assignments are given to be able to apply theories to real-word examples.
- Quizzes to have clarity of concepts.

Note: Various evaluation methods for students to develop different skills along the way.

Course Code: C-01
Course Name: Microeconomics

Course Outcomes:
To acquaint the students with introductory consumer theory and the limitations with an orientation towards behavioural approach (Module I)
- To understand how the choice will be made under uncertainty and how the attitude towards risk will be determined. (Module II)
- To introduce to the students, the concepts associated with the functioning of a firm. (Module III)
- To study the various types of markets prevelant in an economy and the nature of their decision making (Module IV)
- To study the information economics i.e. role of asymmetric information and its way out, designing of optimum incentive scheme under information asymmetry (Module V)
- To acquaint the students with the basics of game theory (Module VI)

Module 1:
Consumer Theory (8 hrs)
- Preference Relation and Its Properties.
- Consumer Preferences and Representation of Preferences by Utility Functions.
- Budget Constraint, Utility Maximization and Derivation of the Demand Function, The Indirect Utility Function and Its Properties, Roy's Identity
- Revealed Preferences. Endowments in the Budget Constraint, Difference between revealed and normative preference
- Limitations of the Consumer Theory
- Behavioral Approach

Module 2:
Choice Under Uncertainty (12 hrs)
- The Expected Utility Model, Utility on Lotteries, Axioms and Preferences under Uncertainty
- Critiques of the Expected Utility Model, Prospect Theory
- Measures of Risk--Domar-Musgrave Index, Roy's Safety Index, Mean-Variance, Semi Variance Mini-max Regret
- Lotteries, Preference Relation over Lotteries, N-M Expected Utility Theory
- Basic Axiom and Representation Theorem Violations of EU theory.
- Subjective Probabilities
- Risk Aversion – Jensen's Inequality, Acceptance Set and Risk Aversion
- Various Measures of Risk Aversion like Arrow-Pratt Measure of Absolute Risk Aversion, Relative Risk Aversion
- Certainty Equivalent and Risk Premium
- Arrow-Pratt Approximation of Risk Premium
- Pratt's Theorem
- Classes of Utility Functions: Decreasing Absolute Risk Aversion (DARA), Constant Absolute Risk Aversion (CARA), Increasing Absolute Risk Aversion (IARA), Decreasing Relative Risk Aversion (DRRA), Increasing Relative Risk Aversion (IRRA), Constant Relative Risk Aversion (CRRA) etc. and their comparative statics
- Applications to Various Settings and Comparative Static Results.

Module 3:
Theory of Firm (6 hrs)
- Theory of Organization. Measurements of Inputs and Outputs
- Profit Maximization, Comparative Statics, Profit Function. Hoteling's Lemma, Factor Demand Functions, Supply Function.
- Cost Minimization, Cost Functions, Average and Marginal Cost Functions, Short-Run and Long-Run Costs, Marginal Cost Pricing, Aggregation – Industry Supply Function, Shephard's Lemma, Conditional Factor Demand Functions.
- The Duality Between Production and Cost Functions.

Module 4:
Theory of Market (8 hrs)
- Perfect Competition: Short-Run and Long-Run Market Equilibrium.
- Monopoly: Monopoly Power, Equilibrium Output and Prices, Effect on Welfare, Price Discrimination – First, Second, And Third-Degree, Quality Choice Under Monopoly. Market Power, Sources of Market Power, Monopoly & Regulation of Monopoly. HHI or Any Other Index Used to Measure the Concentration of Firms.
- Monopolistic Competition.
- Oligopoly: Cournot Equilibrium, Stability, Comparative Statics, Bertrand Equilibrium. Quantity Leadership, Price Leadership. Conjectural Variations.
- Spatial Competition: Linear City Model, Circular City Model.
- Market failure, public goods and introduction to welfare economics,

Module 5:
Information Economics (10 hrs)
- Introduction: The Elements of the Problem
- Types of Asymmetric Information Problems– Moral Hazard, Adverse Selection, Signalling
- Static Full Information Benchmark
- Hidden Action in a Two Action-Two outcome model as well as in a Simple Continuous Action and Continuous Outcome Case
- Solution through First Order Approach and its Validity
- Value of Information and Characteristics of the Optimal contract
- Adverse Selection and Signalling: Akerlof's Model of Lemons,
- Signalling in the Spence's Model of Education
- The Notions of Pooling and Separating Equilibria.

Module 6:
Game theory (introduction) (6 hrs)
- Description of a Game, Normal Form Representation of the Game, Extensive Form Representation of The Game
- Solution Concepts—Nash Equilibrium, Mixed Strategies, Repeated Games, Sequential Games.

Suggested Readings:
Books:

- Serrano.R and Feldman. M.A. (2018). A Short Course in Intermediate Microeconomics with Calculus. Cambridge University Press

- Gravelle, H. and Rees R, 2003, Microeconomics, 3rd Edition, *Prentice Hall*

- Kreps, David. (1992). A Course in Microeconomic Theory, Eastern Economy Edition, *Prentice Hall of India*

- Mas-Colell.A, Whinston &Green, Microeconomic Theory. (1995). Oxford *University Press*

- Perloff.J. (2019). Microeconomics, 7th Edition*, Pearsom Education.*

- Pindyck, Robert S. and Rubinfield, Daniel L. (2017), 9th Edition Microeconomics, *Pearson College*

Articles:

- Arrow, K.J. (1965) Aspects of the Theory of Risk Bearing. Yrjo Jahnssonin Saatio, Helsinki.

- Hadar, J. and Russell, W. (1969). **Rules for ordering uncertain Prospects**. AER.

- Yan Sun & Shu Li, 2010. **The effect of risk on intertemporal choice**, Journal of Risk Research, Taylor & Francis Journals, vol. 13(6), pages 805-820, September.

- Kahneman, D.and Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk.Econometrica. 47(2),pp263-291

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Course Code: C-02
Course Name: Macroeconomics

Course Outcomes:
The course will enable the students:
- To familiarize the students with the contributions of various schools of thought in Macroeconomics. (Module 2 and 3)
- To provide a wider vision of present discourse in Macroeconomics. (Module 6)
- To develop aptitude to relate concepts with research and policy. (Module 5)
- To paraphrase macro-economic policy initiatives both in global and domestic context (Module 2)
- To demonstrate an understanding of the macroeconomic tools to manage business fluctuations. (Module 4)

Module 1:
Macroeconomic Measurement (8 hours)
- 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.

Module 2:
Background Concepts. (8 hours)
- History of macroeconomic thought- Classical, Keynesian and schools of thought after Keynes.
- Behavioral foundations of Macroeconomics:
- Consumption Function: Keynes Psychological Law and Kuznet's consumption puzzle, Fisher's intertemporal Choice Model, Permanent Income Hypothesis, Life Cycle Hypothesis and Relative Income Hypothesis.
- Investment Function: Neo-Classical Theory of Investment, Stock Market and Tobin's q-ratio, Accelerator Theory of Investment (simple and flexible acceleration models)
- The Monetarist School: The quantity theory of money approach.

Module 3:
Rational Expectations and new Classical Macroeconomics (4 hours)
- The basic concepts – the Phillips curve and Lucas Supply equation

Module 4:
Real Business Cycle School (6 hours)
- Real Business Cycle School and inter temporal substitution of labor.
- Real Business Cycle theory- technology shocks- neutrality of money and flexibility of wages and prices.
- Real Business cycle view on great depression.

Module 5:
Micro Foundations of real and nominal rigidities: New Keynesian School (8 hours)
- Imperfect competition and price setting- Real rigidity- Coordination failure models.
- Real Non Walrasian Theories- Small Menu Cost model and Staggering of prices, implicit wage.
- Contract theory- efficiency wage theory- Insider- Outsider model.

Module 6:
Basic Infinite Horizon Models   (8 hours)
- Ramsey Problem: Command Economy, Decentralized economy, dynamic efficiency - Government in the decentralized economy.
- Overlapping Generations Model.
- OLG with production: tow period lives, dynamic inefficiency and altruism, Social Security Models under OLG

Suggested Readings:
Books:

- Barro, Robert J. & Sala-i- Martin, Xavier (1995), *Economic Growth,* McGraw Hill.
- Blanchard, Olivier (2000), *Macroeconomics*, Prentice Hall.
- Blanchard, Olivier and Stanley, Fischer (1989), *"Lectures on Macroeconomics"*, The MIT Press
- Dornbusch, Rudiger, Fischer, Stanley & Startz, Richard (2004), *Macroeconomics,* 9th Edition, McGraw Hill.
- Mankiw Gregory (2002), *Macroeconomics,* 5th Edition, Worth Publishers
- Romer, David (2003), *Advanced Macroeconomics*, 3rd Edition, McGraw Hill Publishers.
- Snowdon Brian and Vane Howard R, (2005) *Modern Macroeconomics: Its Origin, Development and Current State,* Edward Elgar Publishing Ltd.

Additional Reading List: Website Link

- https://www.imf.org/en/Publications/WEO/Issues/2022/07/26/world-economic-outlookupdate-july-2022
- https://www.federalreserve.gov/newsevents/pressreleases/monetary20220727a.htm
- https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.mp220721~53e5bdd317.en.html
- https://www.ecb.europa.eu/press/blog/date/2022/html/ecb.blog220723~c2b1d4b654.en.html
- https://www.ecb.europa.eu/ecb/educational/explainers/tell-memore/html/interest_rates.en.html
- https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=53904
- https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=21035
- https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=21038
- https://dea.gov.in/sites/default/files/MER%20June%202022_Final.pdf
- https://www.indiabudget.gov.in/doc/frbm1.pdf 16. https://www.rbi.org.in

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Course Code: C-03
Course Name: Statistics

Course outcomes:
The course will enable the students:
- To acquaint the students with hypothesis testing and to familiarize its use in real life. (module 1)
- To familiarize the students with distribution and its various types. (module 2)
- To acquaint the students with estimation, inference and its various methods (module 3)
- To familiarize the students with various qualitative tests. (module 4)
- To identify the various types of nonparametric statistics. (module 5)
- To acquaint the students with operational research and its various solving methods. (module 6)
- To improve the students' analytical and problem-solving skills, familiarize the students with various real life examples of linear programming problems. (module 7)

Module 1:
Testing hypotheses.
- Simple versus composite hypothesis.
- critical region, type I and type II errors, power of a test.
- The Decision Rule, trinity of classical tests (Wald test, Lagrange multiplier, likelihood ratio).
- application of hypothesis testing with known and unknown variances, test for correlation.

Module 2:
Special Distributions.
- Introduction
- Various types of distributions (The Poisson Distribution, The Normal Distribution, The Geometric Distribution, The Negative Binomial Distribution, The Gamma Distribution,
- The Central Limit Theorem.

Module 3:
Estimation and Inference.
- Introduction.
- Estimating Parameters.
- The Method of Maximum Likelihood, the Method of Moments.
- Interval Estimation, Properties of Estimators, Minimum-Variance Estimators.
- The Cramer-Rao Lower Bound, Sufficient Estimators, Consistency, Bayesian Estimation.

Module 4:
Bivariate Distributions.
- Contingency tables, joint and conditional distributions.
- Odds ratio, test of independence.
- Analysis of Variance (ANOVA), analysis of covariance.
  Module V: Nonparametric Statistics.

- Introduction.
- Sign Test, Wilcoxon Tests, The Kruskal-Wallis Test, The Friedman Test.
- Testing for Randomness, Comparing Parametric and Nonparametric Procedures.

Module 5:
Introduction to OR.
- Basic algorithms; Linear programming (LP).
- Graphical and Simplex.
- LP Formulation and LP with solver and sensitivity analysis.
- Transportation and transshipment models; Simulation; Decision Analysis.

Module 6:
Advanced algorithms in OR.
- Goal Programming; Queuing Theory, Networking Models.
- Markov chains; Data Envelopment Analysis (DEA); Analytical Hierarchical processing (AHP).

