

**SRI VENKATESWARA UNIVERSITY-TIRUPATI-517502**



**DEPARTMENT OF ECONOMETRICS**  
**S.V.U.COLLEGE OF ARTS::TIRUPATI**  
**Restructured syllabus of 2024-25**

**S.V. UNIVERSITY, TIRUPATI  
SVUCOLLEGE OF ARTS**

**DEPARTMENT OF ECONOMETRICS**

**Re-Structured P.G. Programme (CBCS) as per NEP 2020,  
National Higher Education Qualification Frame Work (NHEQF) and  
Guidelines of APSCHE**

**(With effect from the batch of Students admitted from the academic year 2024-25)**

**M.A. ECONOMETRICS**

<b>SEMESTER - I</b>								
S. No	Course	Code	Title of the Course	H/W	C	SEE	IA	Total Marks
1	*CC	EMT 101	Micro Economic Theory -I	6	4	70	30	100
2		EMT 102	Macro Economic Theory -I	6	4	70	30	100
3		EMT 103	Applied Econometrics					
3		EMT 104	Mathematical Methods					
		EMT 105	Environmental Economics	6	4	70	30	100
4	*SOC	EMT 106	Statistical Methods-1(A) Or Soft Skills Development and Communication- 1(B)	6	4	70	30	100
5		EMT 107	Basic Econometrics 2(A) Or Digital Marketing 2(B)	6	4	70	30	100
			<b>Total</b>	<b>36</b>	<b>20</b>	<b>350</b>	<b>150</b>	<b>500</b>
6	Audit Course	EMT 108	Entrepreneurship and Skill Development -1	6	0	0	100	0

- \*CC (Core Courses) - Student can choose any Three out of Five Core Courses
- \*SOC (Skill Oriented Courses) – Student can choose one from each code
- Audit Course – Zero Credits but mandatory with only a Pass

<b>SEMESTER - II</b>								
S. No	Course	Code	Title of the Course	H/W	C	SEE	IA	Total Marks
1	*CC	EMT 201	Micro Economic Theory -II	6	4	70	30	100
2		EMT 202	Macro Economic Theory -II	6	4	70	30	100
3		EMT 203	Introduction to Econometrics					
3		EMT 204	Public Finance					
		EMT 205	Data Base for Indian Economy	6	4	70	30	100
4	*SOC	EMT 206	Computer Application and Data Analysis - 3(A) Or Actuarial Statistics -3(B)	6	4	70	30	100
5		EMT 207	Advanced Econometrics -4(A) Or Introduction to Information Technology-4(B)	6	4	70	30	100
6	*OOTC	EMT 208	Open Online Transdisciplinary Course - 1	-	2	-	100	100
			<b>Total</b>	<b>36</b>	<b>22</b>	<b>350</b>	<b>250</b>	<b>600</b>
7	Audit Course	EMT 209	Economics of Tourism -2	6	0	0	100	0

- \*CC (Core Courses) - Student can choose any Three out of Five core courses
- \*SOC (Skill Oriented Courses) – Student can choose one from each code
- \*OOTC (Open Online Transdisciplinary Course) - Students can choose any relevant course of his / her choice from the online courses offered by governmental agencies like SWAYAM, NPTEL, etc.,
- Audit Course – Zero Credits but mandatory with only a Pass

SEMESTER - III								
S. No	Course	Code	Title of the Course	H/W	C	SEE	IA	Total Marks
1	*CC	EMT 301	Time Series Econometrics	6	4	70	30	100
2		EMT 302	Indian Economy					
3		EMT 303	Mathematical Economics	6	4	70	30	100
		EMT 304	International Trade and Finance					
		EMT 305	Economics of Development and Planning					
4	*SOC	EMT 306	Optimization Techniques in Economics-5(A) Or Managing Innovation-5(B)	6	4	70	30	100
5		EMT 307	Financial Institutions and Markets-6(A) Or Research Methodology and Data Analysis-6(B)					
6	*OOTC	EMT 308	Open Online Transdisciplinary Course - 2	-	2	-	100	100
*	Seminar / Tutorials / Remedial Classes and Quiz as part of Internal Assessment			6	-	-	-	-
<b>Total</b>				<b>36</b>	<b>22</b>	<b>350</b>	<b>250</b>	<b>600</b>

- **\*CC (Core Courses) - Student can choose any Three out of Five core courses**
- **\*SOC (Skill Oriented Courses) – Student can choose one from each code**
- **\*OOTC (Open Online Transdisciplinary Course) - Students can choose any relevant course of his / her choice from the online courses offered by governmental agencies like SWAYAM, NPTEL, etc.,**

SEMESTER - IV								
S. No	Course	Code	Title of the Course	H/W	C	SEE	IA	Total Marks
1	OOSDC	EMT 401	Open Online Skill Development Courses	-	8	-	200	200
2	PW	EMT 402	Project Work (A-Desertion-200; B-Seminar -50; C-Vivo-Voice-50)	24	12	300	0	300
*	Conducting classes for competitive exams, communication skills, UGC / CSIR and NET / SLET examinations			12	-	-	-	-
<b>Total</b>				<b>36</b>	<b>20</b>	<b>300</b>	<b>200</b>	<b>500</b>
<b>Total Semesters</b>				<b>144</b>	<b>84</b>	<b>1350</b>	<b>850</b>	<b>2200</b>

- **Open Online Skill Development Course (OOSDC) - Students can choose any Two relevant courses of his / her choice from the online courses offered by governmental agencies like SWAYAM, NPTEL, etc., to get 8 credits (with 4 credits from each course)**

## **VISION**

The vision is to promote the publication of high-quality research works in the fields of Economic Theory, Econometrics, and Quantitative Economics more generally. Publications may range from more or less extensive accounts of the state of the art in a field to which the authors have made significant contributions, to shorter monographs representing important advances on more specific issues. In addition to the usual promotion by the Publisher in their advertising and displays at conferences, it also arranges for members of the Econometric Society to receive monographs at a special discount. In the same way as for papers submitted to Econometrics. Our experience shows that this procedure generates quite valuable services to the authors. Referee reports are usually very professional, and contain detailed and specific suggestions on how to improve the manuscript. Such services, which are not normally offered by private publishing companies, are among the features that distinguish the Monograph Series of the Society from others.

## **MISSION**

The department mission is to The Master of Arts programme in Econometrics has been designed with the objective to develop in-depth knowledge of students in frontier areas of economic theory and quantitative methods, so that they are able to use the knowledge to study real world economic problems. The course has a strong focus on theoretical and quantitative skills and train students in the collection and analysis of the data using their software skills. The programme offers specialized optional courses, which allow student to pursue their studies in their area of interest. The students are required to submit report and present their findings of field-study. Besides, to hone the student's writing and analytical skills they are required to submit a term paper on current economic problem. Thus, the Masters in Econometrics programme seek to: Supportive environment for all students.

## **PROGRAMOBJECTIVE**

The basic objectives of our M.A Econometrics degree program. The department's research mission is to develop an environment conducive to promoting high-quality applied research. Applied research is work that informs policy at the global, national or local level, or that is useful in the conduct of business, or the administration of government or non-profit activities.

- To provide our students with appropriate analytical skills to lay the groundwork for lifelong learning;
- To enable our students to become policy-literate and thus be more informed as citizens;

- To encourage the use of experiential learning, including cooperative education, as a means to introduce students to the world of work, reinforce classroom teaching, and assist in the development and advancement of career goals;
- To prepare our students for successful careers as applied economists;
- Prepare students to develop own thinking /opinion regarding current national or international policies and issues;
- Create awareness to become a rational and an enlightened citizen so that they can take the responsibility to spread the Governments initiatives/schemes to the rural areas for the upliftment of the poor or vulnerable section of the society for inclusive growth;
- Motivating the learners to conduct investigations of multifaceted problems by applying research-based knowledge and different types of research methods including conducting of user studies and case studies in libraries, analysis and interpretation of data and synthesis of the information to get right solutions to the problems; and
- Inspiring the learners to learn ICT skills, Retrieval of various Electronic Resources

PO No	Programme outcomes
PO1	<b>Knowledge of Economic System:</b> Ability to understand economic theories and functioning of basic microeconomic and macroeconomic systems. Prepare students to develop own thinking /opinion regarding current national or international policies and issues.
PO2	<b>Statistical and Mathematical Skills:</b> Acquaint with collection, organization, tabulation and analysis of empirical data
PO3	<b>Econometric Applications:</b> Acquaint with basic and applied econometric tools and methods used in economics. The aim of this course is to provide a foundation in applied econometric analysis and develop skills required for empirical research in economics. It also covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models.
PO4	<b>Development Perspective:</b> Delineate the developmental policies designed for developed and developing economics. The course also acquaint with the measurement of development with the help of theories along with the conceptual issues of poverty and inequalities.
PO5	<b>Environmental Strategy and management:</b> This course emphasis on environmental problems emerging from economic development. Economic principles are applied to valuation of environmental quality, quantification of environmental damages, tools of evaluation of environmental projects such as cost-benefit analysis and environmental impact assessments.

PO6	<b>Perspectives on Indian Economy:</b> Acquaint with basic issues of Indian economy and learn the basic concept of monetary analysis and financial marketing in Indian financial markets.
PO7	<b>Develop critical thinking:</b> Prepare students to develop critical thinking to carry out investigation about various socio-economic issues objectively while bridging the gap between theory and practice.
PO8	<b>Acquire Practical Knowledge:</b> Practical exercises done will enable students to analyze and interpret data and also to draw valid conclusions. This will enable students to face real time applications.
PO9	<b>Testing of Hypothesis:</b> Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate results and draw reasonable conclusions thereof.
PO10	<b>Application in Real Life Problems:</b> Apply the concepts of statistics, Operations Research, Probability theory, Time Series, Designs of Experiment, etc. in real life problems. Perform, Assess and implement practical techniques and procedure to solve and understand the problems and analyze and quantify data collected during any project.
PO11	<b>Employment through Entrepreneurship:</b> Prepare students for pursuing research or careers that provide employment through entrepreneurship and innovative methods. Because today's unemployment problem can also be solved by developing the micro and small entrepreneurship.
PO12	<b>Create awareness:</b> create awareness to become a rational and an enlightened citizen so that they can take the responsibility to spread the governments' initiatives/schemes to the rural areas for the upliftment of the poor or vulnerable section of the society for inclusive growth.

## PROGRAM EDUCATIONAL OBJECTIVE

- Understanding the basic assumptions in various econometric analysis, economic theories and enhance capabilities of developing ideas based on them
- Prepare and motivate students for research studies in Econometrics models especially by developing questionnaire, collecting primary data through field surveys
- Provide knowledge of a wide range of econometric techniques using excel or other statistical software
- Motivate students to extract or utilize different websites for secondary data collection, generating concepts for various facets of econometrics studies and gather latest information provided by various Universities, UGC, or ICSSR
- Motivate students in preparing for various competitive examinations, NET, SET, Indian Economic Service etc., by developing or gaining value addition day by day by giving assignments, by following a routine or developing discipline / concentration etc

**SEMESTER – I**  
**Core Course**  
**EMT 101: MICRO ECONOMIC THEORY – I**

---

**Course Objectives:**

The objective of this course is to provide the basic knowledge of decision making, production of products, different market structure and pricing structure of the firms with the study of the subject in a Master's programme.

**Course Outcomes:** At the end of the course, the student will be able to:

- The microeconomic theory is to analyse how individual decision-makers, both consumers and producers, behave in a variety of economic environments;
- The common goal in all of these issues is to identify the incentives of the various participating agents and the trade-offs that they face;
- Microeconomics is a branch of economics that studies the behaviour of individuals and firms in making decisions regarding the allocation of scarce resources and the interactions among these individuals and firms;
- Microeconomics shows conditions under which free markets lead to desirable allocations; and
- The fundamental concepts of supply and demand, rational choice, efficiency, opportunity costs, incentives, production, profits, competition, monopoly, externalities, and public goods will help you to understand the world around you.

**Unit 1: Theory of Individual Decision Making**

Theory of Demand - Consumer equilibrium under Indifference Curve Analysis – Applications of Indifference Curves - Slutsky Theorem – Revealed Preference Hypothesis - Choice under Uncertainty- Recent Developments in the Theory of Market Demand.

**Unit 2: Theory of Production and Cost**

Concepts of Production Function – Homogeneous Production Function - Least Cost Combinations of Factors – Cobb-Douglas and CES Production Functions – Frontier Production Function - Properties - Laws of Returns to Scale - Theory of Cost – Traditional and Modern theories of Cost.

**Unit 3: Traditional Market Structures**

Perfect Competition - Equilibrium, Short Run and Long Run considerations, Efficiency and Welfare – Monopoly – Price and output determination - Price Discrimination - Welfare and Output.

**Unit 4: Modern Theories of Market**

Monopolistic competition – Collusive and Non- Collusive Oligopoly: Cournot, Bertrand Stackelberg models - Nash equilibrium - Kinked Demand curve and Price Leadership models.

**Unit 5: Limit Pricing and Managerial Theories of Firm**

Bain's Limit Pricing: Recent developments – Sylos-Labini and Franco Modigliani Models - Baumol's Sales Maximization: Static single product model with and without advertisements- Marris model of Managerial Enterprise.

**TEXT AND REFERENCE BOOKS:**

- 1) J.M. Henderson and R.E. Quandt (2003) Micro-economic Theory: A Mathematical Approach, Tata McGraw Hill publishing company Ltd.
- 2) Hal R. Varian (1995), Intermediate Micro-econometrics: A Modern Approach, East West Press.
- 3) A. Deaton and J. Muellbauer (1987) Economics and Consumer Behaviour, Cambridge University Press.
- 4) A. Koutsoyiannis, (1979), Modern Micro-economics, London: Macmillan.

