Four Year Undergraduate Programme (FYUP)
(Under NEP- 2020)

B.A. (Hons./Hons. with Research) Economics

Course Structure & Syllabus

(w.e.f. 2024-25)

Department of Economics
Faculty of Social Sciences
Jamia Millia Islamia, New Delhi - 110025

Department of Economics **B.A. (Hons./Hons. with Research) Economics** **(FYUP: Four Year Undergraduate Programme, w.e.f. 2024-25)[1]**					
Paper Code	**Paper Title**	**Credits[4]**	**Internal Assessment Marks (40%)**	**Semester End Examination Marks (60%)**	**Total Marks**
Semester I (July- December)					
Major (Only for Department)					
24-ECO-C-100	Microeconomics-I	4	40	60	100
24-ECO-C-101	Mathematical Methods for Economics-I	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-102	Principles of Microeconomics	4	40	60	100
Multidisciplinary (Open for All)					
24-ECO-T-103	Economics of Education	3	30	45	75
Ability Enhancement Course (Open for All and Offered by Department of English)					
24-ENG-A-106	General English-I	2	20	30	50
Skill Enhancement Course (Open for All)					
24-ECO-S-104	Data Visualization for Economics[2]	3	30	45	75
Value Added Course (Open for All)					
24-ECO-V-105	Introduction to Environmental Thought	2	20	30	50
Compulsory (Only Qualifying and Offered by Other Departments)					
Qualifying – I	General Urdu-I	2	20	30	50
Qualifying – II	IRC/HRS/Islamiat[3]	2	20	30	50
Total Credits		**22**	**Total Marks**		**550**
Semester II (January- June)					
Major (Only for Department)					
24-ECO-C-150	Microeconomics-II	4	40	60	100
24-ECO-C-151	Mathematical Methods for Economics-II	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-152	Principles of Macroeconomics	4	40	60	100
Multidisciplinary (Open for All)					
24-ECO-T-153	Financial Economics	3	30	45	75
Ability Enhancement Course (Open for All and Offered by Department of English)					
24-ENG-A-156	General English-II	2	20	30	50
Skill Enhancement Course (Open for All)					
24-ECO-S-154	Introduction to Indian Statistical System	3	30	45	75
Value Added Course (Open for All)					
24-ECO-V-155	Introduction to Environmental Studies	2	20	30	50
Compulsory (Only Qualifying and Offered by Other Departments)					
Qualifying – I	General Urdu-II	2	-	50	50
Qualifying – II	IRC/HRS/Islamiat[2]	2	-	50	50
24-ECO-I-157	**Vocational Course/ Summer Internship[5]: 4 Credits**				
Total Credits		**22+4**	**Total Marks**		**550**
Exit -I: UG Certificate		**Required Minimum Credits: 48**			

Department of Economics **B.A. (Hons./Hons. with Research) Economics** **(FYUP: Four Year Undergraduate Programme, w.e.f. 2024-25)***					
Paper Code	**Paper Title**	**Credits#**	**Internal Assessment Marks (40%)**	**Semester End Examination Marks (60%)**	**Total Marks**
Semester III (July-December)					
Major (Only for Department)					
24-ECO-C-200	Macroeconomics-I	4	40	60	100
24-ECO-C-201	Statistical Methods-I	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-202	Foundations of Mathematics for Economics	4	40	60	100
Multidisciplinary (Open for All)					
24-ECO-T-203	National Income Accounting	3	30	45	75
Ability Enhancement Course (Open for All)					
24-ECO-A-204	Labour Economics	2	20	30	50
Value Added Course (Open for All)					
24-ECO-V-205	Environmental Economics	2	20	30	50
Compulsory (Only Qualifying and Offered by Other Departments)					
Qualifying – I	General Urdu	2	20	30	50
Qualifying – II	IRC/HRS/Islamiat[2]	2	20	30	50
Total Credits		**19**	**Total Marks**		**475**
Semester IV (January- June)					
Major (Only for Department)					
24-ECO-C-250	Macroeconomics-II	4	40	60	100
24-ECO-C-251	Statistical Methods-II	4	40	60	100
24-ECO-C-252	Indian Economy	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-253	Statistical Methods for Economics	4	40	60	100
Ability Enhancement Course (Open for All)					
24-ECO-A-254	Cyber Security	2	20	30	50
Value Added Course (Open for All)					
24-ECO-V-255	Data Analytics with Python	2	20	30	50
Compulsory (Only Qualifying and Offered by Other Departments)					
Qualifying – I	General Urdu	2	-	50	50
Qualifying – II	IRC/HRS/Islamiat[3]	2	-	50	50
24-ECO-I-258	**Vocational Course/Summer Internship: 4 Credits**				
Total Credits		**20+4**	**Total Marks**		**500**
Exit -II: UG Diploma		**Required Minimum Credits: 87**			

Department of Economics **B.A. (Hons./Hons. with Research) Economics** **(FYUP: Four Year Undergraduate Programme, w.e.f. 2024-25)***					
Paper Code	**Paper Title**	**Credits#**	**Internal Assessment Marks (40%)**	**Semester End Examination Marks (60%)**	**Total Marks**
Semester V (July-December)					
Major (Only for Department)					
24-ECO-C-300	Introductory Econometrics	4	40	60	100
24-ECO-C-301	Money and Banking	4	40	60	100
24-ECO-C-302	History of Economic Thought	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-303	International Trade	4	40	60	100
Skill Enhancement Course (Open for All)					
24-ECO-S-304	Statistical Data Analysis using Softwares	3	30	45	75
Total Credits		**19**	**Total Marks**		**475**
Semester VI (January- June)					
Major (Only for Department)					
24-ECO-C-350	Intermediate Econometrics	4	40	60	100
24-ECO-C-351	Development Economics	4	40	60	100
24-ECO-C-352	International Trade	4	40	60	100
24-ECO-C-353	Public Economics	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-354	Public Economics	4	40	60	100
24-ECO-I-357	**Vocational Course/Summer Internship: 2- 4 Credits**				
Total Credits		**20+4**	**Total Marks**		**500**
Exit -III: UG Degree		**Required Minimum Credits: 124-126**			

Department of Economics **B.A. (Hons./Hons. with Research) Economics** **(FYUP: Four Year Undergraduate Programme, w.e.f. 2024-25)***					
Paper Code	**Paper Title**	**Credits#**	**Internal Assessment Marks (40%)**	**Semester End Examination Marks (60%)**	**Total Marks**
Semester VII (July-December)					
Major (Only for Department) (Choose Any Two Electives)					
24-ECO-C-400	General Equilibrium & Welfare Economics	4	40	60	100
24-ECO-C-401	Macroeconomic Policy and Analysis	4	40	60	100
24-ECO-C-402 (Elective)	International Finance	4	40	60	100
24-ECO-C-403 (Elective)	Game Theory	4	40	60	100
24-ECO-C-404 (Elective)	Time Series Analysis	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-405	Development Economics	4	40	60	100
Total Credits		**20**	**Total Marks**		**500**
Semester VIII (A) (January- June)					
Major (Only for Department) (Choose Any Two Electives)					
24-ECO-C-450	Research Methodology	4	40	60	100
24-ECO-C-451	Growth Economics	4	40	60	100
24-ECO-C-452 (Elective)	World and Globalization	4	40	60	100
24-ECO-C-453 (Elective)	Financial Econometrics	4	40	60	100
24-ECO-C-454 (Elective)	Applied Predictive Modelling	4	40	60	100
Minor (Open to Other Department)					
24-ECO-M-457	Agriculture Economics	4	40	60	100
Total Credits		**20**	**Total Marks**		**500**
Exit -IV(A): UG Degree (Hons.)		**Required Minimum Credits: 164-166**			
Semester VIII (B) (January- June)					
Major (Only for Department)					
24-ECO-C-450	Research Methodology	4	40	60	100
24-ECO-P-460	**Research Project 12 Credits**	12	-	-	300
Minor (Open to Other Department)					
24-ECO-M-455	Agriculture Economics	4	40	60	100
Total Credits		**20**	**Total Marks**		**500**
Exit -IV(B): UG Degree (Hons. with Research)		**Required Minimum Credits: 164-166**			

Notes

1. The distribution of marks between Internal Assessment and Semester End Examination carries the weightage respectively 40% and 60% from the Academic Session, 2025-26. However, the weightage for the same is respectively 25% and 75% for the Batch 2024-25.

2. This course will have Practical/Lab. based assessment instead of internal assessment.

3. Qualifying - II shall be any one of Islamiat/Hindu Religious Studies (HRS)/Indian Religions and Culture (IRC).

4. For all courses, there shall be weekly one hour class per credit.

5. Choose either a Vocational Course or Summer Internship. However, students should inform the preferences to the department before the end of the odd semester examination.

Semester- I

B.A. (Hons./Hons. with Research) Economics

Course: Microeconomics- I

Type of Course: Major **Code:** 24-ECO-C-100

Semester: I **Credits:** 4

I. Introduction to the Course

The course is designed for the students at entry level in undergraduate programme and to expose students to the basic principles of microeconomic theory. The emphasis will be on teaching the fundamental economic concepts and theories pertaining to the important economic players – the consumer and the producer. This course may use graphical/diagrammatical and mathematical methods to illustrate how microeconomic concepts can be understood with lucidity and the students may be exposed to apply the learnings to analyze real-life situations.

II. Course Objectives

- To understand the basic concepts of Economics
- To learn the trade-offs and allocation problems due to scarcity of resources, while optimising the economic decisions.
- To analyse the individual behaviour to make consumption and production decisions.
- To connect theories to real world situations.

III. Learning Outcomes

- The students are expected to be equipped with a solid understanding of microeconomic theory and its practical applications.
- To understand the behaviour of consumers and producers in relation to consumption and production.
- Preparing the students for further study in economics and related fields.

IV. Course Contents

Unit-1: Basic Economic Concepts

- Introduction to Economics and Economic Problems
- Economic Trade offs, Opportunity Costs, and Resource Allocation,
- Assumptions of Rationality, Consistency and Transitivity
- Law of Demand/Supply, Determinants of Demand/Supply,
- Individual Demand/Supply, Market Demand/ Supply Curve
- Concept of Equilibrium – Static and Dynamic
- Elasticity of Demand/Supply and Its Measurement,
- Consumer/Producer Surplus.

Unit-2: Theory of Consumer Behaviour

- Consumer Preferences, Utility and Choice
- Consumer's Equilibrium - Cardinal Utility Approach, Ordinal Utility Approach, Revealed Preference Approach
- Derivation of Demand Curves – Marshallian Approach, IC Approach and Revealed Preference Approach

- Price Consumption Curve, Income Consumption Curve, Engel Curve
- Income Effect, Substitution Effect and Price Effect (Hicks and Slutsky Approaches)

Unit-3: Theory of Production and Costs

- Production Functions – Linear, Quasi-linear, Cobb-Douglas, CES
- Law of Variable Proportions, Returns to Scale, Elasticity of Substitution
- Isoquants, Iso-Cost Lines, Producer's Equilibrium
- Traditional Theory of Costs - Short run and Long run Cost Curves
- Modern Theory of Cost – Short run and Long run Cost Curves,
- Engineering Cost Curves – Short run and Long run Cost Curves,
- Cost Curves and Their Relationships, Economies of Scale and Relevance of Shapes of Cost Curves in Decision Making.

V. References:

1. Varian H.R: Intermediate Microeconomics, 7th Edition 3 2.
2. Pindyck, Rubinfield and Mehta: Microeconomics, 6th Edition
3. Ferguson and Gould: Microeconomics, 6th Edition
4. Gravelle and Rees: Microeconomics; Pearson Education, 2nd Edition
5. Nicholson, Microeconomics
6. Koutsoyiannis, A.: Modern Microeconomics

Course: Mathematical Methods for Economics-I

Type of Course: Major **Code:** 24-ECO-C-101

Semester: I **Credits:** 4

I. Introduction to the Course

For the strong foundation of economic modeling at under graduate level, basic knowledge of Mathematics is essential. Therefore, this course provides an extensive and thorough use of mathematical concepts. In this direction students are expected to gain the knowledge of the concepts of set theory, functions and graphs, limits, continuity and single variable differential calculus, single variable optimization and integral calculus. This course has been designed keeping in mind the aforesaid need of the students. The main focus will be on understanding how the mathematical tools can be used to analyze the economic problems.

II. Course Objectives

- To enhance the mathematical skills essential to study economics.
- To identify, solve and interpret the economic results mathematically.
- To understand and create economic models.
- To explore the techniques to solve complex problems of economics.

III. Learning Outcomes

At the end of the course, students are expected,

- To advance the mathematical skills necessary to study Economics.
- To know the basic concept of mathematics used in Economics.
- To understand the analytical skills required for solving problems in economics.
- To apply the various tools of mathematics in Economics.
- To evaluate the economic policy quantitatively.

IV. Course Contents

Unit -1: **Basic concepts, Functions and Graphs**

- Sets and set operations, Ordered pairs, the real numbers, natural numbers, integers, rational and irrational numbers; absolute value and intervals; inequalities.
- The general concept of function, types of function (linear, quadratic, power, exponential, inverse); graphs of functions; Applications in Economics

Unit-2: Limits, Continuity and Single variable Differential Calculus

- Limits, continuity and differentiability, rules of differentiation (simple differentiation, sums, products, and quotients)
- Second and higher order derivatives, power rule, chain rule, implicit differentiation; Linear approximation and differentials
- Quadratic approximations
- Elasticities the Intermediate-value Theorem
- The Extreme-value Theorem
- The Mean-value Theorem
- Indeterminate forms and L'Hopital's rule
- Applications in Economics

Unit-3: **Single variable optimization and Integral Calculus**

- Stationary points of a function, Maxima and Minima (local and global)
- Convexity and Concavity of functions
- Points of inflection; Optimization of economic functions
- Rules of integration, integration by parts, integration by substitution, indefinite integral, Definite Integral, Proper, and Improper integral
- Areas under curves and economic application of integration

V. References

1. Knut Sydsaeter and Peter J. Hammond (2005), *Mathematics for Economic Analysis*. Pearson Educational Asia: Delhi, 4th Indian reprint.
2. Chiang, A. C. & Kevin Wainwright (2005) (Fourth Edition): Fundamental Methods of Mathematical Economics, McGraw-Hill.
3. Allen, R.G.D.(1974), Mathematical Analysis for Economists, McMillan press, London
4. Chiang, A. C. (1984), *Fundamental Methods of Mathematical Economics, 3rd Ed*, McGraw-Hill.
5. Hoy,M., J. Livernois, C. McKenna, R. Rees and T. Stengos(2001), Mathematics for Economics, 2nd Edition Prentice Hall, India.
6. Dowling, Edward T. (1992), Schaum's Outline of Theory and Problems of Introduction to Mathematical Economics, 3rd Edition, McGraw Hill.
7. Rosser, Mike. (2003). Basic Mathematics for Economists, Second Edition, Routledge, Taylor & Francis Group
8. Handerson, Quandt. (1980). Microeconomic Theory, A Mathematical Approach, Third Edition, McGraw Hill.

Course: Principles of Microeconomics

Type of Course: Minor **Code:** 24-ECO-M-102

Semester: I **Credits:** 4

I. Introduction to the Course

This introductory microeconomics course is designed to offer the students with understanding fundamental principles which govern the behaviour of individual economic agents. Students will be able to understand how individuals make decision to maximise their objective subject to resource constraints. This course also offers the students the functioning of Markets. This course also sheds light on the role of price in allocation of resources.

II. Course Objectives

- To provide students with a robust foundation in the fundamental principles of supply and demand, both at the individual and firm levels.
- This course also intends to build an understanding of how changing prices affect social welfare.
- Through theoretical exploration and applications, students will gain insight into behaviour of agents in the economy, enabling them to analyse and understand economic activities.

III. Learning Outcomes

- Students will acquire necessary knowledge and skills for translating the preferences of economic agents into demand and supply curves.
- Students will also grasp the mechanism of attaining individual and market equilibriums and gain insight into the different market structures
- Skills learned during this course will equip students to effectively participate in other courses of economics.

IV. Course Contents:

Unit- 1: Basic Concepts in Economics

- Nature and scope of economics, opportunity cost, scarcity, production possibility frontier; Market as a system to allocate available resources in the economy, welfare state; Microeconomics-vs-macroeconomics.
- Demand function, demand curve and demand schedule; law of demand, determinants of individual demand; market versus individual demand schedule; extension and contraction of demand, shifts in the demand curve.
- Supply function, supply schedule and supply curve, determinants of supply; market versus individual supply; extension and contraction of supply, shifts in the supply curve.
- Consumer and producer surplus, concepts of elasticity of demand; factors affecting elasticity of demand; elasticity of supply, elasticity and revenue.

Unit- 2: Consumer and Producer Theory

- **Consumer Theory:** Cardinal and ordinal measures of utility, utility function, total utility, marginal utility, law of diminishing marginal utility, water-diamond paradox, budget constraint, consumption and income/price changes, demand for all other goods and price changes; consumer's optimum choice.
- **Producer Theory:** Production function, total, marginal, and average products; law of variable proportion, production isoquants, return to scale using isoquants, economic region of production. Cost of Production: Long run and short run costs of production, various cost concepts and shape of their curves; short run costs and output decisions; equilibrium of the firm.

Unit-3: Markets

- Perfect competition: Assumptions, equilibrium of the firm and the industry in the short and the long runs, including industry's long run supply curve.
- Monopoly: Significance and features of monopoly, price and output under monopoly.

V. References

1. Armstrong, W. E. (1950). A note on the theory of consumer's behaviour. *Oxford Economic Papers*, *2*(1), 119-122.
2. Krugman, P. R., & Wells, R. (2009). *Economics*. Macmillan.
3. Mankiw, N. G. (2018). *Principles of Microeconomics*, Eighth Edition, Cengage Learning.
4. Pindyck, R. S., & Rubinfeld, D. L. (2008). *Microeconomics*, Eighth Edition. Pearson Education.
5. Browining, E.K. and Zupan, M.A. (2015) *Microeconomic: Theory & Applications*. Wiley
6. Case, K. Ray Fair, & Sharon Oster, (2017), *Principles of Microeconomics,* Global Edition. Pearson Education
7. Janssen, M., Knuuttila, T., & Morgan, M. S. (2024). Insider apology for microeconomic theorising?. *Journal of Economic Methodology*, 1-12.
8. Lipsey, R. and Chrystal, A. (2020). *Economics*, Fourteen Edition. Oxford University Press.
9. Salvatore, D. (2006). *Schaum's Outline of of Microeconomic Theory*, McGraw-Hill, Fourth Edition.
10. Goodwin, N., Harris, J. M., Nelson, J. A., Rajkarnikar, P. J., Roach, B., & Torras, M. (2022). *Microeconomics in context*. Routledge, Fifth Edition.

Course: Economics of Education

Type of Course: Multidisciplinary Course **Code:** 24-ECO-T-103

Semester: I **Credits:** 3

I. Introduction to the Course

This introductory course introduces the basic concepts of the economics of education. The historical experiences show that education has played a central role in social and economic development of many countries. It is pertinent to expose students about the mechanisms through which education affects social and economic outcomes.

II. Course Objectives

- To provide the theoretical tools and framework to understand impact of education and society and economy.
- This course intends to impart the knowledge and understanding of various sources of financing for different levels and nature of education
- The course exposes students to Indian education sector; its scope challenges.

III. Learning Outcomes

- To be able to appreciate centrality of education in development process
- To be able to conduct cost-benefit analysis for investment on education
- To be able to examine and analyse potential impacts policy changes on education sector

V. Course Contents:

Unit- I: Economics of Education

- Meaning and Scope of Economics of Education,
- Centrality Education in Development
- Education & Human Resource Development
- Economic growth and development Linkages,
- Education as signaling device in labour market
- Human Capital Index

Unit -2: Education Planning and Finance

- Education planning techniques,
- Cost – Benefit Analysis/rate return of expenditure on education- public vs private
- Education and earnings relationship
- Theories of Public Expenditure, Resource Mobilisation and Utilisation,
- Investment Trade-off between school vs higher education.
- Public Financing of Education in India
- International Perspective on Public Financing of Education

Unit -3: Education in India

- Indian perspective to education, Sarva Shiksha Abhiyan

- Right to Education with special reference to Constitution of India.
- National Education Policy 2020: scope and challenges
- Higher Education in India: Issues and Concerns –
    - Socio-economic inequality in access to higher education
    - Skill formation and productivity
    - Research & Development
    - Brain Drain etc.

V. References

1. Agarwal, A. K. (2005), *Development of Educational Systems in India*, Anmol Publications Pvt. Ltd.
2. Belfield, C.R. (2000), *Economic Principles for Education: Theory and Evidence*, Edward Elgar Publishing.
3. Blaugh, Mark (1972) An Introduction to the Economics of Education
4. Checchi, D. (2006), *The Economics of Education: Human Capital, Family Background and Inequality*, Cambridge University Press.
5. Deka, B. (2000), *Higher Education in India: Development and Problems*, Atlantic Publishers &Dist.
6. Government of India (2022), National Education Policy 2020, New Delhi.
7. Gupta, N.L. (2000), *Human Values in Education*, Concept Publishing Company.
8. Harris, I.M. and Morrison, M.L., Peace Education, McFarland, 2003.
9. *Higher Education in India: Issues, Concerns and New Directions* (December 2003). Recommendations of UGC golden jubilee Seminars-2003, held at eleven universities in India.
10. Jha, P., Das, S., Mohanty, S.S. and Jha, N.K. (2008), *Public Provisioning of Elementary Education in India*, Sage Publications India Pvt. Ltd.
11. Kashyap, S.C. (2006), *The Constitution of India*, Universal Law Publishing.
12. Kraay, A. (2018). Methodology for a World Bank Human Capital Index. *World Bank Policy Research Working Paper*, (8593).
13. Kumar, B. and Hansara, B.S. (2000), *Extension Education for Human Resource Development*, Concept Publishing Company, 2000.
14. Pathak, R.P. (2007), *Education in the Emerging India*, Atlantic Publishers &Dist.
15. Sharma, R.N. and Sharma, R.K. (2004), *Problems of Education in India*, Atlantic Publishers &Dist.
16. *World Development Report 1980*, World Bank Publications

Course: Data Visualization for Economics

Type of Course: Skill Enhancement Course (SEC) **Code:** 24-ECO-S-104

Semester: I **Credits:** 3

I. Introduction to the Course

There is a huge opportunity to find and share the insights contained in data. This course helps in how to use Tableau Software to convert raw data into compelling data visualizations that provide insight or allow viewers to explore the data for themselves. The course will involve a healthy balance of classroom discussion and experiential activities, which will generally include a mixture of lectures and hands-on learning.

II. Course Objectives

- Generate ways of communicating with data
- Build dashboards to combine several visualizations

III. Learning Outcomes

At the end of this course, students will

- Students will understand the various ways in which different types of data can be visualized
- Students will make use of the capabilities of the tableau software to make charts that are able to convey the information in the right sense
- Students will examine the relationships that may exist between the various business variables to draw inferences about the business
- Students will create reports, dashboards etc. using tableau to communicate with the outside world

IV. Course Contents

Unit-1: Dashboards, Charts and Tables

- Introducing Dashboard, Principles of Communicating Data, Types of Dashboards, Introduction to Tableau and Excel
- Table Design, Sparklines, Chartless Visualization, Formatting and Customizing Charts, Charts for Trending Data, Group Data and Performance Data

Unit-2: Data Model and Pivot Tables

- Developing Your Data Model, Adding Interactive, M Charged Reporting, Pivot Tables, Pivot Charts, A Interactivity with Slicers, Internal Data Model and Power View, Dashboard Sharing

Unit-3: Dashboards with Tableau

- Discrete and Continuous Data, Ratios and Rates, Proportions and Percentages, Mean and Median, Variation and Uncertainty, Multiple Quantities, Changes Over Time, Maps and Location, Adding Interactivity to Dashboards

V. References:

1. Communicating Data with Tableau, Ben Jones, O'reilly, 2014
2. Excel Dashboards and Reports, 2nd Edition, Michael Alexander, John Walkenbach, Wily, 2013
3. https://www.tableau.com
4. https://support.microsoft.com/en-us/excel

Course: Introduction to Environmental Thought

Type of Course: Value Added Course (VAC) **Code:** 24-ECO-V-105

Semester: I **Credits:** 2

I. Introduction to the Course

Most people express concerns these days over deterioration of the natural environment, be it just around them (plastic waste), or the city they live in (air pollution) or even at the global level (ozone layer depletion). But expression of thoughts by many individuals for conservation of environment—for its social value—started many decades ago, across continents. Over time, the individual thoughts were shared by others—the common 'agenda' gave rise to environmentalism. The economic, social, political, religious (and other) positioning of different 'groups' resulted in varieties of environmentalism. Some of them could influence the framing of environmental policies in many countries, including India. Of course, some environmental policies have come about due to commitments made in international platforms. This course covers these elements, at an introductory level. No prior knowledge of any discipline is necessary.