Reference list:

- Larsen, R. J., and Morris L. M. (2001*): An Introduction to Mathematical Statistics and its Applications.* 3rd ed. Upper Saddle River, NJ: Prentice Hall.
- Lewis M. (2011): *Applied Statistics for Economists*, Routledge.
- Newbold P. (2007): *Statistics for Business and Economics* (6th edition or later), Prentice Hall.
- Sweet, S. and Karen G.- M. (2008): *Data Analysis with SPSS: A First Course in Statistics*, Allyn & Bacon, 3rd Edition.
- Field A. (2013): *Discovering Statistics using IBM SPSS Statistics*. Fourth Edition, SAGE
- Render and Stair. (2012): *Quantitative Analysis for Managerial Decision Making.*
- Hiller and Liberman. (2011): *Operations Research.*
- Hamdy and Taha. (2013): *Operations Research.*

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Course Code: C-04
Course Name: Basic Econometrics

Course Outcome:
The course will enable the students:
- To provide an overview of the subject and build understanding about the concepts and techniques used in econometrics. (Module 1, 6, 8 & 9)
- To examine basic econometric techniques that are widely used in empirical work in economics and other related disciplines. (Module 3 and 5)
- To enable conceptual understanding and 'hands on' applications using economic data drawn from real-world examples, rather than on formal theoretical proofs alone. (Module 2, 4 and 7)
- By the end of the course, students should be able to develop simple econometric models and interpret the econometric and statistical results reported in other studies.

Note: Students will be taught software packages for performing econometric applications. Computer exercises will be given.

Module 1:
The nature of Econometrics and Economic Data:
- Introduction, Model Specification and applied research
- The role of data in model specification
- The Structure of Economic Data
- Steps in Empirical Analysis
- Causality and the Notation of Ceteris Paribus in Econometrics, etc.

Module 2:
The Classical Linear Regression Model:
- Estimation and Inference: Ordinary least squares (OLS) estimation, the Classical assumptions, the Gauss-Markov theorem and properties of the OLS estimators
- Interval estimation and hypothesis testing and prediction
- Reporting and interpreting regression results
- Maximum Likelihood techniques
- Restricted Least Square estimation
- Likelihood Ratio (LR)
- Wald and Lagrange Multiplier (LM) Test
- Minimum Variance Bound (Rao-Cramer Inequality Theorem).

Module 3:
Non-linear regression:
- Conversion of non-linear forms into linear forms
- Testing linear verses non-linear functional form
- Appropriateness and relevance of the choice of functional form.

Module 4:
Regression Analysis with Qualitative information: Binary (or Dummy) Variables:
- Exogenous Dummy Variable- Formulating and interpreting coefficients on dummy explanatory variables

- Interactions involving dummy variables and use of dummy variables in seasonal analysis
- Piecewise regression analysis
- The dummy variable alternative to chow test.
- Discrete and Limited Dependent variable - Linear Probability Model, Problems relating to LPM
- Logit and Probit Model
- Multinomial Choice Models: Ordered Response Model; Unordered Response Model, Censored and Truncated Regression Model

Module 5:
Multicollinearity:
- Introduction, perfect verses imperfect Multicollinearity
- Consequences, tests for detection and remedies for Multicollinearity.

Module 6:
Violation of the OLS Assumptions:
- Introduction, Consequences of violation of OLS assumption
- GLS Estimation- Aitken's generalization of Gauss Marks Theorem.
- Heteroscedasticity & Autocorrelation: Causes and consequences, diagnostic tests and remedial procedural

Module 7:
Specifications: Choosing the Independent Variables and Functional Form
- Omitted variables: Too few variables, Irrelevant variables: variable overload, Criterion of choice, superfluous variables etc.
- The use and Interpretation of constant term
- Alternative Functional forms, Problem with incorrect functional form, test for choosing the appropriate functional form.

Module 8:
Lagged Variables and Distributed- Lag Models:
- Introduction, Consequences of applying OLS
- Almon's lag approach
- Koyak Transformation: Partial adjustment hypothesis and adaptive expectations hypothesis, estimation of distributed lag models etc.

Module 9:
Simultaneous Equation Models (SEM):
- Introduction, Structural, reduced form and final form model
- Rational behind the use of SEM - simultaneous bias and inconsistency of the OLS estimator
- Problem of Identification: Rank and Orders conditions
- Methods of estimation: ILS, 2SLS, Instrumental Variable, LIML (LVR), Mixed estimation Method, 3 SLS and FIML methods.

References
Books:
- Green, William H. (2014), Econometric Analysis, *Prentice Hall.*
- Griffiths, Hill and Judge (1993), Learning and Practicing Econometrics, *Wiley*, New York.
- Guajarati, Damodar, (2003), Basic Econometrics, 4th Edition, *Tata McGraw Hill Publishing Company*, New Delhi
- Johnston and Dinardo (1997), Econometric Methods, 4th Edition *McGraw-Hill International Edition.*
- Judge, G.G. et al., Introduction to the theory and Practice of econometrics, 2nd Edition *John Wiley and Sons.*
- Koutsoyiannis, A (2004), Theory of Econometrics, 2nd edition, *Palgrave*, N. Y.
- Madala G.S. (2001), Introduction to Econometrics, *John Wiley & Sons*.
- Pindyck & Rubinfeld (1997), Econometrics Models & Economic Forecast, 4th edition*, McGraw-Hill/Irwin.*
- Studenmund, A.H., (2005), Using Econometrics: A Practical Guide, *Addison Wesley Publishing Company*, Boston.
- Wooldridge J. (2009), Introductory Econometrics: A Modern Approach, *South-Western College Pub.*

Articles:
- Amemiya , Takeshi (1980), 'Selection of Regressors', *International Economic Review*, Vol. 21, No. 2, June, pp. 331-354,
- Amin and Islam (2014), 'Are There More Female Managers in the Retail Sector? Evidence from Survey Data in Developing Countries,' Policy Research Working Paper-6843, *World Bank.*
- Angrist and Kruger (2001), 'Instrumental Variables and search for Identification: From Supply and Demand to Natural Experiments,' *Journal of Economic Perspective*, Volume 15, November 4- Fell 2001, P 69-85
- Chen, Dhal, and Khan(2002), 'Nonparametric Identification and Estimation of a Censored Regression Model with an Application to Unemployment Insurance Receipt', *Center For Labor Economics University of California*, Berkeley Working Paper No. 54
- Chintagunta and Honore (1996), 'Investigating the effects of marketing variables and unobserved heterogeneity in a multinomial probit model,' *International Journal of Research in Marketing*, *Elsevier Science*, 13(1996) 1-15
- Comanor William S. and Wilson Thomas A. (1967), 'Advertising Market Structure and Performance', *The Review of Economics and Statistics*, Vol. 49, No. 4, Nov., pp. 423-440
- Dornbusch, R.and Pechman, Clarice (1985), 'The Bid-Ask Spread in the Black Market for Dollars in Brazil', *Journal of Money, Credit and Banking*, Vol. 17, No. 4, Part 1, November, pp. 517-520.
- Halvorsen, R. and Palmquist, R. (1980), 'The Interpretation of Dummy Variables in Semi logarithmic Equations', *The American Economic Review*, Vol. 70, No. 3, June. pp. 474-475
- Harvey, A. C. (1976), 'Estimating Regression Models with Multiplicative

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Course Code: PSHE-A-01
Course Name: Population, Size and Structure

Course Outcomes:
- To enrich the knowledge about nature and scope of population studies. (Module 1)
- To analyse the population growth and distribution around the globe. (Module 1)
- To make students aware of authenticated sources for data collection. (Module 2)
- To familiarise the students with demographic structure. (Module 3)
- To evaluate the theories of population. (Module 4)

Module 1:
Population
- 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

Module 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

Module 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
- Disability

Module 4:
Population Theories

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

References:

- Dyson, T. (2010). Population and development: The demographic transition. Zed Books.
- United Nations, Department of Economic and Social Affairs, Population Division. (2019). World population prospects 2019: Highlights (ST/ESA/SER.A/423). Retrieved from https://population.un.org/wpp/Publications/Files/WPP2019_10KeyFindings.pdf
- Government of India. (2011). Census of India 2011: Provisional population totals. Retrieved from http://censusindia.gov.in/2011-prov-results/prov_data_products_ind.html
- Registrar General & Census Commissioner, India. (2018). Sample registration system statistical report 2016. Retrieved from http://www.censusindia.gov.in/vital_statistics/SRS_Reports_2016.html
- Ram, F., Singh, A., & Sonalde, D. (Eds.). (2019). Population, poverty, and inequality: Evidence from India. Oxford University Press.
- Agarwala, R. (2014). India: The future of population policies. In The future of population policies (pp. 69-92). Springer.
- Government of India. (2018). Handbook on sample registration system. Retrieved from http://www.censusindia.gov.in/vital_statistics/SRS_Handbook/SRS%20Handbook%202018.pdf
- United Nations, Department of Economic and Social Affairs, Population Division. (2017). World population prospects 2017: Key findings and advance tables (ESA/P/WP/248). Retrieved from https://population.un.org/wpp/Publications/Files/WPP2017_KeyFindings.pdf

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Course Code: PSHE-A-02
Course Name: Fertility

Course Outcomes:
- To know about the fundamental concepts of fertility and nuptiality. (Module 1)
- To familiarise with measurement methods for fertility and nuptiality. (Module 2 and 3)
- To understand the trends of fertility and nuptiality. (Module 2 and 3)
- To evaluate the theories of fertility in order to understand real life conditions. (Module 4)

Module 1:
Fertility
- 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

Module 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

Module 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

Module 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

References:

Bongaarts, J. (2017). Modeling the fertility impact of the proximate determinants: Time for a tune-up. Demographic Research, 37(35), 1141-1162.

Cleland, J., & Wilson, C. (1987). Demand theories of the fertility transition: An iconoclastic view. Population Studies, 41(1), 5-30.

Dyson, T., & Moore, M. (1983). On kinship structure, female autonomy, and demographic behavior in India. Population and Development Review, 9(1), 35-60.

Lesthaeghe, R., & Vanderhoeft, C. (2001). Ready, willing, and able: A conceptualization of transitions to new behavioral forms. In M. J. Caspersen, H. K. Rasmussen, & E. O. Sørensen (Eds.), Transitions in Western thought (pp. 167-199). Springer.

Murthi, M. (1995). Fertility change in India: Trends, determinants, and implications. Population and Development Review, 21(3), 499-530.

National Family Health Survey. (2017-18). Key indicators report. Retrieved from http://rchiips.org/nfhs/NFHS-4Reports/India.pdf

National Institute of Medical Statistics, Indian Council of Medical Research. (2019). National Family Health Survey (NFHS-4) India, 2015-16: State fact sheets. Retrieved from http://rchiips.org/nfhs/factsheet_NFHS-4.shtml

Singh, R. B. (2013). Population dynamics in India: Challenges and prospects. Economic and Political Weekly, 48(47), 67-73.

United Nations, Department of Economic and Social Affairs, Population Division. (2019). World fertility patterns 2019: Data booklet (ST/ESA/SER.A/427). Retrieved from https://population.un.org/wpp/Publications/Files/WPP2019_DataBooklet.pdf

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Course Code: PSHE-A-03
Course Name: Mortality and Morbidity

Course Outcomes:
- To understand the basic concepts of mortality and morbidity. (Module 1 and 3)
- To analyse the measurement methods of mortality and morbidity with its applications. (Module 1 and 3)
- To understand the situation of various mortality and morbidity rates in India. (Module 2 and 3)
- To evaluate the trends of mortality and morbidity. (Module 1 and 3)
- To get familiar with life table concepts and its application. (Module 4)

Module 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

Module 2:
- Importance of the study of infant and childhood mortality, infant mortality rate; neonatal, post- neonatal and pre-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

Module 3:
- Definition of morbidity, sources of data and measures of morbidity, incidence and prevalence of disease, Healthy Life Expectancy comparisons.
- WHO classification of causes of death, changing patterns of causes of death;
- Epidemiological transition in developed and developing countries with special reference to India
- Social determinants of health inequalities (education, employment, income, etc.) The Gender perspective in the study of health inequalities; Health inequalities and welfare regimes
- Non-communicable diseases, Global burden of Diseases
- Undernutrition and Over nutrition

Module 4:
Life tables
- Concepts, definitions of columns, Current and cohort life tables
- Construction of life tables
- Complete life tables and abridged life tables
- Model life tables
- Application of life table in demographic analysis.