**Core Course**  
**EMT 102: MACRO ECONOMIC THEORY-I**

---

**Course Objectives:**

The objective of this course is to provide the basic knowledge of the study of the aggregate economy. The primary goals of macroeconomics are to achieve stable economic growth and maximize the standard of living. The basic concepts in macroeconomics and the concepts of National Income, measurement of National Income and factors determining national income and problems in Estimation of National Income. The theory of Employment, consumption Function, investment Multiplier and Accelerator, IS-LM model with Government sector, Monetary and Fiscal Policies and effect of IS and LM curves; Kinds of investment and determinations of investment; the monetary policy and fiscal policy are tools used by the government to control economic performance and reach macroeconomic goals.

**Course Outcomes:** At the end of the course, the student will be able to:

- At the end of the programme, the students will the goal of macroeconomics is to analyse the concepts and measurement of National Income, factors determining national income and problems in Estimation of National Income;
- The theory of Employment, consumption Function, investment Multiplier and Accelerator, IS-LM model with Government sector, Monetary and Fiscal Policies and effect of IS and LM curves; Kinds of investment and determinations of investment; the monetary policy and fiscal policy are tools used by the government to control economic performance and reach macroeconomic goals;
- Microeconomics is a branch of economics that studies the behaviour of individuals and firms in making decisions regarding the allocation of scarce resources and the interactions among these individuals and firms;
- The overarching goals of macroeconomics are to maximize the standard of living and achieve stable economic growth; and
- The goals are supported by objectives such as minimizing unemployment, increasing productivity, controlling inflation, and more. The macro economy of a country is affected by many forces, and as such, economic indicators are invaluable to assessing different aspects of performance.

**Unit 1: Macro-Economics**

Micro and Macroeconomics - Basic Concepts in Macroeconomics – Stocks and Flows - Statics, Comparative statistics and Dynamics – Micro Foundations of Macroeconomics – Circular flow of National income.

**Unit 2: National Income**

Definition – Concepts of National Income – Measurement of National Income – Factors determining National income – National Income and Social Accounting - Methods of Estimation – Problems in Estimation of National Income – National Income and Economic Welfare.

**Unit 3: Classical and Keynesian Economics**

Classical Theory of Employment – Critique of Classical Theory – Basic Keynesian Model – Consumption Function – Investment Multiplier – Accelerator – Interaction between Multiplier and Accelerator - Integration of Monetary theory and Value theory – Don Patinkin theory – The Real Balance Effect – Pigou Effect.



**Unit 4: Neo-Classical and Keynesian Synthesis**

The IS-LM model – Extension of IS & LM model with government sector – Relative effectiveness of Monetary and Fiscal Policies –Shifts in IS and LM curves.

**Unit 5: Savings & Investment**

Kinds of investment – Determinations of investment - Investment demand and Output growth – Marginal Efficiency of Capital – Tobin's 'Q' Theory – Lags in Investment demand.

**TEXT AND REFERENCE BOOKS:**

- 1) Edward Shapiro, Macroeconomic Analysis, Galgotia Publications, New Delhi.
- 2) Keynes, J.M. 1936, General theory of Employment, Interest and Money.
- 3) Gardener Ackley, 1978, Macro-economic Theory - Theory and policy, Macmillan, New Delhi.

**Core Course**  
**EMT 103: APPLIED ECONOMETRICS**

---

The main aim of the Applied Econometrics, problem solving through the application of appropriate economic theories, principles, and the econometric analysis of data. Ability to synthesize ideas, theories and data in developing solutions to economics problems. Ethical approaches to research and practice.

**Course Objectives**

The objective of this course is to provide the basic knowledge of an advanced theoretical understanding of consumer behaviour and decision-making. To develop a theoretical understanding of strategic behaviour of economic agents.

- The course discovers demand analysis; demand functions (single equation), Engel Functions and curves.
- The course covered Consumer analysis and production analysis which is more important in economic ground.
- This course can explore Macro econometric models; Klein-Goldberger Model for USA, Agarwal, K. Krishna Murthy and N.V. A. Narasimhan Models.
- This course covered Applications of Single and Simultaneous Equation Models; Models of Money Demand and Supply, Application in Industrial Organization, Labour Economics and Health Systems.

**Unit 1: Demand Analysis**

Demand functions – Restrictions to be satisfied by Demand functions - Single Equation models, Engel Functions and Curves, Specification of Functional forms and Estimation – Linear Expenditure System - Review of Empirical Studies.

**Unit 2: Consumption Function**

Theories of Consumption Function – Alternative specifications – Absolute Income Hypothesis, Relative Income Hypothesis, Life Cycle Hypothesis, Permanent Income Hypothesis – Problems of Estimating the Consumption Function – Review of some empirical studies.

**Unit 3: Production Functions**

Single Equation Estimation of production functions - Cobb-Douglas, CES, Translog – Specifications and Estimation issues – Review of Empirical studies – Functional forms and Estimation of Cost Functions - Estimation of Factor demand Equations - Empirical Studies.

**Unit 4: Macro Econometric Models**

Nature of Simultaneous Macro Econometric Models – Klein-Goldberger Model for USA - Brookings Model – Macro Econometric models for India – Agarwal, K. Krishna Murthy and N.V. A. Narasimhan Models.

**Unit 5: Other Applications of Single and Simultaneous Equation Models**

Models of Money Demand and Supply – Estimation of Demand for Money Function – Application in Industrial Organization, Labour Economics and Health Systems – Review of Empirical Studies.

**TEXT AND REFERENCE BOOKS:**

- 1) Intriligator, M. D. (1978) Econometric Models, Techniques and Applications, North-Holland.
- 2) ICSSR Survey of Economics – Vol.7 (Econometrics) Allied Publishers
- 3) Deaton A. and John Muellbauer, Economics and Consumer Behaviour –Cambridge University Press, 1987
- 4) Killingsworth Mark R.- Labour Supply, Cambridge University Press 1985
- 5) MeghnadJ.Desai 1973 – Macro-economic models for India: A Survey – Sankhyaseries-B 85 – PP 169-205

**Core Course**  
**EMT104: MATHEMATICAL METHODS**

---

Mathematical economics is a method of economics that utilizes math principles and tools to create economic theories and to investigate economic quandaries. Mathematics permits economists to construct precisely defined models from which exact conclusions can be derived with mathematical logic, which can then be tested using statistical data and used to make quantifiable predictions about future economic activity.

**Course Objectives**

The M.A in Econometrics includes two courses in basic mathematics one in each semester of I and II semester. This is the first of these two courses. The course is designed to build the mathematical foundations of the students by equipping them with basic mathematical methods that are essential for learning and working with economic theories and models. This course also introduces the Mathematical tools such as Basic Algebra, Sets operations, functions which is more important in economic functional relations, differential equations and Matrices and Determinants.

**Learning Outcomes**

**After successfully completing the course the graduate is able to:**

Formulate mathematical models describing the dynamics of economic systems solve independently primary analytical tasks based on non-trivial econometric analysis of underlying data use with erudition advanced econometric tools and techniques for processing relevant data assess critically the adequacy of using econometric and statistical tools and techniques in economy and other scientific disciplines.

**Unit 1: Basic Concepts and Set Theory**

Exponents – Polynomials – Factorization of Equations — Sets - Meaning, Definition, Types of sets, set operations – Ordered Sets – Linear Point Sets - Cartesian product – Relation – Functions.

**Unit 2: Functions and Limits**

Functions - Type of Functions – Increasing and Decreasing – Implicit and Explicit – Constant, Linear, Quadratic, Logarithmic and Exponential functions – Graphical Representations of Functions – Economic Applications of Functions - Limits: Concepts of a Limit of a Function – Theorems on Limits of Functions – Evaluations of Limits in Simple Cases – Limits and Continuity of Functions.

**Unit 3: Differential Calculus and Economic Applications (One Variable)**

Differential Calculus: Meaning – Process of Differentiation – Rules of Differentiation – Differentiation of Logarithmic and Exponential Functions – Higher Order Derivatives – Maximum and Minimum Points – Points of Inflection - Economic Applications: Marginal concepts, Price and cross Elasticity of demand – Relationship among Total, Marginal, Average concepts – Optimizing Economic functions.

**Unit 4: Integration and Economic Applications**

Concept of an Indefinite Integral – Standard Integral Formula – Rules of Integration – Methods of integration – Concept of a Definite Integral – Area under a Curve – Fundamental theorem of Calculus – Properties of Definite Integral – Area between Curves; Economic Applications: Total Functions from Marginal Function – Consumer's and Producer's Surplus.

**Unit 5: Matrices and Determinants**

Matrices: Concept of a Matrix – Types of Matrices – Matrix Operations – Determinants: Properties of Determinants – Minors and Co-Factors – Evaluation of Determinants of Second and Third Order - Inverse of a Matrix – Solutions of Simultaneous Linear Equations involving two or three Variables by Matrix Inverse Method and Cramer's Rule – Characteristic roots and equations – Concept of a Quadratic form – Rank of a Matrix – Concept of g-inverse and c- inverse.

### **TEXT AND REFERENCE BOOKS:**

- 1) Allen, RGD : Mathematical Analysis for Economists
- 2) Mehta, BC and Madanani GMK: Mathematics for Economists, Sultan Chand and Sons, Delhi
- 3) Taro Yamane: Mathematics for Economists (An Elementary Survey), Prentice Hall of India Private Ltd, New Delhi
- 4) Alpha C. Chang: Fundamental Methods for Mathematical Economics
- 5) Barry Bressler: A Unified introduction of Mathematical Economics.
- 6) Dowing, Edward T: Introduction to Mathematical Economics, (2/ed.), Schaum's Outlines, Mc. Graw Hill, 1980
- 7) Bose, D : An Introduction to Mathematical Economics, Himalaya Publishing Company, Delhi.

**Core Course**  
**EMT105: ENVIRONMENTAL ECONOMICS**

---

The main objective of environmental economics is to maintain a balance between economic development and environmental quality. In order to achieve it, environmental economists have to explore the various socio-economic possibilities to reduce pollution and uplift the standard of living of the people. Environmental economics is a distinct branch of economics that acknowledges the value of both the environment and economic activity and makes choices based on those values. The goal is to balance the economic activity and the environmental impacts by taking into account all the costs and benefits.

Environmental economics was a major influence on the theories of natural capitalism and environmental finance, which could be said to be two sub-branches of environmental economics concerned with resource conservation in production, and the value of biodiversity to humans, respectively. The main objective of environmental economics is to maintain a balance between economic development and environmental quality. In order to achieve it, environmental economists have to explore the various socio-economic possibilities to reduce pollution and uplift the standard of living of the people.

**Course Objectives**

The objective is to develop a good understanding of market failure and externalities, Pareto efficiency, maximum social welfare and perfect competition, measures to control pollution and externalities, Pigouvian tax and subsidies, Compensation criterion, social choice and justice, property rights and Coase theorem. Environmental economics will help you understand some important and controversial issues – such as climate change policy, nuclear power, recycling policy, and traffic congestion charging. This is an exciting field of economics to study, and very much at the heart of many public debates and controversies. The objective of this course is to provide the basic knowledge of Nature and Scope of Environmental Economics, Environmental Degradation and Resource Depletion, Sources and Effects of Pollution, Environmental Principles and Policies and Environmental Laws and Management Strategies, with the study of the subject in a Master's programme

**Unit 1: Nature and Scope of Environmental Economics**

Nature and Scope of Environmental Economics – Economic Growth and Environmental degradation – Environmental Kuznets Curve - Limits to Economic Growth - Sustainable Development – Environmental Quality and Economic Development.

**Unit 2: Environmental Degradation and Resource Depletion**

Natural Resources – Renewable and Non-renewable Resources – Approaches to the use of Natural Resources – Theories of Natural Resources - Depletion of Natural Resources – Tragedy of Commons – Causes of Environmental Degradation.

**Unit 3: Sources and Effects of Pollution**

Sources and Types of Pollution – Soil, Air, Water Pollution - Industrialization and Environmental Pollution – Urban Solid-waste and other sources of Pollution – Aqua Culture, Coastal and Marine Pollution - Economic Effects of Pollution.

**Unit 4: Environmental Principles and Policies**

Environmental Regulation and Control of Pollution – Polluter Pays Principle - Hedonic Pricing Principle – Pigovian Analysis of taxes and Subsidies - Pollution Permits – Environmental Institutions - Environmental Policy – Objectives – National Environmental Policy of 2006 - Pollution Control Policies in India.

### **Unit 5: Environmental Laws and Management Strategies**

Environmental Laws and Regulations – The Air Act, The Water Act, The Environmental Protection Act, The Wildlife Protection Act in India - Environment Management Strategies – Development of Clean Production Technologies - Forest Conservation, Management and Conservation of Common Property Resources and Environmental Education – Social Forestry – Community Participation.

#### **TEXT AND REFERENCE BOOKS:**

- 1) Bhattacharya, R.N. (Ed), 2001, Environmental Economics; An Indian Perspective, Oxford University press, New Delhi.
- 2) Sankar,U. (Ed), 2001, Environmental Economics, Oxford University press, New Delhi.
- 3) Baumol, W.J. and W.E. Oates, 1998, the theory of Environmental policy, (2<sup>nd</sup> Edition), Cambridge University press, Cambridge.
- 4) Anil Kumar, 1990 Environmental Protection and Industrial Development, Ashish Publishing House, New Delhi;
- 5) Mussen, A.M. 1999, Principles of Environmental Economics, Rutledge, London
- 6) Kolstad, C.D., 1999, Environmental Economics, Oxford University press, Baltimore.
- 7) Sengupta, R.P.2001, Ecology and Economics: An approach to sustainable development, Oxford University press, New Delhi.

**Skill Oriented Course - 1**  
**EMT 106(A): STATISTICAL METHODS**

---

The Statistical Methods in Economics study programme offers students a superior knowledge of the primary quantitative tools and techniques used in economics and a very good knowledge of current trends of microeconomic and macroeconomic modeling. Attention is also paid to the development of skills in data mining and other advanced applied statistics techniques.