II. Course Objectives

- To *understand* the origin and evolution of environmental thought
- To *identify* and *contrast* the attributes of the varieties of environmentalism
- To *connect* environmentalism with environmental policies in India
- To *analyse* select environmental policies in India

III. Learning Outcomes

At the end of the course, students are expected,

- To *identify* the changing contours of environmental thought over time and space
- To *distinguish* between different types of environmentalism
- To *appraise* the influence of environmentalism on policies and regulations in India
- To *recognize* the broad features of the policy framework related to environment in India

IV. Course Contents

Unit-1: Evolution of Environmental Thought and Environmentalism

- Introduction to environmental thought
- Origin of modern environmental thought
- Introduction to environmentalism and its varieties
- Contrasting environmentalism in the industrial/ developed with non-industrial/ developing countries (environmentalism of the poor)
- Environmentalism through international treaties

Unit-2: Environmentalism in India

- Varieties of environmentalism in India
- Contributions of judiciary in India on environmental matters

- Indian environmental movements
- Impact of environmentalism on policies in India

Unit-3: Environmental Policies in India (selected)

- Environment in the Indian Constitution (Fundamental Duties, other Articles and case law)
- National Forest Policy (1988)
- National Environmental Policy (2006)
- National Water Policy (2012)

V. References

1. David Pepper (1993) *Eco-Socialism: from Deep Ecology to Social Justice*, Routledge. (Selected chapters)
2. Joan Martinez-Alier (2003) *The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation*, Edward Elgar. (Selected chapters)
3. Kanchan Chopra (2017) *Development and Environmental Policy in India: The Last Few Decades*, Springer. (Selected chapters)
4. Madhav Gadgil and Ramachandra Guha (1992) *This Fissured Land: An Ecological History of India*, Oxford University Press, New Delhi. (Selected chapters)
5. Madhav Gadgil and Ramachandra Guha (1995) *Ecology and Equity: The Uses and Abuses of Nature in Contemporary India*, UNRISD and OUP. (Selected chapters)
6. Mahesh Rangarajan (1996) 'The Politics of Ecology: The Debate on Wildlife and People in India, 1970-95', *Economic and Political Weekly*, September, Special Number, pp. 2391-2409
7. Mahesh Rangarajan (2006) *Environmental Issues in India: A Reader,* Pearson. (Selected chapters)
8. P Leelakrishnan (2022) *Environmental Law Case Book*, Sixth Edition, Lexis-Nexis Butterworths, New Delhi. (Selected chapters)
9. Ramachandra Guha (2006) *How Much Should a Person Consume: thinking through the environment*, Permanent Black. (Selected chapters)
10. Ramachandra Guha (2014) *Environmentalism: A Global History*, India Allen Lane. (Selected chapters)
11. Ramachandra Guha and Joan Martínez Alier (1997) *Varieties of Environmentalism: Essays North and South*, Routledge. (Selected chapters)
12. Vasant Saberwal and Mahesh Rangarajan (eds.) (2003) *Battles over Nature: Science and the politics of conservation*, Permanent Black. (Selected chapters)
13. Relevant policies from website of the concerned ministries

Semester- II

B.A. (Hons./Hons. with Research) Economics

Course: Microeconomics- II

Type of Course: Major **Code:** 24-ECO-C-150

Semester: II **Credits:** 4

I. Introduction to the Course

This course is built on the basic microeconomics course. The course is designed to expose students to the working of the markets, and price determinations under different market conditions. This course will use both graphical/diagrammatical methods and mathematical methods to price determinations. The students will be exposed to ideal market scenario to real-life situations.

II. Course Objectives

- To understand the different types of market structures, like perfect competition, monopoly, monopolistic competitions, and oligopoly market structures
- To explore how firms and industry operate under various market structures to make decisions regarding pricings and output levels.

III. Learning Outcomes

- The students will demonstrate a deep understanding of different market structures, like perfect competition, monopoly, monopolistic competitions, and oligopoly.
- The students will develop both analytical and critical thinking skills by evaluating market structures, policy interventions, and implications for real world markets.
- The students will be prepared for further study or research in economics where the understanding of market structure is basic requirements.

IV. Course Contents

Unit-1: Perfect Competition

- Salient Features and Assumptions,
- Short run equilibrium – firms and industry
- Long run equilibrium – firms and industry
- Dynamic changes and Industry equilibrium
- Perfect Competition and Optimum Allocation of Resources

Unit-2: Monopoly and Monopolistic Competition

- Equilibrium of the Monopolist – short run and long run
- Dynamic changes and Equilibrium of the Monopolist
- Elasticity of Demand and Price Discrimination
- Equilibrium of monopolist under Price Discrimination
- Monopolistic Competition: Assumptions, Concept of product group, Excess capacity
- Chamberlin’s models and criticisms of the model

Unit-3: Oligopoly Market Structures

- Collusive and Non-collusive Oligopoly – Introduction
- Duopoly Models – Cournot's, Bertrand's and Stackelberg's duopoly models
- Paul Sweezy's kinked demand curve model and price rigidity
- Cartels – Joint profit maximization and market sharing cartels
- Price Leadership – Low cost price leader and dominant price leadership models
- Critiques of the Traditional price leadership models

V. References

1. Varian H.R: Intermediate Microeconomics, 7th Edition 3 2.
2. Pindyck, Rubinfield and Mehta: Microeconomics, 6th Edition
3. Ferguson and Gould: Microeconomics, 6th Edition
4. Gravelle and Rees: Microeconomics; Pearson Education, 2nd Edition
5. Nicholson, Microeconomics
6. Koutsoyiannis, A.: Modern Microeconomics, Macmillan
7. Chaudhary, Kalyanjit Roy: Microeconomics
8. Mankiw, N. G. (2018). Principles of Microeconomics 8th ed.

Course: Mathematical Methods for Economics-II

Type of Course: Major **Code:** 24-ECO-C-151

Semester: II **Credits:** 4

I. Introduction to the Course

For the strong foundation of economic modeling at undergraduate level, the basic knowledge of Mathematics is essential. Therefore, this course provides an extensive and through use of mathematical concepts. In this direction students are expected to gain the knowledge of the concepts of set theory, functions and graphs, limits, continuity and single variable differential calculus, single variable optimization and integral calculus. This course has been designed keeping in mind the aforesaid need of the students. The main focus will be on understanding how the mathematical tools can be used to analyze the economic problems.

II. Course Objectives

- To enhance the mathematical skills essential to study economics.
- To identify, solve and interpret the economic problem mathematically.
- To understand and create economic models.
- To explore the techniques to solve complex problems of economics.

III. Learning Outcomes

At the end of the course, students are expected,

- To advance the mathematical skills necessary to study Economics.
- To know the basic concept of mathematics used in Economics.
- To understand the analytical skills required for solving problems in economics.
- To apply the various tools of mathematics in Economics.
- To evaluate the economic policy quantitatively.

IV. Course Contents

Unit - 1: Linear Algebra

- System of linear equations, vectors, vector operations, linear combinations of vectors, length of vectors and orthogonality, Applications in Economics
- Matrices and its types, matrix operations(row and column), determinants and its properties, singularity of a matrix, inverse of a matrix, linear independence and rank of a matrix, solution of a system of linear equations (by Cramer's Rule, Matrix Inversion), Applications in Economics

- Solution of Homogeneous Equation System; Leontief Input-Output models (Open and Closed), Input – Output Analysis: Assumptions; Transaction matrix: Technical coefficients, Hawkin Simon Conditions, Metzler condition, Applications in Economics

Unit - 2: Calculus of Multivariate Functions

- Partial derivatives (two variables and many variables) and its economic relevance, Total derivatives, Derivatives of functions using chain rule, Derivative of functions defined implicitly, Homogeneous and Homothetic functions, Multivariable optimization, local and global extreme, Stationary points of a function, first and second order condition using Hessian, Point of Inflection, Saddle point, Constraint Optimization (using Lagrangian multiplier), sufficient condition (using Bordered Hessian), Optimization of economic functions, Applications in Economics.

Unit -3: Dynamic Analysis

- **Continuous time:** First order linear differential equations (homogeneous and non-homogeneous case) with constant coefficient and constant term; with variable coefficient and variable term; Dynamics of market price; Exact differential equations.
- **Discrete Time:** First order Difference equations, the stability analysis of the equilibrium (oscillatory and non-oscillatory, divergent and convergent time paths); The Cobweb model, Applications in Economics.

V. References

1.Knut Sydsaeter and Peter J. Hammond (2005), *Mathematics for Economic Analysis.* Pearson Educational Asia: Delhi, 4th Indian reprint

2. Chiang, A. C. & Kevin Wainwright (2005) Fourth Edition): *Fundamental Methods of Mathematical Economics,* McGraw-Hill.

3. Allen, R.G.D.(1974), *Mathematical Analysis for Economists*, McMillan Press, London

4. Chiang. A.C. (1984), *Fundamental Methods of Mathematical Economics,* 3rd ed. McGraw-Hill

5. Hoy.,M., J. Livernois, C. McKenna, R.Rees and T. Stengos: *Mathematics for Economics*, 2nd Edition Prentice Hall, India (2001)

6. Dowling, Edward T. (1992*), Schaum's Outline of Theory and Problems of Introduction to Mathematics,* 3rd Edition, McGraw-Hill.

Course: Principles of Macroeconomics

Type of Course: Minor **Code:** 24-ECO-M-152

Semester: II **Credits:** 4

I. Introduction to the Course

This introductory course in Principles of Macroeconomics aims to provide students with a conceptual understanding of macroeconomic principles and stylized facts about the economy specially focus to India Economy. Through a blend of traditional and modern economic thinking, students will develop a foundational knowledge of macroeconomics. Additionally, the course will explore the workings of the Indian economy, offering students valuable insights into its dynamics. No pre-requisites for this course.

II. Course Objectives

- To acquaint the students with basic concepts of the national income and to equip them with a holistic understanding of the economic activities that are organized in the economy.
- To familiarizes students with different theories about the process of stabilisation in aggregate income and employment of the economy.
- The course also provides glimpses on impact of autonomous changes in economy's income and employment such as changes in investment spending, government expenditure and taxes.

III. Learning Outcomes

- Students will be equipped to understand and use the national income data to analyse the behaviour of aggregate economy.
- Students will learn about the role of different actors i.e., households, firms and government in the economy and mechanism of circular flow of income and spending in the economy.
- This course will equip students with an understanding of the fundamental principles and frameworks that will enable them to explain the working of aggregate economic variables, their interactions and therefore the economy.

IV. Course Contents

Unit- 1: Basic Concept of National Income

- Concepts of National Income –GNP and NNP at market price and factor cost, Gross value added (GVA) at basic price, National product and Domestic product
- Measurement of National Income– Product or Value-added Method, Income Method and Expenditure Method, difficulties in the measurement of National Income.
- Real and nominal GDP, GDP deflator.
- Trajectory of GDP in post-independent India.

Unit- 2: Classical Theory of Output & Employment

- Brief history of major schools of economic thought.
- Says law of markets and Quantity theory of Money.
- Classical model without saving and Investment, Classical theory with saving and investment

- Effects of the change in Labour supply and in Change in labour demand, on the level of output employment, rigid money wage, monetary policy and full employment.

Unit- 3: Keynesian Theory of Income and Employment

- Great Depression of the 1929 and the Keynesian Revolution.
- Keynesian approach to the determination of price, Output and Employment –The Complete Keynesian model.
- Consumption function, Saving and Investment, Concept of Multiplier, Government Expenditure Multiplier, and tax multiplier, Leakages of multiplier.

V. References

1. Beckerman, W. (1980). *An Introduction to National Income Analysis*. Littlehampton Book Services.
2. D'Souza E. (2009). *Macroeconomics*, Pearson Education.
3. Mankiw, N. (2016). *Macroeconomics*, 9th ed. Worth Publishers.
4. S.K. Aggarwal (2002). *National Income Accounting*. Worldview Publications.
5. Shapiro, D. (2022). *Principles of Macroeconomics 3e*. OpenStax CollegeShapiro E. Macro Economic Analysis Second Edition.
6. Vaish, M.C. (2010). *Macroeconomic Theory*, Vikas Publishing House Pvt.Ltd.

Course: Financial Economics

Type of Course: Multidisciplinary Course **Code:** 24-ECO-T-153

Semester: II **Credits:** 3

I. Introduction to the Course

The importance of financial sector in the economy has been increasing over the period of time. It is pertinent to expose students to the working of the financial markets and its potential link with real sectors of the economy. This course introduces the basic analytical tools for assessing financial market and its functioning. This course dwells on working of stock, bond, and derivative markets.

II. Course Objectives:

- To provide the theoretical tools and framework to understand financial markets.
- This course intends to impart the knowledge and understanding of different types of financial markets and instruments.
- The course demystify the nexus between financial market and the economy.

III. Learning Outcome:

- To be able to identify various instruments in financial markets.
- To be able to conduct fundamental analysis of stocks and bonds
- To develop computing capacities for valuation of financial assets.

IV. Course Contents

Unit- 1: Introduction to Financial Markets

- Capital Market Vs Money Market
- Financial Markets – Role and Functions
- Types of Financial Markets - Primary and Secondary Markets
- Financial Markets – Instruments and Transaction Mechanism in Spot Market
- Introduction to Derivatives Market – Forward, Futures and Options
- Transactions Mechanism in Derivative Markets
- Indian Financial Markets – Equity Market, Bond Market, Mutual Funds and Commodity Market

Unit- 2: Stocks and Portfolio Analysis

- Basic concepts of Investing
- Different types of stocks and Valuation of stocks
- Fundamental Analysis of Stocks and Investment – Qualitative and Quantitative Analysis
- Concept of Market Efficiency and Forms of Market Efficiency
- Portfolio Analysis

Unit- 3: Bond Market Analysis

- Time Value of Money – Present Value and Future Value
- Annuity and Perpetuity, Compounding and Discounting

- Types of Bond – Pure Discount Bond, Coupon Bond, Consols
- Valuation of Bond
- Relationship between Government Bond and Corporate Bond
- Bond Price and Interest Rate

V. References

1. Bailey, R. E. (2005). *The economics of financial markets*. Cambridge University Press.
2. Bhole, L. M., & Mahakud, J. (2017). *Financial institutions and markets: structure growth and innovations*. McGraw-Hill.
3. Bodie, Robert c Merton and David Cleaton (2009), Financial Economics, Pearson
4. Elton, E. J., Gruber, M. J., Brown, S. J., & Goetzmann, W. N. (2014). Modern Portfolio Theory and Investment Analysis.
5. Hull, J. C., & Basu, S. (2016). *Options, futures, and other derivatives*. Pearson Education India.
6. LeRoy, S. F., & Werner, J. (2014). *Principles of financial economics*. Cambridge University Press.
7. Prasanna Chandra (2010), International Analysis and portfolio Management, Tata McGraw Hill

Course: Introduction to Indian Statistical System

Type of Course: Skill Enhancement Course (SEC) **Code:** 24-ECO-S-154

Semester: II **Credits:** 3

I. Introduction to the Course

Indian statistical system has been a major source of the data for research and policy making on Indian economy however introduction of this source of data occurs at much later stage among students. Thid course intends to fill this void by familiarizing students with rich source of data from Indian statistical system at an early stage so that they can independently conduct research on the topics of their interest and can effectively participate in policy discussions and debates.

II. Course Objectives

- To *describe* the broad features of Indian statistical system
- To *locate* the appropriate sources of data for various research issues
- To *analyse* (selected) surveys and reports published by Government of India

III. Learning Outcomes

At the end of this course, students are expected to:

- To *recognise* the scope and limitations of data used in the context of research problems
- To *connect* indicators with data and data sources in India
- To critically *examine* the adequacy of analysis and results drawn by other authors using data from Indian statistical system.

IV. Course Contents

Unit 1: Emergence of Statistical System for Development and Planning

- Need for statistical system—planning and development
- Evolution of institutions to develop the Indian statistical system
    - Registrar General and Census Commissioner of India
    - Role ISI and P C Mahalanobis
    - NSSO
    - CSO
- Ministry level statistical systems: Health, Agriculture, Rural Development
- State level statistical systems

Unit 2: Nationally representative surveys and Census

- Idea of nationally representative sample survey
    - Purpose
    - Survey design
    - Understanding and summarizing the data
    - Using data to compute indicators

- Connecting the surveys with developmental questions
- National Family Health Survey
- Sample registration system (SRS)

- Contrasting Census with representative sample surveys

Unit 3: Macro Aggregates and Budgets

- Gross Domestic Product)
  - Examples of estimating sectoral value added in national Accounts.
  - Nominal vs real
  - Base years
- Union and State Budgets
  - Role of national finance commissions
  - Budget Estimates (BE), Revised estimates (RE) and Actuals

IV. References

1. Rukmani, S. (2021). *Whole numbers and half truths: What data can and cannot tell us about modern India*. Context (publisher).
2. Menon, N. (2022). *Planning Democracy: Modern India's Quest for Development*. Cambridge University Press.
3. Bhattacharya, P. (2023). India's Statistical System: Past, Present, Future Carnegie Endowment for International Peace
4. Historical Perspective of Official Statistics in India https://unstats.un.org/unsd/wsd/docs/India_wsd_history.pdf
5. Rao, T. J. (2010). Official Statistics in India: The past and the present. *Journal of Official Statistics*, *26*(2), 215.
6. Ghosh, J. K., Maiti, P., Rao, T. J., & Sinha, B. K. (1999). Evolution of statistics in India. *International Statistical Review/Revue Internationale de Statistique*, 13-34.
7. Mohan, R. (2007). *Statistical System of India: Some Reflections* (No. id: 1061).
8. Latest Reports of NSSO survey on various themes
9. Reports of Comptroller and Auditor General of India
10. Reports of Annual Survey of Industry
11. Adhikari Committee Report of the Committee on Private Final Consumption Expenditure https://mospi.gov.in/sites/default/files/publication_reports/Adhikari_Committee_PFCE_22may15.pdf
12. Latest Report of Economic census
13. Latest Report of Agriculture census
14. Latest Report of Livestock census
15. Naoroji, D. (1901). *Poverty and un-British rule in India*. London S. Sonnenschein 1901.

Course: Introduction to Environmental Studies

Type of Course: Value Added Course (VAC) Code: 24-ECO-V-155

Semester: II **Credits:** 2

I. Introduction to the Course

Over the years, degradation of environment and depletion of natural resources have increased. India is no exception. Intensity of degradation and depletion has increased in the present century, as per periodic Assessment Reports published by many international organisations, including Inter-governmental Panel on Climate Change (IPCC). This course has been designed to provide an introduction to some matters connected with degradation and degradation of environment, primarily in India. Economic approach will be used mostly. However, no prior knowledge of economics is required.

II. Course Objectives

- To *connect* flow of ecosystem services with human well-being
- To *analyse* the causes behind rise in pollution, degradation of ecosystems and depletion of natural resources
- To *connect* access to natural resources and exposure to pollution with changes in human well-being
- To *analyse* select environmental regulations in India to prevent or reduce the intensity of depletion and degradation of environment

III. Learning Outcomes

At the end of the course, students are expected,

- To *identify* the attributes and characteristics of different components of environment
- To *connect* depletion/ degradation of environment and its differential impacts on various categories of people
- To *assess* the expectations from and effectiveness of laws and regulations to address depletion and degradation of environment in India

IV. Course Contents

Unit-1: Ecosystem Services and Human Well-being

- Open, closed and isolated systems
- Ecosystems—definition, types, categories
- Ecosystem functions and ecosystem services
- Ecosystem services and human well-being
- Trade-off between ecosystem services
- Degradation of ecosystems—originating from human activities
- State of (selected) ecosystems in India
- Management of ecosystems

Unit-2: Natural Resources

- Classification of natural resources
- Different types of natural resources (forests, minerals, water, land, and energy), and their contribution to human well-being
- Common pool resources (CPR) in India
- Degradation of CPRs in India

Unit-3: Introduction to Environmental Regulations and Cases in India (selected)

- Environment (Protection) Act (1986)
- The Energy Conservation Act (2001)
- Biological Diversity Act (2002)
- Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act (2006)
- National Green Tribunal Act (2010)
- Major environmental judgments from Supreme Court (including M C Mehta cases, and Godavarman)

V. References

1. Chhatrapati Singh (1987) 'Emerging Principles of Environmental Laws for Development' in J Bandyopadhyay, N D Jayal, U Schoettli and Chhatrapati Singh (eds.) *India's Environment: Crises and Responses*, Second Edition, Natraj Publishers, Dehra Dun, pp. 247-75
2. CPCB (2021) *Pollution Control Acts, Rules, & Notifications Issued Thereunder*, Delhi: Central Pollution Control Board, available online at https://cpcb.nic.in/7thEditionPollutionControlLawSeries2021.pdf
3. Herman Daly and Joshua Farley (2003) *Ecological Economics: Principles and Applications*, Second Edition, Island Press. (Selected chapters)
4. M N Murty and Sushama Murty (2024) 'Economic Instruments and Economic Regulators: With applications to the case of India', Discussion Paper 21-04, CITD, JNU, New Delhi
5. Millennium Ecosystem Assessment (2005) Chapters 1-3 in *Ecosystems and Human Well-being: A Framework for Assessment*, Island Press, Washington, DC. Available online at https://www.millenniumassessment.org/en/Framework.html#download
6. Partha Dasgupta (2005) 'Common Property Resources: Economic Analytics', *Economic and Political Weekly*, April 16, pp. 1610-1622, available online at https://www.epw.in/system/files/pdf/2005_40/16/commonpropertyresourceseconomicanalytics.pdf
7. Rabindranath Bhattacharya (ed.) (2001) *Environmental Economics- An India Perspective*, Oxford University Press, New Delhi. (Selected chapters)
8. Ramprasad Sengupta (2001) *Ecology and Economics: An Approach to Sustainable Development*, Oxford University Press, New Delhi. (Selected chapters)
9. Ramprasad Sengupta (2013) *Ecological Limits and Economic Development*, Oxford University Press, New Delhi. (Selected chapters)
10. Shyam Divan and Armin Rosencranz (2001) *Environmental Law and Policy in India*, Second Edition, OUP, New Delhi. (Selected chapters)
11. Relevant Supreme Court judgments from https://main.sci.gov.in/judgments

Semester- III

B.A. (Hons./Hons. with Research) Economics

Course: Macroeconomics-I

Type of Course: Major **Code:** 24-ECO-C-200

Semester: III **Credits:** 4

I. Introduction to the Course

This course is designed for the undergraduate students which focuses on basic concepts of macroeconomics. This course discusses the nature and scope of macroeconomics, brief history of different schools of macroeconomics, macroeconomic problems and policy instruments. This course also discusses the determination of aggregate macroeconomic variables particularly output and employment in Classical and Keynesian framework.

II. Course Objectives

- This course provides basic concepts of Macroeconomics.
- It discusses the importance of aggregate macroeconomic variables like GDP, output, and employment.
- It also introduces the students to simple Classical and Keynesian analysis of macroeconomic policies.