- Multiple decrement life table

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Course Code: PSHE-A-06
Course Name: Migration and Urbanization

Course Outcomes:
- To understand the spatial distribution of population and the factors influencing it. (Module 1)
- To evaluate the problem of migration on the basis of trends. (Module 2)
- To apply the measurement techniques of migration in real life. (Module 3)
- To critically evaluate the theories of migration and finding the causes of it. (Module 4)
- To analyse the rapid increase in urbanisation in the modern era. (Module 5)
- To discuss the problems associated with health in urban area. (Module 6)

Module 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.

Module 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

Module 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

Module 4:
Theories of Migration
- Theories of migration: pull and push factors, Ravenstein's laws of migration, Lee's theory of migration

Module 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, Slums in India, Governance

- Problems associated with and policies and programmes affecting urbanization in India

Module 6:
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

References:

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Singh, R. B., & Khora, S. S. (2017). Migration and urbanization in India: An overview. Journal of Regional Development and Planning, 6(2), 41-60.

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Course Code: PSHE-A-07
Course Name: Population and Development, Population Projections

- To understand basic concepts of development, especially in relation to Demography. (Module 1 and 2)
- To analyse the techniques of population projections are necessary. (Module 2 and 5)
- To understand the market of the labour force. (Module 3)
- To evaluate the changing structure of the labour force in India. (Module 4)
- To apply the methods of population projections. (Module 5)

Module 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

Module 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

Module 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

Module 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

Module 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

References:

United Nations. (2019). World population prospects 2019: Highlights. Department of Economic and Social Affairs, Population Division. Retrieved from https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf

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Bongaarts, J., & Bulatao, R. A. (Eds.). (2000). Beyond six billion: Forecasting the world's population. National Academies Press.

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Course Code: PSHE-A-08:
Course Name: Public Health and Epidemiology

- To understand the concept and system of public health. (Module 1)
- This is to understand determinants and measures of health / morbidity. (Module 2)
- To critically evaluate the policies related to health. (Module 3)
- To familiarise students about science, methods and applications of epidemiology in public health decision making (Module 4)

Module 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)

Module 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

Module 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

Module 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

References:

Detels, R., Gulliford, M., Karim, Q. A., & Tan, C. C. (Eds.). (2019). Oxford textbook of global public health (6th ed.). Oxford University Press.

Friis, R. H., & Sellers, T. A. (Eds.). (2019). Epidemiology for public health practice (6th ed.). Jones & Bartlett Learning.

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Rothman, K. J., Greenland, S., & Lash, T. L. (2012). Modern epidemiology (3rd ed.). Lippincott Williams & Wilkins.

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Course Code: PSHE-A-09
Course Name: Health Economics – I

Course Outcomes:
- To understand the scope of health economics and the issues related to it. (Module 1)
- To know the demand and supply of healthcare facilities. (Module 2)
- To synthesise cost-benefit analysis and economic analysis on the healthcare sector. (Module 3)
- To use the measurement techniques for the indicators of health. (Module 4)
- To know the issues in the healthcare sector with a microscopic analysis. (Module 5)
- To understand the related concepts with reference to health. (Module 6)

Module 1:
Economic Development and Health,
- State and Scope of Health Economics, Normative economics and health
- Difference between health and healthcare, Equity and Efficiency
- Socio-economic determinants of health
- Overview of health system
  - Industrialised countries
  - Low and middle income countries

Module 2:
Healthcare market and Demand for healthcare
- Health and wellbeing
- Healthcare as an input in health
- Notion of need, Supplier Induced demand
- Economics of mental health and Issues of Moral Hazard

Module 3:
Analysis
- Cost-effective analysis, Cost-benefit analysis, Cost-Utility analysis and Efficiency analysis
- Economic analysis- reporting for projects, interpretation of finding of report on economic evaluation

Module 4:
Measurements of Health
- Morbidity and Mortality, Burden of Diseases
- Concepts of DALY and QALY, Epidemiology and Morbidity Transition
- Health Technology assessment and real world evidence

Module 5:
The Micro Scenario: Issues related to Healthcare Utilisation
- Preventive and Curative Healthcare
- Public Health and political economy
- Intergenerational aspects of healthcare

Module 6:
- Health and Education

- Health and Nutrition
- Setting Priorities in healthcare

References:
Folland, S., Goodman, A. C., & Stano, M. (2020). The economics of health and health care (8th ed.). Routledge.

McGuire, A., Henderson, J., & Mooney, G. (Eds.). (2017). The economics of health care: An introductory textbook (4th ed.). Routledge.
Glied, S., & Smith, P. C. (Eds.). (2017). The Oxford handbook of health economics. Oxford University Press.

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Smith, P. C., Mossialos, E., & Papanicolas, I. (Eds.). (2008). Performance measurement for health system improvement: Experiences, challenges, and prospects. Cambridge University Press.

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Course Code: PSHE-A-11
Course Name: Health Economics-II

Course Outcomes:
- To understand the role of market forces in the healthcare sector. (Module 1)
- To know about the world scenario of the healthcare sector. (Module 1)
- To assess the role of different sectors and education on health. (Module 2)
- To apply the measurement techniques of quality care and health utilities. (Module 3)
- To get familiarise with the asymmetric information problem in the healthcare sector. (Module 4)
- To assess the working of the health insurance market. (Module 4)
- To critically evaluate the policies related to healthcare. (Module 5)

Module 1:
The Macro Scenario
- Cross Country comparison
- Healthcare Cost Growth
- Pattern of Health expenditure in India: Public (centre and state) and private
- Quality and Sustainability
- Organization and Management of Public Health Institution.

Module 2:
Economic Aspects of Healthcare Provision
- Private sector
- Public sector
- Alternative medicine
- Short term, Long term (Acute and Chronic)
- Health Education

Module 3:
Quality of Healthcare
- 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

Module 4:
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
- Effectiveness of Insurance, Health production function

Module 5:
Economics of Critical Illness and Policy Initiatives
- The economic consequences of chronic disease, critical illness, prolonged illness
- The rationale for public policy intervention
- Cost effectiveness of intervention

References:

Reddy, K. S., & Patel, V. (Eds.). (2015). Health and healthcare in India: A comprehensive approach. Oxford University Press.

Rao, M., & Ramachandra, S. S. (Eds.). (2018). Health economics in India: Evidence for policy. Oxford University Press.

Cutler, D. M., & Zeckhauser, R. J. (Eds.). (2011). The economics of health and health care (7th ed.). Pearson.

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World Health Organization. (2013). WHO guide to identifying the economic consequences of disease and injury. World Health Organization.

Newhouse, J. P. (Ed.). (2012). The economics of health care quality and medical errors. University of Chicago Press.

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Course Code: PSHE-A-12
Course Name: Research Methodology

Course Outcomes:
- To familiarise with the basics of research methods, concepts, and types of research. (Module 1)
- To acquaint yourself with various research designs and steps in research. (Module 2)
- To understand the quantitative and qualitative techniques of data collection and analysis using various software. (Module 3)
- To generate research grants or fellowship applications including ethical guidelines and other regulatory requirements. (Module 4)
- To interpret and apply the processes of monitoring and evaluation required for the successful completion of any project. (Module 5)

Module 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, Operationalisation of concepts, Research Process: conceptual, Empirical and Analytical Phases of Research, Essentials Criteria of Scientific methods.

Module 2:
Research Designs and Logic in research
- Experimental research design: Pre experimental, True experimental and Quasi experimental research design, RCT
- Non-experimental research design: Descriptive, exploratory, Explanatory and Monitoring and Evaluation
- Reliability and Validity- Face, content, construct, convergent, concurrent, and predictive validity
- Inductive and deductive reasoning; Measurements
- Non-random and random errors, Scaling and composite indices

Module 3:
Data collection – Quantitative and Qualitative
- 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
- Qualitative: Types of qualitative research, approaches in qualitative Research-Ethnography, Grounded Theory, Historical research
- Qualitative data collection methods: In Depth Interview, Focus Group Discussion, Observation, Case Study, Participatory methods, KII
- Sampling and Analytical approaches- thematic analysis, content analysis, narrative analysis

Module 4:
Communication and Proposal Development
- Scientific writing, Writing and Presentation of literature review, report, papers, manuals, Research Brief, Plagiarism, Ethics in research

- Select a topic, identify a research gap, Frame research questions, Develop objectives
- Select a study design, Write the detailed methodology, Develop the analysis format
- Write proposal for grant

Module 5:
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.
- 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
- 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)

References:

Kumar, R. (2019). Research methodology: A step-by-step guide for beginners (5th ed.). SAGE Publications.

Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

Neuman, W. L. (2013). Social research methods: Qualitative and quantitative approaches (7th ed.). Pearson.
Babbie, E. (2016). The practice of social research (14th ed.). Cengage Learning.
Guest, G., MacQueen, K. M., & Namey, E. E. (Eds.). (2012). Applied thematic analysis. SAGE Publications

Patton, M. Q. (2014). Qualitative research and evaluation methods: Integrating theory and practice (4th ed.). SAGE Publications.

De Vaus, D. A. (2013). Surveys in social research (6th ed.). Routledge.
Babbie, E. R. (2016). Survey research methods (6th ed.). Cengage Learning.
Maxwell, J. A. (2013). Qualitative research design: An interactive approach (3rd ed.). SAGE Publications.

Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). Evaluation: A systematic approach (7th ed.). SAGE Publications.

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Course Code: PSHE-A-13
Course Name: Actuarial Methods for Life Insurance

Course Outcomes:
- To understand the fundamental principles associated with insurance business. (Module 1)
- To understand the concept of future life time variables. (Module 2)
- To know the legal framework of life assurance contracts and understand the working of this with cost benefit analysis. (Module 3)
- To get familiar with the life annuity contracts and related concepts. (Module 4)
- To synthesise the working of premiums and apply that in real life situations. (Module 5)
- To analyse the techniques and approaches for keeping reserves. (Module 6)

Module 1:
Feasibility of Insurance Business: Expected value principle, utility function.

Module 2:
Future Life Time Random Variable: Concept of a future life time random variable, its distribution function and density function, concept of force of mortality, curtate future life time random variable, its probability mass function, deferred probabilities, all these functions in terms of international actuarial notation.

Module 3:
Life Assurance Contracts: Concept of compound interest rate, discount factor, present value of the money, nominal rate of interest, force of interest, Assurance contracts with level and varying benefits, such as whole life insurance, term insurance endowment insurance. Means and variances of the present value random variables of the payments under these contracts under the assumption of constant force of interest, when the benefit payments are made at the end of year of death (discrete set up) or when it is paid at the epoch of death (continuous set up). Actuarial present value of the benefit, Net single premiums.

Module 4:
Life Annuity Contracts: Annuity contracts, annuity certain, discrete annuity, monthly annuity, continuous annuity, deferred annuity, present values and accumulated values of these annuities. Continuous life annuity, discrete life annuity, such as whole life annuity, temporary life annuity, n-year certain and life annuity, life annuities with mthly payments, Present value random variables for these annuity payments, their means and variances, Actuarial present value of the annuity

Module 5:
Premiums: Loss at issue random variable, various principles to decide net premiums for insurance products and annuity schemes defined in unit II and III, fully continuous premiums and fully discrete premiums, monthly payment premiums. Extended equivalence principle to decide gross premiums

Module 6:
Reserves: Concept of reserve, prospective & retrospective approach, fully continuous reserve, fully discrete reserve, net premium reserves for various life insurance models.

References:
Bowers, N. L., Gerber, H. U., Hickman, J. C., Jones, D. A., & Nesbitt, C. J. (1997). Actuarial mathematics (2nd ed.). Society of Actuaries.

Dickson, D. C. M., Hardy, M. R., & Waters, H. R. (2009). Actuarial mathematics for life contingent risks (2nd ed.). Cambridge University Press.

Kleinow, T. (2013). Life insurance mathematics (3rd ed.). Springer.
Magesan, A. (2013). Life insurance: Models, pricing and hedging. CRC Press.

Vaaler, L. E., & Daniel, W. T. (2019). Actuarial mathematics for life contingent risks (3rd ed.). ACTEX Publications.

Bowers, N. L., & Gerber, H. U. (2018). Life insurance mathematics: 100 problems and detailed solutions. Springer.

Landriault, D., Cossette, H., & Marceau, E. (2007). Risk theory: The stochastic basis of insurance. Springer Science & Business Media.