**Course Objectives**

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. The main objectives of this study programme are to cultivate the analytical skills that can be used to solve complex analytical tasks based on a non-trivial statistical analysis of the underlying data. To solve the tasks of formulating and estimating economic models using statistical methods. This course covers the underlying of descriptive statistics, Probability, Sampling methods, Correlation and Regression Analysis and Testing of Hypothesis.

**Learning Outcomes**

After successfully completing the course the graduate is able to:

After completing this course student can formulate Statistical Methods describing the dynamics of economic systems such as production function analysis and solve econometric analysis of underlying data use with knowledge advanced econometric tools and techniques can solve easily.

**Unit 1: Basics:**

Measures of Central Tendency – Measures of Dispersion – Coefficient of Variation, Skewness and Kurtosis – Numerical problems.

**Unit 2: Probability and Distributions:**

Probability: Concept of Probability – Axioms of Probability – Addition and Multiplication theorems – Bayes's Theorem - Distributions: Random Variables – Distribution Function – Probability Density Function - Mathematical Expectation – Binomial, Poisson, Normal and Lognormal distributions – Mean and Variance - Chief characteristics of Normal Distribution.

**Unit 3: Estimation and Testing of Hypothesis:**

Estimation: Introduction – Point and Interval Estimation - Estimators and their Properties: Consistency, Unbiasedness, Efficiency and Sufficiency - Method of estimation – Method of Least Squares and Method of Maximum Likelihood. Tests of Hypothesis: Statistical Hypothesis – Critical Region – Best Critical region – The Most Powerful Test - Types of errors - Large sample tests for means and proportions - Small sample tests based on t, F and Chi-square distributions.

**Unit 4: Sampling Theory:**

Need for sampling – Census Vs. Sampling - Types of sampling – Simple random sampling – Stratified random sampling – Systematic sampling – Two Stage sampling.

**Unit 5: Correlation and Regression:**

Simple Correlation – Computation – Properties - Rank Correlation - Regression Lines - Numerical problems – Concept of Partial and Multiple Correlations.

**References**

- 1) S.C. Gupta and V.K. Kapoor: Elements of Mathematical Statistics.
- 2) Wonnacott & Wonnacott: Introduction to Statistical Methods.
- 3) Alexander M.Mood, Franklin A. Graybill and Duance C. Boes: Introduction to the Theory of Statistics. Third Edition. McGraw-hill Statistics Series, 1988.
- 4) S.P. Gupta: Introduction to Statistical Methods.
- 5) S.P. Gupta: Elements of Statistics.

**Skill Oriented Course - 1**  
**EMT 106(B): SOFT SKILLS DEVELOPMENT AND COMMUNICATION**

---

**Objectives**

Aims to increase learner's computer knowledge and unique soft skills so as to develop attributes that enhance an individual's interactions, earning power and job performance. The objective of the programme is to inculcate potential skills in the learners to prepare them to deal with the external world in a collaborative manner, communicate effectively, take initiative, solve problems, and demonstrate a positive work ethic so as to hold a good impression and positive impact. Develop effective communication skills (spoken and written). Develop effective presentation skills. Conduct effective business correspondence and prepare business reports which produce results. Become self-confident individuals by mastering interpersonal skills, team management skills, and leadership skills.

- To make the students confident of speaking in English impeccably and with utmost enthusiasm;
- To familiarize the students with different styles of communication;
- To enlighten the students with the seven concepts of communication;
- To make the students understand the nuances of communication; and
- To train the students and make them comprehend various aspects of Interview skills.

**Course Outcomes:** At the end of the course, the student will be able to:

- Effectively communicate through verbal/oral communication and improve the listening skills;
- Write precise briefs or reports and technical documents;
- Actively participate in group discussion / meetings / interviews and prepare & deliver presentations; Become more effective individual through goal/target setting, self-motivation and practicing creative thinking;
- Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.

**Learning Outcomes**

- Develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others;
- Understand and practice different techniques of communication;
- Practice and adhere to the 7Cs of Communication;
- Familiarize with different types of Communication. 5. Understand and practice Interview Etiquettes.



## **Unit-1:**

### **Concepts of Development and Communications**

Definition, Objectives of development and Communication- Self-Development and Self-Assessment, Self-Awareness, Perception and Attitudes, Values and Belief System, Personal Goal Setting, Career Planning, Self-Esteem, Building of Self-Confidence- Characteristics of Communication, Process of Communication, Forms of communication, Roles of a Manager, Effectiveness in Managerial Communication, Role of Verbal & Non-verbal Symbols in communication, Forms of Non-verbal Communication, Interpreting Non-verbal messages, Tips for effective use of non-verbal Communication.

## **Unit-2:**

### **Communications and Listening Spoken Communication**

Components of communication, Principles of communication barriers, listening skills, Listening and observation skills, Anatomy of poor Listening, Features of a Good Listener, Types of Listening skills, Strategies, Barriers to effective Listening, Verbal Communication, Planning, Preparation, Delivery and Assessment of activities like Oral Presentation, Planning presentation, Delivering presentation, Developing & displaying visual aids, Handling questions from the audience, Public speaking, Group Discussion, Oral Presentation skills, Perfect Interview, Body language.

## **Unit-3:**

### **Group Discussion, Interviews and Meetings**

Methodology of Group, Role and Functions of Group Discussions, Form of Group, Characteristics of Effective Groups, Group Decision Making, Group Conflict, Types of Non-functional Behaviour, Fundamental principles of Interviewing, Types of Interviewing Questions, Important Non-Verbal Aspects, Types of Interviews, Style of Interviewing, mock Interviews, Introduction, Greetings and Art of Conversation, Dressing and Grooming, Norms of Business Dressing, Ways and Means of conducting meeting effectively, Planning a Meeting, Meeting Process, How to Lead Effective Meeting, Evaluating Meeting, Writing Agenda and Minutes of meetings, Web Conferencing.

## **Unit-4:**

### **Forms of Communication in Written Mode and Job Application & Resumes**

Written Communication, Basic Principles, Tips for effective writing, Planning steps for effective writing, Kinds of Business Letters, Writing Business Reports (Short & Long), Technical Reports, Project Proposals, Brochures, Newsletters, Technical Articles, Technical Manuals, Official/Business Correspondence, Business letters, Memos, Progress report, Minutes of meeting, Event reporting, Use of style, Grammar and Vocabulary for effective technical writing, Use of Tools, Guidelines for technical writing and Publishing. Sales letters, Job application Letters, Writing Effective Memos, Format and Principles of writing Memos, Identifying potential career opportunities, Planning a Targeted Resume, Preparing Resumes, Supplementing a Resume, Composing Application Messages.

## **Unit-5:**

### **Skills and Writing E-mail, Business Reports**

Managing time, Meditation, Understanding roles of manager and their Responsibility, Exposure to work environment, Improving Personal Memory, Study skills that include Rapid reading, Notes taking, Complex problem solving, creativity, Use of Presentation graphics, Use of Presentation aids, Study of Communication, Effective E-mail, E-mail Etiquettes, Writing Business Reports and Proposals, Purpose of Business Reports, Parts of Report, Format of Business Proposals, Practice for Writing Business Reports, Practical work Analysis, Project presentations.

## References

- 1) Aruna Koneru, Professional Communication Tata McGraw-Hill
- 2) Asha Kaul, Business Communication, Prentice Hall of India
- 3) Basic business Communication, Raymond V. Lesikar & M. E. Flatley, TMH
- 4) Bovee, Thill & Schatzman, Business Communication Today, Prentice Hall
- 5) Jenny Rogers, Effective Interviews, Video Arts Marshal
- 6) John Collin, Perfect Presentation, Video Arts Marshal
- 7) Keith Davis, Organizational Behavior, Tata McGraw-Hill, New Delhi.
- 8) Kitty Locker & Kaczmarek, Business Communication, Building Critical Skills, McGraw-Hill Company.
- 9) Lehman, Cengage, Business Communication, TMH.
- 10) Meenakshi Raman and Prakash Singh, Business Communication, Oxford University Press.
- 11) Monipally, Business Communication Strategies, TMH.
- 12) Murphy, Hildebrandt & Thomas, Effective Business Communication, TMH
- 13) R.Sharma,K.Mohan,, Business Correspondence& Report Writing, TAG McGraw Hill.
- 14) Raman Sharma, Technical Communications, Oxford Press.
- 15) Robert Heller, Effective leadership, Essential Manager series D K, Publishing House, Mumbai.
- 16) Sharon Gerson, Steven Gerson, Technical Writing Process And Product, Pearson, Education Asia, LPE.
- 17) Sheila Cameron, Business student Handbook, Pitman Publishing House, Mumbai.
- 18) Shiv Khera, You Can Win, Macmillan Books, New Delhi.
- 19) Stephen Covey, 7 Habits of Highly effective people, Free Press, Mumbai.
- 20) Tim Hindle, Reducing Stress, Essential Manager Series DK, Publishing, New Delhi.

**Skill Oriented Course - 2**  
**EMT 107(A): BASIC ECONOMETRICS**

---

**Course Objectives:** This course is designed to define Econometrics, Steps in Empirical Economic Analysis, Different types of data involved in econometric Analysis. The courses involved Simple and Multiple Linear regression model and Functional forms of Non-Linear Regression models. Basic concept of Auto regressive distributed lag model (ARDL) developed which will be helpful for future research work with time series data.

- Adequate competency in the frontier areas of economic theory and methods;
- Formulation and estimation of a multiple regression model;
- Decision about the statistical significance of individual explanatory variable and also over all models;
- Impacts for the violation of one of the important assumptions for application of OLS regression; and
- Estimation of system of equations, estimation of panel data models, generalized method of moments, discrete response models, censored regression models and estimation of average treatment effects.

**Unit 1: Nature of Econometrics and Economic Data**

Definition of Econometrics – Steps in Empirical Economic Analysis - Econometric Model – The Role of Measurement in Economics – The Structure of Economic Data: Cross-Sectional data, Time Series data, Pooled Cross Section data, Panel Data.

**Unit 2: Simple Regression Model**

Two Variable Linear Regression Model: Assumptions, Estimation of Parameters, Tests of Significance and Properties of Estimators – Functional forms of Regression models – Log-linear models, Semi log- models and Reciprocal models – Choice of Functional Form.

**Unit 3: The General Linear Model**

Review of Assumptions, Estimation and Properties of Estimators: Un-biasness, BLUEs and Tests of significance of estimates – Analysis of Variance - Dummy variables - Nature of Dummy variables – Use of Dummy Variables – Errors in Variables and its consequences.

**Unit 4: Auto-regressive and Distributed Lag Models**

Introduction – Types of Lag schemes - Koyck's lag model, Almon's Lag scheme, Partial Adjustment and Expectations models - Causality in Economics – The Granger Causality Test.

**Unit 5: Simultaneous Equation Models**

Specification – Simultaneous Bias – Inconsistency of OLS Estimators - The concept of Identification, Rank and Order conditions for Identification – Indirect Least Squares - Two stage Least Squares (without proof), Problems.

**TEXT AND REFERENCE BOOKS:**

- 1) Johnston, J: Econometric Methods, McGraw-Hill Book Co., New York.
- 2) Maddala, G.S: Econometrics, McGraw-Hill Book Co., New York, 3<sup>rd</sup> Ed.
- 3) Gujarathi, D.N: Basic Econometrics, Fourth Edition, Tata McGraw-Hill, New Delhi.
- 4) Tintner, G: Econometrics, John Wiley & Sons, New York.
- 5) Wooldridge, Jeffery M: Econometrics, Cengage Learning India Pvt. Ltd, New Delhi.

**Skill Oriented Course - 2**  
**EMT 107(B): DIGITAL MARKETING**

---

**Course Objectives:**

This course aims to familiarize students with the concept of digital marketing and its current and future evolutions. It further aims to be able to equip students with the ability to understand and subsequently create strategic and targeted campaigns using digital media tools. This is an initiative designed to educate students in the area of Digital Marketing. Digital Marketing and Social Media have transformed marketing and business practice across the globe. This course provides an understanding of the ever evolving digital landscape and examines the strategic role of digital marketing processes and tools in designing the overall Marketing strategy and the Digital Marketing Plan. It explores the challenges of Interactive media, the online market place, and the creative challenges of communicating and retention strategies of customers through these media, the main search engines and the future trends in digital marketing.

**Course Outcomes:-**

At the end of this course, students would be able to:

- Understand the concept of digital marketing and its real-world iterations;
- Articulate innovative insights of digital marketing enabling a competitive edge;
- Understand how to create and run digital media based campaigns; Identify and utilise various tools such as social media etc.;
- Understand the concept of digital marketing and its integration of traditional marketing;
- Understand behaviour of online consumers;
- Create digital media campaigns through an understanding of e-mail, content and social media marketing;
- Examine search engine optimisation tactics to enhance a website's position and ranking; and
- Leverage digital strategies to gain competitive advantage for business and career.

**Unit-1:**

Fundamentals of Digital marketing & Its Significance, Traditional marketing Vs Digital Marketing, Evolution of Digital Marketing, Digital Marketing Landscape, Key Drivers, Digital Consumer & Communities, Gen Y & Netizen's expectation & influence wrt Digital Marketing, The Digital users in India, Digital marketing Strategy- Consumer Decision journey, POEM Framework, Segmenting & Customizing messages, Digital advertising Market in India, Skills in Digital Marketing, Digital marketing Plan.

**Unit-2:**

Terminology used in Digital Marketing, PPC and online marketing through social media, Social Media Marketing, SEO techniques, Keyword advertising, Google web-master and analytics overview, Affiliate Marketing, Email Marketing, Mobile Marketing , Display adverting, Buying Models, different type of ad tools, Display advertising terminology, types of display ads, different ad formats, Ad placement techniques, Important ad terminology, Programmatic Digital Advertising.