III. Learning Outcomes

At the end of this course students should be able to:

- Get an overall understanding of macroeconomic fundamentals.
- Provide basic understanding of Classical and Keynesian analysis of employment and output determination in an economy.
- Evaluate important macroeconomic policies & their implications.

IV. Course Contents

Unit-1: Introduction to Macroeconomics

- Nature and Scope of Macroeconomics
- Meaning and definition of key macroeconomic variables (GDP, output, unemployment, inflation etc),
- Macroeconomic problems, goals and instruments
- Circular flow model of an economy with injections and leakages
- real versus nominal GDP, price indices
- brief history and Schools of Macroeconomics

Unit-2: Classical Theory of Output and Employment

- Say's law of Market
- Quantity Theory of Money, Classical Model without saving and investment, Classical Theory with Saving and Investment
- Effects of a change in labour supply and a change in labour demand on the level of output and employment.
- Wage Determination: Natural Rate of Unemployment, Rigid Money Wage
- Monetary Policy and Full Employment

Unit-3: Keynesian Theory of Output and Employment

- The Keynesian Approach to the Determination of Price, Output and Employment: The Complete Keynesian Model.
- Derivation of Aggregate Demand and Aggregate Supply Curves, Consumption Function, Saving and Investment Equality
- Concept of Multiplier: Government Expenditure Multiplier, Tax Multiplier and Leakages of Multiplier

V. References

1. Blanchard O., Macro Economics 7th Edition
2. Bradley R. Schiller, Macro Economy Today, Eleventh Edition, Tata Mcgraw-Hill.
3. John Lindauer. Macroeconomics Third Edition.
4. Lioyd G.Reynolds Macroeconomics Analysis and Policy Sixth Edition.
5. N. Gregory Mankiw, Macroeconomics
6. Richard T Froyen, Macro Economics: Theories and Policies 7th Edition
7. Rudiger Dornbush, Stanley Fischer, Richard Startz, Macroeconomics Eleventh Edition.
8. S. K. Aggarwal, National Income Accounting Latest Edition.
9. Shapiro E., Macro Economic Analysis Second Edition.
10. Wilfred Beckerman, An Introduction to National Income Analysis.
11. William Branson, Macro Economic Theory and Policy
12. William H. Branson, Macroeconomic Theory and Policy Second Edition.
13. William J. Baumol, Macroeconomics Theory and Policy

Course: Statistical Methods-I

Type of Course: Major **Code:** 24-ECO-C-201

Semester: III **Credits:** 4

I. Introduction to the Course

To develop the basic understanding of economic modeling at undergraduate level, basic knowledge of statistics is essential. Therefore, this course provides the thorough use of statistical concepts. In this direction, students are expected to gain knowledge of the concepts of statistics in economics. The focus will be on understanding how statistical tools can be used to analyze economic problems.

II. Course Objectives

- Know the basic concept of Statistics used in Economics;
- Advance the Statistical skills necessary to study Economics through data driven insights
- Classify and organize the data for economic interpretation

III. Learning Outcomes

At the end of this course students should be able to:

- Learned the analytical skills required to estimate the indicator performance based on large data
- Apply the various tools of Statistics in economic analysis
- Evaluate the policy options in economics quantitatively

IV. Course Contents

Unit-1: Descriptive Statistics and Data Summarization

- Definition and Role of Statistics; Types of Data-Quantitative, Qualitative, Scales of Measurement- Nominal, Ordinal, Interval, Ratio;
- Measures central tendency: Median, Mode, Mean, Harmonic Mean, Geometric Mean, simple and weighted averages, group averages;
- Measures of dispersion: Range, Variance and Standard Deviation, Mean Deviation, Quartile Deviation, Measures of Skewness and kurtosis; Measures of economic inequality;
- Graphic Presentation of Data: Bar Plot, Pie Chart, Histogram, Density Plot, Box Plot, Scatter Diagram, Cross-tabulation.

Unit-2: Probability and Probability Distributions

- Random experiment, sample space and events;
- Classical, empirical and axiomatic definitions of probability; addition and multiplication theorems;
- Conditional probability, independent events and Baye's rule;
- Random variable; mathematical expectation -mean and variance of a random variable, Binomial, Poisson and Normal distributions.

Unit-3: Index Numbers and Time Series Analysis

- Index Numbers: Concept and uses; Laspeyres, Paasche's and Fisher's index numbers; time reversal, factor reversal and circular tests; problems in constructing index numbers; splicing, base shifting; use of index numbers for deflating other series.
- Time Series Analysis: Concept and uses; Components of time series; Methods of moving averages and least squares.

V. References

1. Allen, R.G.D. (1949). *Statistics for Economists*. Hutchinson's University Library, London, UK.
2. Croxton, F.E., D.J. Cowden and S. Klein (1973). *Applied General Statistics*. Prentice Hall, New Delhi.
3. Freund John E. & Ronald E. Walpole (1987). *Mathematical Statistics*. Prentice-Hall of India, New Delhi.
4. Gupta, S.C. & V.K. Kapoor (1993). *Fundamentals of Applied Statistics*. S. Chand and Sons, New Delhi.
5. Nagar, A.L. and R.K. Das. (1983). *Basic Statistics.* Oxford University Press, New Delhi
6. Gupta, S. P. (2005). *Statistical Methods.* S. Chand & Sons, New Delhi
7. Freund, John E. (1979). *Modern Elementary Statistics*. Prentice Hall of India, New Delhi.
8. Speigal, M.R. (1992). *Theory and Problems of Statistics*. McGraw Hill Book, London.
9. Thukral, J. K. (2010). *Business Statistics*. Taxmann Publications, New Delhi
10. P.H. Karmel and M. Polasek (1978). *Applied Statistics for Economists,* (4th Ed). Pitman, Australia
11. Allen Webster (1997), *Applied Statistics for Business and Economics: an Essential Version*, (3rd Ed). McGraw-Hill.
12. Lind, Douglas A., William G. Marchal, and Samuel A. Wathan (2006). *Business Statistics for Business & Economics,* 5th ed. Boston: McGraw-Hill Irwin.

Course: Foundations of Mathematics for Economics

Type of Course: Minor **Code:** 24-ECO-M-202

Semester: III **Credits:** 4

I. Introduction to the Course

Mathematics is a fundamental tool that helps us understand and analyze the world around us. While often associated with complex theories and abstract concepts, this course is designed to make mathematics accessible and practical for students from diverse academic backgrounds, especially those not specializing in economics. This course focuses on essential mathematical concepts that are widely applicable in field of economics.

II. Course Objectives

- To enhance mathematical skills essential to study economics.
- To identify, solve and interpret the economic results mathematically.
- To understand economic models.

III. Learning Outcomes

At the end of the course, students are expected,

- Able to create graphs and interpret graphical functions.
- Demonstrate the use of calculus in economic optimization
- Build simple economic models

IV. Course Contents

Unit -1: **Basic concepts, Functions and Graphs**

- Sets and set operations, Ordered pairs, the real numbers, natural numbers, integers, rational and irrational numbers; absolute value and intervals; inequalities.
- The general concept of function, types of function (linear, quadratic, power, exponential, inverse); graphs of functions; Applications in Economics

Unit-2: Limits, Continuity and Single variable Differential Calculus

- Limits, continuity and differentiability, rules of differentiation (simple differentiation, sums, products, and quotients);
- Second and higher order derivatives, power rule, chain rule, implicit differentiation;
- Linear approximation and differentials; Quadratic approximations
- Elasticity
- Intermediate-value Theorem; the Extreme-value Theorem; The Mean-value Theorem; Indeterminate forms and L'Hopital's rule; Applications in Economics

Unit-3: Single variable optimization and Integral Calculus

- Stationary points of a function, Maxima and Minima (local and global); Convexity and Concavity of functions; Points of inflection; Optimization of economic functions
- Rules of integration, integration by parts, integration by substitution, indefinite integral, Definite Integral, Proper and Improper integral; Areas under curves and economic application of integration.

V. References

1. Allen, R.G.D.(1974), Mathematical Analysis for Economists, McMillan press, London
2. Chiang, A. C. & Kevin Wainwright (2005) (Fourth Edition): Fundamental Methods of Mathematical Economics, McGraw-Hill.
3. Chiang, A. C. (1984), *Fundamental Methods of Mathematical Economics, 3rd Ed*, McGraw-Hill.
4. Dowling, Edward T. (1992), Schaum's Outline of Theory and Problems of Introduction to Mathematical Economics, 3rd Edition, McGraw Hill.
5. Handerson, Quandt. (1980). Microeconomic Theory, A Mathematical Approach, Third Edition, McGraw Hill.
6. Hoy,M., J. Livernois, C. McKenna, R. Rees and T. Stengos(2001), Mathematics for Economics, 2nd Edition Prentice Hall, India.
7. Knut Sydsaeter and Peter J. Hammond (2005), *Mathematics for Economic Analysis*. Pearson Educational Asia: Delhi, 4th Indian reprint.
8. Rosser, Mike. (2003). Basic Mathematics for Economists, Second Edition, Routledge, Taylor & Francis Group

Course: National Income Accounting

Type of Course: Multidisciplinary Course **Code:** 24-ECO-T-203

Semester: III **Credits:** 3

I. Introduction to the Course

National Income Accounting (NIA) is a subject that is becoming increasingly relevant given the debates around data and GDP estimates. Social Accounting system allows us to understand the nitty gritty of macro-economic aggregates that students of social sciences use on everyday basis. Further it greatly enhances students research capability in the area of macroeconomics and disparities across factors of production.

II. Course Objectives

- To appreciate the need for a system of social (national income) accounting.
- To acquire a reasonable command over (selected) national income accounting procedures in Indian context.
- To equip students with the skills to understand measures of size of the economy produced by Accounting System.

III. Learning Outcomes

- To be able to calculate and differentiate various macroeconomic aggregates using official data.
- To be able to understand various government publications and reports on national/macro economy.
- To hone the skills for future research and learning connected with macroeconomic accounting.

IV. Course Contents

Unit-1: Social or National Income Accounting: Basic concepts

- Income vs capital
  - Generic idea of stocks vs flows
- Intermediate, final product
- Production boundary
- Historical evolution in the definition of production boundary
- Concept value added
- Depreciation of capital stock
- Values at market price, basic price and factor cost
- Imputing for unpaid services and products in economy
  - Depreciation or appreciation for natural capital and commons
- Input-output transaction matrix of national economy

Unit-2: Methods of Arriving at National Income

- Expenditure method
- Value added method
- Income method
- Treatment of government services in assessing national income
- Concept of operating surplus
  - Labour vs non-labour income
  - Gauging inequality in the economy through income method

Unit-3: Estimating the Value of Output in Various Sectors of Economy: The Indian Approach

- Indian System of National Accounts
- Valuation of agriculture, forestry & fishing
- Estimation of organised and unorganised manufacturing
- Valuing financial and non-financial services
- Importance of base years
- Nominal vs real value
- Recent debates in GDP estimation

V. References

1. Abraham, W. I. (1969). National Income and Economic Accounting, Prentice-Hall.
2. Adhikari Committee Report of the Committee on Private Final Consumption Expenditure https://mospi.gov.in/sites/default/files/publication_reports/Adhikari_Committee_PFCE_22may15.pdf
3. Aggarwal, S.K. (2002) National Income Accounting. Worldview Publications
4. Beckerman, W. (1980) *An Introduction to National Income Analysis*. Littlehampton Book Services.
5. Bhatia D.P. (1996). National Accounting: Concepts and Estimates. Khama Publishers, New Delhi.
6. CSO National Account Statistics
7. CSO National Accounts Statistics (Sources and Methods)
8. CSO. (2015). Changes in Methodology and Data Sources in the New Series of National Accounts. *Base Year 2011–12*.
9. Mathews, R. (1969) *Accounting for Economics*.
10. Mazzucato, M. (2018). *The value of everything: Making and taking in the global economy*. Hachette UK. Introduction Chapter.
11. Piketty, T. (2014). *Capital in the twenty-first century*. Harvard University Press. Chapter 1.
12. Rao V.K.R.V. (1934) an Essay on India's National Income, 1925-29.
13. Rastogi, S. and Aiyar S. (1997), National Income Accounting, Lotus Books.
14. Rosen, S. (1972). National income and other social accounts.
15. Schultze, C. L. (1964). National Income Analysis. India: Prentice-Hall.
16. Stone, R., & Stone, G. S. (1966). National income and expenditure.
17. Studenski, P. (1958). The Income of Nations Theory, Measurement, and Analysis: Past and Present. University Press.
18. Studenski, P. (1961). Income of Nations. New York University Press.
19. UN (2009). System of National Accounts 2008.

Course: Labour Economics

Type of Course: Ability Enhancement Course (AEC) **Code:** 24-ECO-A-204

Semester: III **Credits:** 2

I. Introduction to the Course

This course provides an overview of labour economic at undergraduate level. Therefore, this course provides an extensive and through insights of labour economic concepts and theories. This course has been designed keeping in mind the aforesaid need of the students. The main focus will be on understanding how the labour economic theories can be used to analyze the wages and employment problems and policies that affect employment and wages.

II. Course Objectives

- Address the issue of Gender and Social Equity in Labor Markets
- Examine the Impact of Technological Change on Labor Markets
- Know the Labor Market Mechanisms

III. Learning Outcomes

At the end of this course students should be able to:

- Analyze the Wage Determination and Income Distribution
- Understand the Labor Productivity and Efficiency
- Evaluate the Labor Policies and its Impact.

IV. Course Contents

Unit-1:

- Introduction to labour economics: Concept and scope of labour economics
- Concept, significance and peculiarities of labour
- Nature and characteristics of labour markets in developing countries
- Concept and Determinants of labour force participation
- Unemployment: Concept, measurement & types; Migration: Classical, neo-classical and dualistic theories of labour markets: Demand for labour-Short and long run.

Unit-2:

- Labour Markets and Wage labour markets: Formal and informal
- Wages: Concept and types; Theories of wage determination: Classical, Neo-classical and bargaining theories; Concept of minimum wage
- Living wage and fair wage
- Wage determination in organized and unorganised sector; Non-wage component of labour remuneration
- Five year Plans- Employment Policy of India.

Unit-3:

- Labour Policies and Issues; Concept of Industrial relations
- Labour Productivity Growth, Structure and pattern of trade unions in India
- Settlement and Collective bargaining, conciliation
- arbitration and labour participation in management. Appraisal of Indian State policies
- Special problems of labour: Child labour, Female labour, Discrimination and Gender bias
- Reforms in India Labour market.

V. References

1. Das, N. (1960). *Unemployment, Full Employment and India*. Asia Publishing House, Bombay.
2. Datt, G. (1996). *Bargaining power wages and Employment: An Analysis of Agricultural labour Markets in India.* Sage Publications, New Delhi.
3. Deshpande L.K. and J.C. Sandesara, (Eds.) (1970). *Wage Policy and Wages Determination in India*. Bombay University Press, Bombay.
4. Hajela, P.D. (1998). *Labour Restructuring in India: A Critique of the New Economic Policies.* Commonwealth Publishers.
5. Hicks J.R. (1932). *The Theory of Wages*. Clarendon Press, Oxford.
6. Jhabvala, R. and R.K. Subrahmanya (Eds.) (2000). *The Unorganised Sector Work Security and Social Protection.* Sage Publications, New Delhi.
7. Lester, R.A. (1996). *Economics of labor* (2nd Ed). Macmillan, New Youk.
8. Mazumdar, D. (1989). *Micro-economic Issues of Labour Markets in Developing Countries*, EDI Services Paper No.40. World Bank, Washington D.C.
9. McConnell, C.R. and S.L. Brue. (1986). *Contemporary Labor Economics*. McGraw-hill, New york.
10. McCormickm B. & Smith (Eds.) (1968). *The Labour Market*. Penguin, Harmondsworth.
11. Memoria, C.B. (1966). *Labour Problems and Social Welfare in India*. Kitab Mahal, Allahabad.
12. Misra, L. (2000). *Child Labour in India*. Oxford University Press, New Delhi.
13. Papola, T.S., P.P. Ghosh and A.N. Sharma (Eds.) (1993). *Labor Employment and Industrial Relations in India*. B.R. Publishing Corporation, New Delhi.
14. Punekar, S.D. (1978). *Labour Welfare, Trade Unionism and Industrial Relations*. Himalaya Publishing House, Bombay.
15. Riveros, L. (1990). *Labour Market Policies and Labour Market Reforms in Socialist Economies*. World Bank, Washington D.C.
16. Rosenberg M.R. (1988). *Labour Markets in Low Income countries* in Chenary, H.B. and T.N. Srinivasan (Eds.). The Handbooks of Development Economics, North-Holland, New York.
17. Singh V.B. (Eds.) (1970). *Industrial Labour in India*. Popular Parakashan, Bombay.
18. Venkata Ratnam, C.S. (2001). *Globalization and Labour-Management Relations: Dynamics of Change*. Sage Publications / Response Books, New Delhi.

Course: Economics of Environment

Type of Course: Value Added Course (VAC) **Code:** 24-ECO-V-205

Semester: III **Credits:** 2

I. Introduction to the Course

Economic activities depend on inputs drawn from nature. Undesirable by-products like pollution impacts nature. They in turn affect the flow of inputs from nature to economic systems. Economically valuable outputs and undesirable by-products are joint products. Reducing one will imply reducing the other one too. Is there a socially desirable level of output, where benefits to the society from the valuable output net of losses owing to undesirable by-products, is maximum? This is one of the questions that this paper asks. Another aspect is valuing the costs and benefits of using nature for economic reasons, at a point of time and over time—and how to account for them. The course also looks at the effectiveness of economic instruments to address environmental problems, at national as well as global levels.

For this course knowledge of mathematics at Class X is necessary.

II. Course Objectives

- To *identify* the economic dimensions of nature
- To *appreciate* the contributions of nature in economic systems
- To *understand* economic methods to value different aspects of nature
- To *analyse* economic instruments to address environmental matters

III. Learning Outcomes

At the end of the course, the students are expected,

- To be able to *explain* foundational aspects of economics of environment
- To *recognize* the significance of nature in sustaining economic systems
- To *distinguish* between different methods to evaluate nature's contribution to economic systems
- To *evaluate* the effectiveness of different economic instruments to address environmental problems

IV. Course Contents

Unit-1: Introduction

- Major challenges before the society: climate change, access to water, desertification, forest cover depletion and energy transition—economic aspects
- Economy- Environment Linkages

- Conceptual matters: static efficiency, property rights, market equilibrium
- Environmental degradation as a case of market failure—externality, public goods, common property resources

Unit-2: Environment and economic decision-making

- Types of values: use value and non-use value
- Conceptual matters: WTP and WTA for substitute and complementary goods, and discount rate
- Non-market valuation methods: revealed preference and stated preference
- Cost Benefit Analysis
- Economics of non-renewable resources: optimal extraction path
- Economics of renewable resources: Maximum Sustainable Yield and Faustmann rotation

Unit- 3: Economic policies to address environmental problems

- Internalising the externality: direct regulation, economic instruments (tax, subsidy, deposit system, emission trading), voluntary bargaining
- Instruments: ecolabelling, carbon credit, biodiversity offset, payment for ecosystem services
- Global policies Clean Development Mechanism, REDD+, Paris agreement, Convention on Biological Diversity

V. References

1. Charles D. Kolstad (2010) *Environmental Economics*. Second edition. Oxford University Press.
2. Jason F. Shorgen, ed. (2013) *Encyclopedia of Energy, Natural Resource, and Environmental economics*. Elsevier.
3. Kentaka Aruga (2022) *Environmental and Natural Resource Economics*. Springer. (Text)
4. M. Verma, A. Edgaonkar, D. Negandhi, C. Khanna, R. Agarwal, C. Tiwari (2017) Valuation of Ecosystem Services from Tiger/ Snow Leopard Landscapes: A manual on economic valuation approaches for practitioners. Indian Institute of Forest Management, Bhopal, India.
5. Tom Tietenbeg and Lynne Lewis (2024) *Environmental and Natural Resource Economics*. 12th Edition. Routledge. (Text)

Semester- IV

B.A. (Hons./Hons. with Research) Economics

Course: Macroeconomics-II

Type of Course: Major **Code:** 24-ECO-C-250

Semester: IV **Credits:** 4

I. Introduction to the Course

This course introduces the students to theories of consumption, investment and rate of interest. It discusses various alternative theories of output and employment determination in a closed economy using analytical framework like IS-LM model and role of macroeconomic policies. This course also discusses the concepts of inflation and business cycle.

II. Course Objectives

- This course provides basic understanding of major theories of consumption and investment in macroeconomics.
- It discusses the determination of aggregate macroeconomic variables like saving, interest rate, investment, output, and inflation.
- It also introduces students to simple analytical frameworks (e.g. the IS-LM model) for determination of equilibrium output.

III. Learning Outcomes

At the end of this course students should be able to:

- Analyse the major macroeconomic issues and their implications to the real economy.
- To introduce basic concepts of the money market and product market
- Learn the connection between macroeconomic variables and fiscal and monetary policies through IS-LM model.

IV. Course Contents

Unit-1: Theories of Consumption & Investment

- General Theories of Spending Behaviour: Absolute Income Hypothesis, Relative Income Hypothesis, Permanent Income Hypothesis, Life Cycle Hypothesis, Fisher's Optimal Intertemporal Choice
- Motivation for Investment: Determination of Business Investment, Residential Investment and Inventory Investment, Marginal Efficiency of Capital, Supply Price, Expected Income Streams, Marginal Efficiency of Capital and Interest Rate, Acceleration Principle.

Unit-2: Keynesian Theory of Money and Interest

- Keynesian Theory of Interest, Determination of Rate of Interest, Changes in the levels of Income, Demand for Money and Supply of Money and their Effect on Equilibrium Rate of Interest, Liquidity Trap and Policy Implications
- IS and LM Curve Analysis: The General Equilibrium of Product and Money Market, Relative Effectiveness of Monetary and Fiscal Policies.

Unit-3: Theory of Inflation and Business Cycle

- Types and Theories of Inflation, Demand Pull and Cost Push Inflation,
- The Phillips Curve: Trade-off between Inflation and Unemployment,
- Concept and Phases of Business Cycle, Innovation Theory, Keynesian Theory, Monetary Theory.

V. References

1. Blanchard O., Macro Economics 7th Edition
2. Bradley R. Schiller, Macro Economy Today, Eleventh Edition, Tata Mcgraw-Hill.
3. John Lindauer, Macroeconomics Third Edition.
4. Lioyd G. Reynolds, Macroeconomics Analysis and Policy Sixth Edition.
5. N. Gregory Mankiw, Macroeconomics
6. Richard T Froyen, Macro Economics: Theories and Policies 7th Edition
7. Rudiger Dornbush, Stanley Fischer, Richard Startz, Macroeconomics Eleventh Edition.
8. S. K. Aggarwal, National Income Accounting Latest Edition.
9. Shapiro E., Macro Economic Analysis Second Edition.
10. Wilfred Beckerman, An Introduction to National Income Analysis.
11. William Branson, Macro Economic Theory and Policy
12. William H. Branson, Macroeconomic Theory and Policy Second Edition.
13. William J. Baumol, Macroeconomics Theory and Policy

Course: Statistical Methods-II

Type of Course: Major **Code:** 24-ECO-C-251

Semester: IV **Credits:** 4

I. Introduction to the Course

The knowledge of statistics plays a crucial role in economics as it provides various tools for analyzing the big data, testing the theories and apprising the policy decisions. Therefore, to develop understanding of economic modeling at under graduate level, learned statistics is crucial for students. The main focus of this course will be on understanding concepts and tools of statistical which help to analyze the real economic phenomena.

II. Course Objectives

- To apply the statistical inference for economic decisions
- To provide data-driven insights for designing economic policies
- To analyze the economic trends, patterns, and relationships using statistical methods.

III. Learning Outcomes

At the end of this course students should be able to:

- Facilitates the evidence-based decisions in both public and private sectors
- Refine the economic models for better predictive accuracy
- Measures the impact of policies on economic growth and social well-being.