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Course Code: PSHE-A-15
Course Name: Health Economics-III

Course Outcomes:
- To understand the working of the pharmaceutical industry. (Module 1)
- To know the environmental impacts on health. (Module 2)
- To learn the preventive measures for the risk associated with ecological problems. (Module 2)
- To evaluate the environmental policy and its inter linkage with health. (Module 3)
- To critically study the healthcare framework, reforms and finance allocated to it in Inida. (Module 4)
- To evaluate the role of healthcare initiatives with respect to India. (Module 5)

Module 1:
Pharmaceutical Industry
- Size, Spread, Turnover, Products, Main players, Capacities, Research and Development - World
- Size, Spread, Turnover, Products, Main players, Capacities, Research and Development – India

Module 2:
Ecology and Health
- 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 issues - Food safety, Food contamination - Waste management, POET variables- Population, Organisation, Environment and Technology.

Module 3:
Environmental Health and 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

Module 4:
Issues related to Healthcare Reform, Policy and Healthcare Finance in India
- Experiences of healthcare 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 Healthcare Finance
- Public and private finance and provision - Public Private Partnership

Module 5:
Healthcare Services and Healthcare Delivery Systems in India
- Healthcare 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

References:

Danzon, P. M. (2012). Pharmaceutical price regulation: National policies versus global interdependence. Journal of Health Economics, 31(1), 208-218.

World Health Organization. (2018). Air pollution and child health: Prescribing clean air. World Health Organization.

Haines, A., & Ebi, K. (2019). The imperative for climate action to protect health. New England Journal of Medicine, 380(3), 263-273.

Prüss-Ustün, A., Wolf, J., & Corvalán, C. (2016). Preventing disease through healthy environments: A global assessment of the burden of disease from environmental risks. World Health Organization.

Bhaskar, B. S., & Arora, S. (2014). Environmental health and safety management: A guide to compliance. CRC Press.

World Health Organization. (2016). Global report on urban health: Equitable, healthier cities for sustainable development. World Health Organization.

Government of India. (2017). National Health Policy 2017. Ministry of Health and Family Welfare, Government of India.

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Government of India. (2018). Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana. Ministry of Health and Family Welfare, Government of India.

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Course Code: PSHE-A-16
Course Name: Term Paper

This will be in consultation with the Faculty

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Course Code: PSHE-B-02
Course Name: Business Analytics

Course Outcomes:
- To develop a proficiency in analysing data using different techniques. (Module 1 to 8)
- To learn how to build and apply predictive models to forecast future outcomes. (Module 2 and 3)
- To gain knowledge of business outcomes. (Module 1 to 8)
- To apply optimization techniques to solve business problems. (Module 1 to 8)
- To understand the role of business analytics in strategic decision making. (Module 3 and 5)
- To learn skills and techniques for the application of R. (Module 4,6 and 7)

Module 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

Module 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

Module 3:
Descriptive Analytics with excel and Tableau
- An introduction to Tableau
- Using descriptive statistics in analysis and reporting
- Advanced reporting with Tableau

Module 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

Module 5:
Data Pre-processing
- Data Exploration and Assessment for Data Science
- Identifying and dealing with noise in Data
- Preparing data for Data Science Modelling

Module 6:
Predictive Models in R
- Linear Regression Models and their applications
- Logistics Regression Models and Their applications
- Time Series Forecasting

Module 7:
ML Models in R
- Clustering Algorithms and application
- Decision Tree Algorithms and applications
- Random Forest Algorithms and applications

Module 8:
Storytelling with Data
- Communicating data science results
- Effective presentation skills
- Using Data visualizations for storytelling

References:

Provost, F., & Fawcett, T. (2013). Data science for business: What you need to know about data mining and data-analytic thinking. O'Reilly Media.

Davenport, T. H., & Harris, J. G. (2017). Competing on analytics: Updated, with a new introduction. Harvard Business Press.

Evans, J. R., & Paquette, L. (2019). Business analytics: Methods, models, and decisions. Pearson.

Shmueli, G., Bruce, P. C., & Patel, N. R. (2019). Data mining for business analytics: Concepts, techniques, and applications in R. John Wiley & Sons.

Witten, I. H., Frank, E., Hall, M. A., & Pal, C. J. (2016). Data mining: Practical machine learning tools and techniques. Morgan Kaufmann.

Kelleher, J. D., Mac Namee, B., & D'Arcy, A. (2015). Fundamentals of machine learning for predictive data analytics: Algorithms, worked examples, and case studies. MIT Press.

Few, S. (2019). Show me the numbers: Designing tables and graphs to enlighten. Analytics Press.

Cairo, A. (2019). The truthful art: Data, charts, and maps for communication. New Riders.

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Course Code: PSHE-B-03
Course Name: Health Informatics I

Course Outcomes:

- To understand the principles and fundamental concepts related to health informatics. (Module 1 and 2)
- To get familiar with the controlled terminology and terms. (Module 3)
- To analyse various tools of data collection. (Module 2)
- To synthesise the role of information technology in health informatics. (Module 1 and 4)
- To know about the basic anatomy of the human body for research purposes. (Module 5)
- To utilise the concepts and vocabulary of related concepts. (Module 6)

Module 1:
Introduction to health informatics
- Introduction to the program, Healthcare informatics, computers, networks, internet and cloud computing.
- Practical on what information you want to collect, designing database to collect information, code table for one disease, integrated code table for many diseases, Appreciate need of ICD, SCT, LOINC etc, Refine data structure to answer queries

Module 2:
Data collection and interoperability
- Introduction to Data, Information and knowledge, examples,
- Database, RDBMS
- Internet and internet searching, Understanding information sources
- Medical literature searching and Pubmed
- Interoperability HL7

Module 3:
Controlled terminology
- International Classification of Diseases (ICD)
- Logical Observation Identifiers Names and Codes (LOINC)
- Code of Procedural terminologies (CPT)
- RxNorm
- Systematised Nomenclature of Medicine - Clinical Terminology SNOMED-CT

Module 4:
Data structure and analysis
- Databases and Sequential Query Language (SQL)
- Social media
- XML
- DICOM and PACS
- Big data analysis

Module 5:
Anatomy and physiology of body systems
- Introduction to cell and biological feedback mechanism

- Infection, immunity and inflammation
- Blood and its characteristics, clotting, groups
- Cardiovascular, respiratory, Urogenital systems
- Sensory organs, nervous and musculoskeletal system
- Biochemistry, Pathology and Pharmacology

Module 6:
Vocabulary of Medical specialties

Obstetrics, Gynaecology, Paediatrics and Medicine; Surgery, Orthopaedics, ENT and Ophthalmology; Neurology, neurosurgery, psychiatry and endocrinology; Respiratory medicine, cardiology and cardiothoracic surgery; Nephrology, Urology, skin and cosmetology

References:

Hoyt, R. E., & Yoshihashi, A. (Eds.). (2014). Health informatics: Practical guide for healthcare and information technology professionals. Lulu.com.

Safran, C., & Shabot, M. M. (Eds.). (2015). The book of informatics. American Medical Informatics Association.

O'Carroll, P. W., Yasnoff, W. A., Ward, M. E., & Ripp, L. H. (Eds.). (2014). Public health informatics and information systems. Springer Science & Business Media.

Ball, M. J., Douglas, J. V., Hinton Walker, P., & Hannah, K. J. (2019). Nursing informatics: Where technology and caring meet. Springer Publishing Company.

Hersh, W., & Saltz, J. (Eds.). (2019). Health care information systems: A practical approach for healthcare management. John Wiley & Sons.
Raghupathi, W., & Raghupathi, V. (2014). Big data analytics in healthcare: promise and potential. Health Information Science and Systems, 2(1), 3.

Shortliffe, E. H., & Cimino, J. J. (Eds.). (2014). Biomedical informatics: Computer applications in health care and biomedicine. Springer Science & Business Media.
Greenes, R. A., & Shortliffe, E. H. (Eds.). (2014). Medical informatics: An executive primer. Springer Science & Business Media.

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Course Code: PSHE-B-04
Course Name: Health Informatics II

Course Outcomes:

- To understand the basic requirements for any medical procedure. (Module 1)
- To apply the present knowledge for the purpose of getting results of research. (Module 2)
- To synthesise the role of tech gadgets in health monitoring. (Module 3)
- To familiarise with speaking on various diseases. (Module 4)
- To evaluate the role of economic burden and the interlinkage with various diseases. (Module 5)
- To analyse the role of epidemics and diseases. (Module 6)

Module 1:
EHR, HIS and NDHM
- Personal Health Record, Electronic Health Record
- Clinical Informatics: Electronic Medical Records, Hospital Information Systems
- NDHM overview, Provider Registry, Hospital registry, Unique Health ID and patient registry
- Project Management, Requirement gathering, Requirement analysis

Module 2:
Application areas
- Bioinformatics, Image Informatics
- Maintaining of record book of cases in electronic format, Store, transmit data over a range of connectivity options
- Clinical Decision Support Systems, Artificial Intelligence
- Tour of Hospital using various Health Informatics Tools, Project on evaluation of hospital information system
- Information protection (privacy, security, confidentiality), HIPAA

Module 3:
Telemedicine and mobile health
- Telemedicine : clinical setting, ethical, technical, legal aspects, implementation
- Introduction about digital bio - medical sensors,
- mHealth, Mobile Apps useful for clinicians

Module 4:
Public Health Informatics
- Outbreak of diseases, epidemics, detection and prevention
- eLearning for medical and healthcare learning
- Medical Blogging, Social media

Module 5:
Economic Burden of Diseases
- Economic burden, health economics and outcomes research
- Tuberculosis, asthma, COPD, Ischemic Heart Disease
- Paralysis and disability
- Intensive Care Unit management and economics,

- Clinical trials, pharmaceutical and vaccine economics

Module 6:
Economic Burden of epidemics
- Dengue,
- Malaria,
- H1N1,
- COVID-19
- Typhoid

References:

Bhattacharya, I., & Choudhury, S. (Eds.). (2019). Handbook of research on healthcare informatics and the utilization of big data analytics. IGI Global.

Fridsma, D. B., & Cimino, J. J. (Eds.). (2016). Biomedical informatics: An introduction to information systems and software in medicine and health. Springer.

Khoumbati, K. (Ed.). (2018). Healthcare informatics and analytics: Emerging issues and trends. Springer.

Nelson, R., Staggers, N., & Harkness, G. (Eds.). (2018). Health informatics: An interprofessional approach. Elsevier.

Ammenwerth, E., Rigby, M., & de Keizer, N. (Eds.). (2017). Evidence-based health informatics: Promoting safety and efficiency through scientific methods and ethical policy. IOS Press.

Ball, M. J., Douglas, J. V., Hinton Walker, P., & Hannah, K. J. (2019). Nursing informatics: Where technology and caring meet. Springer Publishing Company.

Rahimi, B., Vimarlund, V., & Timpka, T. (Eds.). (2019). Innovative health informatics: Smart healthcare technologies for the future. IOS Press.

Schreiber, R., de Vries, G., & Peek, N. (Eds.). (2020). Clinical informatics and patient-centered technologies: Studies in health technology and informatics (Vol. 270). IOS Press.