**Unit-3:**

Fundamentals of Social Media Marketing & its significance, Necessity of Social media Marketing, Building a Successful strategy: Goal Setting, Implementation, Facebook Marketing: Facebook for Business, Facebook Insight, Different types of Ad formats, Setting up Facebook Advertising Account, Facebook audience & types, Designing Facebook Advertising campaigns, Facebook Avatar, Apps, Live, Hashtags, LinkedIn Marketing: Importance of LinkedIn presence, LinkedIn Strategy, Content Strategy, LinkedIn analysis, Targeting, Ad Campaign, Twitter Marketing:- Basics, Building a content strategy, Twitter usage, Twitter Ads, Twitter ad campaigns, Twitter Analytics, Twitter Tools and tips for managers. Instagram & Snapchat basics.

**Unit-4:**

Advertising & its importance, Digital Advertising, Different Digital Advertisement, Performance of Digital Advertising:- Process & players, Display Advertising Media, Digital metrics, Buying Models- CPC, CPM, CPL, CPA, fixed Cost/Sponsorship, Targeting:- Contextual targeting, remarking, Demographics, Geographic & Language Targeting., Display advertising, different type of ad tools, Display advertising terminology, types of display ads, different ad formats, Ad placement techniques, Important ad terminology, ROI measurement techniques, AdWords & AdSense, YouTube Advertising:- YouTube Channels, YouTube Ads, Type of Videos, Buying Models, Targeting & optimization, Designing & monitoring Video Campaigns, Display campaigns, Website Planning & Development- Website,

**Unit-5:**

Types of Websites, Phases of website development, Keywords: Selection process, Domain & Web Hosting:- Domain, Types of Domain, Where to Buy Domain, Webhosting, How to buy Webhosting, Building Website using Word press-What is Word press, CMS, Post and Page, Word press Plug-ins- Different Plug-ins, social media Plug-ins, page builder plug-ins: the elementor, how to insert a section, how to insert logo, Google Micro sites,

**References**

- 1) Digital Marketing –Kamat and Kamat-Himalaya
- 2) Marketing Strategies for Engaging the Digital Generation, D. Ryan,
- 3) Digital Marketing, V. Ahuja, Oxford University Press
- 4) Digital Marketing, S.Gupta, McGraw-Hill
- 5) Quick win Digital Marketing,
- 6) H. Annmarie, A. Joanna, Paperback edition

**Audit Course**  
**Indian Knowledge System - 1**  
**EMT 108: ENTREPRENEURSHIP AND SKILL DEVELOPMENT-1**

---

**Course Objectives:** To make students develop and can systematically apply an entrepreneurial way of thinking to import knowledge on organizations for Skill Development. Development of communication skills and skill development.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Entrepreneurship and skill development course outcome study of concepts, functions and types of entrepreneurship;
- To familiar the student with the basic concepts function and type of entrepreneurs;
- Women entrepreneurship and economic development. Role of national and state level organizations in the development of entrepreneurship;
- Provide orientation on identification and to assess the feasibility of the project; and
- To make students develop and can systematically apply an entrepreneurial way of thinking.

**Unit I: Entrepreneurship**

Concepts of Entrepreneurship - Functions and Types of Entrepreneurs - Motivation and Competency – Entrepreneurship - Women Entrepreneurship and Economic Development.

**Unit II: Organizations For Entrepreneurship Development**

Programmes for the Development of Entrepreneurship - National and State Level Organizations - Entrepreneurship Development Institute of India (EDII) - National Institute for Entrepreneurship and Small Business Development (NIESBUD) - National Science and Technology Entrepreneurship Development Board (NSTEDB) - National Institute of Small Industry Extension and Training (NISIET).

**Unit III: Identification And Preparation Of Project Report**

Identification of Project – Objectives of Project – Methods and Contents of Project Report – Formulation and Appraisal of Project Report.

**Unit IV: Development Of Skills**

Need for the Development of Skills –Communication Skills – Verbal and Non-Verbal Communication – Barriers to Communication – Individual Interaction Skills – Basic Interaction Skills - Leadership Skills - Working Individually and as a Team - Personality Development – Intra and Inter-personal Communication Skills.

**Unit V: Organizations For Skill Development**

Skill Development Mission – PM’s National Council on Skill Development – National Skill Development Coordination Board – National Skill Development Corporation – SIKSHAM- National Skill Foundation of India(NSFI) – Skill Development Initiative (SDI) - KaushalVikasYojana (KVY) – AP State Skill Development Board.

## REFERENCES:

- 1) Kent G. A, 1982, Encyclopedia of Entrepreneurship, Prentice Hall, USA
- 2) Markcassion, 2000, Enterprise and Leadership, Edward Elgar., UK
- 3) Michael and et al, 1998, Educating Entrepreneurs for Wealth creation, Aghgate Publisher, Hampshire, U.K.
- 4) Patel V.G., 1987, Entrepreneurial Development Programmes in India and its relevance to Developing Countries, World Bank.
- 5) Samuddin, 1990, Entrepreneurial Development in India, Mittal Publications, New Delhi.
- 6) Stenenson et al, 1986, Importance of Entrepreneurship and Economic Development.
- 7) Rajiv K Misra, Personality Development, Rupa & Co.
- 8) Govt. of India (2012) XI Plan Document.
- 9) Govt. of India (2014) Economic Summary.
- 10) M. Gangadhar Rao. et al, 1993, Industrial Economy Part-I, Kanishka Publishing House, New Delhi.
- 11) Katar Singh, 1994, Rural Development Principles, Policies and Management, Sage Publication India, New Delhi.
- 12) Development Commissioner: Annual Reports, Small Scale Industries, New Delhi.
- 13) UDAI PAREEK and T. Venkateswara Rao, Developing Entrepreneurship - A Hand Book Learning Systems, New Delhi.
- 14) Deshpande, M.U., Entrepreneurship of Small Scale Industries, Deep and Deep Publications, New Delhi.
- 15) D.L. Narayana, 1972, Entrepreneurship and Economic Development, Madurai University Press, Madurai.

**SEMESTER - II**  
**Core Course**  
**EMT 201: MICRO ECONOMIC THEORY – II**

---

**Course Objectives:-** The microeconomic theory is to analyse how individual decision-makers, both consumers and producers, behave in a variety of economic environments. The factor prices are land, labour, capital and organization, determination of factor prices, pricing of factors; Ricardian theory of Rent, wage determination under perfect competition, classical theory of interest, theories of Profit; static and dynamic equilibrium, Walrasian System of General Equilibrium, Existence and Stability of General Equilibrium, externalities and Allocative Efficiency; Adam Smith, Bentham, Pigou, Kaldor-Hicks Compensation Criteria. The Fundamental concepts of supply and demand, rational choice, efficiency, opportunity costs, incentives, production, profits, competition, monopoly, externalities, and public goods will help you to understand the world around you.

- Demonstrate the meaning and function of money, high powered money, monetary and paper system, illustrate various version of quantity theory of money;
- Identify types of banks, explain the meaning and function of commercial banks, illustrate how banks create credit, and suggest the instruments to control credit;
- Analyse different phases of trade cycle, demonstrate various trade cycle theories, understand the impact of cyclical fluctuation on the growth of business, and lay policies to control trade cycle;
- Illustrate the meaning of inflation, deflation, stagflation and reflation, identify different kinds of inflation, causes and effects of inflation on different sectors of the economy, describe different measures to control inflation and
- Criteria of Social Welfare – Adam Smith, Bentham, Pigou, and Cardinal school – Pareto Optimality in Consumption, Production and Distribution – Kaldor-Hicks Compensation Criteria- Bergson Social Welfare Function - Social Choice Theory, Coase and Sen.

**Unit 1: Factor Markets**

Factor Pricing: Marginal Productivity Theory of determination of Factor prices - Factor shares and the 'Adding up' problem - Euler's theorem - Pricing of factors under Imperfect Competition.

**Unit 2: Functional Distribution**

Theories of Rent: Concept of Rent – Ricardian theory of Rent – Quasi Rent, Theories of Wages: Wage determination under Perfect competition, Monopsony and Collective bargaining (Bilateral Monopoly), Theories of Interest: Classical theory of interest – Loanable fund theory – Keynes liquidity preference theory of interest, Theories of Profit: Profit as dynamic surplus – innovations and profits – risk uncertainty and profits

**Unit 3: Economics of Information**

Basic Concepts of Economics of Information - Economic Value of information - Role of information in Economic theory – Information, a measure of risk - Bayes' Rule - Classical Paradoxes - Choice under Risk - Risk Allocation in Exchange Economies Model - Monopolist Insurer - Perfect Competition - Adverse Selection - Monopolistic Screening, Competition and Market Breakdown - Public Intervention - Brief introduction to Game theoretic approach to information use.



#### **Unit 4: General Equilibrium**

Meaning of Partial and General Equilibrium – Static and Dynamic Equilibrium – Stable and Unstable Equilibrium –Walrasian System of General Equilibrium - Existence and Stability of General Equilibrium - Externalities and Allocative Efficiency.

#### **Unit 5: Welfare Economics**

Welfare Economics – Criteria of Social Welfare – Adam Smith, Bentham, Pigou, and Cardinal school – Pareto Optimality in Consumption, Production and Distribution – Kaldor-Hicks Compensation Criteria- Bergson Social Welfare Function - Social Choice Theory, Coase and Sen.

#### **TEXT AND REFERENCE BOOKS:**

- 1) J.M. Henderson and R.E. Quandt (2003) Microeconomic Theory: A Mathematical Approach, Tata McGraw Hill publishing company Ltd.
- 2) Hal R. Varian(1995), Intermediate Micro economics: A Modern Approach, East West Press.
- 3) A. Deaton and J. Muellbauer(1987) Economics and Consumer Behaviour, Cambridge University Press.
- 4) A. Koutsoyiannis, (1979), Modern Microeconomics, London: Macmillan.
- 5) Macho-Stadler, I and D. PerezCastrillo (1997): "An Introduction to the Economics of Information", Oxford University Press.
- 6) J. Hirshleifer and J. Riley (1992): "The Analytics of Uncertainty and Information", Cambridge University Press
- 7) J.-J. Laffont (1989): "The Economics of Uncertainty and Information", MIT Press
- 8) L. Philips (1988): "The Economics of Imperfect Information", Cambridge University Press
- 9) T. Van Zandt (2006): "Introduction to the Economics of Uncertainty and Information"
- 10) K. Binmore (2011): "Rational Decisions", Princeton University Press
- 11) M. Osborne: "An Introduction to Game Theory", Oxford University Press.

\*\*\*\*\*

**Core Course**  
**EMT 202: MACRO ECONOMIC THEORY – II**

---

**Course Objectives:**

Macroeconomics refers to the study of the overall performance of the economy. While microeconomics studies how individual people make decisions, macroeconomics deals with the overall aggregate effect of microeconomics. Macroeconomics is crucial for the government to understand and predict the long-term consequences of their decisions. The overarching goals of macroeconomics are to maximize the standard of living and achieve stable economic growth. The goals are supported by objectives such as minimizing unemployment, increasing productivity, controlling inflation, and more. The objectives are Full employment. Price stability. A high, but sustainable, rate of economic growth. Keeping the balance of payments in equilibrium.

- The overarching goals of macroeconomics are to maximize the standard of living and achieve stable economic growth;
- The goals are supported by objectives such as minimizing unemployment, increasing productivity, controlling inflation, and more;
- The macro economy of a country is affected by many forces, and as such, economic indicators are invaluable to assessing different aspects of performance;
- Meaning and Types of Inflation – Demand-Pull inflation – Cost-Push Inflation – The Phillips curve – The Inflation – Unemployment trade-off;
- Objectives of Macroeconomic policies – Objectives of Monetary policy. New-classical and Real Business cycles Theorem – Post-Keynesians - Implications for Stabilization Policies.

**Unit 1: Demand for and Supply of Money**

The Classical View- Neo-classical view-Quantity Theory of Money – Keynes and the Demand for Money - Post Keynesian theories of demand for money - Baumol , James Tobin and Friedman – Concept of Money Supply – Components of Money Supply – RBI approach to Money supply – High Power Money and Money Multiplier – Determinants of Supply of Money.

**Unit – 2: Macro Theories of Distribution**

Functional Versus Personal Distribution of Income – Micro Vs Macro-theories of Distribution - Marxian, Ricardian, Kelecki Theories of Distribution - Alternate theories of distribution – Kaldor.

**Unit 3: Trade Cycles**

Meaning and Types of Trade Cycles – Different theories of Trade Cycles – Samuelson's Model of Trade Cycle – Hicks' Theory Cycle – Kaldor's Model of Trade Cycle – Control of Business Cycle – Monetary and Fiscal Policies.

**Unit 4: Theories of Inflation**

Meaning and Types of Inflation – Demand-Pull inflation – Cost-Push Inflation – The Phillips curve – The Inflation – Unemployment trade-off - The Monetarists Acceleration Hypothesis – Rational Expectations Hypothesis – New-classical and Real Business cycles Theorem – Post-Keynesians - Implications for Stabilization Policies.

**Unit 5: Macroeconomic policies**

Objectives of Macroeconomic policies – Objectives of Monetary policy – The policy of Activists arguments – The policy of Non-activists arguments - Fiscal policy – objectives and tools - Automatic stabilizers – Problems of using of Fiscal policies – Effectiveness of Monetary and Fiscal policies –The concept of Open Economy macroeconomics.

**TEXT AND REFERENCE BOOKS:**

- 1) Ackley, G. Macroeconomic theory, Macmillan
- 2) Edward Shapiro, Macroeconomic Analysis, 5<sup>th</sup> edition, New-Delhi Galgotia publications.
- 3) Branson, W.B., Macro Economic Theory and Policy.
- 4) Gupta, S.B., 1983, Monetary Economics, Chand and Co.
- 5) Hicks, J.R., Mr. Keynes and the Classicals; A suggested Interpretation, Econometrics,
- 6) Laidler, D.E.W., Demand for money.
- 7) Friedman, M. (ed), The quantity theory of money – A Restatement of studies in the quantity theory of money.
- 8) Patinkin, Don., Money, Interest and Prices.
- 9) Rosalind Levacic and Alexander Rebthann, 1982, Macroeconomics; The English Language Book Society and Macmillan.
- 10) Rongar L. Miller and Robert Pulsinelli, Macroeconomics.