IV. Course Contents

Unit-1: Uni-variate and Bi-variate Analysis

- Moments and moment generating function (M.G.F.), Multivariate Statistics - joint, marginal and conditional distribution;
- Product moment– covariance, correlation, rank correlation, Simple linear regression; method of least squares; linear and exponential trend.

Unit- 2: Sampling and Sampling Distributions

- Population Versus Sample, IID Random Variables, Sampling Errors; Non-Random or Judgement Sampling, Methods of Random Sampling – Simple Random, Cluster, Stratified, Systematic; Sample Statistic – Sample Mean and Sample Variance; Standard Error.
- Methods of Finding Sampling Distributions – Direct Method, Transformation of Variables Method.

- Z, Chi-Square, T and F Distributions.
- Chebyshev's Inequality, Law of Large Numbers, Central Limit Theorem, Sampling Distribution of Sample Mean, Sampling Distribution of Sample Variance.
- Sampling from Finite and Infinite Population, Finite Population Correction Factor, Sampling from Normal Population.

Unit-3: Methods of Statistical Inference

- Desirable Properties of An Estimator - Unbiasedness, Consistency, Efficiency and Sufficiency. Robustness, Mean-Squared Error. Consistency and Best Asymptotically Normal Estimator, Cramer-Rao Inequality, Interval Estimation - Confidence Intervals For Mean and Variance
- Testing of Hypothesis- Types of Errors, Level of Significance, Power of a Test, Interpretation of P-Value; Most Powerful Test – Neyman-Pearson Lemma.
- Definitions and Uses of Z, Chi-square, t and F statistics, large sample and small sample tests for mean, one tail and two tail tests for difference of means; Chi-Square Tests – Goodness of Fit Test, Test for Independence, Homogeneity Test; F-test for ratio of two variances, one-way analysis of variance.

V. References

1. Allen, R.G.D. (1949). *Statistics for Economists*. Hutchinson's University Library, London, UK.
2. Croxton, F.E., D.J. Cowden & S. Klein (1973). *Applied General Statistics.* Prentice Hall, New Delhi.
3. Gupta, S.C. & Kapoor, V.K. (1988). *Elements of Mathematical Statistics.* S. Chand & Sons, New Delhi.
4. J. E. Freund. (1999). *Mathematical Statistics*, (5th Ed). Prentice-Hall International.
5. J. E. Freund and R. E. Walpole. (1987). *Mathematical Statistics*, (5th Ed). Prentice-Hall inc.
6. Hogg, R.V. and Craig, A.T. (1995). *Introduction To Mathematical Statistics*. Prentice-Hall International, inc. Engle Wod Cliff, N.J.
7. Mood, A.M. Graybill, F.A. and Boes, D.C. (1974). *Introduction to the Theory of Statistics,* (3rd Ed). Mcgraw-Hill Book Company, New York.
8. Hogg, R. V. and A. T. Craig. (1970). *Introduction to Mathematical Statistics* (3rd Ed). Macmillan Publishing Co., New York.
9. Sukhatme, P. V. and B. V. Sukhatme (1970). *Sampling Theory of Survey With Applications.* Lowa State University Press, Ames.
10. J. A. Rice (1995). *Mathematical Statistics and Data Analysis,* (2nd Ed). Duxbury Press.
11. Hogg, R.V. and Tanis E.A. (1993). *Probability and Statistical inference*, (4th Ed). Macmillan Publishing Company, New York.
12. S. C. Gupta. (1993). *Fundamentals of Applied Statistics*, S. Chand and Sons, New Delhi.
13. D. Gujrati. (2002). *Basic Econometrics,* (4th Ed). Mcgraw-Hill/Irwin.
14. D. G. Rees. (1987). *Foundation of Statistics.* Chapman & Hall.
15. G. M. Clarke and D. Cooke. (1992). *A Basic Course in Statistics*, (3rd Ed). Arnold.
16. R. L. Schaeffer. (1990). *Introduction to Probability and its Applications.* Pws-Kent.
17. F. Daly, D. J. Hand, M. C. Jones, A. D. Lunn, K. J. Mcconway. (1995). *Elements of Statistics*. Addison-Wesley.
18. S. Ross. (1976). *A First Course in Probability*. Macmillan.

19. Chou, Y. (1975). *Statistical Analysis.* Holt, Reinhart and Winston, New York.
20. Croxton, Crowden and Klein. (1971). *Applied General Statistics*, Prentice Hall of India, New Delhi.
21. Millar, J. (1996). *Statistics For Advanced Level*. Cambridge University Press, Cambridge.
22. Lind, Douglas A., William G. Marchal, & Samuel A. Wathan. (2006). *Business Statistics for Business & Economics*, (5th Ed). Boston: McGraw-Hill Irwin.
23. P.H. Karmel and M. Polasek. (1978). *Applied Statistics for Economists, (*4th Ed). Pitman, Australia.
24. Kapur, J.N. & Saxena, H.C. (1988). *Elements of Mathematical Statistics*. S. Chand & Sons, New Delhi.
25. Nagar, A.L. & R.K. Das. (1983*). Basic Statistics*. Oxford University Press, New Delhi.

Course: Indian Economy

Type of Course: Major **Code:** 24-ECO-C-252

Semester: IV **Credits:** 4

I. Introduction to the Course

This course provides an overview of Indian Economy and introduces the working of Indian Economy under the post-independence era along with an overarching discussion of the enduring effects of the colonial regime on Indian economy. The course intends to develop a deeper insight of interconnection that exists among different sectors of the economy through examination of intended and unintended consequences of various policy choices. By providing comprehensive review of major debates pertaining to various sectors of the economy this course builds on existing theoretical training on economic theory of course participants while exposing students to major policy challenges that India faces.

II. Course Objectives

- Students will be exposed to the importance of the historical perspective of the Indian economy and characteristics of a developing economy.
- It will equip students with the rationale behind success and failure of various policies adopted since independence.
- Students will be exposed to interdependencies in working of the different sectors of the economy and its impact on economic growth, poverty, Inequality and employment.

III. Learning Outcomes

- Students will be able to apply their analytical skills on sectoral data to develop insights on real world socio-economic problems.
- Development of critical thinking about policy choices, pre-existing arguments, relevance of evidence on Indian Economy.
- Students will be able to assess contemporary economic issues like progress of SDGs, globalization, fiscal and monetary policy, and impact of Artificial intelligence (AI) on productivity and employment and develop skills for identifying policy relevant research questions.

IV. Course Contents

Unit- 1: Indian Economy after independence: The legacies and strategies

Characteristics of a developing economy

- Indian Economy under colonial rule
  - Commercialization of Indian agriculture
  - Comparative advantage of Indian industry in pre-colonial period
  - De-industrialization and Trade policy
  - Enduring effects of Land Tenure system

- Features of Indian economy at the time of independence
  - The challenge of Structural Transformation and Development Planning

- Role of state in Indian Economy – Five-year plans
  - Approach to Rural development: Land reforms Vs Green Revolution
  - Planning for Industry: Capital Goods vs wage goods approach
- Occupational and output structure of Indian economy
- Criticality of informal economy
- Poverty, disguised unemployment and economic inequality
- Demographic transition and its regional variation in India
- Human Development in India: Education, health and other social indicators
- Fiscal Federal structure of Indian economy

Unit- 2: Perspective of India's Agricultural and Industrial Economy

Importance of Agriculture in Indian economy

- Green Revolution and its consequences: Intended and unintended
  - Trends in agriculture production and productivity after Green Revolution
  - Food Security
  - Agriculture Price Policy
  - Sources of Agricultural Finance
  - Sustainable Agricultural Growth
  - Growing Regional disparity
  - Growth interpersonal inequality
  - Net negative support to agriculture
- Performance Industry in pre-reform period
  - Trends in India's industrial growth and productivity,
  - Small vs. large industry,
  - Public vs. private sector industries
  - Impact of licensing and import substitution policies
- Industry in Post reform Period:
  - Impact of
    - Delicensing
    - Disinvestment and privatisation
    - Trade Liberalisation
    - Foreign exchange rate policies
  - Growth of Global Value Chains and Indian Industry
  - Infrastructure, technology bottlenecks
  - Growth of unorganised manufacturing sector
  - Regional imbalances in industrial Performance
  - Premature deindustrialization in India

Unit- 3: Contemporary Issues

Growth and stabilisation of Indian Economy – Role of fiscal and monetary policies

- Globalisation and exposure to adverse shocks
  - Globalisation in history
  - COVID and Indian economy: Monetary and Fiscal instruments
  - Global Financial crisis 2007-08 and Indian economy.
- External Sector Policies:
  - Trade Policy
  - Exchange rate policy
  - Investment and capital convertibility policies
- Sustainable Development Goals and Human Development
  - Correspondence between economic growth and development outcomes
  - Regional disparity in human and social development

- Achievements in Education and Public Health & Nutrition

- Implications of AI on Productivity and Employment

V. References

1. Acemoglu, D., & Robinson, J. (2021). Why nations fail. *The Origins of Power, Prosperity, and Poverty.*
2. Acharya, S. (2002), *India: Crisis, Reforms and Growth in the Nineties*, Working Paper No. 139, Centre for Research on Economic Development and Policy Reform, Stanford University.
3. Ahluwalia, I. J., & Little, I. M. D. (2012). *India's Economic Reforms and Development: Essays for Manmohan Singh*. Oxford University Press. Second Edition.
4. Arezki, R., & Sen, P. (2025). Solving India's Industrialization Puzzle. Project Syndicate.
5. Banerjee, A., & Iyer, L. (2005). History, institutions, and economic performance: The legacy of colonial land tenure systems in India. *American economic review*, *95*(4), 1190-1213.
6. Bansil, P.C, (1975) *Agricultural Problems of India*, Vikas Publishing House Pvt. Ltd.
7. Basu, S.C. and Gulati, A. (2005), *Economic Reforms and Food Security: The Impact of Trade and Technology in South Asia*, Routledge.
8. Bhagwati, J.N.(1993), *India in Transition: Freeing the Economy*, Clarendon Oxford.
9. Bhalla, G.S. and Singh, G. (2001), *Indian Agriculture: Four Decades of Development*, Sage Publications.
10. Broadberry, S., & Gupta, B. (2009). Lancashire, India, and shifting competitive advantage in cotton textiles, 1700–1850: The neglected role of factor prices. *The Economic History Review*, *62*(2), 279-305.
11. Datt, R. and Sundharam, K.P.M, (2024) *Indian Economy*, S. Chand & Company Ltd, New Delhi. 73rd Edition.
12. Glinskaya, E. and Lokshin, M. (2005), *Wage Differentials Between The Public And Private Sectors in India*, The World Bank.
13. Gulati, A., & Sharma, A. (1995). Subsidy Syndrome in Indian Agriculture. Economic and Political Weekly, A93-A102.
14. Gulati, A., & Narayanan, S. (2003). The Subsidy Syndrome in Indian Agriculture. *OUP Catalogue*.
15. Kapila, U. (2024-25), *Indian Economy Since Independence*, Academic Foundation, New Delhi. 35th Edition
16. Mattoo, A. and Stern, R.M. (2003), *India and the WTO*, World Bank Publication.
17. Mohan, T.T.R. (2005), *Privatisation in India: Challenging Economic Orthodoxy*, Routledge.
18. Mookherjee, D. (1997), *Indian Industry: Policies and Performance*, Oxford University Press.
19. Rao, C.H.H. (2005), *Agriculture, Food Security, Poverty and Environment: Essays on post-reforms India*, Oxford University Press.
20. Sengupta, D., Chakraborty, D. and Banerjee, P. (2006), *Beyond the Transition of WTO: An Indian Perspective on Emerging Issues*, Academic Foundation.
21. Varshney, A. (1998). *Democracy, Development, and the Countryside: Urban-rural Struggles in India*. Cambridge University Press, Chapter 2.

Course: Statistical Methods for Economics

Type of Course: Minor **Code:** 24-ECO-M-253

Semester: IV **Credits:** 4

I. Introduction to the Course

This course is designed for students who do not have an economics background but need statistical skills for their respective disciplines. The focus is on practical applications rather than complex mathematical theories, ensuring that students can confidently apply statistical techniques to real-world problems. Throughout the course, students will learn how to describe and visualize data, understand probability concepts, conduct hypothesis testing, and use regression analysis to identify relationships between variables.

II. Course Objectives

- To enhance statistical skills essential to understand data.
- To identify, solve and interpret the economic results statistically.
- To understand statistical models.

II. Learning Outcomes

At the end of the course, students are expected,

- Able to create graphs and interpret graphical functions.
- Demonstrate the use of statistical methods in data analysis.
- Build simple statistical models.

IV. Course Contents

Unit-1: Descriptive Statistics and Data Summarization

- Definition and Role of Statistics; Types of Data-Quantitative, Qualitative, Scales of Measurement- Nominal, Ordinal, Interval, Ratio.
- Measures central tendency: Median, Mode, Mean, Harmonic Mean, Geometric Mean, simple and weighted averages, group averages.
- Measures of dispersion: Range, Variance and Standard Deviation, Mean Deviation, Quartile Deviation, Measures of Skewness and kurtosis; Measures of economic inequality.
- Graphic Presentation of Data: Bar Plot, Pie Chart, Histogram, Density Plot, Box Plot, Scatter Diagram, Stem-and-leaf Chart, Cross-tabulation.

Unit-2: Probability, Distributions, and Inferential Statistics

- Random experiment, sample space and events

- Classical, empirical and axiomatic definitions of probability; addition and multiplication theorems
- Conditional probability, independent events and Baye's rule
- Binomial, Poisson and Normal distributions

Unit-3: Correlation, Regression and Time series Analysis

- Correlation, Types of correlation, correlation versus causation, difference between covariance, correlation and regression, coefficient of correlation, rank correlation
- Simple linear regression; method of least squares; prediction and interpretation
- Time Series Analysis: Concept and uses; Components of time series; Methods of moving averages and least squares.

V. References

1. Allen, R.G.D. (1949). Statistics for Economists. Hutchinson's University Library, London, UK.
2. Agresti, A. (2018). Statistical Methods for the Social Sciences. Pearson.
3. Carlson, K. A., & Winquist, J. R. (2017). An Introduction to Statistics: An Active Learning Approach. Sage Publications.
4. Chou, Y. (1975). Statistical Analysis. Holt, Reinhart and Winston, New York.
5. Croxton, Crowden and Klein. (1971). Applied General Statistics, Prentice Hall of India, New Delhi.
6. Croxton, F.E., D.J. Cowden & S. Klein (1973). Applied General Statistics. Prentice Hall, New Delhi.
7. D. G. Rees. (1987). Foundation of Statistics. Chapman & Hall.
8. D. Gujrati. (2002). Basic Econometrics, (4th Ed). Mcgraw-Hill/Irwin.
9. F. Daly, D. J. Hand, M. C. Jones, A. D. Lunn, K. J. Mcconway. (1995). Elements of Statistics. Addison-Wesley.
10. G. M. Clarke and D. Cooke. (1992). A Basic Course in Statistics, (3rd Ed). Arnold.
11. Gupta, S.C. & Kapoor, V.K. (1988). Elements of Mathematical Statistics. S. Chand & Sons, New Delhi.
12. Hogg, R. V. and A. T. Craig. (1970). Introduction to Mathematical Statistics (3rd Ed). Macmillan Publishing Co., New York.
13. Hogg, R.V. and Craig, A.T. (1995). Introduction To Mathematical Statistics. Prentice-Hall International, inc. Engle Wod Cliff, N.J.
14. Hogg, R.V. and Tanis E.A. (1993). Probability and Statistical inference, (4th Ed). Macmillan Publishing Company, New York.
15. J. A. Rice (1995). Mathematical Statistics and Data Analysis, (2nd Ed). Duxbury Press.
16. J. E. Freund and R. E. Walpole. (1987). Mathematical Statistics, (5th Ed). Prentice-Hall inc.
17. J. E. Freund. (1999). Mathematical Statistics, (5th Ed). Prentice-Hall International.
18. Kapur, J.N. & Saxena, H.C. (1988). Elements of Mathematical Statistics. S. Chand & Sons, New Delhi.
19. Lind, Douglas A., William G. Marchal, & Samuel A. Wathan. (2006). Business Statistics for Business & Economics, (5th Ed). Boston: McGraw-Hill Irwin.
20. Millar, J. (1996). Statistics For Advanced Level. Cambridge University Press, Cambridge.

21. Mood, A.M. Graybill, F.A. and Boes, D.C. (1974). Introduction to the Theory of Statistics, (3rd Ed). Mcgraw-Hill Book Company, New York.
22. Nagar, A.L. & R.K. Das. (1983). Basic Statistics. Oxford University Press, New Delhi.
23. P.H. Karmel and M. Polasek. (1978). Applied Statistics for Economists, (4th Ed). Pitman, Australia.
24. R. L. Schaeffer. (1990). Introduction to Probability and its Applications. Pws-Kent.
25. S. C. Gupta. (1993). Fundamentals of Applied Statistics, S. Chand and Sons, New Delhi.
26. S. Ross. (1976). A First Course in Probability. Macmillan.
27. Sukhatme, P. V. and B. V. Sukhatme (1970). Sampling Theory of Survey With Applications. Lowa State University Press, Ames.

Course: Cyber Security

Type of Course: Ability Enhancement Course (AEC) **Code:** 24-ECO-A-254

Semester: IV **Credits:** 2

I. Introduction to the Course

In the era of digitalization, Cyber security becomes pertinent when large sections of the country work with digital technology, social media, online E-commerce, mobile banking etc. A course on Cyber security becomes significant in educating about the threats, precautions required, various initiatives by governments and developing skills of secure online space. This course is aligned with the mandate of UGC to teach Cyber Security course at undergraduate level.

II. Course Objectives

- Familiarize the students with fundamentals of Cyber Security and threat landscape.
- To equip students with the technical knowledge and skills needed to protect and defend themselves against cyber threats.
- To systematically educate the necessity to understand the impact of cybercrimes and threats with solutions in a global and societal context.

III. Learning Outcomes

At the end of the course, students are expected to,

- Develop a deeper understanding of various types of cyberattacks, cybercrimes, vulnerabilities and remedies.
- Analyze and evaluate the security aspects of social media platforms and ethical aspects associated with use of social media.
- Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training.

IV. Course Contents

Unit -1: **Introduction to Cyber Security**

- Defining Cyberspace and Architecture of cyberspace
- Regulation of cyberspace, Concept of Cyber Security
- Issues and challenges of Cyber Security.
- Classification of cybercrimes, Common cybercrimes- cybercrime targeting computers, cybercrime against woman and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks.
- Reporting of cybercrimes, Remedial and mitigation measures,
- IT Act,2000 and its amendments
- Organizations dealing with Cybercrime and Cyber Security in India, Case studies

Unit-2: Social Media Management and Security

- Introduction to Social networks.
- Social media privacy, Security issues related to social media
- Flagging and reporting of inappropriate content
- Laws regarding posting of inappropriate content
- Best practices for the use of Social media
- Case studies.

Unit-3: E-Commerce and Digital Payments

- Electronic Commerce definition, Main components of E-Commerce, Elements of E-Commerce security, E-Commerce threats.
- Introduction to digital payments, Components of digital payment and stake holders.
- Modes of digital payments- Banking Cards, Unified Payment Interface (UPI), e-Wallets, Aadhar enabled payments
- Digital payment frauds and preventive measures.
- RBI guidelines on digital payment and customer protection in unauthorized banking transactions.
- Relevant provisions of Payment settlement Act, 2007.

V. References

1. Awad, E. M. (2006). Electronic Commerce. Prentice Hall of India Pvt Ltd.
2. Cole, E. (2011). Network Security Bible. John Wiley & Sons.
3. Henry A. Oliver (2001) Security in the Digital Age: Social Media Security Threats and Vulnerabilities. Create Space Independent Publishing Platform.
4. Kumar, K., & Sharma, S. R. (Eds.). (2001). Cyber Laws: Intellectual Property and E-commerce Security. Dominant Publishers and Distributors.
5. Maiwald, E. (2003). Fundamentals of Network Security. Dreamtech Press.
6. Michael E. Whitman, Herbert J. Mattord, (2018). Principles of Information Security, 6th edition, Cenage Learning, N. Delhi.
7. Sunit, B., & Nina, G. (2011). Cyber security: Understanding cybercrimes, computer forensics and legal perspectives. Wiley India.

Course: Data Analytics with Python

Type of Course: Value Added Course (VAC) **Code**: 24-ECO-V-255

Semester: IV **Credits:** 2

I. Introduction to the Course

This paper introduces the students to the basics of python programming, data handling & processing and exploratory data analysis. This paper guides through the complete data management process, from the initial data acquisition to visualization using important python libraries – *numpy, pandas, matplotlib.*

II. Course Objectives

- Understand the basics of python programming concepts
- To able to use python for data cleaning and processing
- Conduct exploratory data analysis with python

III. Course Outcomes

At the end of this course, students will:

- Understand nature, collection and analysis of data
- Demonstrate understanding commands and functions by developing codes
- Analyze and evaluate the codes and concepts in various data analytics projects
- Apply exploratory analysis techniques

Pedagogy

The pedagogy blends theory with hands-on practice, supporting collaborative and individualized learning. The goal is to produce competent analysts who can tackle real data problems and clearly communicate their insights.

IV. Course Contents

Unit- 1: *Basics of Python*

- Python basics, reserved keywords, Properties, Methods, Inheritance, Class Variables, Class Functions, Static Methods, Descriptors, Names, Tuples & Data Classes, File Input Output, Modules, Python Data Types and Variables, Control Structures (Conditionals, Loops), Functions and Modules
- Working with Strings and String Methods, Lists, Tuples, Sets, and Dictionaries, Exception Handling and Debugging Techniques, File
- Handling (Reading/Writing Files), Introduction to Python Standard Library, Overview of Python Package Index (PyPI) Writing and Running Python Scripts, Using Jupyter Notebooks for Interactive Coding and Documentation, Basic Regular Expressions for Data Parsing

Unit- 2: ***Basic Mathematical Operations and Data Handling***

- Introduction to NumPy, Creating and manipulating arrays, Array indexing and slicing, Arithmetic operations and broadcasting, Multi-dimensional arrays and matrices, Mathematical and statistical functions, Reading and writing arrays, Performance comparison with Python lists, Use cases in data analytics
- Introduction to pandas, Series and Data Frame structures, Importing and exporting data, Data selection and filtering, Handling missing data and duplicates, Data transformation and mapping, Merging, joining, and concatenating datasets, Grouping and aggregation, Reshaping data (pivot, melt), Time series data handling.

Unit- 3: ***Visualization & Data Aggregation***

- Introduction to Matplotlib, Creating basic plots (line, scatter, bar, histogram, pie)
- Plot customization (labels, titles, legends, colors), Multiple plots and subplots, Plotting with pandas integration
- Advanced visualization (error bars, annotations), Saving and exporting figures, Visualization best practices. Group By Mechanics, Data Aggregation, Group-wise Operations and Transformations
- Pivot Tables and Cross-Tabulation

V. References

1. McKinney, Wes. Python for Data Analysis. 3rd Edition. O'Reilly Media, 2022. ISBN: 9781098104030
2. VanderPlas, Jake. Python Data Science Handbook. O'Reilly Media, 2016. ISBN: 9781491912058
3. Grus, Joel. Data Science from Scratch: First Principles with Python. 2nd Edition. O'Reilly Media, 2019. ISBN: 9781492041139

Semester- V

B.A. (Hons./Hons. with Research) Economics

Course: Introductory Econometrics

Type of Course: Major **Code**: 24-ECO-C-300

Semester: V **Credits:** 4

I. Introduction to the Course

Introductory Econometrics (24-ECO-C-300), intends to equip students with fundamentals of data analysis and econometric techniques for scientific enquiries. Besides equipping students in Ordinary Least Square (OLS) estimation and hypothesis testing under Gauss Markov theorem, students also learn to address issues in data such as skewness and outliers before modelling to minimise the problems that models may suffer from. The course also equips students with ability to compute frequently used socio-economic metrics (e.g., group based averages, elasticities, growth rates and Gini coefficient) so that they can do meaningful data analysis. The course uses matrix algebra for better and more intuitive grasp of multivariate regression analysis.