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Course Code: PSHE-B-05
Course Name: Population and Health

Course Outcomes:
- To develop the fundamental knowledge about population and health system. (Module 1)
- To get familiarise with the Indian system of medicine. (Module 1)
- To learn about the concepts, issues and solutions associated with maternal, child and reproductive health. (Module 2)
- To analyse the impact of various health issues on indigenous people. (Module 3)
- To assess the role of various programmes that can promote public nutrition. (Module 4)
- To synthesise the issues related to elderly people and the policies for supporting them. (Module 5)
- To develop a strong mindset in handling mental health issues. (Module 6)
- To enable students for research activities. (Module 1 to 6)

Module 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.
- Public health delivery system and its challenges
- Indian system of Medicine: AYUSH Systems: Ayurveda, Yoga, Unani, Siddha, Sowa Rigpa, Naturopathy, Homeopathy, Herbal medicine and health traditions

Module 2:
Reproductive, Maternal and Child Health
- Concept, 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: ICPD-1994, MDGs Nairobi conference and SDGs
- Common morbidities among young children; lower respiratory tract infections, diarrhoea; Immunisation- coverage, implication and determinants

Module 3:
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

Module 4:
Public Health Nutrition
- Introduction to public health nutrition, Inter relationship between food, nutrients and health.
- Nutrition Transition: Demographic, economic transition, poverty alleviation, food consumption patterns

- Undernutrition and Over Nutrition: global and Indian prevalence, risk factors, consequences
- Micronutrient deficiency disorders: prevalence, risk factors, Interventions that worked globally, lessons learnt.
- Food Security: Factors affecting food security, economics food security and community development, Food security bill
- Lifestyle disease, NCDs, Guidelines for prevention of NCDs

Module 5:
Elderly Health
- Demographic trends and epidemiological description of the major health problems and issues for older populations
- Implications of elderly health for public health
- 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

Module 6:
Mental Health
- Concept, Definition, Types, trends in mental illness, underlying drivers, Burden of mental health globally and at national level
- Life course: mental health and youth, adults, and geriatrics
- Mental health and sustainable development
- Social determinants, Violence, Stigma, and human rights
- Prevention and Promotion- Policies, Programme and legislative framework for mental health- research development in mental health policy, mental health care systems
- Understanding of mental disorders
  - 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

References:
- World Health Organization. (2019). World Health Statistics 2019: Monitoring health for the SDGs, sustainable development goals. World Health Organization.
- United Nations Population Fund. (2019). The state of world population 2019: Unfinished business - the pursuit of rights and choices for all. United Nations Population Fund.
- International Conference on Population and Development. (1994). Programme of action adopted at the International Conference on Population and Development, Cairo, 5-13 September 1994. United Nations.
- Ministry of Tribal Affairs, Government of India. (2019). National policy for the scheduled tribes, 2019. Ministry of Tribal Affairs, Government of India.
- Registrar General & Census Commissioner, India. (2011). Census of India 2011: Scheduled tribes. Ministry of Home Affairs, Government of India.
- World Health Organization. (2020). Double-duty actions for nutrition: Policy brief. World Health Organization.
- Ministry of Women and Child Development, Government of India. (2013). National guidelines on infant and young child feeding. Ministry of Women and Child Development, Government of India.
- World Health Organization. (2015). World report on ageing and health. World Health Organization.
- Ministry of Health and Family Welfare, Government of India. (2011). National policy for older persons. Ministry of Health and Family Welfare, Government of India.
- World Health Organization. (2019). Mental health atlas 2017. World Health Organization.
- Ministry of Health and Family Welfare, Government of India. (2014). National mental health policy of India. Ministry of Health and Family Welfare, Government of India.

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Course Code: PSHE-B-06
Course Name: Social Exclusion and Inclusive Policy

Course Outcomes:
- To identify the dimensions and factors contributing to social exclusion in different contexts. (Module 1)
- To interpret the theoretical frameworks and models related to inclusive policy. (Module 2)
- To apply analytical tools to assess and measure the impact of social exclusion on specific populations such as tribal, physically challenged and old age.(Module 3 and 5)
- To know about the various institutions such as financial institutions for the excluded population. (Module 4)
- To critically evaluate the impact of existing policies. (Module 6)
- To design intervention strategies to empower and enhance social participation of marginalised groups. (Module 1 to 6)

Module 1:
Understanding Social Exclusion
- Conceptualising 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

Module 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

Module 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

Module 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

Module 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

Module 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

References:

- Sen, A. (2000). Social exclusion: Concept, application, and scrutiny. Asian Development Bank.
- Arrow, K. J. (1973). The theory of discrimination. In O. Ashenfelter & A. Rees (Eds.), Discrimination in labour markets (pp. 3-33). Princeton University Press.
- Nussbaum, M. (2000). Women and human development: The capabilities approach. Cambridge University Press.
- Thorat, S., & Newman, K. S. (2010). Blocked by caste: Economic discrimination in modern India. Oxford University Press.
- Ahmad, I. (Ed.). (2006). Social exclusion and the way out: An individual and community response to human social dysfunctioning. Concept Publishing Company.
- Deshpande, S. (2007). The grammar of caste: Economic discrimination in contemporary India. Oxford University Press
- Kundu, A. (2016). Social exclusion, deprivation and discrimination: Studies on social indicators. Springer.
- United Nations. (2006). Convention on the rights of persons with disabilities. United Nations.
- HelpAge India. (2018). India ageing report 2017: Building a society for all ages. HelpAge India.
- United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. United Nations.

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Course Code: PSHE-B-07
Course Name: Academic Writing - (Swayam Platform)

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

Course Objectives:
- To differentiate between various kinds of academic writings.
- To identify and avoid plagiarism.
- To practise the basic skills of performing quality literature review.
- To practise the basic skills of research paper, review paper and thesis writing.
- To target the research work to suitable journal and communicate for publication
- To practise the Time and team management.
- To practise digital writing or develop Open Educational Resources (OER).
- 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 licences
Week 15: Open Educational Resources (OERs) for learning & Research; OERs development I & II

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Course Code: PSHE-B-08
Course Name: Behavioural Economics

Course Outcomes:
- To understand the basic theories for decision making. (Module 1)
- To compare and contrast the rationality assumptions and bounded rationality. (Module 1)
- To analyse the influence of biases such as overconfidence, status quo bias on decision making. (Module 2)
- To analyse the implications of hyperbolic discounting in inter- temporal choices. (Module 3)
- To examine the concepts of trust, fairness and cooperation in strategic decisions. (Module 4)
- To critically evaluate the psychological perspective on issues like poverty, health and climate change. (Module 5)
- To explain the usage of surveys in hypothetical choices. (Module 6)

Module 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
- Duel System theory, Prospect theory

Module 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

Module 3:
Inter-temporal choices
- The discounted utility model, exponential discounting
- Hyperbolic discounting

Module 4:
Strategic interactions
- Fairness, trust, cooperation, reciprocity, altruism
- Norms and Culture

Module 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

Module 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

References:

Thaler, R. H. (2015). Misbehaving: The Making of Behavioral Economics. W. W. Norton & Company.

Kahneman, D. (2011). Thinking, Fast and Slow. Farrar, Straus and Giroux.

Ariely, D. (2008). Predictably Irrational: The Hidden Forces That Shape Our Decisions. HarperCollins.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. Science, 185(4157), 1124-1131.

Camerer, C. F., Loewenstein, G., & Rabin, M. (Eds.). (2011). Advances in Behavioral Economics. Princeton University Press.

Gintis, H. (2007). The bounds of reason: Game theory and the unification of the behavioral sciences. Princeton University Press.

Ariely, D., & Norton, M. I. (2008). How actions create - not just reveal - preferences. Trends in Cognitive Sciences, 12(1), 13-16.

Mullainathan, S., & Shafir, E. (2013). Scarcity: Why Having Too Little Means So Much. Macmillan.

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Course Code: PSHE-B-09
Course Name: Applications of Statistical Software

Course Outcomes:
- To understand and get familiar with the structure of Demographic Health Survey Data (DHS) and National Sample Survey Data. (Module 1)
- To assess software interface with the knowledge of basic commands. (Module 2)
- To be able to create new variables and manipulate existing variables. (Module 3)
- To be proficient in graphical presentation of data using various types of plots. (Module 4)
- To be able to work with various data. (Module 5)
- To get the knowledge of conducting chi-square and ANOVA tests. (Module 6)
- To understand the logistics of various regression techniques. (Module 7)
- To get familiar with ArcGIS software. (Module 7)
- To understand map layout and printing. (Module 8)

Module 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

Module 2:
Getting started with quantitative software
- Introduction of the software and its interface
- Basic commands of the software
- Import and export of data file

Module 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.)

Module 4:
Working with a secondary dataset
- Data entry
- Writing the syntax file
- Restructure/reshaping the data
- Extraction of DHS and NSS data

Module 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

Module 6:
Multivariate technique with the help of statistical software
- Linear regression
- Multiple linear regression
- Logistic regression
- Survival Analysis

Module 7:
Working with qualitative data software
- Data organisation 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

Module 8:
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.

References:

Groves, R. M., Fowler Jr, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). Survey methodology. John Wiley & Sons.

Field, A. (2013). Discovering statistics using IBM SPSS Statistics. SAGE Publications.

Fox, J. (2016). Applied regression analysis and generalized linear models. SAGE Publications.

Heeringa, S. G., West, B. T., & Berglund, P. A. (2017). Applied survey data analysis. CRC Press.

Agresti, A., & Franklin, C. (2018). Statistics: The art and science of learning from data. Pearson.

Hair Jr, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis. Pearson.

Bazeley, P., & Jackson, K. (2013). Qualitative data analysis with NVivo. SAGE Publications.

Kwan, M. P. (2012). The handbook of geographic information science. John Wiley & Sons.

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Course Code: PSHE-B-10
Course Name: Population and Health Policies and Programmes

Course Outcomes:
- To Demonstrate an understanding of the organisation setup and implementation of family welfare programs at various levels in India. (Module 1)
- To analyse the evolution of population policy in India and its shift from population control to family welfare and women empowerment. (Module 1)
- To assess the impact and effectiveness of population policy programs and evaluate them based on ethical considerations. (Module 2)
- To understand the medical and non-medical benefits of reproductive health services to individuals, families, and communities. (Module 3)
- To explain the concept of gender budgeting and its application in India, including the tools and mechanisms involved. (Module 5)
- To apply statistical techniques and evaluation methods to analyse and assess the outcomes of health and population-related programs and policies. (Module 4 and 5)

Module 1:
- Family Welfare Programme Implementation
- Organisation 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

Module 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

Module 3:
- Medical and non-medical benefits of reproductive health services to the individual, family, and community
- National Health Policy
- Mental health care act

Module 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

Module 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.

References:

Family Welfare Programme Implementation:

International Institute for Population Sciences (IIPS) & ICF. (2017). National Family Health Survey (NFHS-4), India, 2015-16: State Report. IIPS.

Ministry of Health and Family Welfare. (2015). National Health Policy 2015. Government of India.

United Nations. (2019). World Population Policies 2017. Department of Economic and Social Affairs, Population Division.

Ministry of Health and Family Welfare. (2000). National Population Policy 2000. Government of India.

World Health Organization. (2019). Reproductive Health Strategy to Accelerate Progress Towards the Attainment of International Development Goals and Targets. WHO.

Ministry of Women and Child Development. (n.d.). Integrated Child Development Services Scheme. Government of India.

Ministry of Health and Family Welfare. (n.d.). Janani Shishu Suraksha Karyakram. Government of India.

Ministry of Finance. (2010). Gender Budgeting Manual. Government of India.

United Nations Development Programme (UNDP). (2008). Gender Responsive Budgeting: Key Dimensions and Practical Examples. UNDP.

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Course Code: PSHE-B-11
Course Name: Urban Economis

Course Outcomes:
- To understand the fundamentals of urban economics with the help of case studies. (Module 1)
- To get familiar with the conditions of urban cities. (Module 2 and 3)
- To understand the role of urban infrastructure. (Module 4, 5, and 6)
- To synthesize the approaches and limitations associated with urban infrastructure. (Module 4, 5 and 6)
- To analyze the situation of land and rent. (Module 3)
- To critically evaluate the role of local government for urban development. (Module 6)

Module 1:
Introduction
Urban Economics, Existence and importance of cities, 5 axioms of urban economics, Case Studies and Reports related to important Indian cities**.**

Module 2:
The Development of Cities: Clusters & Agglomeration; City Size and Urban Growth
Development of a factory town, firm clustering, labor pooling, localization and urbanization economies, differences in city sizes
Urban employment growth and the multiplier, the effects of taxes and subsidies on location choices

Module 3:
Land Rent & Markets and Land use pattern
Land rent and urban structure, Residential Land Market, Urban Land Markets with Factor Substitution
The Spatial Distribution of Employment and Population, The Monocentric City- Rise and Demise, Urban Sprawl, Neighborhood Choice, Zoning and Growth controls
Case study of Mumbai and Pune

Module 4:
Urban Transportation
Congestion Externalities, Congestion Tax and Alternatives, Autos and Air Pollution, Automobiles and Poverty.
Commuting and transit Ridership- the Cost of Travel and Model Choice, Efficient Volume of Ridership, Designing a Transit System

Module 5:
Urban Infrastructure
Spending and Educational Achievement- Education Production Function, Spending Inequalities and Public Policy
Crime Facts, the Rational Criminals, the Equilibrium Quantity of Crime, Legal Opportunities and Education Water supply and sanitation, Access to basic urban amenities

Module 6:
Housing

Importance of Housing- Durability, Detritions and Maintenance, the Filtering Model of Housing Market
Housing Policy- Public Housing, Housing Vouchers, Rent Control and Rent Regulation

Model 7:
Local Government
The Role of Local Government, Local Government Revenue and Expenditure, The Tiebout Model and Property tax
Financial Instruments (municipal Bonds)
*Students would be encouraged to go through the case studies on Indian Cities related to above mentioned topics.