**Core Course**  
**EMT203: INTRODUCTION TO ECONOMETRICS**

---

**Ragnar Frisch**, along with Jan Tinbergen, pioneered development of mathematical formulations of economics. He coined the term econometrics for studies in which he used statistical methods to describe economic systems. Econometrics is the use of statistical methods using quantitative data to develop theories or test existing hypotheses in economics or finance. Econometrics relies on techniques such as regression models and null hypothesis testing. Econometrics can also be used to try to forecast future economic or financial trends. By taking this introduction to econometrics you will gain an overview of what econometrics is about, and develop some “intuition” about how economic things work.

### **Course Objectives**

The objective of this course is to provide the basic knowledge of econometrics that is essential equipment for any serious economist or social scientist, to a level where the participant would be competent to continue with the study of the subject in a Master’s programme.

- This course is designed to define Econometrics, steps in Empirical Economic Analysis, Different types of data involved in econometric Analysis.
- The courses involved Simple and Multiple Linear regression model and Functional forms of Non-Linear Regression models.
- Basic concept of Auto regressive distributed lag model (ARDL) developed which will be helpful for future research work with time series data.

### **Learning Outcomes**

After successfully completing the course Introduction to Econometrics the graduate is able to: At the end of the programme, the students will have adequate competency in the frontier areas of economic theory and methods. Formulation and estimation of a multiple regression model. Decision about the statistical significance of individual explanatory variable and also over all models. Impacts for the violation of one of the important assumptions for application of OLS regression. The students will acquire additional specialization topics are estimation of system of equations, estimation of panel data models, generalized method of moments, discrete response models, censored regression models and estimation of average treatment effects.

### **Unit 1: Nature of Econometrics and Economic Data**

Definition of Econometrics – Steps in Empirical Economic Analysis - Econometric Model – The Role of Measurement in Economics – The Structure of Economic Data: Cross-Sectional data, Time Series data, Pooled Cross Section data, Panel Data.

### **Unit 2: Simple Regression Model**

Two Variable Linear Regression Model: Assumptions, Estimation of Parameters, Tests of Significance and Properties of Estimators – Functional forms of Regression models – Log-linear models, Semi log- models and Reciprocal models – Choice of Functional Form.

### **Unit 3: The General Linear Model**

Review of Assumptions, Estimation and Properties of Estimators: Un-biasness, BLUEs and Tests of significance of estimates – Analysis of Variance - **Dummy variables** - Nature of Dummy variables – Use of Dummy Variables – Errors in Variables and its consequences.

#### **Unit 4: Auto-regressive and Distributed Lag Models**

Introduction – Types of Lag schemes - Koyck's lag model, Almon's Lag scheme, Partial Adjustment and Expectations models - Causality in Economics – The Granger Causality Test.

#### **Unit 5: Simultaneous Equation Models**

Specification – Simultaneous Bias – Inconsistency of OLS Estimators - The concept of Identification, Rank and Order conditions for Identification – Indirect Least Squares - Two stage Least Squares (without proof), Problems.

#### **TEXT AND REFERENCE BOOKS:**

1. Johnston, J: Econometric Methods, McGraw-Hill Book Co., New York.
2. Maddala, G.S: Econometrics, McGraw-Hill Book Co., New York, 3<sup>rd</sup> Ed.
3. Gujarathi, D.N: Basic Econometrics, Fourth Edition, Tata McGraw-Hill, New Delhi.
4. Tintner, G: Econometrics, John Wiley & Sons, New York.
5. Wooldridge, Jeffery M: Econometrics, Cengage Learning India Pvt. Ltd, New Delhi.

**Core Course**  
**EMT 204: PUBLIC FINANCE**

---

The objectives of public finance are achieved by managing and drafting policies pertaining to key areas such as taxation, management of public revenue and expenditure, raising and servicing public debt, fiscal administration at various levels. Public Finance deals with the financial activities of government concerning revenue, expenditure and debt operations and their effects on the economy. It tries to analyze the impacts of these financial activities of government on individuals and corporate bodies.

**Course Objectives**

The objective of this course is to provide the basic knowledge of public finance and relationship with other Sciences, principles of public finance; difference between Public and Private Expenditure, reasons for growth of Public Expenditure, effects of Public Expenditure, controls and accountability of Public expenditure in India; sources of Public Revenue, principle of public revenue, characteristics of Good Tax system in India, taxable Capacity, classification of Public Debt, causes of public debt - public debt Management and public Debt in India; and budgetary deficit and Fiscal deficit, functions of Finance Commission.

**Unit 1: Scope and Structure of Public Finance**

Nature, Scope and Importance of Public Finance - Public Finance and relationship with other Sciences - Distinction between Public and Private Finance - Principles of Public Finance-Principle of Opportunity Cost in Public Finance - Theory of Public Goods and Merit Goods - Role of Public Finance in Developing Economies and Underdeveloped Countries.

**Unit 2: Public Expenditure**

Introduction - Difference between Public and Private Expenditure - Reasons for growth of Public Expenditure - Classification and Canons of Public Expenditure - Effects of Public Expenditure - Wagner's Law of Increasing State Activities - Peacock and Wiseman Hypothesis - Controls and Accountability of Public expenditure in India

**Unit 3: Public Revenue and Taxation**

Sources of Public Revenue - Classification of Public Revenue - Principle of Public Revenue - Effects and significance of Public Revenue - Characteristics of Good Tax system in India - Canon of Taxation - Classification of Taxation - Benefit (Modern) theories of Taxation - Ability to Pay Theory - Taxable Capacity - Value Added Taxation(VAT)and GST Principle and Issues – Indian Tax Structure – Incidence and Effects of Taxation.

**Unit 4: Public Debt**

Classification of Public Debt - Causes of Public Debt - Objectives of Public Debt - Effects of Public Debt - Burden of Public Debt - Public debt Management - Public Debt in India.

**Unit 5: Budget and Federal Fiscal Systems**

Introduction –Definitions of Primary deficit, Revenue deficit, Budgetary deficit and Fiscal deficit - Budget classification - Zero Base Budgeting - Fiscal Deficit and Budgetary Deficit in India – FRBM -Centre-State Financial relations in India –Functions of Finance Commission - Recommendations of 13<sup>th</sup>and14<sup>th</sup> Finance Commissions.

**Text and Reference Books:**

- 1) B.P.Tyagi, Public Finance, Jai Prakash& Company, Meerut, 2008.
- 2) Bhargava .R.N, the Theory and Practice of Union Finance in India, Chaitanya Publishers, Allahabad, 1998.
- 3) Dalton.H, Principle of Public Finance, Allied Publishers, Bombay, 1992.
- 4) Dwevedi.P.N, Reading in Indian Public Finance, Chanakya Publications, New Delhi, 2006.
- 5) Lakadawala.D.T, Union State Financial Relations, Lalwani Publishers House, Mumbai, 1986.
- 6) Mathew.T, Tax Policy, Some Aspects of Theory and Policy, Chanakya Publications, New Delhi, 2001.
- 7) Mundle.Sudipto.(ed), Public Finance, Policy Issues for India, Oxford University, Press, 1999.
- 8) Musgave.R.A, The Theory of Public Finance- A Study of Public Finance, McGraw hill company, Tokyo, 1999.
- 9) R.K.Lekhi, Public Finance, Kalyani Publishers, New Delhi, 2007.

**Core Course**  
**EMT 205: DATA BASE FOR INDIAN ECONOMY**

---

**Course Objectives:** The main objective of this course is data warehouse of the Department of Statistics and Information Management (DSIM), under the Reserve Bank of India. The entire statistics have been presented in seven subject areas - Real Sector, Corporate Sector, Financial Sector, Financial Market, External Sector, Public Finance, Socio-Economic Indicators. The new website launched by the Reserve Bank of India on macroeconomic indicators of the Indian economy, is aimed at providing useful and relevant information to researchers, analysts and general users. It includes significant data on the financial and real sectors, markets, and public and corporate finance.

**Course Outcomes:** At the end of the course, the student will be able to

- Develop ideas of the basic characteristics of Indian economy, its potential on natural resources;
- Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development;
- Students can able to describe the knowledge or skills students should acquire by the end of a particular assignment, class, course, or program, and help students understand why that knowledge and those skills will be useful to them;
- Creating new knowledge (Cognitive) Developing feelings and emotions (Affective) Enhancing physical and manual skills (Psychomotor); and
- Students can also be scarf folded so that they continue to push student learning to new levels in any of these three categories.

**Unit 1:** Census – Demographic Indicators – Definitions – schedules – Dissemination – Database – Types – Other data sets from Census – Economic census – Education census – Agricultural census – Major Results of Recent Census Data in India.

**Unit 2:** National Income Accounting – Base year – Methods of Estimation – Types of Reporting – Balance of Payments (BOP) and National Income (NI) – State Domestic Product – District Domestic Product - District Census Handbooks.

**Unit 3:** NSSO – Large and Small samples – NSSO Rounds on Consumption Expenditure, Employment and Unemployment Status in India – Major Findings of Recent NSS reports on Poverty, Inequality and Unemployment – Annual Survey of Industries (ASI) – Coverage – Definition of Terms – price and wage statistics Major Findings of Recent reports – Socio-economic statistics – National Family Health Survey (NFHS) – Health and Morbidity Data.

**Unit 4:** RBI – Balance sheet approach – Financial and Banking statistics – Money supply Indicators and Statistics on Money Supply in India – Foreign Exchange Reserves – Exchange rate – Stock Market Statistics – Non-banking Financial Institutions data.

**Unit 5:** Govt. and International data – Ministry of Commerce Data on Exports and Imports – Data in Annual Economic Surveys from the Ministry of Finance - Data from World bank, IMF, ILO, WTO, UNCTAD, UN and other international agencies – Specific data bases such as World Value Surveys – Penn World Tables - Gallop Poll.

**Books for Reference:**

- 1) Websites and reports of respective ministries and organizations, like Directorate of Census Operations, CSO, NSSO, GOI, SEBI, RBI.
- 2) Reports of Statistics Departments in State Governments.
- 3) Reports of UN Organizations.
- 4) Annual Economic Surveys, Ministry of Finance, Government of India.
- 5) <http://www.commerce.nic.in/eidb/iecnttopn.asp>



**Skill Oriented Course - 3**  
**EMT 206(A): COMPUTER APPLICATION AND DATA ANALYSIS**

---

**Course Objectives:** The objective of the course is to provide knowledge on Econometric tools and their applications on Economic theory and practice using statistical packages like STATA, SPSS, R, e-views etc.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Students will get basic knowledge of computers i.e., block diagram, evolution of computer, input/output devices, storing information in computer etc.
- At the end of this course student will gain Examine spreadsheet concepts and explore the Microsoft Office Excel environment. Import and export data;
- Work with pivot tables and charts. Create and edit charts. Learn to use functions and formulas. Perform analysis tasks using Data analysis pack;
- Student gained and evaluate Econometric Methods such as OLS, LPM, Logistic regression analyses and conclude using SPSS Package; and
- Finally, student will be able to write programme for Simple statistical analyse and interpret through R-programming.

**Unit 1: Computer Fundamentals**

Definition - Components of a computer-block diagram – Evolution of computer – Generations – input/output devices – storing information in computer – types of computers – Hardware and Software – Compilers and Assemblers – Low level and high-level languages – Operating systems and the graphic user interface – Microsoft Windows operating system.

**Unit 2: MS-WORD**

Creating, opening and saving files - editing and formatting text - spell and grammar check – auto correct- hyphenation – creating of tables and columns - mail merge - equation editor – concept of a macro - print preview.

**Unit 3: MS-EXCEL**

Work sheet – entering data – creation of worksheets and workbooks – opening and saving workbooks - editing and formatting - sorting, filtering and pivot tables - Creating graphs and charts - mathematical and statistical functions -Data analysis pack in Excel - Descriptive statistics, tests of hypothesis, ANOVA, Correlation and Regression, Random Number Generation.

**Unit 4:Data Handling Using SPSS**

Opening Excel files in SPSS - Variables, labels and values, Analysis tools - Descriptive statistics - Selection of variables in multiple linear regression - Stepwise, forward and backward procedures - Factor analysis and Discriminant analysis (Stress on procedures and syntax only).

**Unit 5: Data Analysis using R**

**R environment** – Workspace, Getting help, Packages and Built-in data - Assigning values, performing vectorized arithmetic - Creating objects, vectors, lists, matrices, arrays and data frames - Conditional selection, sorting and indexing data frames, implicit looping - Importing data - Branching and looping statements - plotting data – Bar plots, Pie charts, Histogram, Box plots - Summary statistics - Generating samples from discrete and continuous distributions - Simple correlation and regression - Testing hypothesis of mean and variance, Analysis of variance.

### **TEXT AND REFERENCE BOOKS:**

- 1) Shelly and Hunt, Computers and Common Sense, Prentice Hall of India, New Delhi.
- 2) Rajaraman V, Fundamentals of Computers, Prentice Hall of India, New Delhi.
- 3) Peter Dalgaard (2008): Introductory Statistics with R, 2<sup>nd</sup> Edition, Springer, New York.
- 4) Peter Norton's Introduction to computers, Tata McGraw Hill Publishing Co., New York.
- 5) Foster,J.J.(2001), Data Analyzing using SPSS For Windows 8.0 – 10.0, A Beginner's Guide.
- 6) M. Crawley, Basic Statistics: An Introduction using R.
- 7) B.S. Everitt& T. Hothorn, A Handbook of Statistical Analyses Using R (2nd Ed.).
- 8) J. Maindonald & J. Braun, Data Analysis and Graphics Using R: An Example-based.
- 9) Approach.
- 10) P. Murrell, R Graphics (2nd Ed.).