II. Course Objectives

- Foundations of a scientific empirical enquiry for socio-economic themes.
- Deeper understanding of demands of Regression Analysis
- Socio-Economic analysis**:** Compute indexes that are frequently needed for socio-economic analysis and address data issues so that standard models may produce better result.

III. Learning Outcomes

After completing the course students can

- Examine the nature of distribution a socio-economic variable may have and how to use it for analysis.
- Evaluate conditions that needs to be met before attempting a Regression Analysis.
- Interpret and draw statistically valid inferences from analysis and devise tools (visual or numeric) to communicate those results to non-experts.

IV. Course Contents

Unit- 1: Foundations of Data Analysis

- Demands of a scientific empirical enquiry, Conventional (deductive) and modern (inductive) approaches to model specification, modelling an average (univariate modelling), Kinds of averages, mean-based versus order-based sample statistics.
- Revising Statistical concepts: probability density function, mathematical expectation, and moments. Monotonic transformation –origin and scale changes.
- Grasping ideas around sampling distribution through simulation exercise, Unbiasedness of sample statistic or estimator, understanding standard error, assumptions, Sample mean as best linear unbiased estimator (BLUE), Variance (standard error) of sample mean versus sample median. Normality & Maximum likelihood principle.
- Use of standard error in inference making. Deriving unbiased estimator of population variance to estimate standard error, Identifying Outliers, Skewness and its treatment through

data transformation. Exploratory Data Analysis tools – Density Plot, Histogram, Boxplot, stem and Leaf Plot, Q-Q Plot and P-P Plot, Statistical tests of normality.

- Computing frequently used concepts in socio-economic analysis: e.g., averages, growth rates, elasticities, Gini coefficient.

Unit- 2: Simple (Classical) Linear Regression Analysis

- Bivar iate Analysis: Exploratory visual plots – scatter plot, loess (localised mean) curve
- Bivariate regression analysis - Population regression function and Sample regression Function, Significance of stochastic disturbance term
- Problem of estimation of bivariate regression model – CLRM assumptions or Gauss Markov Theorem, Method of OLS estimation, Goodness of fit, Desirable properties of OLS estimators
- Setting confidence intervals and Hypothesis testing, criticality of non-stochasticity assumption of independent variable, Extension of bivariate regression model.

Unit 3: Multivariate Regression Analysis

- Multivariate Regression Equation, OLS estimation of Partial Regression Coefficients, Coefficient of Determination (R^2) and Adjusted R^2 in multivariate case
- Partial Correlation Coefficients of first order, Problem of Inferences and Hypothesis Testing.
- Use of F-test judging nested models
- Use matrix for better grasp of multivariate regression.
- Introduction to implications of violations of standard assumption of Gauss Markov Theorem.

IV. References

1. Brooks, C. (2014). Introductory econometrics for finance. Cambridge university press, 2nd Edition.
2. Goldberger, Arther S. (1998). Introductory Econometrics. Harvard University Press, Cambridge, Massachusetts.
3. Green W. H. (2003). Econometric Analysis. Prentice Hall, Pearson Education, New Delhi
4. Gujarati D (1992). Essential Econometrics. McGraw Hill, Singapore
5. Gujrati, D 2007. Basic Econometrics. McGraw Hill, 4th edition, New Delhi
6. Johnston, J. and Dinardo(1997), Econometric Methods. 4th Edition. McGraw Hill, New York.
7. Kmenta J (1997). Elements of Econometrics. Michigan Press New York
8. Koutsoyiannis A (1977). Theory of Econometrics. The Macmillan Press Ltd,
9. Maddala (2001). Introduction to Econometrics. 3rd Edition. John Wiley
10. Mukherjee, C., White, H., & Wuyts, M. (2013). Econometrics and data analysis for developing countries. Routledge.
11. Wooldridge, Jeffrey M. (2016). Introductory econometrics a modern approach, South-Western cengage learning, 2016.

Course: Money and Banking

Type of Course: Major **Code**: 24-ECO-C-301

Semester: V **Credits: 4**

I. Introduction to the Course

This course provides an in-depth understanding of money, banking systems, and monetary policy with a special focus on the Indian economy and global banking advancements. It explores the evolution of money, the structure of financial institutions, and the role of central banks in shaping monetary policy. Recent trends such as FinTech, digital payments, and the rise of Central Bank Digital Currencies (CBDC) are integrated to provide industry-relevant insights.

II. Course Objectives

- Understand the evolution of money, various monetary theories, and their application in modern economies.
- Analyse the structure and role of commercial and central banks in financial intermediation and credit creation.
- Evaluate monetary and fiscal policies and their impact on economic stability, inflation, and growth.

III. Learning Outcomes

- To be able to Explain the concepts, theories, and role of money in economic systems.
- To be assess the Indian banking system and recent technological advancements in banking.
- To be evaluate monetary policy decisions and their macroeconomic implications.

IV. Course Contents

Unit- 1: Money and Evolution

- Money an overview- Evolution, Origin, Definition, Types and Classification of Money.
- Theories of Demand for Money -Various Approaches- Fisher's Transaction Approach, Cambridge's Cash Balance Approach, Keynes, Friedman, Post-Keynesian.
- Supply of Money: H- theory of money supply, Money-Multiplier and Monetary Aggregates: Definition and measurement (Traditional and New Monetary Aggregates).
- Digital currencies: Cryptocurrencies, CBDCs, UPI & India's Digital Rupee- Evolution, role, and impact on traditional monetary systems.

Unit- 2: Banking System- an overview

- Indian Banking System- Structure and Types: Commercial Banks- Functions, Process of Credit Creation, Cooperative banks, RRBs, Small finance banks, Payment banks, and Neo banks.
- Nationalisation and development of banks in India; role of public and private sector banks.
- Central Bank- Role, Functions, and Credit Control instruments of RBI.

- Banking Regulation and Governance: RBI Act, Banking Regulation Act, and Basel Norms (I–III).
- Recent Advancements in the Banking System- Social Banking, Digital Banking, Online Banking, and Fintech Innovations.

Unit- 3: Monetary Policy and Perspectives

- Monetary Policy: Objectives, Goals, Instruments, and transmission mechanisms.
- Monetary Policy in India: Monetary Policy Committee (MPC), Inflation targeting, and RBI's recent stance.
- Limitations of Monetary Policy with reference to India.
- Fiscal–Monetary Linkages: coordination and conflicts.

IV. References

1. Blanchard, O. (2020). *Macroeconomics* (8th ed.). Pearson.
2. Bhole, L. M., & Mahakud, J. (2011). *Financial Institutions and Markets* (5th ed.). Tata McGraw Hill.
3. Gupta, S. B (1982). *Monetary Economics - Institutions, Theory & Policy,* Publisher. S Chand
4. Mishkin, F. S. (2019). *The Economics of Money, Banking, and Financial Markets* (12th ed.). Pearson.
5. Mishkin, F. S., & Eakins, S. G. (2009). *Financial Markets and Institutions* (6th ed.). Pearson Education.
6. Rangarajan, C. (1999). *Indian Economy: Essays on Money and Finance.* UBS Publishers.
7. Reddy, Y. V. (2000). *Monetary and Financial Sector Reforms in India.* UBSPD, New Delhi.
8. Reserve Bank of India. (2023). *Report on Trends and Progress of Banking in India.*

Additional Reading:

1. Eichengreen, B., Choudhary, R., Eichengreen, B., & Gupta, P. (2020). *Inflation targeting in India: An interim assessment*. Washington, DC: World Bank.
2. Dua, Pami & Rajan, Rituparna (2019). "Inflation Targeting in India: An Assessment of the Monetary Policy Framework," *Economic & Political Weekly (EPW).*

Course: History of Economic Thought

Type of Course: Major **Code**: 24-ECO-C-302

Semester: V **Credits:** 4

I. Introduction to the Course

The History of Economic Thought course gives an overview of the process of development of Western Economic Thoughts. The course allows the students to understand the analytical foundations of the approaches in the Economics over the centuries and develop logical grasp on the evolution and debates around various economic thoughts and its application in contemporary time.

II. Course Objectives

- To develop an insight in contributions of various economic thoughts.
- To develop a chronological understanding of the development of Economic thoughts and relate the developments in different schools of thought with contemporary issues.
- The course attempts to fulfil the need to integrate the history of economics with the teaching of the principles of economics.
- To develop a holistic understanding of the evolution of contemporary economics.

III. Pre-requisites

- The course could be taught afresh to first semester students to enable them to understand the finer theoretical constructs and develop keen interest in the development of the subject of Economics.

OR

- If taught to any other level, preferably basic understanding of Micro, Macro and Development Economics is a prerequisite.

IV. Learning Outcomes

- To be able critically evaluate and compare economic theories.
- To be able to interpret Socio-Political context of Economic thoughts.
- Help in application and synthesis of economic thoughts to contemporary issues

V. Course Contents

Unit-1: Pre Classical and the Classical School

- Mercantilism: Main Principles, Physiocracy: Natural order, Agriculture and Product Net
- Adam Smith: Division of Labour, theory of value, doctrine of laissez faire
  David Ricardo: Theory of Value, Theory of Distribution
- Malthus: Theory of Gluts, Theory of Population
- John Stuart Mill: Principles of Political Economy

Unit-2: The Marxian Challenge and Marginal Revolution

- Karl Marx: A Contribution to the Critique of Political Economy
  William Stanley Jevons: The Theory of Political Economy
- Alfred Marshall: Principles of Economics
- Eugen von Bohm-Bawerk: The Positive Theory of Capital

Unit-3: Contemporary School of Economic Thought

- Irving Fisher: The Purchasing Power of Money and its Determination and Relation to Credit Interest and Crises
- John Maynard Keynes: Treatise on Money and The General Theory of Employment, Interest and Money
- Milton Friedman: Restatement of the Quantity Theory of Money
  George Akerlof: Information Asymmetry

VI. References

1. Hunt, E.K. and Lautzenheiser, M. (2011), History of Economic Thought: A Critical Perspective, M.E. Sharpe.
2. Medema, S.G. and Samuels, W.J. (2003), The History of Economic Thought: A Reader, Routledge.

Detailed Readings:

1. Ekelund, R.B. and Hebert, R.F. (1975), A History of Economic Theory and Method, McGraw-Hill.
2. Hajela, T.N. (2008), History of Economic Thought, Ane Books Pvt. Ltd.
3. Haney, L.H. (1922), History of Economic Thought: A Critical Account of the Origin and Development of the Economic Theories of the Leading Thinkers in the Leading Nations, Macmillan.
4. Landerth, H. and Colander, D.C. (2002), History of Economic Thought, Houghton Mifflin.
5. Robbins, L. (2000), A History of Economic Thought: The LSE Lectures, Princeton University Press.
6. Roncaglia, A. (2005), The Wealth of Ideas: A History of Economic Thought, Cambridge University Press.
7. Spiegel, H.W. (1991), The Growth of Economic Thought, Duke University Press.

Course: International Trade

Type of Course: Minor **Code**: 24-ECO-M-303

Semester: V **Credits:** 4

I. Introduction to the Course

This course helps students to analyse the issues in international trade. After completing this course, students will be able to critically explore policies in International Economics. This course is design to equip the Students to apply theoretical principles of international trade to the prevailing global economic situation. Therefore, this course is expected to provide an extensive and through use of tools and theories involved in framing and implementation of international trade policies.

II. Course Objectives

- To study the current issues in international trade.
- To analyse the trade patterns.
- To Apply trade theories to describe the effects of trade liberalization policies on current trade.

II. Learning Outcomes

On successful completion of this course, students will be able to

- Gain the conceptual clarity of the theoretical aspects, foundations and principles of International trade.
- Examine the changes in the pattern of International trade policy and global economic environment.
- Aware the fundamental exposure such as role, structure and functioning of international institutions.

IV. Course Contents:

Unit-1: Introduction to International Trade

- International Trade definition, domestic, regional and intra-regional trade, scope current scenario of trade
- Opportunity cost and production possibility curve, Terms of Trade, Ricardian Theory of Trade, its criticism and application.

Unit-2: International Trade Policies

- Free Trade and Economic Protection, Theory and Practice, Economic Effects of Tariff, Import Quota, Import Substitution and Export Promotion
- Trade Negotiation under General Agreement on Tariff and Trade (GATT) and World Trade Organization (WTO).

Unit-3: Balance of Payment and International Monetary System

- Balance of payment meaning and its components
- Exchange rate determination, fixed and flexible exchange rate, balance of payments in under liberalized trade regime

- Bretton Woods Agreement and its breakdown, World Bank, organization, function and its role in the development of developing countries.

V. References

1. Bo-Sodersten and Goeffrey Reed, International Economics III Edition, 1994
2. Salvatore. D, International Economics, 1983
3. Haberler G, The Theory of International Trade, 1935
4. Kindleberger. C.P., International Economics, 1976.
5. Ellsworth, P.T. International Economics, 1969

Course: Statistical Data Analysis using Softwares

Type of Course: Skill Enhancement Course **Code**: 24-ECO-S-304

Semester: V **Credits:** 3

I. Introduction to the Course

This course is designed to for understanding of open-source R Programming language to undergraduate students as a multidisciplinary subject. The course will cover the basics of R to application R for econometric and statistical analysis.

II. Course Objectives

- To understand the basics of R and R studio
- To understand how to apply R Programming Languages for econometric and statistical analysis.

III. Learning Outcomes

- Students will be able to appreciate basics of R and R Studio
- It will equip the students with the skill to apply R software for eco econometric and statistical analysis and drawing inferences from that.

IV. Course Contents

Unit – 1: Introduction

Introduction to R and R studio, Understanding datasets, Data Structures, Creating new variables, importing variables from other database management system like excel, Use of R as a calculator.

Unit – 2: Basic & Advanced Data Visualisation and Data Wrangling

Basic Data Visualisation-Adding Text, customised axez and legends, Basic Graphs-Bar Plots, Pie Charts, Histograms, Kernel Plots, boxplots, dot plots, Scatter Plots, Line Chart. Advanced Data Visualisation using ggplot 2 package. Data wrangling using dplyr package- rename(), pull(), mutate(),filter(), arrange(), and select().

Unit – 3: Basic and Advanced Data Analysis

Descriptive Statistics, Frequency Tables , Hypothesis testing- one sample t test, independent sample t test and dependent or paired sample t test, Correlation analysis, Regression analysis-simple, multiple and regression through origin.

V. References

1. G.S. Bhalla, *Agricultural Development since Independence*
2. V.V. Stauthur, *Transformation of Traditional Agriculture*
3. Mellor, *Agricultural Development*
4. Dantwala, *Leading Issues in Agricultural Economics*

5. Sadhu and Singh, *Agricultural Problems in India*
6. Soni, R.N., *Leading Issues in Agricultural Economics – Relevant issues*
7. Bhaduri, *Economic of Backward Agriculture*
8. Rao, C.H. Hanumantha, *Agricultural Economics*
9. Swaminathan, M.S., *Agriculture Cannot Wait – New Horizons in Indian Agriculture*

Semester- VI

B.A. (Hons./Hons. with Research) Economics

Course: Intermediate Econometrics

Type of Course: Major **Code**: 24-ECO-C-350

Semester: VI **Credits:** 4

I. Introduction to the Course

This course provides an in-depth exploration econometric techniques used in economic research and data analysis. It focuses on addressing standard violations of the Gauss-Markov assumptions in Ordinary Least Squares (OLS) regression and their remedial measures. The course also covers binary (discrete) choice models emphasizing their design, interpretation, and limitations.

Additionally, students will study simultaneous equation models and causal inference methods to establish causality. Through theoretical discussions, practical examples, and hands-on exercises, this course is designed for those seeking to apply robust econometric methods to real-world social and economic problems.

II. Course Objectives

The course intends to equip students with

- econometric tools and techniques to address violations of classical regression assumptions.
- modelling of binary or discrete socio-economic outcomes
- establishment causal relationships in social and economic outcome
- These skills will enable them to conduct rigorous empirical research and make informed policy recommendations.

III. Learning Outcomes

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

- Identify and address violations of the Gauss-Markov assumptions using appropriate tests and remedial measures.
- Apply and interpret binary (discrete) choice models to analyze binary and multinomial outcomes, computing conditional probabilities and marginal effects.
- Evaluate causal relationships using simultaneous equation models and causal inference techniques, such as Difference-in-Difference, Regression Discontinuity Design, and Propensity Score Matching, in economic applications.

IV. Course Contents

Unit- 1: Violations in Assumptions of Gauss Markov theorem

- Problems in OLS Methods: Analysis of Residuals

- Heteroscedasticity: Applying OLS under Heteroscedasticity – Consequences, tests and remedial measures. Heteroskedasticity Sensitive standard error.
- Autocorrelation: Applying OLS under autocorrelation – Consequences, tests and remedial measures.
- Multicollinearity: consequences, tests and remedial measures.
- Endogeneity: Applying OLS under Endogeneity— Consequences and tests and remedial measures. Instrumental variable regression

Unit- 2: Discrete Choice Models

- Challenge of modelling binary/discrete outcomes
- **Linear Probability Model:** Its design and logic, Limitations,
- **Logit models:** Odds, Odds ratio, log-odds, Basics of logit modelling, approximation of logit function from binomial distribution, variance components of logit model. Assumption regarding the error component, latent variable approach to logit modelling, Interpretation of logistic regression coefficient, computing probability using logit regression co-efficient, marginal effect. Extending binary logit model to multinomial logit model.
- **Probit Model:** Probit model uses standard normal distribution instead of standard logistic distribution which are very similar. One-to-one correspondence between Logistic and Probit regression co-efficient.

Unit 3: Simultaneous Equation Model and causal Inference

- Simultaneous Equation Bias, Identification Problem, Rules for Identification – Order and Rank Conditions, Indirect Least Square Methods (ILS), Two State Least Square (2SLS) Method, Application in macro- and micro-economics with suitable examples.
- *Causal Inference and impact measurement:* Directed Acyclic Graphs, Potential outcomes in a causal model, Instrumental Variable Regression technique, Difference-in-Difference (DiD), Regression Discontinuity Design, Propensity score matching for DiD for when treatment is not random.

V. References

1. Brooks, C. (2014). Introductory econometrics for finance. Cambridge university press, 2nd Edition.
2. Cunningham, S. (2021). Causal inference: The mixtape. Yale university press.
3. Goldberger, Arther S. (1998). Introductory Econometrics. Harvard University Press, Cambridge, Massachusetts.
4. Green W. H. (2003). Econometric Analysis. Prentice Hall, Pearson Education, New Delhi
5. Gujrati, D 2007. Basic Econometrics. McGraw Hill, 4th edition, New Delhi
6. Huber, M. (2023). Causal analysis: Impact evaluation and Causal Machine Learning with applications in R. MIT Press.
7. Johnston, J. and Dinardo(1997), Econometric Methods. 4th Edition. McGraw Hill, New York.
8. Kmenta J (1997). Elements of Econometrics. Michigan Press New York
9. Koutsoyiannis A (1977). Theory of Econometrics. The Macmillan Press Ltd,
10. Maddala (2001). Introduction to Econometrics. 3rd Edition. John Wiley

11. Mukherjee, C., White, H., & Wuyts, M. (2013). Econometrics and data analysis for developing countries. Routledge.
12. Wooldridge, Jeffrey M. (2016). Introductory econometrics a modern approach, South-Western Cengage Learning, 2016.
13. Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2009). Handbook on impact evaluation: quantitative methods and practices. World Bank Publications.

Course: Development Economics

Type of Course: Major **Code**: 24-ECO-C-351

Semester: VI **Credits:** 4

I. Introduction to the Course

This course offers a comprehensive exploration of the concepts, models, and real-world challenges associated with economic development. It draws on both classical and contemporary economic theories and provides students with analytical tools to evaluate policy and development outcomes in different countries, especially in the context of underdevelopment, inequality, unemployment, and poverty.

II. Course Objectives

- To understand and differentiate key concepts of economic growth, development, underdevelopment, and sustainability.
- To analyze major economic growth and development models and their application to real-world economies.
- To evaluate critical development issues such as poverty, inequality, and unemployment, along with related policy measures.

III. Learning Outcomes

After completing the course, students will be able to:

- Explain core concepts and theories of economic growth and development.
- Apply analytical tools and indicators to assess development outcomes.
- Critically assess the effectiveness of development policies in addressing poverty, inequality, and unemployment.

IV. Course Contents

Unit- 1: Concepts of Economic Growth and Development

- Meaning of Economic Growth: Definition, Measurement and Determinants
- Growth Vs. Development; Indicators, Human Development Index
- Concept of Underdevelopment and Characteristics of Underdeveloped Countries
- Sustainable Development: Concept, Measurement and Scope

Unit- 2: Theories/Models of Growth and Development

- Rostow's Stages of Growth
- Harrod-Domar Growth Model
- Solow Growth Model
- Structural Change and Lewis Model
- Balanced Vs. Unbalanced Growth Theories.

Unit- 3: Poverty, Inequality, and Human Development

- Poverty: Definition, Concepts of Poverty (Absolute vs Relative), Causes, Measures of Poverty alleviation.
- Inequality: Concepts of Income and Wealth Inequality, Kuznets hypothesis, causes and measurement.
- Interlinkages between poverty, inequality, and development
- Education and Health: Role of public policy in health and education
- Gender and development: Disparities, Empowerment, Role of institutions

V. References

1. Debraj Ray, Development Economics, Oxford University Press, 2009.
2. David N. Weil, Economic Growth: Pearson, 2012
3. A.P. Thirlwall, Growth and Development 8e. New York : Palgrave McMillan, 2005.
4. Michael P. Todaro and Stephen C. Smith, Economic Development, 8e. Delhi : Pearson Education, 2003.

Course: International Trade

Type of Course: Major **Code**: 24-ECO-C-352

Semester: VI **Credits:** 4

I. Introduction to the Course

This course introduces International Trade as a major subject. The course will provide comprehensive principles, theories and policies of International Trade to students. It will also cover tools and techniques of International Trade and throw light on various the issues in international trade and strategies of international trade.

II. Course Objectives

- To equip the student the current issues in international trade.
- To analyse the trade patterns.
- To equip the students tools, techniques and theories of International trade
- To expose the students various trade strategies and its impact on Trade.

III. Learning Outcomes

On successful completion of this course, students will be able to

- Gain the conceptual clarity of the theoretical aspects, foundations and principles of International trade.
- Examine the changes in the pattern of International trade and global economic environment.
- Provide exposure to role, structure and functioning of international institutions such as Wold Bank, IMF and WTO.

IV. Course Contents

Unit-1: Introduction to International Trade

- International trade, domestic, regional and intra regional trade, forces for and against economic integration, need for separate theory of international trade, production possibility curve, Offer curve, terms of trade.
- Pure theory of international trade, Ricardo's comparative cost advantage Hecksher Ohlin trade model, Leontif Paradox.
- Brief Introduction to Intra- Industry Trade.

Unit-2: International Trade Policies

- Free trade and economic protection, Tariff, Economic effects of tariff, partial and general equilibrium, import quota
- Trade Strategies- Import substitution vs export promotion, Prebisch Singer Hypothesis
- General Agreement on Tariff and Trade (GATT), World Trade Organization.

Unit-3: Balance of Payment and International Monetary System

- Balance of payment, exchange rate determination, exchange rate liberalization, disequilibrium in the balance of payments, adjustment mechanism
- Bretton Wood monetary system and its break down and current scenario, World Bank, organization, function and its role in the development of developing countries.

V. References

1. Bo-Sodersten and S Geoffrey Reed, International Economics III Edition, 1994
2. Salvatore. D , International Economics, John Wiley & Sons, 26 Nov, 2019
3. Haberler G, The Theory of International Trade, William Hedge and Company Limited,1935
4. Kindleberger. C.P. International Economics, Homewood, Ill. : R. D. Irwin, 1973.
5. Ellsworth, P.T. International Economics, Macmillan, 1969

Course: Public Economics

Type of Course: Major **Code**: 24-ECO-C-353

Semester: VI **Credits:** 4

I. Introduction to the Course

This course is an amalgamation of concepts, theory and practice. It builds upon microeconomic models to examine the role of the government in the economy focusing equity and efficiency two distinctive evaluative criteria. This course rationalizes conditions under which market may fail even within the neo-classical framework and therefore necessitate government intervention such is production of public goods and regulation of externalities.