Text Books
Arthur O'Sullivan, Urban Economics (7th edition), McGraw Hill Irwin, 2008.
Jan K Brueckner, Lectures on Urban Economics, the MIT Press, 2011

Reference Books
Edward L. Glaeser, <u>Cities, Agglomeration, and Spatial Equilibrium</u>: the Lindahl Lectures, New York, Oxford University Press, 2008 (ISBN-13: 9780199290444)
(Focus   on   Mathematical   Modeling)
 Klein, Daniel B., Moore, Adrian T., and Reja, Binyam. Curb Rights: A Foundation for Free Enterprise in Urban Transit. (New York: Brookings Institution, 1997 (ISBN: 978-0815749394)
William Cronon. Nature's Metropolis: Chicago and the Great West. W.W. Norton, 1991.
 James Howard Kunstler. The Geography of Nowhere. Free Press, 1994
William Julius Wilson. The Truly Disadvantaged: The Inner City, the Underclass and Public Policy.University of Chicago Press, 1987.
Brueckner, Jan (1987) "Structure of Urban Equilibria: A Unified Treatment of the Muth-Mills Model," Handbook of Regional and Urban Economics, Volume II, Edwin W. Mills Ed., 821-845.
Arzaghi & Henderson (2008) "Networking off Madison Avenue" Review of Economic Studies (2008) 75, 1011–1038
Edward Glaeser (1998) "Are Cities Dying?" Journal of Economic Perspectives 12(2): 127-138.
Adam Jaffee et al. (1993) "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations." Quarterly Journal of Economics 108(3): 577-598

Quigley (1998) "Urban Diversity and Economic Growth" Journal of Economic Perspectives—Volume 12, Number 2—Spring 1998—Pages 127–138
Roger G. Noll and Andrew Zimbalist (1997) "Sports, Jobs, and Taxes: Are New Stadiums Worth the Cost?" The Brookings Review 15: 35-39.
Kerr & Kominers (2010) "Agglomerative Forces and Cluster Shapes", NBER working paper, 16639
18(4): 177-200.
Glaeser, Edward L., Matthew Kahn, and Jordan Rappaport (2007) "Why do the poor live in cities?" Journal of Urban Economics.
Book_ Newman, P. and Kenworthy, J. (1999) "Sustainability and Cities. Overcoming automobile dependence". Washington D.C.: Island Press ISBN-13: 978-1559636605, ISBN-10: 1559636602
Glenn Blomquist, Mark Berger, and John Hoehn (1988) "New estimates of the quality of life in urban areas." The American Economic Review 78(1): 89-107.
Glaeser, Edward L., Matthew Kahn, and Jordan Rappaport (2007) "Why do the poor live in cities?" Journal of Urban Economics.
Glenn Blomquist, Mark Berger, and John Hoehn (1988) "New estimates of the quality of life in urban areas." The American Economic Review 78(1): 89-107.
Caitlin Knowles Myers (2004)"Discrimination and neighborhood effects: Understanding racial differentials in US housing prices." Journal of Urban Economics 56(2): 279-302.
Michael Greenstone Enrico Moretti (2004) "Bidding for Industrial Plants: Does Winning a "Million Dollar Plant" Increase Welfare?" Working Paper Series, MIT (0-39).

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Course Code: PSHE-B-12
Course Name: Insurance Economics

Course Outcome:
The Course will enable the students:
- To know the conceptual inputs related to Insurance Environment in India (Module I)
- To understand implications of insurance legislation in India (Module II)
- To have insurance product knowledge – both life and non life for all classes of usiness so as to succeed in techno marketing assignment (Module III)
- To apply principles of economics and related mathematics to insurance(Module IV & V)
- To get knowledge of underwriting acceptances and risks measurement including pricing
   (Module VI)
- To have awareness of new techniques, products and processes of Insurance which will be covered for remaining updated in the industry (Module VII)

Module 1:
Introductory Inputs (7 Hrs.)
- Insurance concepts like, Historyand Advantages of insurance , Insurance Environment, Contribution to economy, Latest Trends.
- Insurance value chain PESTLE Analysis, H'ubiverse's Theory of Human Life Value.
- Principles Of Insurance like Indemnity , Utmost good faith, Insurable interest and proximate cause.
- Basic terms like Risk, Perils, Hazard, Spread of Risk, Co insurance, Reinsurance etc.

Module 2:
Insurance Legislation (7 Hrs.)
- Like Insurance Act, Indian Contracts Act, IRDAI Act.
- Latest IRDAI Regulations, Investment Norms for insurers, Organizational Structure of insurance companies.

Module 3:
Types of Insurance Products (9 Hrs.)
- Life Insurance policies like ULIPs, Double Endowment, Term Assurance, Survival benefits, death cover, Group Insurance Policies.
- Key man Insurance, Whole life policies, types of Annuities, Life & Death Annuities, Immediate & Deferred Annuities.
- Various types of Health Insurance policies including Mediclaim & OMP, Group Health Insurance Policies for Corporates etc. critical illness, OPD covers, corona kavach etc.
- Various types of Nonlife Policies like Fire, Motor , Marine , Liability , PA , Engineering etc.

Module 4:
Principles of Economics (6 Hrs.)
- Approach of Mathematics and basic actuarial concepts like theory of probability, law of large numbers.
- Mortality, Morbidity, Risk Based underwriting, Maximum & Minimum probable loss.

- Control of expenses, aiming at profitability, claim minimization measures, contingency risks v/s investment risks, sharing & Spreading risks.

Module 5:
Mathematics Of Insurance (9 Hrs.)
- Special features of Insurance accounting, Investment function in insurance companies, present value methods, compounding effect, perpetuities.
- Discounted cash flow, sinking fund, life fund, yield, profitability, stationary population, select mortality tables, survival rates, morbidity concept, BMI, Valuation of surplus, Assets & Liability.
- Types of Financial Reserves in Insurance Companies Balance Sheets, Premium Loadings, Pricing of insurance products etc. Bonus/Malus concepts, "Fair Value" of assets/liabilities, life office valuations.
- Concepts of Estate & Trading Profits, distribution of surplus, payment of dividends/bonus, profit centers, management expenses, fresh/renewal expenses, solvency margins etc.

Module 6:
Underwriting (7 Hrs.)
- Definition, importance, profits generation , underwriting process , physical & moral hazards.
- Extras & discounts in rating structure, deductibles, underwriting factors in Life Insurance & General Insurance.
- Risk inspection, risk minimization, adverse selection, Use of riders, Loss sensitive pricing, Embedded devices, comparison between Indian & Global underwriting practices and need for contract certainty, proposal form.

Module 7:
Basic Concepts (5 Hrs.)
- This module is for creating awareness for advanced course in insurance.
- Reinsurance, claims settlement, coinsurance.
- Risk Management, Insurance Marketing and Intermediaries, Futuristic Insurance Products , "Insure Tech".

References :
Text Books

Understanding General Insurance - PC James PCJ Value Media , Bengaluru
Insurance Institute of India Books on various aspects of general insurance IC 51 to IC 54 , IC 71 to IC 74, IC 77.
Black, Kenneth Jr, Skipper, Harold D Jr, Life & Health Insurance Latest Edition, Prentice Hall.
Rejda George E (2010)
Principles of Risk Management and Insurance Prentice Hall (11th Edition)
Zartman, Lester W (2003), Yale Readings in Insurance , Life Insurance, William S Hein & Company
Bates, Ian and Atkins, Derek (2009) Management of Insurance Operations, Global, Professional, Publications.

Research Papers :
Underwriting Prudence – Winning Strategy, MD Garde, BIMAQUEST, Volume 17, January 2017.
KPMG Report titled "The Connected Ecosystem a New Business Model for Insurance.
"BIMAQUEST" & "Pravartak" Publications of National Insurance Academy, Pune.
Asian Insurance Review, Publication from Singapore.
The Journal, Insurance Institute of India.
Webliography References :
https://www.insuranceinstituteofindia.com
https://www.licindia.in
https://www.agriinsurance.gov.in/pmfby.aspx

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Course Code: PSHE-B-13
Course Name: Advanced Econometrics

Course Outcomes:
- The course starts with advanced topics of econometrics, namely, the seemingly unrelated regressions. (Module 1)
- Various aspects of time series data are covered in time series econometrics. In particular, stationarity, trend and simultaneity of variables are discussed. (Module 2)
- Detailed account of panel data and its issues are covered in Module 3.
- Overall, the course allows students to form a foundation of advanced econometrics.

Module 1:
Seemingly Unrelated Regression (SURE): Estimation by OLS, GLS and FGLS, testing for structural change and aggregation bias, case of autoregressive errors

Module 2:
Time Series:
    2.1. Introduction to Time Series Analysis: The nature of time Series data; Examples of time Series Regression Models: Static Models: Finite Distributed Lag Models. Trends and Seasonality: Characterizing Trending Time Series, Using Trending Variables in Regression Analysis. A Detrending Interpretation of Regressions with a Time Trend, Computing R-Squared when the Dependent Variable Is Trending Seasonality
    2.2 Stationary Time-Series Models: Stochastic Difference Equation Models, ARMA Models, Stationarity, Stationarity Restrictions for an ARMA(p, q) Model, The Autocorrelation Function, The Partial Autocorrelation Function, Sample Autocorrelations of Stationary Series, Box–Jenkins Model Selection, Properties of Forecasts, A Model of the Interest Rate Spread, Seasonality, Parameter Instability and Structural Change.
    2.3 Models with Trend: Deterministic and Stochastic Trends, Removing the Trend, Unit Roots and Regression Residuals, The Monte Carlo Method, Dickey–Fuller Tests , Examples of the ADF Test, Extensions of the Dickey- Fuller Test, Structural Change, Power and the Deterministic Regressors, Panel Unit Root Tests, Trends and Univariate Decompositions
    2.4 Multiequation Time-Series Models: Intervention Analysis, Transfer Function Models, Estimating a Transfer Function, Limits to Structural Multivariate Estimation, Introduction to VAR Analysis, Estimation and Identification, The Impulse Response Function, Testing Hypothesis, Structural VARs. , The Blanchard and Quah Decomposition.
    2.5 Cointegration and Error-correction Models: Linear Combinations of Integrated Variables, Cointegration and Common Trends, Cointegration and Error Correction, Testing for Cointegration -The Engle–Granger Methodology, Illustrating the Engle-Granger Methodology, Cointegration and Purchasing-Power Parity, Characteristic Roots, Rank, and Cointegration, Hypothesis Testing, Illustrating the Johansen Methodology, Error-Correction and ADL Tests, Comparing the Three Methods
    2.6 Modeling Volatility*:* Economic Time Series- The Stylized Facts, ARCH Processes, ARCH and GARCH Estimates of Inflation, A Garch Model Of Risk, The Arch-M Model, Additional Properties Of Garch Processes, and Maximum Likelihood Estimation of GARCH Models**.**

Module 3:
Panel Data

3.1 Introduction Panel Data: Some Examples, Benefits and Limitations

3.2 The One-way Error Component Regression Model: Introduction, The Fixed Effects Model, The Random Effects Model, Fixed vs Random, Maximum Likelihood Estimation, Prediction

3.3. The Two-way Error Component Regression Model: Introduction, The Fixed Effects Model, Testing for Fixed Effects, The Random Effects Model, Maximum Likelihood Estimation, Prediction

3.4 Test of Hypotheses with Panel Data: Tests for Poolability of the Data, Tests for Individual and Time Effects: The Breusch–Pagan Test, King and Wu, Honda and the Standardized Lagrange Multiplier Tests, Gourieroux, Holly and Monfort Test, Conditional LM Tests, ANOVA F and the Likelihood Ratio Tests; Hausman's Specification Test

3.5 Introduction to Dynamic Panel Data Models

Note: The students will be taught software packages for performing econometric applications. Computer exercises will be given to students.