**Skill Oriented Course - 3**  
**EMT 206(B): ACTUARIAL STATISTICS**

---

**Course Objectives:** The objective of the course is to provide knowledge on Actuarial Statistics. Actuarial analysis is an essential task performed by insurance companies to analyze data and estimate the probability of an insurance claim being filed for a given event. This work allows insurance companies to predict with areas on able degree of accuracy the amount of claims they will pay out, which helps them determine what premiums they must charge to remain profitable.

**Course Outcomes:-** At the end of the course, the student will be able to:

- To learn and gain the knowledge about the impact of economic and social conditions in the financial sector;
- To create awareness about the financial terminology and calculations in the policy designing;
- To skill development and honed by successful actuaries include an excellent business communications in sense with knowledge of finance, accounting, and economics;
- Actuaries often required keen analytical and problem solving skills using mathematics and statistics; and
- Actuaries can ability to work with reliability and relevance by using the analytical and scientific reports generated by the researchers.

**Unit -1** Theory of Interest rates, Rate of Interest, Nominal rate of interest. Accumulation factors. Force of interest, present values, Stoodley formula for the force of interest, Present value of cash flows, Valuing cash flows - Basic Annuities Certain, Present values and accumulation, Concepts of different annuities, Continuously payable annuities, Varying annuities.

**Unit- 2** Utility Theory, Insurance and Utility Theory, Models for individual claims and their sums, Approximations for the distribution of the sum - Application to Insurance - Survival function, time until death for a person age  $X$ , Accurate future Life time, Force of Mortality.

**Unit-3** Life Table and its Relation with Survival Function – Examples - The Deterministic Survivorship group, Recursion formulas, Assumptions for traditional ages, Analytical Laws of Mortality, Select and Ultimate tables.

**Unit – 4** Life Insurance: Insurance payable at the moment of death and at the end of the year of death – Level benefit insurance, Endowment insurance, Deferred insurance and Varying benefit insurance. Life Annuities. Single payment, Continuous Life annuities, discrete life Annuities - life annuities with monthly payments, Complete annuities – Immediate and Apportion able annuities – due.

**Unit 5** Multiple life functions, Joint life and Last Survivor status, Insurance and Annuity benefits through multiple life function, Evolution for Special Mortality laws - Multiple decrement models, associated single decrement tables, Central of multiple decrement, Central force assumptions for multiple decrements. Uniform distribution assumption for multiple decrements.

**TEXT AND REFERENCE BOOKS:**

- 1) Bowes, N.L., Gerber, H.U., Hickman, J.C, Jones, D.A., and nesbitt, C., J .(1986). Actuarial Mathematics. Society of Actuaries, Lthaca, Illins, U/S.A. 2<sup>nd</sup>ed(1997) C.H.1,2,3,4,5,9&10.
- 2) McCutchheon, J.J. and Scott, W.F., An introduction to Mathematics of finance.
- 3) Spurgeoin,E.T .(1972). Life Contingencies. Cambridge University Press.
- 4) Nall, A (1977), Life Contingencies. Heinemann.

**Skill Oriented Course - 4**  
**EMT 207(A): ADVANCED ECONOMETRICS**

---

**Course Objectives:** The objective of this course to provide students with a knowledge of the core techniques of econometric analysis which forms the basis for the understanding and critical assessment of published work in empirical econometrics. To develop the analytical skills required to demonstrate theoretical asymptotic properties of different econometric estimation and testing procedures under weakened modeling assumptions..

**Course Outcomes:-** At the end of the course, the student will be able to:

- Concepts of Heteroscedasticity & Multicollinearity, Possible reasons behind the presence of Heteroscedasticity & Multicollinearity. Skill to judge the reliability of estimation in case of violation of basic assumptions for the application of ordinary linear regression method;
- Concepts of Autocorrelation reasons behind the presence of Heteroscedasticity & Multicollinearity. Describe the variance/covariance matrix for the regression errors under the assumption that the errors are correlated;
- Apply modern econometric methods covering time series analysis, financial econometrics, micro econometrics, macro econometrics and structural econometric modelling;
- Interpret and critically evaluate applied economics research literature; demonstrate programming skills and numerical methods; and
- Apply methods learned to address policy and business decision questions.

**Unit 1: Multicollinearity and Heteroscedasticity**

Multicollinearity: Source and Consequences, Tests for Multicollinearity and solutions for Multicollinearity. Heteroscedasticity: Sources and Consequences, Tests for Heteroscedasticity, Generalized Least Squares Method of Estimation.

**Unit 2: Autocorrelation**

Sources of Autocorrelation - first order Autoregressive scheme - Consequences of Autocorrelation - Tests for Autocorrelation – Durbin-Watson test - Methods of estimation of Autocorrelation coefficient - Estimation from d- statistic and Cochran-Orcutt iterative method.

**Unit 3: Qualitative and Limited Dependent Variables Models**

Binary Choice Models: Linear Probability Model, Probit Model and Logit Models – Censored and Truncated regression models.

**Unit 4: Simultaneous Equation Models: Estimation Methods**

Two stage Least Squares, Limited Information Maximum Likelihood, K-class Estimators, Three Stage Least Squares and Full Information Maximum Likelihood Methods – Numerical Problems.

**Unit 5: Panel Data Regression Models and Time Series Econometrics**

Panel Data – Estimation of Panel Data Regression Models - Fixed and Random Effects – Estimation – Introduction to Time Series Econometrics - Stationary and Non-Stationary Stochastic Process – Integrated Stochastic Process – Unit roots – Co-integration – Test for co-integration, Co-integration and error correction mechanism.

**TEXT AND REFERENCE BOOKS:**

- 1) Maddala, G.S: Econometrics, McGraw-Hill Book Co., New York, 3<sup>rd</sup> Rd.
- 2) Johnston, J: Econometric Methods, McGraw-Hill Book Co., New York.
- 3) Gujarathi, D.N: Basic Econometrics, Fourth Edition, New Delhi.
- 4) Maddala, G.S: Limited-Dependent and Qualitative Variables in Econometrics, Cambridge University Press.

**Skill Oriented Course - 4**  
**EMT 207(B): INTRODUCTION TO INFORMATION TECHNOLOGY**

---

**Course objectives**

The basic objective of this course is to make the student aware that we are living in an information age. The course begins with the basics of Information and touches various aspects of Information Systems and information technology. The possess strong fundamental concepts in Information Technology to address technological challenges. the possess knowledge and skills in the field of Information Technology for analysing, designing and implementing complex engineering problems of any domain with innovative approaches. The possess an attitude and aptitude for research, entrepreneurship and higher studies in the field of Information Technology.

**Course Outcomes:-** At the end of the course, the student will be able to:

- An ability to apply the theoretical concepts and practical knowledge of Information Technology in analysis, design, development and management of information processing system and applications in the interdisciplinary domain;
- An ability to analyse a problem and identify and define the computing infrastructure and operations requirements appropriate to its solution;
- An understanding of professional, business and business processes, ethical, legal, security and social issues and responsibilities; and
- Practice communication and decision making skills through the use of appropriate technology and be ready for professional responsibilities.

**Unit-I-Computer Basics**

Introduction, Evolution of Computers- Generations of Computers- Classification of Computers- The Computer system, Applications of Computers- Computer organization and Architecture, Central Processing Unit- Types of Number Systems- Computer Memory and Storage- Memory Hierarchy- Input Output Media.

**Unit-II- Computer Programming and Languages**

Introduction, Algorithm, Programming Paradigms- Characteristics of a Good Program, Programming Languages- Generations of Programming Languages- Features of a Good Programming Language- Operating System- Operating System Definition- Evolution of Operating System, Types of Operating Systems- Database Fundamentals- Database Definition.

**Unit-III-Information Technology Basics**

Introduction, Information, Technology, Information Technology, Present scenario, Role of Information Technology, Information Technology and the Internet Multimedia:- Multimedia- definition, Multimedia Applications.

**Unit-IV-Computer Networks**

Computer Network, Network Topologies, Network Devices Internet- Evolution of Internet, Basic Internet Terms, and Getting connected to the Internet, Internet Applications Internet Tools- Introduction, Web Browser, Browsing Internet using Internet Explorer, E-mail Address Structure and Search engines.

**Unit-V-Current and Future Trends in IT**

Introduction, Electronic commerce, Electronic Data Interchange, Smart card, Internet Protocol Television, Blogging, Radio Frequency Identification, Imminent Technologies.

**Text Book:**

- 1) Introduction to Information Technology, IITL Education solutions limited, PEARSON.
- 2) Fundamentals of Information Technology, 2nd Edition, Alexis Leon, Mathews Leon, (Leon VIKAS)
- 3) <http://nptel.ac.in/courses.php>
- 4) <http://jntuk-coeerd.in/>
- 5) V.Rajaraman, Introduction to Information Technology, PHI Learning Pvt. Ltd., New Delhi.
- 6) Shambhavi Roy, Clinton Daniel, and Manish Agrawal, Fundamental of Information Technology, Chand Publications, New Delhi.

**OOTC – 1**

**EMT 208 OPEN ONLINE TRANSDISCIPLINARY COURSE**

Open Online Transdisciplinary Course (OOTC)- Students can choose any relevant course of his/her choice from the online courses offered by Governmental agencies like SWAYAM, NPTEL., etc.,

\*\*\*\*\*

**Audit Course**  
**Indian Knowledge System - 2**  
**EMT 209: ECONOMICS OF TOURISM**

---

**Course objectives:**

To provide entertainment to tourists, organize tourism related activities such as cultural shows, fairs and festivals etc. To take over and develop and manage places of tourist interest, parks, lakes, avenues, beaches and recreational places, spots etc. The Tourism Economics is a branch of economics that studies the economic effects of tourism activity. The expenditure decisions, Investment decisions, Structure and organization of the markets. The introducing students with the basic elements and content of tourism economics. The study of the economic characteristics and functions of tourism,. The learning about the effects of tourism on the global, national and local economy and social superstructure.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Identify the characteristics of tourism economy, identify tourism demand and supply, identify the economic characteristics of the tourism product and identify the characteristics of the tourism market;
- Explain the roles of government in terms of tourism industry, the reasons of the roles of government in tourism, the role of government on the economic effects of tourism by preparing national and regional plans, role of government on the growth of tourism.
- The economic impact of tourism; tourism demand and tourism supply: theory and practice; crisis management issues in the tourism and hospitality industry; the importance of performance measurement; the impacts, opportunities and constraints arising from tourism for local economies; the importance of foreign direct investment, destination attractiveness and tourism benefits; the nexus between economics, agritourism and heritage.
- Explain the economic effects of tourism, the effects of tourism on national economies; the effects of tourism on prices; the relationships between tourism and exchange rates, employment, income, balance of payments etc.
- The group the economic and social functions of international travel and tourism; connect the emergence and development of tourism with its economic effects; identify the economic aspects of tourism using professional economic tourism terminology and postulates of scientific disciplines of tourism economics; detect the flow of business in the tourism industry through a variety of basic and complementary activities at macro and microeconomic level; interpret the role of tourism expenditure in the national and world economy; and display economic effects of tourism in the tourism balance of trade, balance of payments and tourism satellite account.

**Unit-I: Introduction**

Nature, concept and scope of tourism- Tourism System- Historical Perspective of Tourism in India- Components and Elements of Tourism- Types and Forms of Tourism in India Tourism organizations and the market for tourism products, Tourism organisations and the external environment social, economic and physical environment, Tourism and economic development, Domestic, National and International Tourism, Composition of Tourism Industry in India.

## **Unit-II: Tourism Demand & Tourism Supply**

Concepts and definitions of demand for tourism, Determinants and measurement of tourism demand, Measurement of tourism demand and elasticity of tourism demand, Tourism consumer behaviour, Measuring & Modeling of tourism demand, Forecasting tourism demand, Supply of tourism product, Patterns and characteristics of supply of tourism, Determinants & measurement of tourism supply, Determinants of tourism sector, attractions and accommodations of Tourism, Cost of Tourism Product, Pricing of Tourism Product and Marketing Strategy in Tourism Industry.

## **Unit-III: Impact of Tourism in National Economy**

Current Status of Tourism Sector in India, Growth and Trends, Impact and Contribution of Tourism Sector in National Economy, Tourism Multipliers, Tourism impact on balance of payments and exchange rates, Economic, environmental & socio-cultural impact of tourism, Principles and benefits of sustainable tourism, Tourism & development planning in India.

## **Unit-IV: Tourism Investment and Finance**

Investment in Travel and Tourism, Investment Appraisal in Public and Private Sector, Sources of Finance in Tourism, Role of Private and Public Organizations in the Development of Travel and Tourism, Factors Influencing Travel and Tourism's Yield and Future.

## **Unit-IV: Analysis of Tourism and Corporations**

Tourism demand forecasting, concept of break-even point, cost benefit analysis in tourism and project feasibility study, Principal sectors of Indian economy with special reference to Tourism, ITDC, State Tourism Development Corporations.



**Core Course**  
**EMT 301: TIME SERIES ECONOMETRICS**

---

**Course Objectives:** The objective of the course is to provide knowledge on Econometric applications of Economic theory, especially time series econometrics.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Students will acquire additional specialization through the Time series Econometrics Analysis;
- Skill to judge the reliability of estimation in case of Stationary and Non-Stationary test, Co-integration test;
- Forecasting with a single-equation linear regression model, and Forecasting with a multi-equation econometric model;
- Student can evaluate Univariate Time Series Models like MA, AR, ARMA and ARIMA models; and
- Student will be able to calculate VAR model which most important in macro-economic models.

**Unit 1: Basic concepts**

Introduction – Stationary Stochastic Process – Non-stationary Stochastic Process; Unit root Stochastic Process, Integrated Stochastic Process, tests of Stationary.