However, this course does move away from neoclassical framework to understand the role of state for in a developing country context. Such a state as entrepreneurial agent. For instance, this course examines growth and overall welfare implications of public expenditure in a historical perspective. Students are also expected to develop a skill to critically examine government budgets.

II. Course Objectives

- To explain the rationale for government intervention in the economy from within the neo-classical perspective.
- To understand the principles, sources, and fairness of taxation systems.
- To analyze the dynamic impact of strategic choices made for public expenditure and public debt on the economy i.e., entrepreneurial role of state in developing economy.

III. Learning Outcomes

At the end of the course, students are expected to,

- Analyze the role and functions of government in the economy within the neoclassical framework.
- Evaluate different sources of government revenue and assess the equity and efficiency of taxation.
- Apply principles of public finance to critically examine government policies on taxation, public expenditure, and public debt and their implication.

IV. Course Contents

Unit-I: Public Economics: Meaning and Scope and Provision of Public Goods

- Meaning and scope of Public Economics; Public and Private Finance; Principle of Maximum Social Advantage
- Functions of Government

- Conditions for departure from Efficient outcomes in neoclassical framework: Public goods, natural monopoly, Problems of Preference Revelation, Externalities, Asymmetric Information, Public Provision of Health Care, Mechanism Design,
- Local Public Goods and the Decentralization Theorem
- Public choice: Voting Rules and Characteristics of Majority Voting

Unit-2: Public Revenue and Taxes

- Sources of Public Revenue; Buoyancy and Elasticity of a Tax
- Division of Tax Burden: Ability to pay, Benefit received and Cost of Service approach
- Objectives and Classification of Taxes; Canons of Taxation
- Incidence, Impact, and Shifting of Tax Burden; Theories of Tax Shifting
- Deadweight loss, Theory of Optimal Taxation
- Measuring Fairness of Tax Systems: Average and Marginal Tax Rates, Vertical and Horizontal Equity
- Tax Base: Income vs Consumption Tax Base; Haig–Simons Definition; Deviations due to Externalities and Public Goods; Units of Taxation
- Taxation and Labour Supply, Taxation Savings, Corporation Taxation
- State-finance: Value Added Tax (VAT), Goods and Services Tax (GST) and its implications on state-finance

Unit- 3: Public Expenditure, Public Debt and Fiscal Federalism

- Structure, Growth and Effect of Public Expenditure
- On entrepreneurial role of state in Developing country
- Canons of Public Expenditure
- Theories of Public Expenditure: Pure Theory of Public Expenditure, Wagner's Law, Peacock–Wiseman Hypothesis and Colin-Clarks critical limit theory
- Cost Benefit Analysis and Project Evaluation of Public Expenditure
- India's Fiscal Federalism: Assignment of Functions, Constitutional Provisions, Centre–State Resource Transfers, Fiscal imbalance: horizontal and vertical imbalances, Principles of Multi-Unit Finance
- Public Debt: Meaning, Types, Debt sustainability, it's impact on economic growth, Debt Redemption, FRBM Act.
- Introduction to Government Budgets, Conventional Budgeting and its Evaluation, Outcome Budgeting, Zero base Budgeting, Gender Budgeting

V. References

Main Readings

1. Gruber, Jonathan (2022) Public Finance and Public Policy, 2022, 7th Edition, Macmillan Publication.
2. Hindriks, J. & Myles, G.D (2013). Intermediate Public Economics. 2nd Edition, The MIT Press, Cambridge
3. Jain, N. (2025) Union Budgets 2014-24: An Analysis. Aakar Books; First Edition; New Delhi, India.
4. Mazzucato, M. (2011). The entrepreneurial state. Soundings, 49(49), 131-142.
5. Musgrave, R. A., and Musgrave, P. B. (2004) Public Finance: Theory and Practice, Tata Mc Graw-Hill Book Company, Fifth Edition, New Delhi.

6. Rao, M. G. (2022). Studies in Indian Public Finance. Oxford University Press.
7. Reddy and Reddy (2019). Indian Fiscal Federalism, Oxford Publication.

Additional Readings

1. Bagchi, Amaresh (2005), Readings in Public Finance, OUP.
2. Bailey, S. J. (1995). Public Sector Economics: Theory, Policy and Practice. Basingstoke: Macmillan.
3. Bailey, Stephen J. (1999), Local Government Economics: Principles and Practice, Macmillan Press Ltd, Hampshire and London
4. Bhattacharjee, G. (2016). Special Category States of India, Oxford Publications.
5. Buiter, W.H. (1990): Principles of Budget and Fiscal Policy, MIT Press.
6. Chakraborty, P., & Shanmugam, K. R. (Eds.). (2024). Fiscal Policy and Public Financial Management. Oxford University Press.
7. David, N. and Nicholas, S. (eds.) (1987): The Theory of Taxation for Developing Countries, OUP.
8. Favaro, Edgardo M.and Ashok K. Lahiri (eds)(2004), Fiscal Policies and Sustainable Growth in India, OUP, New Delhi.
9. Friedman, L. S. (2002). The Microeconomics of Public Policy Analysis. Princeton University Press.
10. Herber, B. P. (1996). Modern Theory of Public Finance, Richard D. Irwin Inc., Illinois.
11. Hyman, D.N (2010). Public Finance: A Contemporary Application of Theory to Policy, 10th Edition, South-Western CENGAGE Learning
12. John Cullis and Philip Jones (2009). Public Finance and Public Choice: Analytical Perspectives, Third Edition, Oxford University Press.
13. Karnam, G. (2018). Public Budgeting in India: Principles and Practices, Springer Publication
14. Keen, Michael (2009), "What Do (and Don't) We Know about the Value Added Tax?", Journal of Economic Literature, Vol. 47, No. 1, pp. 159-70.
15. Leach, J. (2004). A Course in Public Economics. Cambridge University Press.
16. Ministry of Women and Child Development (2007), Gender Budgeting Handbook for Government of India Ministries and Departments, GOI.
17. Mishan, E.J. (1987): Cost-Benefit Analysis: An Informal Introduction, George Allen and Unwin, London.
18. Mundle, Sudipto (ed.) (1997), Public Finance: Policy Issues for India, Delhi: Oxford University Press.
19. Musgrave, Richard A. (1989). Public Finance in Theory and Practice, Mc Graw-Hill Book Company, New York.
20. Myles, G. D. (1995). Public Economics. Cambridge University Press.
21. Oommen, M.A. (2006), "Fiscal Decentralisation to the Sub-State Level Governments", Economic and Political Weekly, 41(10), 897-903.
22. Rangarajan, C., & Srivastava, D. K. (2024). Federalism and Fiscal Transfers in India. Oxford University Press.
23. Reddy, Y. V., Ray, P., & Chakraborty, P. (2024). Financial and Fiscal Policies: Crises and New realities. Oxford University Press.
24. Report of Various Finance Commissions; Govt Budgets of Various Years
25. Reserve Bank of India, Handbook of Statistics on the Indian Economy, Various Years.
26. Reserve Bank of India, State Finances - A Study of Budgets, Various Years.

27. Rosen, H. and Gayer, T. (2010). Public Finance, The McGraw-Hill.
28. Sarma, J. V. M. (2018). Public Finance: Principles and Practices. Oxford University Press.
29. Shanmugam, K. R. (Eds.). (2025). India's Public Finance and Policy Challenges in the 2020s. Singapore: Springer Nature Singapore.
30. Stiglitz, J. E., & Rosengard, J. K. (2015). Economics of the Public Sector: Fourth International Student Edition. WW Norton & Company.
31. Tiebout, C.M. (1956), “A Pure Theory of Local Expenditure”, J. of Political Economy, 64(5), 416-24.

Course: Public Economics

Type of Course: Minor **Code**: 24-ECO-M-354

Semester: VI **Credits:** 4

I. Introduction to the Course

This course helps the students to understand the role of the government in the economy. This course also familiarizes causes of market failure in neo-classical framework and why government intervenes to produce public goods. This course also introduces sources of government revenues and its welfare implications. Furthermore, this course also exposes the students with causes of growth and effects of public expenditure on the economy. Students will understand the consequences and sustainability of public debt with special focus to India. This course will help the students to understand the government budgets.

II. Learning Objectives

- To explain the theoretical foundations of the role of government.
- To understand the principles of taxations and fairness of tax systems.
- To analyze the impact of public expenditure and public debt on the economy.

III. Learning Outcomes

At the end of the course, students are expected,

- Analyze the role and functions of government in the economy.
- Evaluate different sources of government revenue and assess the equity and efficiency of taxation.
- Apply principles of public finance to critically evaluate the government policies on taxation, public expenditure, and public debt and its implication.

IV. Course Contents

Unit-1: Meaning and Scope of Public Economics

- Meaning and scope of Public Economics; Public and Private Finance; Principle of Maximum Social Advantage
- Functions of Government and Entrepreneurial role of state in Developing country
- Private, Public, Merit, Pure and Impure Public Goods, Quasi-Public Goods
- Problems of Preference Revelation and Externalities

Unit-2: Public Revenue and Taxes

- Sources of Public Revenue; Buoyancy and Elasticity of a Tax
- Division of Tax Burden: Ability to pay, Benefit received and Cost of Service approach
- Objectives and Classification of Taxes; Canons of Taxation
- Incidence, Impact, and Shifting of Tax Burden; Theories of Tax Shifting

- Measuring the Fairness of Tax Systems: Average and Marginal Tax Rates, Vertical and Horizontal Equity
- Tax Base; Haig–Simons Definition; Deviations due to Externalities and Public Goods; Units of Taxation
- Value Added Tax (VAT), Goods and Services Tax (GST) and its implications on state finance

Unit- 3: Public Expenditure, Public Debt and Fiscal Federalism

- Meaning, Importance, and Growth of Public Expenditure
- Canons of Public Expenditure, Effects of Public Expenditure
- Theories of Public Expenditure- Wagner's Law and Peacock–Wiseman Hypothesis and Colin-Clarks critical limit theory
- Public Debt: Meaning, Types, Debt sustainability and Debt Redemption.
- Introduction to Government Budgets

V. References

Main Readings

1. Gruber, Jonathan (2022) Public Finance and Public Policy, 2022, 7th Edition, Macmillan Publication.
2. Hindriks, J. & Myles, G.D (2013). Intermediate Public Economics. 2nd Edition, The MIT Press, Cambridge
3. Jain, N. (2025) Union Budgets 2014-24: An Analysis. Aakar Books; First Edition; New Delhi, India.
4. Mazzucato, M. (2011). The entrepreneurial state. *Soundings*, *49*(49), 131-142.
5. Musgrave, R. A., and Musgrave, P. B. (2004) Public Finance: Theory and Practice, Tata Mc Graw-Hill Book Company, Fifth Edition, New Delhi.
6. Rao, M. G. (2022). Studies in Indian Public Finance. Oxford University Press.
7. Reddy and Reddy (2019). Indian Fiscal Federalism, Oxford Publication.

Additional Readings

1. Bagchi, Amaresh (2005), Readings in Public Finance, OUP.
2. Bailey, S. J. (1995). *Public Sector Economics: Theory, Policy and Practice*. Basingstoke: Macmillan.
3. Bailey, Stephen J. (1999), Local Government Economics: Principles and Practice, Macmillan Press Ltd, Hampshire and London
4. Bhattacharjee, G. (2016). Special Category States of India, Oxford Publications.
5. Buiter, W.H. (1990): Principles of Budget and Fiscal Policy, MIT Press.
6. Chakraborty, P., & Shanmugam, K. R. (Eds.). (2024). Fiscal Policy and Public Financial Management. Oxford University Press.
7. David, N. and Nicholas, S. (eds.) (1987): The Theory of Taxation for Developing Countries, OUP.
8. Favaro, Edgardo M.and Ashok K. Lahiri (eds)(2004), Fiscal Policies and Sustainable Growth in India, OUP, New Delhi.
9. Herber, B. P. (1996). Modern Theory of Public Finance, Richard D. Irwin Inc., Illinois.

10. Hyman, D.N (2010). Public Finance: A Contemporary Application of Theory to Policy, 10th Edition, South-Western CENGAGE Learning
11. John Cullis and Philip Jones (2009). Public Finance and Public Choice: Analytical Perspectives, Third Edition, Oxford University Press.
12. Karnam, G. (2018). Public Budgeting in India: Principles and Practices, Springer Publication
13. Keen, Michael (2009), "What Do (and Don't) We Know about the Value Added Tax?", Journal of Economic Literature, Vol. 47, No. 1, pp. 159-70.
14. Leach, J. (2004). A Course in Public Economics. Cambridge University Press.
15. Ministry of Women and Child Development (2007), Gender Budgeting Handbook for Government of India Ministries and Departments, GOI.
16. Mishan, E.J. (1987): Cost-Benefit Analysis: An Informal Introduction, George Allen and Unwin, London.
17. Mundle, Sudipto (ed.) (1997), Public Finance: Policy Issues for India, Delhi: Oxford University Press.
18. Musgrave, Richard A. (1989). Public Finance in Theory and Practice, Mc Graw-Hill Book Company, New York.
19. Myles, G. D. (1995). *Public Economics*. Cambridge University Press.
20. Oommen, M.A. (2006), "Fiscal Decentralisation to the Sub-State Level Governments", Economic and Political Weekly, 41(10), 897-903.
21. Rangarajan, C., & Srivastava, D. K. (2024). *Federalism and Fiscal Transfers in India*. Oxford University Press.
22. Reddy, Y. V., Ray, P., & Chakraborty, P. (2024). Financial and Fiscal Policies: Crises and New realities. Oxford University Press.
23. Report of Various Finance Commissions; Govt Budgets of Various Years
24. Reserve Bank of India, Handbook of Statistics on the Indian Economy, Various Years.
25. Reserve Bank of India, State Finances - A Study of Budgets, Various Years.
26. Rosen, H. and Gayer, T. (2010). Public Finance, The McGraw-Hill.
27. Sarma, J. V. M. (2018). Public Finance: Principles and Practices. Oxford University Press.
28. Shanmugam, K. R. (Eds.). (2025). India's Public Finance and Policy Challenges in the 2020s. Singapore: Springer Nature Singapore.
29. Stiglitz, J. E., & Rosengard, J. K. (2015). Economics of the Public Sector: Fourth International Student Edition. WW Norton & Company.
30. Tiebout, C.M. (1956), "A Pure Theory of Local Expenditure", J. of Political Economy, 64(5), 416-24.

Semester- VII

B.A. (Hons./Hons. with Research) Economics

Course: General Equilibrium & Welfare Economics

Type of Course: Major **Code**: 24-ECO-C-400

Semester: VII **Credits:** 4

I. Introduction to the Course

This paper introduces the students to the basics of general equilibrium concepts and theory, building general equilibrium model, and evaluation of social welfare by using some of the state of the art statistical techniques.

II. Course Objectives

- Learn to build general equilibrium models
- Execute the general equilibrium model using software
- Apply statistical techniques for welfare evaluation

III. Learning Outcomes

At the end of this course, students will**:**

- understand the link between theory and model outcomes
- make use of the capabilities of software for general equilibrium modelling
- evaluate public social welfare projects
- apply modeling techniques to real-world economic problems

Pedagogy

- The course will involve a healthy balance of classroom discussion and experiential activities, which will generally include a mixture of lectures and hands-on learning.

IV. Course Outlines

Unit- 1: General Equilibrium Theory and Concepts

- **Introduction to General Equilibrium Models:** Economic Models, Computable General Equilibrium Model (CGE), Standard CGE Model, CGE Model Structure/Database/Applications
- **Nuts and Bolts of General Equilibrium Model:** Sets, Endogenous and Exogenous Variables, Exogenous Parameters, Behavioral and Identity Equations, and Model Closure. Prices, Price Normalization, Price Transmission, and the Numeraire. Social Accounting Matrix (SAM)

Unit-2: General Equilibrium Model Applications

- **Final Demand and Supply:** Final Demand and Income Data in a SAM, Utility-Maximizing, Demand Response to Income and Relative Price Changes, Production Data in a SAM, Producer Behavior in a CGE Model, Input Prices and Level of Output, Production Externalities, Production Taxes, Sales Taxes, Income Taxes

- **Trade:** Trade Data in a SAM, Exchange Rates, Terms of Trade, Trade Theory in CGE Models, Factor Endowment Changes, Trade, and Terms of Trade, World Price Changes and Factor Income Distribution, Trade Taxes, Non-Tariff Measures in International Trade

Unit-3: Welfare and Welfare Evaluation

- **Estimation of Welfare Changes:** Valuing the Consequences of a Project, Contingent Valuation, Discrete Choice Experiment, Hedonic Pricing, Travel Cost Method
- **Cost Benefit Analysis:** Rationale for Cost Benefit Analysis, Discount of Benefits and Costs, Accounting for Market Distortions, Deterministic and Probabilistic Sensitivity Analysis, Mean-Variance Analysis
- **Cost Effectiveness Analysis:** Appraisal of Projects with Non-monetary Outcomes, Cost Effectiveness Indicators, Efficiency Frontier Approach, Decision Analytic Modeling
- **Multi-criteria Decision Analysis:** Problem Structuring, Assessing Performance Levels with Scoring, Criteria Weighting, Construction of a Composite Indicator, Non-Compensatory Analysis

IV. References

1. Mas-Colell, Andreu, Michael Dennis Whinston, and Jerry R. Green. Microeconomic Theory. Vol. 1. Oxford University Press, 1995. ISBN: 9780195073409
2. Welfare Economics and Social Choice Theory, Allan M. Feldman and Roberto Serrano, Publisher: Springer (2006), ISBN: 10: 0-387-29367-1
3. *Introduction to Computable General Equilibrium Models*, Mary E. Burfisher, Cambridge University Press, 2016, ISBN 978-1-107-58468-6
4. *Statistical Tools for Program Evaluation* , Jean-Michel Josselin & Benoıt Le Maux, Springer, 2017, ISBN 978-3-319-52826-7

Course: Macroeconomic Policy and Analysis

Type of Course: Major **Code**: 24-ECO-C-401

Semester: VII **Credits:** 4

I. Introduction to the Course

The primary objective of **Macroeconomic Policy and Analysis** is to provide students with a comprehensive understanding of the theoretical foundations, tools, and applications of macroeconomic policy in both closed and open economies. The course aims to equip students with the analytical skills necessary to evaluate the effectiveness of fiscal and monetary policies, understand macroeconomic indicators, and assess the implications of policy decisions on economic growth, inflation, employment, interest rates, and exchange rates.

II. Learning Objectives

- Understand key macroeconomic policy objectives and theoretical underpinnings.
- Analyze the roles and interactions of monetary and fiscal policies in achieving macroeconomic stability.
- Critically evaluate contemporary macroeconomic issues and policy debate

III. Course Contents

Unit- 1: Foundations of Macroeconomic Policy

- Objectives of macroeconomic policy: growth, inflation, employment, stability
- IS-LM model and the role of monetary and fiscal policy
- Expectations and credibility in policymaking
- Policy rules vs discretion
- Time inconsistency and central bank independence

Unit 2: Instruments and Transmission of Macroeconomic Policy

- Monetary policy instruments: repo, CRR, OMOs, liquidity adjustment
- Fiscal policy: tax-spending tools, deficits, debt management
- IS-LM and IS-MP frameworks
- Transmission mechanisms: interest rate, credit, expectations
- Policy coordination and macroeconomic stabilization

Unit 3: Contemporary Macroeconomic Policy Challenges

- Inflation management and supply-side shocks
- Fiscal consolidation and debt sustainability
- External sector: exchange rate policy, capital flows, trilemma
- Financial stability and macroprudential regulation
- Challenges: liquidity trap, ZLB, fiscal multipliers

V. References

1. Blanchard, O. (2021). *Macroeconomics* (8th ed.). Pearson.
2. Branson, W. H. (1989). *Macroeconomic theory and policy* (3rd ed.). Harper & Row.
3. Dornbusch, R., Fischer, S., & Startz, R. (2018). *Macroeconomics* (13th ed.). McGraw-Hill Education.
4. Dornbusch, R., & Fischer, S. (2004). *Macroeconomics* (9th ed.). Tata McGraw-Hill.
5. Mankiw, N. G. (2020). *Macroeconomics* (10th ed.). Worth Publishers.
6. Mishkin, F. S. (2018). *The economics of money, banking, and financial markets* (12th ed.). Pearson.
7. Romer, D. (2018). *Advanced macroeconomics* (5th ed.). McGraw-Hill Education.
8. Taylor, J. B. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy, 39*, 195–214.

Course: International Finance

Type of Course: Major **Code**: 24-ECO-C-402

Semester: VII **Credits:** 4

I. Introduction to the Course

This course offers an advanced study of international finance with a strong emphasis on exchange rate dynamics, international monetary systems, and the challenges of financial globalization. It blends theoretical models with empirical applications and case studies, enabling students to critically analyse global financial issues and their implications for emerging economies such as India.

II. Course Objectives

- Build a rigorous understanding of the international monetary system, exchange rate regimes, and policy trilemmas.
- Apply advanced models of exchange rate determination, balance of payments, and capital flows to real-world contexts.
- Critically evaluate the impact of financial globalization, contagion, and crises on advanced and emerging economies, with emphasis on India.

III. Learning Outcomes

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

- Analyse and apply key theories of international finance, including the impossible trinity, PPP, UIP/CIP, and overshooting models.
- Evaluate exchange rate policies, interventions, and capital flow management using balance of payments and policy frameworks.
- Assess the dynamics of financial globalization, contagion, and major crises, and draw relevant policy lessons for India.

IV. Course Contents

Unit- 1: International Financial System & Institutions

- International Financial System – Historical Evolution
- International Gold Standard and External Balance
- Bretton Woods System and the IMF
- Collapse of Bretton Woods & Case for Floating Exchange Rates
- Macroeconomic Policy Goals – Internal and External Balance

- **The Impossible Trinity (Mundell–Fleming Trilemma)**
- Optimum Currency Areas – Theory and Case Studies
- Reserve Bank of India and Exchange Rate Management

Unit- 2: World Trade, Payments and Exchange Rate Determination

- National Income Accounting and Balance of Payments
- Exchange Rates and the Foreign Exchange Market – Asset Approach
- Money, Interest Rates, and Exchange Rate Dynamics
- Uncovered and Covered Interest Parity (UIP & CIP)
- Price, Output, and Exchange Rate – PPP and Dornbusch Overshooting Model
- Foreign Exchange Intervention and Stabilization Policies
- Exchange Market Pressure – Modelling and Estimation

Unit- 3: Financial Globalisation – Opportunities and Crises

- International Banking and Global Liquidity (including Offshore Currency Trading)
- International Banking and Financial Fragility
- Challenges of Regulating International Banking
- **Contagion and Spillovers in Global Financial Markets**
- Global Financial Crises – Dynamics and Lessons
- Case Studies of Global Financial Crises (Asian Crisis 1997, Global Crisis 2008, COVID-19 Shock)

V. References

Textbooks

1. Krugman, Paul; Mourice Obstfeld; and Marc Melitz (2018). International Economics: Theory and Policy (Tenth Edition). Pearson India Education Services Pvt. Ltd.
2. Caves, Richard E.; Jeffrey A. Frankel; and Ronald W. Jones (2016). World Trade and Payments: An Introduction (Ninth Edition). Pearson India Education Services Pvt. Ltd.
3. Frederic S. Mishkin; Sanley G. Eakins; Tulsi Jayakumar; and R.K. Pattnaik (2018). Financial Markets and Institutions (Eighth Edition). Pearson India Education Services Pvt. Ltd.