Basic Reading List

Baltagi, B.H. (2008), **Econometric Analysis of Panel Data**, 4th Edition, Wiley
Wooldridge, J. (2002), Econometric analysis of Cross Section and Panel Data
Wooldridge, J. (2009), Introductory **Econometrics,** 4th Edition, South-Western College Pub.
Hsiao, C. (2003), Analysis of Panel Data, Cambridge University Press, Cambridge.
Walter Enders (2008), Applied Econometrics Time series, Wiley India
Hamilton, JD (1994) Time Series Analysis. Princeton University Press, New Jersey.
Judge, G.G., Griffiths, W.E., Hill, R.C., Lutkepohl, H. and Lee, T.C. (1985), The Theory and Practice of Econometrics, 2nd edition John Wiley and Sons, New York.
Johnston, J. and Dinardo, D., Econometric Methods, McGraw Hill, New York.
Lutkepohl, Helmut (2007) New Introduction to Multiple Time Series Analysis, Springer, New York
Rao, P., Miller, R. L. (1971), Applied Econometrics, Wadsworth Publishing Company.

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Course Code: PSHE-B-14
Course Name: Mathematics for Economic Analysis

Course Outcomes:
The course will enable the students:
- The course aims at providing students an understanding of mathematical concepts along with economic applications, and introduces them to mathematical thinking and vocabulary. The concepts and techniques discussed in this course will find applications in the various branches of Economics. (Module 1,3,4)
- To Emphasize use of Real analysis in core economics to mathematically model and analyze economic concepts and behaviors of economic functions, in order to make predictions and informed decisions. (Module 2)

Module 1:
Linear Algebra
- Review of Matrices
- Eigenvalues and Eigenvectors, Principal Minors and Sign Definiteness
- Introduction to Vector Spaces
- Applications of Linear Algebra in Economics and Econometrics

Module 2:
Real Analysis
- Open and Closed Sets, Compact Sets, Convex Sets
- Rolle's Theorem and Mean Value Theorem
- Taylor Series
- Convex and Concave Functions,
- Brouwer and Kakutani Fixed Point Theorems

Module 3:
Static Optimization and Comparative Statics
- Introduction to Linear Programming and Game Theory
- Unconstraint and Constraint Optimization
- Euler's Theorem
- Kuhn-Tucker Conditions and Non-Linear Programming
- Maximum Value Functions and Envelope Theorem
- Comparative Statics
- Applications in Microeconomics
- An Overview of Matrix Differentiation and Applications to Econometrics

Module 4:
Dynamic Optimization
- First and Second Order Differential Equations and Difference Equations
- Simultaneous Differential and Difference Equations
- Optimal Control Theory
- Applications in Macroeconomics and Growth Theory
- Dynamic Programming
- Applications in Macroeconomics

Suggested Readings:

Chiang, A.C., Fundamentals Methods of Mathematical Economics, McGraw-Hill, 2005

Chiang, A.C., Elements of Dynamic Optimization, McGraw-Hill, 1992

Dorfman, R., P. A. Samuelson and R. M. Solow, Linear Programming and Economic Analysis, Dover Publications, Inc., 1958

Hoy, M., J. Livernois, C. McKenna, R. Rees, T. Stengos, Mathematics for Economics, PHI Learning Private Ltd., 2011

Intriligator, Michael D., Mathematical Optimization and Economic Theory, Prentice Hall, 1971

Shone, R., An Introduction to Economic Dynamics, Cambridge University Press, 2001

Shone, R., Economic Dynamics: Phase Diagrams and their Economic Applications, Cambridge University Press, 2002

Simon, Carl P. and Lawrence Blume, Mathematics for Economists, W. W. Norton & Company, Inc., 1994

Sydsaeter, K and P. J. Hammond, Mathematics for Economic Analysis, 2002

Additional Readings

Anton H. and Chris Rorres, Elementary Linear Algebra, Wiley India, 2005

Bartle R. G. and D. R. Sherbert, Introduction to Real Analysis, John Wiley & Sons, 2000

Binmore, K., Foundations of Analysis, Books 1, Cambridge University Press, 1980

Binmore, K., Foundations of Analysis, Books 2, Cambridge University Press, 1981

Dhrymes, P. J., Mathematics for Econometrics, Springer, 2013

Strang, G., Linear Algebra and Its Applications, Cengage Learning, 2007

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Course Code: PSHE-B-15
Course Name: Financial Economics

Course Outcome:
The course will enable the students:
- To familiarize students with the financial system and its components (Module 1 and 2)
- To understand the risk and return structure in financial markets (Module 1)
- To comprehend the students with the functioning of capital market (Module 3)
- To help students with contemporary theories related to financial markets including money market, capital markets (bonds, stocks and hybrids) and derivative markets. (Module 4, 5, 6, 7, 8 and 9)
- To familiarize them with the policy and regulatory framework within which financial markets are required to function (Module 10)

Module 1:
The demand for securities (15 hours)
- The time dimension, Present value and duration, The calculation of yields on zero-coupon bonds
- The term structure of interest rates
- The risk dimension, Measurement of risk
- Bivariate distributions, Conditional probabilities and expected values
- Estimating the mean and variance of returns, Expected utility

Module 2:
The supply of securities (15 Hours)
- Regulations governing supply of securities,
- General characteristics of securities,
- Government bonds
- Index linked bonds
- Corporate Securities, equities, bonds, convertible securities
- Stock market operations
- Money market funds
- Claims on financial institutions.

Module 3:
Securities markets and their efficiency (5 Hours)
- Stock exchanges
- The over the counter stock market
- Operational efficiency and the Efficient Market Hypothesis(EMH) - The weak, semi-strong and the strong form of EMH.

Module 4:
The determination of equity prices (6)
- Shares as claims on future dividends and on corporate net worth
- The Capital Asset Pricing Model (CAPM)- The simplest form, Estimating betas, Implications for portfolio management, Validity of CAPM
- Arbitrage Pricing theory- An alternative approach

- Stock indices – Bombay Sensitive Index, Bombay National Index, Dow Jones Industrial Index(DJI), New York Stock exchange composite index(NYSE)

Module 5:
Security analysis and market efficiency (6 Hours)
- A modern view of security analysis
- Macroeconomic developments and securities markets
- Performance of securities markets
- Industry growth, structure and firm specific factors
- Uses and pitfalls of Price / Earnings ratios.

Module 6:
Derivatives Uses of Derivatives – Futures contracts and futures markets – Forward contracts – The origins of Futures trading – Basic elements and organization of futures contracts.

Module 7:
Futures prices Relation among spot and futures prices – financial futures – commodity futures – Closing out with futures – Hedgers,speculators, market equilibrium – The role of expectations – Futures and portfolio management.

Module 8:
Options and option pricing Institutional aspects – Exchange traded stock options – The pa offs from buying and selling options – Boundary conditions on option prices – The put-call parity theorem – The BlackScholesformula – Other option models

Module 9:
Swaps, Currency and Interest Rate Swaps Vanilla Interest Rate Swaps – Swaptions – Other types of swaps – Currency, Equity and Commodity Swaps.

Module 10:
Regulation of financial markets (3 hours)
- The ethics of finance and the economic function of financial markets
- The purpose of regulation, levels of regulation
- Securities Contract Regulation Act – Securities and Exchange Board of India (SEBI).

Suggested Reading

Books

- Black, F., Jensen, M.C. and Scholes, M.A. (1972), "*The Capital Asset Pricing Model: Some Empirical Tests*", in M.C. Jensen (ed.), Studiesin the Theory of Capital Markets, (Praeger, New York)
- Chandra, Prasanna (2008), *Investment Analysis and Portfolio Management*, Tata McGraw Hills
- Fabozzi (2009), *Bond Markets*, 7th revised edition, Pearson Publications, USA, February 27
- Houthakkar H.S. and Williamson P.J. (1996), *The Economics of Financial Markets*, Oxford University Press

Papers

- Barsky, R. and Long, J. De (1993), "*Why Does the Stock Market Fluctuate*?", Quarterly Journal of Economics, 108, pp. 291-311
- Markowitz, H. (1952), "*Portfolio Selection*," Journal of Finance, 7: 77-91.
- Merton, R. (1980), "*On Estimating the Expected Return on the Market: An Exploratory Investigation*", Journal of Financial Economics, 8, pp. 323-361.
- Ross, S.A. (1976), "*Arbitrage Theory of Capital Asset Pricing*", Journal of Economic Theory, 13, pp. 341-60

Additional Reading List:

- (Basel: BIS, April 1986) "*Bank for International Settlements*", Recent Innovations in International Banking.
- Benjamin M. Friedman H. Hahn (1990) "*A formal treatment of the requirements for targets*" is available in Benjamin M. Friedman, "*Targets and Instruments of Monetary Policy*," chapter 22 in Benjamin M. Friedman H. Hahn, handbook of Monetary Economics, (Amsterdam: North-Holland, 1990).
- Blume, Marshall, E. (June 1975) "*Betas and Their Regression Tendencies*," Journal of Finance, 30, 785-96.
- Cox. Ingersoll, and Ross, "*A Re-examination of Traditional Hypothesis*," pp. 774-775.
- Culbertson, J.M. (November 1957) "*The Term Structure of Interest Rates*," Quarterly Journal of Economics, pp. 489-504.
- Daniel C. Inro, Christine X. Jaing, Michael Y. Ho, Wayne Y. Lee (May/June 1999) "*Mutual Fund Performance: Does Fund Size Matter?*" Financial Analysis Journal, pp. 74-87.
- William F. Sharpe (September 1964) "*Capital Assets Prices: A Theory of Market Equilibrium Under Conditions of Risk*," Journal of Finance, pp. 425-442.

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Course Code: PSHE-B-16
Course Name: Introduction to Game Theory

Course Outcome:
The course will enable the students:
- This module enables students to understand what a game is and how to model a game in matrix format (Module 1)
- To learn how to model real life situations in a game theoretic form and to find the solutions and outcomes of such situations through Nash equilibrium (Module 2 & 3)
- To learn dynamic games and their solution concepts (Module 4)
- To appreciate the outcomes in finite repeated games vs infinite repeated games (Module 5)
- To learn games of incomplete and imperfect information along with solving the Bayesian Nash equilibrium of these games (Module 6)
- The last module enables students to differentiate between non-cooperative games and cooperative games along with some cooperative games and Shapley value (Module 7)
- Overall, the course enables the student to analyze strategic situations in game theoretic form in facing real-life situations.

Module 1, 2 & 3:
Introducing games, its form and a solution concept : (8 hours)
- Definition and description of games is introduced.
- One of the solution concepts namely Nash equilibrium (in both pure strategies and mixed strategies) is defined along with its existence and other properties.
- Problems are solved to find Nash equilibrium in two-players and finite players games.
- Various famous two-player games and real-life applications are discussed.

Module 4:
Dynamic games of complete information : (8 hours)
- Extensive form games are introduced along with its strategic forms.
- Backward induction is discussed.
- Relevant solution concept called subgame perfect Nash equilibrium is discussed.
- Introduction to imperfect information games along with applications.

Module 5:
Repeated games : (8 hours)
- An application of repeated prisoner's dilemma is taught.

- Finite and infinite repeated games, along with comparisons of equilibrium strategies in finite vs infinite games are analyzed.
- Folk theorem for Nash equilibrium is discussed in a theoretical way.

Module 6:
Games of incomplete information: (12 hours)
- Bayesian games along with real life applications are discussed.
- Signaling games with strategies and solutions are taught.

Module 7:
Introduction to cooperative games : (12 hours)
- Introduction to TU-games, core, Shapely value and nucleolus are taught.