**Unit 2: Co-integration**

Integrated Variables, Unit root tests - Dickey-Fuller tests; Co-integration and error correction mechanism – Engle–Granger, Johansen and Juselius Co-integration tests – ARDL Co-integration Tests.

**Unit 3: Forecasting**

Nature and uses of Forecasts – Forecasting with a single-equation linear regression model - Forecasting with a multi-equation econometric model - Evaluation of the forecasting power of a model – Conditional and Unconditional Forecasting – Single and Double exponential smoothing – Box-Jenkins Model.

**Unit 4: Linear Time Series Models**

Univariate Time Series Models - Moving Average Models - Auto Regressive Models - Mixed Auto Regressive Moving Average Models – ARIMA models.

**Unit 5: Vector Auto-regressions and Models for Volatility**

Estimation and Forecasting with VAR, VAR and Causality, Some problems with VAR Modeling, Measuring Volatility - The ARCH (p) models – ARCH tests – GARCH (p, q) model – Asymmetric GARCH models.

**TEXT AND REFERENCE BOOKS:**

- 1) Gujarathi, D.N, Basic Econometrics, Fourth Edition, Tata McGraw Hill, New Delhi, 2004.
- 2) Koutsoyiannis, A, Theory of Econometrics, The Macmillan Press Ltd., Hong Kong, Second Edition, 1983.
- 3) Robert S.Pindyck and Daniel L. Rubinfeld, Econometric Models and Economic Forecasts, McGraw Hill Book Company, 1988
- 4) Francis Diebold, Elements of Forecasting, South Western College Publishing, 1998.
- 5) Newbold and Bos, Introductory Business and Economic forecasting (second edition), South Western College Publishing, 1994.
- 6) William H. Green, Econometric Analysis, Pearson's Education, fifth Edition, 2003.
- 7) Hamilton, J.D, Time Series Analysis, Princeton, N.J., Princeton University Press, 1994.

**Core Course**  
**EMT 302: INDIAN ECONOMY**

---

**Course Objectives:**

The objective of this course is to provide the basic knowledge of Indian economy Structure of the Indian Economy, Agricultural Sector, Industrial Sector, Tertiary and Foreign Sectors and Planning and Development of the Indian economy that is with the study of the subject in a Master's programme.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Students will develop ideas of the basic characteristics of Indian economy, its potential on natural resources. Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development;
- Understand agriculture as the foundation of economic growth and development, analyse the progress and changing nature of agricultural sector and its contribution to the economy as a whole. Students will obtain information regarding various agricultural issues in India and remedies for it;
- Students will aware about recent economic affairs such as demonetization, universal basic income, cashless economy, skill and training development schemes, make in India etc;
- Students will get benefit about various economic issues at local, national and global level; and
- Grasp the importance of planning undertaken by the government of India, have knowledge on the various objectives, failures and achievements as the foundation of the ongoing planning and economic reforms taken by the Government.

**Unit 1: Structure of the Indian Economy**

Indian Economy a Historical perspective-India as developing economy- Economic growth, Development, Underdevelopment- Population growth and economic development- Economic infrastructure- Natural Resources- Poverty- Employment and unemployment in India.

**Unit 2: Agricultural Sector**

Role of agriculture in Indian Economy- Trends of agriculture production and productivity- Land reforms - Farm size and efficiency - food security in India- Green revolution - Agricultural finance and marketing - Agriculture prices - Agricultural labour.

**Unit 3: Industrial Sector**

Industrial development during the plans- Large scale industries- Small scale and cottage industries- Industrial labour- industrial sickness in India- Industrial finance- Industrial policy - Public and Private sector in India.

**Unit 4: Tertiary Sectors**

India Balance of payments- Foreign Trade of India- Trade policy of India- WTO and India- New trade policies in India- LPG policies and impact on the economy.

**Unit 5: Financial Sector**

Money and money market- Commercial banks- Development financial institutions- RBI and Monetary policy-Capital market in India- Institutional financing in India.

**REFERENCE BOOKS:**

- 1) A.N.Agarwal, Indian Economy, New Age International publishers, New Delhi, 2013.
- 2) Ghosh. Alak, Indian Economy – Its Nature and Problems, A New Look Indian Economics, Calcutta, The World Press Private Limited, 1989.
- 3) Jalan.B, The Indian Economy Problems and Prospects, Viking Publications, New Delhi, 2006.
- 4) Ruddar Datt and Sundaram. K.P.M, S.Chand and Company, New Delhi, 2008.
- 5) S.K.Misra and V.K. Puri, Indian Economy, Himalaya Publishing House, New Delhi, 2013.
- 6) Sen R.K and B.Chatterjee, Indian Economy-Agenda for 21<sup>st</sup> Century, Deep and Deep Publications, New Delhi, 2001.
- 7) Uma Kapila, Indian Economy Since Independence, Agricola Publications Academy, New Delhi, 1998.

**Core Course**  
**EMT 303: MATHEMATICAL ECONOMICS**

---

**Course Objectives:**

This course also introduces the Mathematical tools such as Differential Calculus and Economic Applications (Two or More Variables), Differential Equations and Economic Applications. This course explores Input-output analysis and Linear programming which is most important in the area of Inter industrial dependency and maximization of the profits and minimization of the cost of the firms.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Students can deal Mathematical calculation of static optimization, Application of Lagrange's method and also student can evaluate Differential Equations and with Economic Applications;
- Able to estimate and interpret Inter industrial relationships using Input-output analysis, also analyse maximization of profits and minimization of costs of the firms using Linear Programming method;
- Economic Applications of Differential Equations – Dynamic Multiplier – Harrod-Domar Model;
- Homogeneous Linear Difference Equations with Constant Coefficients – Particular Solution of Non-homogeneous Linear Equations – Linear First Order and Second Order Difference Equations with constant coefficients – Cobweb Model –Market model with Stocks; and
- Formulation of LPP – Basic and Feasible Solutions – Graphical Solution - Simplex Method – Duality in Linear Programming – Elements of Data envelop Analysis and its Applications.

**Unit-1: Differential Calculus and Economic Applications (Two or More Variables)**

**Differential Calculus:** Functions of two or more variables and Partial Derivatives – Rules of Partial Differentiation – Second-Order Partial Derivatives – Optimization of Multivariable Functions – Constrained Optimization with Lagrange Multipliers – Significance of Lagrange Multiplier – Differentials – Total and Partial Differentials – Homogeneous Functions – Euler's Theorem – Partial Elasticities; **Economic Applications:** Maximization of Utility – Minimization of Cost – Maximization of Cost, Profit – Elasticity of Substitution

**Unit 2: Differential Equations and Economic Applications**

Definitions and Concepts – Linear Differential Equations of the First and Second Order with constant coefficient – Non-linear Differential equations of First-Order and First Degree – Variable Separable Case, Differential Equations with homogeneous equations - Economic Applications of Differential Equations – Dynamic Multiplier – Harrod-Domar Model.

**Unit 3: Difference Equations and Economic Applications**

Definitions and Concepts – Homogeneous Linear Difference Equations with Constant Coefficients – Particular Solution of Non-homogeneous Linear Equations – Linear First Order and Second Order Difference Equations with constant coefficients – Cobweb Model –Market model with Stocks – Dynamic Multiplier – Multiplier Acceleration Model : Harrod-Domar Model – Multiplier's Accelerator Interaction Model of Samuelson.

#### **Unit 4: Input-Output Analysis**

Assumptions - Technological Co-efficient Matrix – Closed and open Model – Solution of Open Model – Hawkins-Simon Conditions – Dynamic Input-Output Model – Production Function Approach to Input Output Model.

#### **Unit 5: Linear Programming**

Basic Concepts – Formulation of LPP – Basic and Feasible Solutions – Graphical Solution - Simplex Method – Duality in Linear Programming – Elements of Data envelop Analysis and its Applications.

#### **TEXT AND REFERENCE BOOKS**

- 1) Allen, RGD: Mathematical Analysis for Economists.
- 2) Mehta, BC and Madanani GMK: Mathematics for Economists, Sultan Chand and Sons, Delhi.
- 3) Taro Yamane: Mathematics for Economists (An Elementary Survey), Prentice Hall of India Private Ltd, New Delhi.
- 4) Alpha C. Chang: Fundamental Methods for Mathematical Economics.
- 5) Barry Bressler: A Unified introduction of Mathematical Economics
- 6) Dowing, Edward T: Introduction to Mathematical Economics, (2/ed.), Schaum's Outlines, McGraw Hill, 1980.
- 7) Bose, D: An Introduction to Mathematical Economics, Himalaya Publishing Company, Delhi.

**Core Course**  
**EMT 304: INTERNATIONAL TRADE AND FINANCE**

---

**Course Objectives:**

The course has a strong focus on International trade and the accompanying financial transactions are generally conducted for the purpose of providing a nation with commodities it lacks in exchange for those that it produces in abundance; such transactions, functioning with other economic policies, tend to improve a nation's standard of living.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Identify the basic difference between inter-regional and international trade, understand how international trade has helped countries to acquire goods at cheaper cost and explain it through the various international trade theories;
- Show the benefits of international trade in a way how nations with strong international trade have become prosperous and have the power to control world economy and how global trade can be one of the major contributors of reducing poverty;
- Explain how restrictions to international trade would limit a nation in the services and goods produced within its territories and at the same time explain that a rise in international trade is essential for the growth of globalization;
- Show the importance of maintaining equilibrium in the balance of payments and suggests suitable measures to correct disequilibrium as well; and
- Be aware of the changes in the composition as well as direction of foreign trade after international trade and know the causes and effects of deficits in the balance of payments, measures adopted to correct the deficits and identify the need for having trade reforms.

**Unit 1: Old and New Theories of International Trade**

Comparative advantage in Ricardian, Haberler and Heckscher–Ohlin Theories – Factor Price Equalization Theorem - Intra Industry Trade – Neo-Chamberlin and Neo-Heckscher-Ohlin Theorems - Product Cycle and Technology Gap and Strategic Trade theories.

**Unit 2: Free Trade and Protection**

Free Trade vs. Protection – Theory of Tariffs –The Political Economy of Non-tariff Barriers - Terms of Trade – Secular Deterioration (Singer-Prebisch) Thesis -Immiserizing Growth- The Concept of Customs Union - Regional Trade Agreements - EU and SAARC.

**Unit -3: Balance of Payments and adjustment Mechanism**

Balance of Payments Accounts –Adjustment of Deficit in Balance of Payments – Traditional Elasticity and Absorption Approaches - Theories of policy mix - BOP adjustments with capital mobility – Foreign Trade Multiplier.

**Unit 4: Theories of Exchange rate determination**

Exchange rate under free market – Spot and Forward Rates -Exchange rate adjustments under capital mobility - Floating Rates and their implications for developing countries - Currency Boards - Import and Exchange Controls and Multiple Exchange Rates.

**Unit 5: Global Institutions**

The Bretton Woods System - IMF and World Bank – Collapse of Bretton Woods System – New International Monetary Order – WTO – Issues at the recent WTO ministerial Conferences- Multinational Corporations - Implications for Developing countries.

### **TEXT AND REFERENCE BOOKS:**

- 1) Paul Krugman & Maurice Obstfeld (6<sup>th</sup> ed.) International Economics, (Chapters 2-11) Addison Wesley, 2003.
- 2) Caves, R. and Jones, R. World trade and payments (chapters 4, 6, and 7). Boston: Little, Brown and Company, 1977.
- 3) Sodersten, B. and Reed, G. International economics (chapters 1-11, 13-16, 19, 20, 22-24, 26 & 27). Macmillan Company, 1994.
- 4) Pilbeam, K. International finance (chapters 4-15). Macmillan, 1994.
- 5) Turnovsky, S. J. Macroeconomic analysis and stabilization policy (chapters 9-12). Cambridge University Press, 1977.
- 6) Dixit, A. and Norman, V. The theory of international trade. Cambridge University Press, 1980.
- 7) Grossman, G. M. and Rogoff, K., eds. Handbook of international economics. Vol III. Elsevier, 1995.
- 8) Kierzkowski, H., ed. Protection and competition in international trade. New York: Blackwell, 1987.
- 9) Bhagwati, J, Arvind Panagariya, & T.N. Srinivasan: Lectures on International Trade, 2<sup>nd</sup> ed. MIT Press 2001.
- 10) Grossman, G. M. and Rogoff, K., eds. Handbook of international economics. Vol III. Elsevier, 1995.

**Core Course**  
**EMT 305: ECONOMICS OF DEVELOPMENT AND PLANNING**

---

**Course Objectives:**

The paper provides fundamental foundation of basic growth and development issues, approaches and models. The paper attempts to discuss the structure and change in variables. It helps understand the overall static and dynamic perspectives of the economy in a purely theoretical perspective.

**Course Outcomes:-** At the end of the course, the student will be able to:

- The economic development plan provides a comprehensive overview of the economy, sets policy direction for economic growth, and identifies strategies, programs, and projects to improve the economy;
- The aim of economic development is to improve the material standards of living by raising the absolute level of per capita incomes. Raising per capita incomes is also a stated objective of policy of the governments of all developing countries;
- One of the most important functions of economic planning is to achieve consistency among different economic objectives. Some desirable goals are likely to conflict with others;
- One of the most important functions of economic planning is to achieve consistency among different economic objectives; and
- Five basic stages are traditional society, preconditions for take-off, take-off, drive to maturity, and age of high mass consumption), there exists no clear definition for the stages of economic development.

**Unit 1: Concepts and Measurement of Economic Growth and Development**

Economics of Development and Growth - Problems and Causes of Underdevelopment and Development - Factors of Economic Growth - Obstacles to Economic Development - Vicious Circle of Poverty - Characteristics of Modern Economic Growth - Measures of Economic Growth and Economic Development, HDI and PQLI.

**Unit 2: Theories of Growth and Development**

Classical, Karl Marx and Schumpeter - Joan Robinson Golden Age model, Harrod-Domar model, Rostow Stages of Growth - Lewis theory of Surplus Labour - Rodan's Big Push theory - Nurkse Balanced Growth theory - Hirschman's Unbalanced theory - Ranis - Fei Model - Dependency Theory of Development.