Research Papers:

1. Cassel, G. (1918), “Abnormal Deviations in International Exchanges”, The Economic Journal, Vol.28, pp. 413-15.

2. Dornbusch, R.(1976), "Expectations and Exchange Rate Dynamics", Journal of Political Economy, 84(6), pp.1116-76.
3. (1987), "Exchange Rate Economics: 1986", The Economic Journal, Vol. 97, No. 385, pp. 1-18.
4. Johnson, H.G. (1977), "The Monetary Approach to Balance of Payments Theory and Policy: Explanation and Policy Implications", Economica, Vol. 44, pp. 173-76.
5. Friedman, M. (1953) "The Case for Flexible Exchange Rates." In Essays in Positive Economics, 157 203. Chicago: University of Chicago Press.
6. Girton, L. and D. Roper (1977), "A Monetary Model of Exchange Market Pressure Applied to the Postwar Canadian Experience", American Economic Review, Vol. 67, No. 4, September, pp. 537-48.
7. Baig, M.A., V. Narasimhan, and M. Ramachandran (2003). "Exchange Market Pressure and the Reserve Bank of India's Intervention Activity", Journal of Policy Modeling, Elsevier Publication, Vol. 25, No. 8, pp. 727-48.
8. Turnovsky, S.J. (1985), "Optimal Exchange Market Intervention: Two Alternative Classes of Rules" in: J.S. Bhandari, (ed.), Exchange Rate Management under Uncertainty, MIT Press, Cambridge, MA. pp. 286-331.
9. Obstfeld, M. (1990), "The Effectiveness of Foreign Exchange Intervention: Recent Experience: 1985 88", in Branson, W.H., J.A. Frenkel, and M. Goldstein (eds), International Policy Coordination and Exchange Rate Fluctuations, University of Chicago Press, Chicago.
10. Eichengreen, B., A.K. Rose, and C. Wyplosz (1995), "Exchange Market Mayhem", Economic Policy, Vol. 21, pp.249-312.
11. Obstfeld, M. (1990), "The Effectiveness of Foreign Exchange Intervention: Recent Experience: 1985 88", in Branson, W.H., J.A. Frenkel, and M. Goldstein (eds), International Policy Coordination and Exchange Rate Fluctuations, University of Chicago Press, Chicago.
12. Rogoff, K. (1996), "The Purchasing Power Parity Puzzle", Journal of Econometric Literature, Vol. 34, No. 2, pp. 647-68.
13. Mundell, R. (1961), "A Theory of Optimum Currency Areas", American Economic Review, V-51, September, pp. 657-64.

Additional Readings:

Text/Reference Books

1. Kenneth J. Arrow and Michael D. Intrilligator (1985). Handbook of International Economics – International Monetary Economics and Finance (Volume-II). Elsevier Science Publishers B.V.
2. Freixas, Xavier and Jean-Charles Rochet (2008). Microeconomics of Banking (Second Edition). The MIT Press, Cambridge.
3. Kruger, A.O (1983), Exchange Rate Determination, Cambridge University Press, Cambridge.
4. Brain Tew (1985). The Evolution of International Monetary System. Hutchinson. Bernanke,
5. Ben S., T. Laubach, F. S. Mishkin, and A.S. Posen (2001), Inflation Targeting: Lessons from the International Experience , Princeton University Press.

Research Papers:

1. Obstfeld, Maurice (2014), "The International Monetary System: Living with Asymmetry", in Feenstra and Taylor (eds.) Globalization in an Age of Crisis: Multilateral Economic Cooperation in the Twenty-First Century, Chicago: Chicago University Press.
2. Eichengreen, B., and C. Wyplosz (1993), "The Unstable EMS", Brookings Papers on Economic Activity, part 1, pp.51-143.
3. McKinnon (1963), "Optimum Currency Areas", American Economic Review, V-53, September, pp. 717-24.
4. Rose, A. and C. Engel (2002), "Currency Unions and International Integration", Journal of Money, Credit and Banking, V-34, 1067-89.
5. Baig, M.A. (2011). "A Study of Economic Feasibility of Optimum Currency Area in South Asia", in Ahmed and Ashraf (eds), Regional and Multilateral Trade in Developing Countries, Routledge Publication.
6. Levich, R.M (1985), "Empirical Studies on Exchange Rate: Price Behaviour, Rate Determination and Market Efficiency", in: R.W. Jones and P.B. Kenen (eds.), Handbook of International Economics, Elsevier Science Publishers B.V., Vol.2, pp. 979-1040.
7. Baig, M.A., V. Narasimhan, and M. Ramachandran (2002). "On Sterilising Capital Inflows - The Indian Experience", Journal of Indian School of Political Economy, Vol. 14, No. 2, pp. 221-34.
8. Edison, H. (1987), "Purchasing Power Parity in the Long run: A Test of the Dollar Pound Exchange Rate, 1890-1978", Journal of Money, Credit and Banking, Vol. 19, pp. 376-87.
9. Edison, H.J. (1993), "The Effectiveness of Central Bank Intervention: A Survey of the Literature after 1982", Special Papers in International Economics, International Finance Section, No. 18, pp. 1-68.
10. Roper, D. and S.J. Turnovsky (1980), "Optimal Exchange Market Intervention in a Simple Stochastic Macro Model", Canadian Journal of Economics, Vol. 13, pp. 296-309.
11. Ramachandran, M. and M.A. Baig (2004). "Exchange Market Pressure and Monetary Policy" (with M.), in Romer Correa and L.G. Burange (eds.), Reforms, Institutions and Policies: Challenges Confronting the Indian Economy, pp 299-312, Himalaya Publishing House, Mumbai, 2004.
12. Dominguez, K. M.E., Fatum, R., and Vacek, P(2010). Does Foreign Exchange Reserve Decumulation Lead to Currency Appreciation?. EPRU Working Paper Series 2010-06. Economic Policy Research Unit, Department of Economics University of Copenhagen, Copenhagen.
13. Nayak, S. and M.A. Baig (2019- forthcoming). "International Reserves and Domestic Money Market Disequilibrium: Empirics for India and China", International Journal of Emerging Markets, Emerald Publishing Limited, UK.
14. Forbes, Kristin J. (2013), "The "Big C": Identifying and Mitigating Contagion", in Economic Policy Symposium Proceedings, Federal Reserve Bank of Kansas City.
15. Lo, Andrew W. (October 26, 2011), "Reading About the Financial Crisis: A 21-Book Review". Available at SSRN: https://ssrn.com/abstract=1949908 or http://dx.doi.org/10.2139/ssrn.1949908.

Course: Game Theory

Type of Course: Major **Code**: 24-ECO-C-403

Semester: VII **Credits:** 4

I. Introduction to the Course

This course introduces students to game theory as a tool for analysing strategic interactions in economics and social sciences. Emphasis is placed on understanding how (hidden) payoffs and discounting contribute to bargaining problems, inefficiencies, and failures in cooperation.

II. Course Objectives

- Introduce core concepts of game theory and strategic interaction to understand how incomplete information and discounting shape outcomes.
- Explore real-world problems (environmental policy, labour disputes, international relations, etc.) through this lens.
- Develop skills to design mechanisms and bargaining solutions that overcome inefficiencies.

III. Learning Outcomes

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

- Analyze why hidden payoffs and discounting lead to inefficient outcomes.
- Apply bargaining theory to real-world negotiations.
- Propose institutional designs to mitigate inefficiencies.

IV. Course Contents

Unit- 1: Foundations of Game Theory

- **Introduction to Game Theory**

  Strategies for Economic modelling, Rationality and strategic thinking, Types of games: cooperative vs. non-cooperative, static vs. dynamic, complete vs. incomplete information, perfect vs imperfect information game, Payoff structures and social dilemmas

- **Static Games of Complete Information**

  Normal form games, Extensive form games,

  Solution Concepts: (Strict, Weak and Iterated) Dominance strategy, Nash equilibrium, Multiple Nash Equilibria, Examples: Prisoner's Dilemma, Coordination games

- **Dynamic Games of Complete Information**

  Dynamic one-off games, Backward induction, Subgame perfect equilibrium, infinitely repeated games and emergence of tacit cooperation (Folk theorem basics), Infinitely repeated games, Example: Oligopoly under quantity (Cournot) and price (Bertrand) competition and price leadership (Stackelberg), Non-cooperative(tacit) collusion

Unit- 2: Hidden Payoffs & Uncertainty

- **Games of Incomplete Information (Bayesian Games)**

  Dynamic games of complete but imperfect information, Harsanyi Transformation of incomplete information to imperfect information game, Private information, types, beliefs, Bayesian Nash equilibrium, Rosenthal's Centipede game, Applications: Auctions, signalling games

- **The Role of Hidden Payoffs in Society**

  Externalities of private information (why not knowing others' payoffs leads to inefficiency)

  Case studies: Environmental policy (countries' hidden costs of mitigation), Healthcare bargaining (patients vs. insurers), Labor strikes (employers' vs. unions' private payoffs)

Unit- 3: Bargaining & Time Preferences

- **Discounting & Present Bias**

  Discount factors, impatience, and strategic delay, Why discount rates differ and why it matters (behavioural perspectives)

  Applications: Climate change (short-term vs. long-term incentives) and Debt crises (lenders' vs. borrowers' impatience)

- **Bargaining Theory**

  Nash bargaining solution (efficient benchmark), Rubinstein's alternating-offer model (discount factors as bargaining power), Incomplete information in bargaining (delays, breakdowns, and inefficiencies)

- **Institutions for Cooperation**

  Reputation, repeated interactions, and credible commitments, Role of law, norms, and enforcement, collective action.

V. References

1. Church, J., & Ware, R. (2000). Industrial organization: a strategic approach. Mc-Graw –Hill, International Editions, Available at SSRN 5366237.
2. Fudenberg, D., & Tirole, J. (1991). Game theory. MIT press.
3. Gibbons, R. (1992). A primer in game theory. Pearson Education India, Printice Hall
4. Jehle, G. A. (2001). Advanced microeconomic theory. Pearson Education India.
5. Mas-Colell, Andreu, Michael D.Whinston and Jerry R. Green, (1995). Microeconomic Theory, OUP, New York.
6. Romp, G. (1997). Game theory: introduction and applications. Oxford University Press.
7. Shy, O. (1996). Industrial organization: theory and applications. MIT press.
8. Varian, Hall R., (1992). Microeconomic Analysis. 3rd Edition, W.W. Norton & Company, New York, London.
9. Dixit, A. K., & Nalebuff, B. J. (1993). Thinking strategically: The competitive edge in business, politics, and everyday life. WW Norton & Company.

10. Ostrom, E. (2000). Collective action and the evolution of social norms. Journal of economic perspectives, 14(3), 137-158.
11. Holler, M. J. (1993). Fighting pollution when decisions are strategic. Public Choice, 76(4), 347-356.
12. Osborne, M. J. (2012). An introduction to game theory. Oxford University Press; First Edition
13. Rubinstein, A. (1982). "Perfect Equilibrium in a Bargaining Model." Econometrica 50(1): 97–109.

Course: Time Series Analysis

Type of Course: Major **Code**: 24-ECO-C-404

Semester: VII **Credits:** 4

I. Introduction to the Course

Time Series Analysis is a crucial area of empirical research where the dynamic behavior of variables is studied over time. This course introduces students to key concepts and modeling techniques for analyzing time-dependent data. Emphasis is placed on understanding, modeling, and forecasting economic and financial time series, using both theoretical knowledge and applied statistical software.

II. Course Objectives

This course aims to:

- Develop an understanding of the statistical characteristics of time series data and its components.
- Apply appropriate techniques to test for stationarity and identify suitable models for time series analysis.
- Learn to construct and estimate autoregressive (AR) and moving average (MA) models.

III. Learning Outcomes

After completing the course, students will be able to:

- Differentiate between stationary and non-stationary time series processes.
- Apply key tests like the Augmented Dickey-Fuller (ADF) to check for unit roots.
- Build and interpret AR, MA, ARMA, ARIMA, and GARCH models.

IV. Course Contents

Unit- 1: Introduction to Time Series and Stationarity

- Types of time series: Univariate vs. Multivariate
- Components: Trend, Seasonality, Cyclical, and Irregular
- Stationarity and non-stationarity
- White noise and random walk processes
- Autocorrelation and Partial Autocorrelation
- Unit root testing: Dickey-Fuller and Augmented Dickey-Fuller (ADF) tests
- Transformations and differencing for stationarity

Unit- 2: Time Series Models and Forecasting Techniques

- AR, MA, ARMA, ARIMA models
- Box-Jenkins methodology (Identification, Estimation, Diagnostic Checking)
- Model selection
- Forecasting with ARIMA
- Volatility models: ARCH and GARCH

Unit- 3: Causal Analysis and Multivariate Time Series

- Causality in economics
- Basic introduction to Vector Autoregression (VAR)
- Cointegration and Error Correction Models (conceptual overview)
- Introduction to software for time series (hands-on sessions or demo using EViews

V. References

1. Enders, W. (2014). *Applied Econometric Time Series* (4th ed.). Wiley.
2. Gujarati, D.N. & Porter, D.C. (2009). *Basic Econometrics* (5th ed.). McGraw-Hill.
3. Brockwell, P.J. & Davis, R.A. (2002). *Introduction to Time Series and Forecasting* (2nd ed.). Springer.
4. Hamilton, J.D. (1994). *Time Series Analysis*. Princeton University Press.
5. Tsay, R.S. (2010). *Analysis of Financial Time Series* (3rd ed.). Wiley.
6. Stock, J.H. & Watson, M.W. (2020). *Introduction to Econometrics* (4th ed.). Pearson.
7. Lütkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*. Springer.
8. EViews User Guide & Tutorials (available on eviews.com)

Course: Development Economics

Type of Course: Minor **Code**: 24-ECO-M-405

Semester: VII **Credits:** 4

I. Introduction to the Course

This course introduces students to the key issues in economic development, particularly in the context of developing countries. It focuses on understanding poverty, inequality, and the role of development policies. The course focuses on concepts, real-world examples, and policy debates.

II. Course Objectives

This course aims to:

- Understand what development means beyond just economic growth.
- Identify the challenges faced by developing countries.
- Understand the roles of education, health, and institutions in development.

III. Learning Outcomes

After completing this course, students will be able to:

- Explain the basic concepts of development and underdevelopment.
- Identify causes of poverty and inequality.
- Discuss the importance of education, health, and gender in development.

IV. Course Contents

Unit- 1: Understanding Development and Its Measurement

- Concept of development. Difference between growth and development
- Characteristics of developing countries
- Indicators of development: Per capita income, HDI, education, health
- Introduction to Sustainable Development Goals (SDGs)

Unit- 2: Poverty, Inequality, and Human Development

- What is poverty? Absolute vs. relative poverty
- Causes of poverty and inequality
- Role of education and health in development
- Gender and development

Unit- 3: Development Policies and Institutions

- Role of government in development
- Importance of institutions (law, property rights, governance)
- Development programs in India (e.g., MGNREGA, Mid-Day Meal, Awas Yojana)
- Introduction to environment and sustainable development
- Role of NGOs and international organizations (World Bank, UNDP)

V. References

1. Todaro, M. P. & Smith, S. C. – *Economic Development*
2. UNDP Human Development Reports
3. Dreze, J. & Sen, A. – *India: Development and Participation*
4. World Bank – *Poverty and Shared Prosperity Report*
5. Banerjee & Duflo – *Poor Economics*
6. Planning Commission / NITI Aayog Reports
7. Basic introductory material from Ministry of Rural Development (Govt. of India)
8. Sachs, J. – *The End of Poverty*

Semester- VIII(A)

B.A. (Hons./Hons. with Research) Economics

Course: Research Methodology

Type of Course: Major **Code**: 24-ECO-C-450

Semester: VIII (A) **Credits:** 4

I. Introduction to the Course

To conduct the high level research and thesis writing, the basic understanding of Research Methodology at undergraduate level is essential. Therefore, this course is expected to provide an extensive and thorough exposure to research tools in academic and industry research**.** As a result, students are expected to have necessary skills to conduct a scientific research. The main focus will be on demonstrating how scientific research can help understand contemporary social, economic and scientific challenges. How can they use research as a tool for innovation in academic, industrial and policy-making institutions.

II. Course Objectives

- To learn the basic research concepts, approaches and techniques.
- To equip the students with the skills to conduct rigorous and reliable research.
- Students are able to present the research findings for dissertations, thesis and research projects.

III. Learning Outcomes

At the end of this course students should be able to:

- Understand and developed the fundamentals of research and research skills.
- Prepare for academic and professional research.
- Applying research to real-world problems.

IV. Course Contents

Unit-1: Introduction to Research Methodology

- Nature, scope and purpose of social research; What is a scientific research; Types of research: Pure & applied research, Explanatory (Deductive) research, Exploratory(Inductive) research, Historical research, Experimental research, Survey research; Steps of research proposal
- Review of literature: Sources and importance
- Research problem: Identification and formulation of research problem, Conceptualization and operationalization of research problem, Sources of research problem, Criteria of a good research problem
- Research objectives; Research design: Definition, concepts, and types- Exploratory, descriptive and diagnostic; Experimental and analytical research designs.

Unit-2: Data Collection and Processing Types of data

- Time series, Cross sectional, Panel and cohort; Population and sample; Sampling Frame,
- Sampling techniques: Probability and non-probability sampling techniques; Sample Design, Methods of collection of primary data: Direct personal investigation, Indirect

oral investigation, Information received through local agents and correspondents, Mailed questionnaire, Observation and focus group discussion; Differences between questionnaire and schedule; Drafting and design of questionnaire; Secondary data: Sources, Limitations of secondary data, Precautions in the use of secondary data

- Hypothesis: Meaning, types and formulation of hypothesis; Types of errors in testing of hypothesis, Level of significance.

Unit-3: Research Writing and Ethics

- Writing of a research report and research ethics editing, Coding, Classification and tabulation of data
- Research report: Meaning and significance; Layout of a research report: Preliminary pages, Main body and end matters
- Principles of writing the research report: Organization and style; Citation and referencing: Footnotes and end notes; Types & style of referencing; Format of appendices and bibliography
- Ethical issues relating to research: Falsification, Fabrication and plagiarism.

V. References

1. Goode, J. Willium & Hatt K. Paul. (1952). Methods of Social Research. McGraw- Hill, New York.
2. Gopal, M.H. (1970). An Introduction to Research Procedures in Social Sciences. Asia Publishing House, Bombay.
3. Gosh, B.N. (1982). Scientific Method and Social Research. Sterling Publishers (P) Ltd.
4. Gupta S.C. & V.K. Kapoor. (1993). Fundamentals of Applied Statistics. S. Chand and Sons.
5. Kothari, C.R. (1988). Research Methodology, Methods and Techniques. Willey Eastern Ltd.
6. Kothari, C.R. (2004). Research Methodology: An Introduction, New Age International (P) Ltd., New Delhi.
7. Lundberg, G. A. (1929). Social research: A study in methods of gathering data. Longmans, green & Co.
8. Nachmias, D., & Nachmias, C. (1981). Research Methods in the Social Sciences. Edward Arnold.
9. Rajaram, V. (1996). Fundamentals of computers. Prentice Hall of India, New Delhi
10. Sadhu, A.N. & Singh, A. (1983). Research Methodology in Social Sciences. Himalaya Publishing House.
11. Thanulingom, N. (2000). Research Methodology. Himalaya Publishing House.
12. Kumar, R. (2008). Research methodology: A step-by-step guide for beginners. Sage Publication.

Course: Growth Economics

Type of Course: Major **Code**: 24-ECO-C-451

Semester: VIII (A) **Credits:** 4

I. Introduction to the Course

This course provides an in-depth study of the theories and empirical aspects of long-run economic growth. Building on students' prior understanding from Development Economics (Semester 6), the paper focuses on the mechanisms of sustained income and output growth, including capital accumulation, technological progress, human capital formation, institutional factors, and structural change. It introduces both mainstream and heterodox theories, including the Cambridge approach, offering a broad and critical understanding of growth processes.

II. Course Objectives

This course aims to:

- Introduce key theoretical models that explain long-run economic growth.
- Examine both neoclassical and alternative (Cambridge and endogenous) frameworks.
- Explore the roles of capital, technology, institutions, and structural transformation.

III. Learning Outcomes

After completing the course, students will be able to:

- Explain the core theoretical models of economic growth and their assumptions.
- Compare different models and understand their implications for policy.
- Analyze the role of institutions, demography, and structural change.

IV. Course Contents

Unit- 1: Theoretical Foundations of Economic Growth

- Stylized facts of economic growth (Kaldor)
- Solow-Swan model: assumptions, steady state, transitional dynamics
- Golden Rule level of capital accumulation
- Convergence: absolute and conditional
- Cambridge Growth Models:
- Kaldor’s model of income distribution and accumulation
- Joan Robinson’s model of capital accumulation
- Critique of marginal productivity theory

Unit- 2: Endogenous Growth and Innovation

- Limitations of neoclassical growth theory
- AK model and constant returns to capital
- Human capital accumulation (Lucas model)
- Technological innovation and R&D (Romer model)
- Increasing returns and knowledge spillovers
- Empirical relevance of endogenous growth models
- Policy implications for education, innovation, and openness

Unit- 3: Institutions, Structural Transformation, and Growth Experience

- Role of institutions in long-run growth (Acemoglu-Robinson framework)
- Structural transformation and growth: Lewis model of surplus labour, Sectoral productivity and industrialization, Premature deindustrialization
- Demographic transition and the demographic dividend
- Inequality and growth: revisiting Kuznets hypothesis
- India's growth trajectory since 1991: Growth accelerations, Services-led growth, Policy and institutional reforms

V. References

1. Weil, D. N. (2013). *Economic Growth*
2. Jones, C. I. (2013). *Introduction to Economic Growth*
3. Kaldor, N. (1956). "Alternative Theories of Distribution." *Review of Economic Studies*, 23(2).
4. Robinson, J. (1956). *The Accumulation of Capital*. Selected chapters.
5. Thirlwall, A. P. (2011). *Economics of Growth and Development*. Palgrave. (Chapter on Cambridge models)
6. Romer, P. M. (1990). "Endogenous Technological Change." *JPE*, 98(5).
7. Aghion, P., & Howitt, P. (2009). *The Economics of Growth*, MIT Press.
8. Acemoglu, D., & Robinson, J. A. (2012). *Why Nations Fail*
9. Lewis, W. A. (1954). "Economic Development with Unlimited Supplies of Labour." *The Manchester School*.
10. Rodrik, D. (2016). "Premature Deindustrialization." *Journal of Economic Growth*, 21(1).
11. Panagariya, A. (2008). *India: The Emerging Giant*. OUP. Selected chapters.

Course: World and Globalization

Type of Course: Major **Code**: 24-ECO-C-452

Semester: VIII (A) **Credits:** 4

I. Introduction to the Course

This course provides an overview of the evolution and current dynamics of globalization in the world economy. It explores the drivers, patterns, and consequences of global economic integration, with a focus on trade, investment, financial flows, and institutional frameworks. The course also critically examines the social, environmental, and policy challenges arising from globalization, and discusses current debates on its future.

II. Course Objectives

- To introduce students to the concept and historical development of globalization.
- To understand the role of trade, investment, and financial markets in the global economy.
- To analyze the key challenges and debates surrounding globalization today.

III. Course Contents

Unit- 1: Foundations of Globalization

- Meaning and dimensions of globalization
- Historical evolution of economic globalization
- Key drivers: technology, liberalization, capital flows, and MNCs
- Overview of the global economy in the 21st century

Unit- 2: Global Trade, Investment, and Institutions

- Patterns of international trade in developed and developing countries
- Global trade policy and institutions: WTO and trade agreements
- Foreign Direct Investment and portfolio flows
- Role of international institutions: IMF and World Bank

Unit- 3: Contemporary Challenges and Debates

- Globalization and inequality: global income distribution, North-South divide
- Environmental impacts and the need for sustainable development
- National sovereignty and challenges in global economic governance
- The de-globalization debate: causes and future prospects

IV. References

1. Bhagwati, J. (2007). In defense of globalization: With a new afterword. Oxford University Press.
2. Dicken, P. (2015). Global shift: Mapping the changing contours of the world economy (7th ed.). SAGE Publications.