References
Books:
Game Theory, by Fudenberg and Tirole, 1st Edition, MIT Press.
Thinking Strategically: The Competitive Edge in Business, Politics, and Everyday Life (Norton Paperpack), Dixit and Nalebuff.
Games of Strategy, Dixit, Skeath et al, W.W. Norton and Co., (2020)
Games and Decisions, Luce and Raiffa, Dover Publications.
Collected Papers, Vol. 1, Robert J Aumann

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Course Code: PSHE-B-17
Course Name: Economic Sociology

Course Outcomes:
- To discuss the various sociological approaches and its boundaries. (Module 1)
- To appreciate the various schools of sociological views of the economy and to critically appraise them. (Module 2)
- To understand the various social contexts of economic action. (Module 3)
- To enunciate the labour market outcomes based on sociological concepts. (Module 4)
- To similarly appraise the consumption aspects of sociological concepts. (Module 5)
- All the above modules culminate in understanding the socio-cultural aspects of economic development. (Module 6)

Module 1:
Emergence of economic sociology and its boundaries; sociological approaches to the study of economy.

Module 2:
Classical sociological views of the economy: Marx: critique of political economy; Durkheim: division of labour; Weber: sociology of capitalism, religious ethics and economic rationality; Polanyi: economy as instituted process.

Module 3:
Social contexts of economic action: Economic action, varieties of embededness, social networks in economic behaviour, social structure and competition

Module 4:
Sociology of labour markets: Sociological approaches to labour market; social determinants of inequalities in wage and earning

Module 5:
Sociology of consumption: Sociological theories of consumption (Marry Douglas and Baron Isherwood: the use of goods, Jean Baudrillard: the system of objects, Pierre Bourdieu: forms of capital, Veblen: conspicuous consumption); socio-cultural aspects of consumer spending

Module 6:
Socio-cultural aspects of economic development: Impact of religion, caste, gender, ethnicity, family on economy, social background of business groups and entrepreneurship, debate on influence of social capital and public action on economic progress; social movements and economic development

Basic Reading List

Dobbin, Franf. 2004, "Comparative and Historical Approaches to Economic Sociology" in Neil J. Smelser, and Richard Swedberg, (eds.) *Handbook of Economic Sociology,* Princeton: Princeton University Press.

Durkheim, Emile, 1960, *The Division of Labour in Society*, Glencoe: The Free Press. (2nd edt: Chapter one & two, 3rd edt: Chapter one)

Gerth H. H and C. Wright Mills, 1946, *From Marx Weber,* New York: Oxford. (Part III: Chapter 12th &13th)

Smith-Doerr, Laurel and Walter W. Powell, 2005, "Networks and Economic Life" in Neil J. Smelser, and Richard Swedberg, (eds.) *Handbook of Economic Sociology,* Princeton: Princeton University Press.

Streeck Wolfgang, 2004, "The Sociology of Labour Markets and Trade Unions" in Neil J. Smelser, and Richard Swedberg, (eds.) *Handbook of Economic Sociology,* Princeton: Princeton University Press.

Weeden, Kim, 2002, "Why do some occupations pay more than others? Social Closure and Earning inequality in the United States", *American Journal of Sociology*, 108, (55-101).

William P. Bridges and Robert L. Nelson 2001, "Economic and sociological approaches to Gender Inequality in Pay" in Mark Granovetter and R. Swedberg, (eds.) *The Sociology of Economic Life*, Boulder: Westview Press.

Sen, Amartya, 2004, "How does Culture Matter?" in Vijayendra Rao and Michael Walton (eds.) *Culture and Public Action*, Delhi: Permanent Black.

Wuthnow, Robert. 2004, "New Directions in the Study of Religion and Economic Life", in Neil J. Smelser, and Richard Swedberg, (eds.) *Handbook of Economic Sociology,* Princeton: Princeton University Press.

Additional Reading List:

Kalpagam, U. 1993, Labour and Gender: Survival in Urban India. New Delhi: Sage.

Kalpagam, U. Analytics of Work and Survival.

Agarwal, B. 1999, The Gender and Environment Debate: Lessons from India in Menon, N. (Ed.), Gender and Politics in India. New Delhi: OUP.

Banerjee, N. 1991, Indian Women in a Changing Industrial Scenario. New Delhi: OUP.

Yadav, Sushma and A. Dutta Mishra (2003), *Gender issues in India: Some Reflections*, Radha Publications, New Delhi.

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Course Code: PSHE-B-18
Course Name: Insurance Economics (Advanced Practices)

Course Outcome:
The Course will enable the students:
- To know the marketing principles applied to insurance (Module I)
- To deal with claim matters as after sales service (Module II)
- To get knowledge of innovative insurance products (Module III)
- To learn the importance of reinsurance and its methods (Module IV)
- To understand applications of risk management to insurance issues (Module V)
- To learn the best practices followed globally including India (Module VI)

Module 1:
Insurance Marketing (10 Hrs.)
- Fixing premium goals annually, need for marketing strategy, front desk skills, insurance intermediaries like agents, brokers etc.
- Bancassurance tie ups as a win – win mechanism, direct/tied clients servicing, Market funneling, segmentation.
- New products development, PR & Publicity, Customer Service Pre – Sale , POS & Aftersales, Lead generationthro referrals, Broker development programs.
- Customer focus at all levels, grievances resolution etc.

Module 2:
Insurance Claims (8 Hrs.)
- Use of claim form, need for Claims Investigations, Importance of claims as a service parameter, types of claims for each class of insurance business.
- Stages involved in the claims process, control over claims ratio , typical claim disputes, out sourcing of claims function, arbitration process.
- Compliance of section 64 VB, salvage disposal, reinstatement and loss of profits claims , fraudulent claims handing etc.

Module 3:
Innovative Insurance Products (8 Hrs.)
- Innovative policies in Health Insurance. The process of product innovation as a 24×7 activity, Customer Focused & Tailor Made Products.
- New Global Products Like Autonomous Car Insurance, PAYD, Genetic Defects Coverage, Aerospace Related Products, Cyber Liability, Robot Surgeons Cover , Political risk.
- Demat Policies , Drone Insurance , Sports events , Retirement Products, Managed Care , Retroactive Liability ,Gaming & Entertainment Covers.

Module 4:
Reinsurance (7 Hrs.)
- Types of risks covered in reinsurance, Definition , Importance and the process involved, various methods of reinsurance like Reciprocal , surplus Treaties etc. concept of lines, layers, avoidanceof "Spiral" effect.
- Advantages of Reinsurance, reinsurance brokers , consortiums in reinsurance, Increasing retention capacities.
- Big Reinsurance Companies & Reinsurance Brokers.

Module 5:
Risk Management (9 Hrs.)
- Definition and process, its importance, various methods, advantages , covering maximum risk at minimum premium, Risk identification, transfer, evaluation, finance & controlling,
- Risk inspection reports, Types of risks covered, Global risk report, Insurance and reinsurance as risk transfer mechanisms.
- Need for Enterprise Risk Management (ERM)

Module 6:
Global Insurance Best Practice (8 Hrs.)
- Underwriting desk bench , formation of KPO's, LPO's BPO's, Demat policies.
- Online claims & underwriting, implementation of Insure Tech, Telematics, Telemedicine, Embedded Devices.
- CRM solutions, Artificial Intelligence tools in insurance underwriting & claims, fraud investigations.
- Better practices of Pvt. Insurance Companies in India Project Insurance.

References:
Text Books

Insurance Institute of India *IC 22 to IC 26 , IC 81 & 85*

Gastel, Ruth (Ed) (2004) *Reinsurance : Fundamentals and New Challenges*, Insurance Information Institute latest Edition.

Fundamentals of Risk Management By Paul Hopkin (irm) (Kogan Page Publications , London).

Cummins, J David and Doherty, Neil A (2005) *The Economics of Insurance Intermediaries*, Wharton School, University of Pennsyivania.

Research Papers :

Case Study, Motor Claims Management, M D Garde and Gautam Prasad, BIMAQUEST, Volume 17, Jaunary 2017.

Enterprise Risk Management – A Strategy to build a resilient organization & be a Busines Partner – by Delzad D Jivasha – Legal Era Magazine – October 2017 issue.

Webliography References :

https://www.irdai.gov.in
https://www.policyholder.gov.in
https://www.insurancethebox.com/telematics
https://www.ibm.com/blogs/insights-onbusiness/insurance/customerengagement-services-excellencein-insurance

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Course Code: PSHE-B-19
Course Name: Economics of Labour

Course Outcomes:
- To introduce students to micro-economic foundations of the economics of labour. (Module 1, 2 and 3)
- To introduce students to equilibrium concepts of labour market, both from the demand side and supply side of the economy. (Module 4 and 5)
- To appreciate the income distribution, wage adjustment process and unemployment issues pertaining to labour market. (Module 6, 7 and 8)
- To enunciate the macro-economic aspects of the labour market. (Module 9 and 10)
- Unions and labour contracts are discussed. (Module 11 and 12)
- Overall, the course gives a comprehensive view of labour economics.

Module 1:
Supply
Static Labour-Leisure Choice – Effects of Social Programs and Income Taxes – The Life-Cycle Model – Investments
in Human Capital – Collective Models of Household Labour Supply
– Occupational Choice

Module 2:
Demand
Static Cost, Profit and Labour Demand Functions – Elasticity of Derived demand: the Hicks-Marshall Rules; Adjustment Costs and Dynamic Labour Demand

Module 3: Equilibrium
Compensating Differences – Adam Smith – Evidence on Premium for Risky or Nasty Jobs – Efficiency Wages – Segmented Labour markets – Migration

Module 4: Wage
Structure
Industry Wage Differentials – Productivity and Real wages – Returns to Education – Signaling – Pensions and Retirement – Training – Minimum Wage Laws

Module 5: The Distribution of Income
Earnings by Size – The Roy Model – Functional Distribution – Intergenerational Income Mobility

Module 6: Cyclical Fluctuations
Equilibrium Models of Employment Fluctuations – Real Wages over the Business
Cycle

Module 7: Discrimination
Economic Effects of Prejudice: Theoretical Analysis – Wage Differentials by Race and Sex

Module 8:
Unemployment
Definition and Measurement – Variations over time and Space – Job Search – Effects of Unemployment Insurance

Module 9: Macroeconomics of Labour Market

Classical Analysis – Neoclassical Analysis – Keynesian Analysis – Dual and Segmented Labour Market Theory – Marxian Alternative – Human Capital theory – Flexibility and Institutions in Labour Market

Module   10:
Unions

Objectives and Political Structure – Bargaining Theories – Relative Wage Effects – Strikes – Union Growth and Decline – Unions in the Public Sector – Union-Oligopoly Models

Module 11: Labour Contracts

Employment Determination – Allocation of Risk – Compensation – Bonding; Tournaments; Incentive Pay – Multi- tasking – Team Production – Relational Contracts – Career Concerns – Wages and Promotions

Module 12: Regulations and International Labour Standards

Regulation of Labour – Experience of India vis-à-vis Other Countries – Entry and Product Market Regulation – International Labour Standards – Comparative Analysis – International Trade and Labour Markets

Reading List

- Sundaram, K, 2001, 'Employment- Unemployment Situation in the Nineties: Some Results from the NSS 55th Round Survey', Economic and Political Weekly, P.931-40.
- Robinson, Joan, R, 1936, 'Disguised Unemployment', The Economic Journal, June
- Banerjee, P C, 1960, 'Full Employment and Low Full Employment in a Developing Economy', Indian Journal of Labour Economics, 2(4): 227-243.
- Rakshit, Mihir, 1983, The Labour Surplus Economy: A Neo-Keynesian Approach, Macmillan India Limited, New Delhi.
- Seth, V K and S C Aggarwal, The Economics of Labour Markets: Policy Regime Changes and The Process of Labour Adjustment in the Organised Industry in India. New Delhi: Ane Books, 2004
- Basu, K, 1984, The Less Developed Economy: A Critique of Contemporary Theory, New Delhi: Oxford India Paperbacks. (Chapter 5: The structure of Dual Economy; Chapter 6: Migration and Unemployment).
- Stephen, Donald Deere. 1994. "Unionization and Profitability: Evidence of Spillover Effects," *Journal of Political Economy*, 102(6): 1281-128
- Schmidt, C. M., A. Stilz and K. F. Zimmermann (1994): "Mass Migration, Unions, and Government Interventions," *Journal of Public Economics*, 55, 185- 210.
- Laffont, J. and Martimort, D. (2002), *The Theory of Incentives: The Principal-Agent Model*, Princeton University Press.

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