3. Reinert, K. A. (2012). An introduction to international economics: New perspectives on the world economy. Cambridge University Press.
4. Rodrik, D. (2011). The globalization paradox: Democracy and the future of the world economy. W. W. Norton & Company.
5. Rodrik, D. (2018). What do trade agreements really do? (NBER Working Paper No. 24344). National Bureau of Economic Research. https://doi.org/10.3386/w24344
6. Rodrik, D. (2017). Populism and the economics of globalization (CEPR Discussion Paper No. DP12119). Centre for Economic Policy Research. https://cepr.org/publications/dp12119
7. Stiglitz, J. E. (2003). Globalization and its discontents. W. W. Norton & Company.
8. Stiglitz, J. E. (2017). Globalization and its discontents revisited: Anti-globalization in the era of Trump. W. W. Norton & Company.
9. United Nations Conference on Trade and Development. (Annual). World investment report. UNCTAD. https://unctad.org/publications
10. International Monetary Fund. (Annual). World economic outlook. IMF. https://www.imf.org/en/Publications/WEO
11. World Bank. (Annual). Global economic prospects. World Bank. https://www.worldbank.org/en/publication/global-economic-prospects

Course: Financial Econometrics

Type of Course: Major **Code**: 24-ECO-C-453

Semester: VIII (A) **Credits:** 4

I. Introduction to the Course

Financial Econometric is essential for economic and finance students. The objective of this paper is to demonstrate how statistical and econometric methods can be applied to financial data. This paper builds on the basis of materials covered in basic econometrics and time series component of applications of econometrics. It provides the necessary tools for the analysis of dynamics, volatility, and risk in financial markets. The paper offers a mixture of theoretical and practical components. This paper is highly important for the students who are interested in empirical investigations of financial market volatility and fluctuations, identify the issues and opportunities in financial time series modelling, and apply the appropriate techniques to financial data using econometrics software.

II. Learning Objectives

- Essential knowledge and understanding of subject matter of financial econometrics, including theoretical models and empirical evidence.
- Enhance the intuitive research competencies such as framing the problem and the ability to assemble and estimate the complex evidence.
- Practical and Technical skills such as, modelling skills, qualitative and quantitative analysis.
- Critically review empirical works that use financial time series.

III. Course Contents

Unit-1: Foundations of Financial Econometrics

- Introduction to Financial Econometrics, and an overview of its applications; Financial Data Characteristics & Stylized Facts
- Simple Regression with Classical Assumptions; Least Square Estimation and BLUE, Properties of estimators.
- Multiple Regression Model and Hypothesis Testing Related to Parameters – Simple and Joint. Functional forms of regression models.
- Violations of Classical Assumptions: multicollinearity, heteroscedasticity, autocorrelation and model specification errors, methods to take care of violations of assumptions, goodness of fit.

Unit- 2: Time Series & Volatility Models

- Time Series Properties: Stationarity, Random Walks Model, Unit Root Test (Dickey-Fuller, Augmented Dickey-Fuller (ADF), and Phillips-Perron (PP).
- Autoregressive Models AR(p), Moving Average Models MA(q), Autoregressive Moving Average Models ARMA(p,q), ARIMA(p,d,q); Box-Jenkins Framework of model building - identification, estimation and diagnostic checks. AIC, BIC (Schwarz Bayesian Criterion) Criteria and Portmanteau Statistic.
- Volatility concepts: unconditional vs conditional volatility; implied volatility and realized volatility; economic interpretation and uses.
- ARCH/GARCH Models & Variants (EGARCH, TGARCH, GJR-GARCH); Multivariate GARCH models; Constant-Correlation and Time-Varying Correlation Models; The Dynamic Conditional Correlations (DCC) model
- Volatility Forecasting & Evaluation: forecasting approaches, loss functions, Diebold–Mariano test for predictive accuracy.

Unit-3: Advanced & Emerging Topics in Financial Econometrics

- Market Integration: Granger Causality; Cointegration, ECM,
- Behavioural Finance and VAR Framework (Unrestricted- VAR & VECM, ARDL Model)
- Dynamic Models of High-Frequency Data**:** Realized Volatility and Bipower Variation. Autoregressive Conditional Duration (ACD) Models. Stochastic Volatility Models for High-Frequency Data. Microstructure Noise and Filtering Techniques.
- Applications to Market Risk Management: Value-at-Risk (VaR), Expected Shortfall, Backtesting, and Stress Testing.
- Market Microstructure Econometrics: Modelling bid–ask spreads, order flow dynamics, and liquidity.

IV. References

Unit I – Foundations of Financial Econometrics

1. Wooldridge, J. M. (2019). *Introductory Econometrics: A Modern Approach* (7th ed.). Cengage.
2. Dougherty, C. (2011). *Introductory Econometrics* (4th ed.). Oxford University Press.
3. Brooks, C. (2019). *Introductory Econometrics for Finance* (4th ed.). Cambridge University Press.
4. Tsay, R. S. (2010). *Analysis of Financial Time Series* (3rd ed.). Wiley.
5. Enders, W. (2015). *Applied Econometric Time Series* (4th ed.). Wiley.
6. Hamilton, J. D. (1994). *Time Series Analysis*. Princeton University Press.

7. Engle, R. F. (2009). *Anticipating Correlations: A New Paradigm for Risk Management*. Princeton University Press.
8. Andersen, T. G., Davis, R. A., Kreiß, J.-P., & Mikosch, T. (Eds.). (2009). *Handbook of Financial Time Series*. Springer.
9. Fan, J., & Yao, Q. (2017). *The Elements of Financial Econometrics*. Cambridge University Press.

Additional Readings (Advanced / Topic-Specific) :

1. Engle, R. F., & Bollerslev, T. (1986–2005). Key papers on ARCH/GARCH, Multivariate GARCH, and DCC models.

2. Diebold, F. X. (2015). *Forecasting in Economics, Business, Finance and Beyond*. University of Pennsylvania (open-source).

3. Campbell, J. Y., Lo, A. W., & MacKinlay, A. C. (1997). *The Econometrics of Financial Markets*. Princeton University Press.

4. Aït-Sahalia, Y., & Jacod, J. (2014). *High-Frequency Financial Econometrics*. Princeton University Press.

5. Härdle, W. K., & Simar, L. (2019). *Applied Multivariate Statistical Analysis*. Springer. (useful for VAR, SVAR, and multivariate extensions).

6. Hastie, T., Tibshirani, R., & Friedman, J. (2009). *The Elements of Statistical Learning* (2nd ed.). Springer.

Course: Applied Predictive Modelling

Type of Course: Major **Code**: 24-ECO-C-454

Semester: VIII (A) **Credits:** 4

I. Introduction to the Course

This course prepares students to gather, describe, and analyze data, and use advanced data analytics and machine learning to make decisions on banking, operations, risk management, finance, marketing, etc. Analysis is done targeting economic and financial decisions in complex systems that involve multiple partners. Broad topics include Data Exploration and Preparation, Prediction and Classification, and Ensemble Methods, Association Rules, Text Analytics, Random Forests

II. Course Objectives

- To learn to apply concepts of data analytics and machine learning that enables businesses, in banking and finance, to effectively interpret big data; essential for competition today.
- To learn not only the principles of data analytics and machine learning, but apply them to achieve real, pragmatic solutions.
- To illustrate each technique with hands-on examples, and include in-depth case studies that apply data analytics and machine learning to common business scenarios.

III. Course Contents

Unit-1: Data Exploration and Preparation

- Data Cleaning, Handling Missing Data, Identifying Misclassifications, Graphical Methods for Identifying Outliers, Measures of Centre and Spread, Data Transformation, Min–Max Normalization, Z-Score Standardization, Decimal Scaling
- Transformations to Achieve Normality, Numerical Methods for Identifying Outliers, Flag Variables, Transforming Categorical Variables into Numerical Variables, Binning Numerical Variables, Reclassifying Categorical Variables
- Adding an Index Field, Removing Variables that are not Useful, Variables that Should Probably not be Removed, Removal of Duplicate Records, A Word About ID Fields, Exploring Categorical Variables, Exploring Numeric Variables, Exploring Multivariate Relationships, Selecting Interesting Subsets of the Data for Further Investigation
- Using EDA to Uncover Anomalous Fields, Binning Based on Predictive Value, Deriving New Variables: Flag Variables, Deriving New Variables: Numerical Variables, Using EDA to Investigate Correlated Predictor Variables

Unit-2: Prediction and Classification

- Linear Regression – Estimation, Multicollinearity, Cross-validation, Model adequacy, Parsimony, Penalty-Based Variable Selection in Regression Models with Many Parameters (LASSO)
- Logistic Regression - Building a Linear Model for Binary Response Data, Interpretation of the Regression Coefficients, Statistical Inference, Classification of New Cases; Binary Classification, Probabilities, and Evaluating Classification Performance
- Naıve Bayesian Analysis - Model for Predicting a Categorical Response from Mostly Categorical Predictor Variables; The k-Nearest Neighbor Algorithm; Decision Trees - Classification and regression trees (CART), model building, pruning; Chi-Square Automatic Interaction Detection (CHAID); Support Vector Machines (SVM)

Unit- 3: Ensemble Methods, Association Rules, Text Analytics, Random Forests

- Rationale for Using an Ensemble of Classification Models - Bias, Variance, and Noise, Bagging, When to Apply, and not to apply Bagging, Boosting; Affinity Analysis and Market Basket Analysis - Support, Confidence, Frequent Item sets, and the A Priori Property, Generating Frequent Item sets, Generating Association Rules, Extension From Flag Data to General Categorical Data,
- Information-Theoretic Approach: Generalized Rule Induction Method; Fundamentals of text data, text mining and sentiment analysis; Random Forests.

IV. References

1. Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst, Dean Abbott, Publisher: Wiley (2014),ISBN - 978-1118727966.
2. Machine Learning with R, the tidyverse, and mlr, Hefin Rhys, Publisher: Manning Publications (2020), ISBN 9781617296574.
3. Data Mining and Predictive Analytics, by Daniel T. Larose and Chantal D. larore: Publisher Wiley (2015), ISBN – 978-81-265-5913-8

Reference Books:

1. Machine Learning (in Python and R) For Dummies, by John Paul Mueller and Luca Massaron; Publisher: Wiley; 1st edition (2016), ISBN-13: 978-8126563050
2. An Introduction to Statistical Learning with Application in R, by Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani; Publisher: Springer (2013); ISBN-13: 978-1461471370
3. Elements of Statistical Learning: Data Mining, Inference, and Prediction, by Trevor Hastie, Robert Tibshirani and Jerome Friedman; Publisher: Springer (2009), ISBN-13: 978-0387848570
4. Data Mining and Business Analytics with R, by Johannes Ledolter; Publisher: Wiley (2013), ISBN-13: 978-1118447147

Course: Agriculture Economics

Type of Course: Minor **Code**: 24-ECO-M-455

Semester: VIII (A) **Credits:** 4

1.Introduction to the Course

This course is designed to for preliminary understanding of principles of Agricultural Economics and its scope to UG students as a minor subject. It also discusses the role of agricultural Economics in Economic Development besides discussing some of the issues affecting Indian Agricultural sector.

II. Course Objectives

- To understand the basic principles of Agricultural Economics
- To understand the nature and scope of Agricultural Economics
- To understand the major issues affecting Indian Agricultural Sector

III. Learning Outcomes

- To be able to appreciate role of Agricultural Economics as a separate Discipline
- It will equip the students with problems and solutions affecting Indian Agriculture

IV. Course Contents

Unit- 1: Introduction

- Definition and scope of Agricultural Economics, Unique features of Agriculture
- Role of Agriculture in Economic Development – Kuznet formulation
- Linkage between Agriculture and Non Agricultural sectors.

Unit- 2: Agricultural Marketing and Price Policy

- Agricultural Marketing, Efficiency criteria of Agricultural Marketing, causes for the inefficiency of Indian Agricultural Marketing
- E-Marketing in agricultural commodities – issues and challenges.
- Agricultural Price Policy, Public Distribution system in India – issues and challenges, Food Corporation of India, Agricultural Costs and Price Commissions.

Unit- 3: Issues in India's Agricultural Development

- Land Tenure system on the eve of independence, land reforms measures – achievements, problems and policy.

- The new agricultural technology and Green Revolution – Rationale, Progress, Problems and Prospects.
- Agricultural credit – Problems and sources, WTO and Indian Agriculture.

V. References

1. T Schultz, Transforming Traditional Agriculture, Yale University Press, 1964
2. Mellor John Wiliams, Economics of Agricultural Development, Cornell University Press, 1966
3. Sadhu and Singh, Agricultural Problems in India, Himalaya, 1979
4. Soni, R.N and Malhotra Sangeeta., Leading Issues in Agricultural Economics, Vikas Publishing House, Thirteenth Edition, 2021
5. Bhaduri A, Economic Structure of Backward Agriculture, Academic Press, 1983
6. Rao, C.H. Hanumantha, Agricultural Economics
7. Swaminathan, M.S., Agriculture Cannot Wait – New Horizons in Indian Agriculture, Academic Foundation, 2007
8. G.S. Bhalla, Indian Agriculture since Independence, National Book Trust, 2007

Semester- VIII(B)

B.A. (Hons./Hons. with Research) Economics

Course: Research Methodology

Type of Course: Major **Code**: 24-ECO-C-450

Semester: VIII (B) **Credits:** 4

I. Introduction to the Course

To conduct the high level research and thesis writing, the basic understanding of Research Methodology at undergraduate level is essential. Therefore, this course is expected to provide an extensive and thorough exposure to research tools in academic and industry research**.** As a result, students are expected to have necessary skills to conduct a scientific research. The main focus will be on demonstrating how scientific research can help understand contemporary social, economic and scientific challenges. How can they use research as a tool for innovation in academic, industrial and policy-making institutions.

II. Course Objectives

- To learn the basic research concepts, approaches and techniques.
- To equip the students with the skills to conduct rigorous and reliable research.
- Students are able to present the research findings for dissertations, thesis and research projects.

III. Learning Outcomes

At the end of this course students should be able to:

- Understand and developed the fundamentals of research and research skills.
- Prepare for academic and professional research.
- Applying research to real-world problems.

IV. Course Contents

Unit-1: Introduction to Research Methodology

- Nature, scope and purpose of social research; What is a scientific research; Types of research: Pure & applied research, Explanatory (Deductive) research, Exploratory(Inductive) research, Historical research, Experimental research, Survey research; Steps of research proposal
- Review of literature: Sources and importance
- Research problem: Identification and formulation of research problem, Conceptualization and operationalization of research problem, Sources of research problem, Criteria of a good research problem
- Research objectives; Research design: Definition, concepts, and types- Exploratory, descriptive and diagnostic; Experimental and analytical research designs.

Unit-2: Data Collection and Processing Types of data

- Time series, Cross sectional, Panel and cohort; Population and sample; Sampling Frame,

- Sampling techniques: Probability and non-probability sampling techniques; Sample Design, Methods of collection of primary data: Direct personal investigation, Indirect oral investigation, Information received through local agents and correspondents, Mailed questionnaire, Observation and focus group discussion; Differences between questionnaire and schedule; Drafting and design of questionnaire; Secondary data: Sources, Limitations of secondary data, Precautions in the use of secondary data
- Hypothesis: Meaning, types and formulation of hypothesis; Types of errors in testing of hypothesis, Level of significance.

Unit-3: Research Writing and Ethics

- Writing of a research report and research ethics editing, Coding, Classification and tabulation of data
- Research report: Meaning and significance; Layout of a research report: Preliminary pages, Main body and end matters
- Principles of writing the research report: Organization and style; Citation and referencing: Footnotes and end notes; Types & style of referencing; Format of appendices and bibliography
- Ethical issues relating to research: Falsification, Fabrication and plagiarism.

V. References

1. Goode, J. Willium & Hatt K. Paul. (1952). Methods of Social Research. McGraw- Hill, New York.
2. Gopal, M.H. (1970). An Introduction to Research Procedures in Social Sciences. Asia Publishing House, Bombay.
3. Gosh, B.N. (1982). Scientific Method and Social Research. Sterling Publishers (P) Ltd.
4. Gupta S.C. & V.K. Kapoor. (1993). Fundamentals of Applied Statistics. S. Chand and Sons.
5. Kothari, C.R. (1988). Research Methodology, Methods and Techniques. Willey Eastern Ltd.
6. Kothari, C.R. (2004). Research Methodology: An Introduction, New Age International (P) Ltd., New Delhi.
7. Lundberg, G. A. (1929). Social research: A study in methods of gathering data. Longmans, green & Co.
8. Nachmias, D., & Nachmias, C. (1981). Research Methods in the Social Sciences. Edward Arnold.
9. Rajaram, V. (1996). Fundamentals of computers. Prentice Hall of India, New Delhi
10. Sadhu, A.N. & Singh, A. (1983). Research Methodology in Social Sciences. Himalaya Publishing House.
11. Thanulingom, N. (2000). Research Methodology. Himalaya Publishing House.
12. Kumar, R. (2008). Research methodology: A step-by-step guide for beginners. Sage Publication.

Course: Agriculture Economics

Type of Course: Minor **Code**: 24-ECO-M-455

Semester: VIII (B) **Credits: 4**

1.Introduction to the Course

This course is designed to for preliminary understanding of principles of Agricultural Economics and its scope to UG students as a minor subject. It also discusses the role of agricultural Economics in Economic Development besides discussing some of the issues affecting Indian Agricultural sector.

II. Course Objectives

- To understand the basic principles of Agricultural Economics
- To understand the nature and scope of Agricultural Economics
- To understand the major issues affecting Indian Agricultural Sector

III. Learning Outcomes

- To be able to appreciate role of Agricultural Economics as a separate Discipline
- It will equip the students with problems and solutions affecting Indian Agriculture

IV. Course Contents

Unit- 1: Introduction

- Definition and scope of Agricultural Economics, Unique features of Agriculture
- Role of Agriculture in Economic Development – Kuznet formulation
- Linkage between Agriculture and Non Agricultural sectors.

Unit- 2: Agricultural Marketing and Price Policy

- Agricultural Marketing, Efficiency criteria of Agricultural Marketing, causes for the inefficiency of Indian Agricultural Marketing
- E-Marketing in agricultural commodities – issues and challenges.
- Agricultural Price Policy, Public Distribution system in India – issues and challenges, Food Corporation of India, Agricultural Costs and Price Commissions.

Unit- 3: Issues in India's Agricultural Development

- Land Tenure system on the eve of independence, land reforms measures – achievements, problems and policy.
- The new agricultural technology and Green Revolution – Rationale, Progress, Problems and Prospects.
- Agricultural credit – Problems and sources, WTO and Indian Agriculture.

V. References

9. T Schultz, Transforming Traditional Agriculture, Yale University Press, 1964
10. Mellor John Wiliams, Economics of Agricultural Development, Cornell University Press, 1966
11. Sadhu and Singh, Agricultural Problems in India, Himalaya, 1979
12. Soni, R.N and Malhotra Sangeeta., Leading Issues in Agricultural Economics, Vikas Publishing House, Thirteenth Edition, 2021
13. Bhaduri A, Economic Structure of Backward Agriculture, Academic Press, 1983
14. Rao, C.H. Hanumantha, Agricultural Economics
15. Swaminathan, M.S., Agriculture Cannot Wait – New Horizons in Indian Agriculture, Academic Foundation, 2007
16. G.S. Bhalla, Indian Agriculture since Independence, National Book Trust, 2007

Course: Internship

Type of Course: Internship **Code:** 24-ECO-I-157/24-ECO-I-258/24-ECO-I-357

Semester: II/IV/VI **Credits:** 4

I. Introduction to the Course

This course has been introduced with the objective of imparting knowledge through experiential learning. Students may have a real-world exposure to the development problems in India and world economy and their possible solutions. This course shall have a short-term research assignment but through hands-on training. In the process students may able to see and take a much closer look at the working of the economy (than what is offered within the confines of the classroom and laboratory).

II. Durations

Minimum 4 Weeks, May to July, only during the summer vacation as per the relevant notification. It is to be completed before exiting the Program but not later than the vacation between sixth and seventh semester.

III. Place of Internship

Government and Non-government Organizations (NGOs), Enterprises, Industry, Corporate, Research and Policy Think Tanks, Development Organizations, International Organizations and Higher Education Institutions (HEIs), et cetera. However, students should inform the Department regarding the place of internship.

IV. Course Objectives

- The students get exposure to the basic understanding of economic activities in the real-world environment.
- Internship provides the opportunities to the students to work in a formal setting.
- To assist students to develop and hone their skillset, such as cognition, communication, conceptualization, problem-solving, decision-making, team-work, and policy makings.

V. Learning Outcomes

- To be able to review, interpret technical report and communicate findings with their peers.
- To formulate and conceptualize a research problem and its execution.
- To gain various research skills, such as, development of models /framework, collect and analyse data, etc.
- To learn the process involved in preparation of reports and its presentation.
- To learn the work and functioning of the organization,
- To be able to learn on adapting to the workplace.

VI. Evaluation

1. At the workplace: By the designated Supervisor (at the place of internship)
   (Annexture 1 Performa attached)

2. At the department: Students will submit the internship report. Viva-voce will be conducted by a faculty panel based on feedback from internship supervisor and internship report submitted by the students to the department. Panel of experts will be nominated by the Head of the Department as per JMI ordinance/rule. Viva voce will be conducted based on following components

   i. Activity logbook and evaluation report of Supervisor
   ii. Format of presentation and the quality of the intern's report
   iii. Acquisition of skillsets by the intern
   iv. Originality and/or innovativeness of intern's contribution
   v. Significance of research outcomes
   vi. Attendance at the workplace

Total Marks	Assessment based on feedback from Internship supervisor/ Agency	Viva-voce
100	40	60

VII. Responsibility of Students:

1. Maintaining the activity logbook with expected regularity.
2. Punctuality and the regularity of attendance at the workplace. For leave (except in case of emergency), to inform the Supervisor at least one day in advance, following the process in place at the workplace.
3. On completion of Internship, preparation of a report, and its submission at the Department for evaluation.
4. Presentation, after completion of internship.

VII. Responsibility of Internship Providing Organization and Internship Supervisor:

1. Providing safe and decent space to intern for work.
2. Appointing a Supervisor (i.e. a staff who will guide, advise and supervise the intern's work).
3. Assigning such works to the intern that are more focused on the working of the Indian economy.
4. Monitoring the regularity of the intern.
5. Issuing of a completion certificate at the end of the internship and an evaluation report based on the efforts and outcome of work carried out by the intern.

Annexture- I: Performa for Internship Assessment

Department of Economics, Jamia Millia Islamia, New Delhi

B.A.(Hons.) Economics Student's Performance Assessment for Internship

(Confidential & to be mailed to Head of the Department, Economics, JMI
Email: economics@jmi.ac.in**)**

1. Internship Organization: :
   Name:
   Address:

2. Reporting Officer:
   Name:
   Designation:
   Phone No & e-mail:

3. Name of the student/intern:

4. Date of Reporting for internship:

5. Date of relieving from internship:

6. Performance review of intern (Please tick your response for a, b, c, d, e, f and 7):

   a. Regularity in attending to the task assigned: (Excellent/Good/Average/Below Average)
   b. Process adopted for completion of tasks assigned: (Excellent/Good/Average/Below Average)
   c. Demonstrated skills of task accomplishment: (Excellent/Good/Average/Below Average)
   d. Critical aptitude of the student: (Excellent/Good/Average/Below Average)
   e. Originality and/or innovativeness of intern's contribution: (Excellent/Good/Average/Below Average)
   f. Attitude and behaviour of the student: (Excellent/Good/Average/Below Average)

7. Overall Performance of the intern: (Excellent/Good/Average/Below Average)

8. Feedback and Suggestions for Department of Economics, JMI regarding internship arrangement:

Course: Vocational Course

Type of Course: Vocational Course **Code:** 24-ECO-I-157/24-ECO-I-258/24-ECO-I-357

Semester: II/IV/VI **Credits:** 4