**Unit 3: Domestic Factors in Economic Development**

Capital Formation and Economic Development- Role of Agriculture and Industry in Economic Development - Population Growth and Economic Development - Human Capital Formation and Man Power Planning - Entrepreneurship in Economic Development - Role of Technology in Economic Development.

**Unit 4: Trade and Development**

Role of Foreign Trade in Economic Development - Trade as an Engine of Economic Growth - Two Gap Model - Objectives and Role of Monetary and Fiscal Policies in Economic Development - Commercial Policy and Economic Development - Price Policy and Economic Development.

**Unit 5: Planning Techniques and Planning in India**

Capital-Output Ratio - The Choice of Techniques and Appropriate Technology - Investment Criteria - Elements of Cost-Benefit Analysis - Poverty, Unemployment and Economic Inequalities in India - Role of Public Sector in India - Role of Foreign Aid and Foreign Capital in India.

**TEXT AND REFERENCE BOOKS:**

- 1) Kindleberger.C.P, Economic Development, McGraw Hill Company, New York, 1988.
- 2) Lewis.W.A, The Theory of Economic Growth, George Allen and Unwin, London, 1998.
- 3) Michel.P.Todero& Stephen C.Smith, Economic Development, Pearson Education (Singapore) Limited, New Delhi, 1998.
- 4) S.K.Misra and V.K. Puri, Economics of Development and Planning, Himalaya Publishing House, New Delhi, 2006.
- 5) Solow.R.M, Growth Theory: An Exposition, Oxford University Press, New York, 2000.

**Skill Oriented Course - 5**  
**EMT 306(A): OPTIMIZATION TECHNIQUES IN ECONOMICS**

---

**Course Objectives:**

The objective of the course is to provide knowledge on Optimization in Economic. Optimization techniques are very crucial activities in managerial decision-making process. Expressing relationships through equations is very useful in economics as it allows the usage of powerful differential technique, in order to determine the optimal solution of the problem.

**Course Outcomes:-** At the end of the course, the student will be able to:

- Knowledge of several models will enhance the applicability of the knowledge to actual data solving and getting appropriate conclusions;
- Be able to understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type;
- This course will sharpen the quantitative skills of a student and help them understand applications of Operations research in varied fields like manufacturing, Finance, purchasing and procurement, assigning and allocation of resources for optimum result;
- Be able to design new simple models, like: CPM, PERT to improve decision –making and develop critical thinking and objective analysis of decision problems; and
- Students will be able to identify and develop operational research models from verbal description of real system.

**Unit 1: Transportation Problem**

Nature and Matrix form of TP – Transportation Table – Types of Transportation Problem – Balanced Transportation Problem, Unbalanced Transportation Problem – Methods to solve Transportation Problem - The Initial Basic Feasible solution: North-West Corner Rule and Vogel’s Approximation method – Moving towards optimality, the Transportation Algorithm.

**Unit 2: Assignment Problem:** Assignment problem, Transportation problem and Linear Programming – Types of Assignment problem – Properties of Optimal Solution – Solving the Assignment Problem by Hungarian Algorithm – The Auction Algorithm for Assignment Problem – Branch and Bond Techniques for Assignment Problem.

**Unit 3 : Game Theory:** Basic concepts -Two–person Zero Sum Games - The Maximum Minimax Principle – Games without Saddle Points – Mixed Strategies – Graphical solution of 2 x n and m x 2 Games – Dominance property – The Modified Dominance Property – Reducing the Game Problem as a Linear Programming Problem.

**Unit 4 : Inventory Management**

Introduction - Inventory control - Techniques of Inventory control with known demand - Economic Lot Size Problems –The fundamental Problem of Economic Order Quantity (EOQ), The Problem of EOQ with Uniform Demand, and The Problem of EOQ with Finite Rate of Replenishment - Problem of EOQ with Shortage.

**Unit 5: Simulation**

Introduction – Elements of a Simulation Model – Event – Types of Simulation – Generation of Random Phenomena – Monte Carlo Technique – Generation of Uniform (0,1) Random Observations – Simulation languages.



**TEXT AND REFERENCE BOOKS:**

- 1) KantiSwarup, P.K.Gupta and Man Mohan: Operations Research, Sultan Chand and sons, New Delhi.
- 2) Panneerselvam, R: Operations Research, Eastern Economy Edition, Prentice Hall of India, New Delhi, 2007.
- 3) Srinivasan, G., Operations Research \_Principles and Applications, Second Edition, Prentice Hall of India, New Delhi, 2012.
- 4) Richard, Brown and Govindaswamy, N., Schaum's Outlines Series Operations Research, Second Edition, 2012.
- 5) Gupta, P.M. and D.S.Hira: Operations Research, Sultan Chand and Sons, New Delhi.
- 6) Harven, Wagner: Operations Research.
- 7) Starr and Miller: Inventory Control.

**Skill Oriented Course - 5**  
**EMT 306(B): MANAGING INNOVATION**

---

The goal of innovation management within a company is to cultivate a suitable environment to encourage innovation. The suitable environment would help the firms get more cooperation projects, even 'the take-off platform for business ventures. The Course is designed to reap the economic benefits of new technological inventions by commercializing in time to meet the needs of entrepreneurs. The course will identify the difference between creativity and innovation and will increase the awareness about the importance of creativity and innovation among the students. It will help to develop and recognize students own creativity and carry out innovative work in an effective way. It also exposes and motivates the students to apply problem solving steps and tools for carrying out creative and innovative work. The course helps the students to get into and out of the technologies faster and more efficiently. To provide a basic understanding of innovation, its taxonomy and the related organizational processes as well as enabling mechanisms. To Appreciate the role that compulsory licenses, fair dealings, term extension and other key concepts play in the new innovations. To solve problems and build innovations and ensure technology adoption and diffusion. To successfully manage its intellectual assets to gain competitive advantage through the effective innovation management. To equip students with skills to transform research outputs into innovative products and services.

**Course Outcomes:-** At the end of the course, the student will be able to:

- The students will understand the concept of Innovation & Creativity which will build a foundation in creative thinking among the students;
- The students will gain knowledge on Innovation & Creativity process, principles and hurdles in creativity;
- The students will acquire knowledge regarding scope, characteristics, evolution, and significance of Innovation Management;
- The students will acquire knowledge regarding Tools for Innovation through Individual and Group Creative Techniques. This will develop skills for analysing innovations;
- Restate the definitions and concepts of invention, design, research, technological development and innovation, processes and methods of creative problem solving;
- Interpret information on national and international IPR issues;
- Develop the ability of formulating Managerial strategies to shape innovative performance;
- Apply the tools of innovation management to measure innovative activities; and
- Make use of the ability to diagnose and provide effective solutions to innovation challenges.

**Unit-1**

**Innovation and Technology**

Concept, Definition and Characteristics of Innovation- Creativity and Innovation- Barriers to Creative Thinking- Dimensions of Innovation- How Innovation Stars do things differently- How our mind works- Technology- Management of Technology, Two contemporary perspectives in Management.

## **Unit-2**

### **Lateral thinking**

Concept of Lateral thinking, Difference between lateral and vertical thinking, advantages of lateral thinking, Techniques to develop habit of lateral thinking– Generation of alternatives-challenging assumptions-Suspended judgment, Crucial factors, Fractionation, Analogy, Choice of entry point, and Random stimulation.

## **Unit-3**

### **Innovation Process and Organisation**

An overview of the innovation process- Problem Statement- Idea generation- The art of brainstorming- Incubation; Analysis- Taking good ideas to market- Blockers for Process Innovation- Levels of Process Innovation- Organizing for Innovation-Organizational Mechanism for Innovation- Principles & Process of organizing- Characteristics of continuously innovative organizations- Role of Leadership

## **Unit-4**

### **Managing and Process of Innovation**

How to manage innovation- Developing Innovative Skills- Going beyond nine dots- Art of Observation- Listening to your Depth Mind-Tolerating Ambiguity- Ideas Banking- The Culture of Innovation-Executing Innovation Initiatives- Drivers of change in value chain- Modes of Value chain configuration- Value chain configuration and Organizational characteristics- Design of work and careers- Influence of Environmental Trends.

## **Unit-5**

### **Innovative Reward Strategies**

Understanding Reward Systems, Customization of Rewards, Measuring Performance-Transformation from entitlement to achievement- Managing Performance versus Appraisal; Innovative Pay Design- Appropriate Rewards- Taking workplace to next level.

## **References**

- 1) Edosomwan, J. A, Integrating Innovation and Technology Management, John Wiley & Sons,
- 2) Edward De Bono, Lateral Thinking, Harper & Row
- 3) Esward De Bono, New Thinking for The New Millennium, Viking Publishers, New Delhi.
- 4) John Adair, Effective Innovation, Pan Books
- 5) Nord, W., & Tucker, S., Implementing routine and Radical Innovations. Lexington Books
- 6) Rogers, E. M., Diffusion of Innovation, Free Press
- 7) S. Makridakis, Forecasting Methods for Management, Wiley- Inter Science
- 8) Thomas B. Wilson, Innovative reward systems for the changing workplace, McGraw Hill Publication
- 9) Tom Peters, Circle of innovation, Knopf.

**Skill Oriented Course - 6**  
**EMT 307(A): FINANCIAL INSTITUTIONS AND MARKETS**

---

**Course Objectives:**

To introduce students to the world of financial services to enrich student's understanding of the fundamental concepts and working of financial service institutions. Further, to equip students with the knowledge and skills necessary to become employable in the financial service industry.

**Course Outcomes:** - At the end of the course, the student will be able to:

- Explain the broad features of Indian financial institutions with its apex banks' objectives and purview. Also understand the instruments to control credit in the country;
- Effectively narrate the kinds and components of money with its regulatory system, be aware of the functions, objectives and limitations of commercial banks;
- Identify the existence and development of non-banking financial institutions, know the important role of Mutual funds, LIC, investment companies etc., utilize and effectively participate in the development process;
- Understand the conditions of financial markets and its impact in the economy; and
- Demonstrate the role and significance of foreign exchange rate and its markets with its impact on various sectors in the economy.

**Unit 1: Financial System**

Evolution of Financial System – Structure of Financial System – Functions of Financial System – Financial System and Economic Development.

**Unit 2: Money Market**

Features of Money Market – Instruments of Money Market: Call Money Market – Treasury Bills Market – Commercial Bills – Market for Commercial Papers – Certificate of Deposits – Discount and Finance House of India (DFHI) – Securities Trading Corporation of India (STCI) – Deficiencies and Recent Developments in Indian Money Market.

**Unit 3: Capital Market**

Industrial Securities Market: Primary and Secondary Markets – Government Securities Market and Long Market – Objectives, Functions and performance of Securities and Exchange Board of India (SEBI) – Over the Counter Exchange of India (OCTCEI) – Functions of Stock Exchanges – Bombay Stock Exchange (BSE) – National Stock Exchange (NSE) – Reforms in Capital Market.

**Unit 4: Banking and Financial Institutions**

Banking: Central Banking: Objectives and Functions - Commercial Banks, Functions and Growth - Process of Credit Creation – Growth and Control of Non-banking Financial Institutions - Functions and Performance of Industrial Finance Corporation of India (IFCI) – Industrial Development Bank of India (IDBI) – Industrial Credit and Investment Corporation of India (ICICI) – Small Industrial Development Bank of India (SIDBI) – State Financial Corporations (SFCs) – Mutual Funds.

**Unit 5: Investment Institutions and Foreign Capital**

Functions and Performance of Life Insurance Corporation (LIC) – General Insurance Corporation (GIC) and Unit Trust of India (UTI) – Forms of Foreign Capital – International Financial Instruments – Trends in Foreign Capital Inflows to India – Advantages and Disadvantages of Foreign Capital.

**TEXT AND REFERENCE BOOKS:**

- 1) M.Y. Khan, Indian Financial System, Tata McGraw Hill, New Delhi.
- 2) L.M.Bhole, Financial Institutions and Markets, Tata McGraw Hill, New Delhi.
- 3) V.A.Avadhani, Indian Capital Market, Himalaya Publishing House, Bombay.
- 4) H.R.Machiraju, International Financial Markets and India, Wheeler Publishing Company, New Delhi.
- 5) Vasant Desai, Indian Financial System, Himalaya Publications, Bombay.
- 6) Peter.S. Rose, Money and Capital Market: Financial Institutions and Instruments, Tata McGraw Hill, London.
- 7) S.C.Kucchal, Corporation Finance, Chaitanya Publishing, Allahabad.
- 8) S.L.N.Sinha, Capital Market in India, Vora& Co, Bombay.
- 9) Hendrik.S. Houthakker, The Economics of Financial Markets, Oxford University Press, New Delhi.

**Skill Oriented Course - 6**  
**EMT 307(B): RESEARCH METHODOLOGY AND DATA ANALYSIS**

---

**Course Objectives:**

The main objective of this course is to introduce the basic concepts in research methodology in Social science. These courses address the issues inherent in selecting a research problem and discuss the techniques and tools to be employed in completing a research project. This will also enable the students to prepare report writing and framing Research proposals.

**Course Outcomes:** - At the end of the course, the student will be able to:

- Students who complete this course will be able to understand and comprehend the basics in research methodology and applying them in research/ project work;
- This course will help them to select an appropriate research design;
- With the help of this course, students will be able to take up and implement a research project/ study;
- The course will also enable them to collect the data, edit it properly and analyse it accordingly. Thus, it will facilitate students' prosperity in higher education;
- The Students will develop skills in qualitative and quantitative data analysis and presentation; and
- Students will be able to demonstrate the ability to choose methods appropriate to research objectives.

**UNIT-1: Introduction to Research Methodology**

Introduction, Definition and objectives of the Research, Types of Research, Importance and Significance of Research in Social sciences, Research Problem Formulation, Identifying Research Problems, Formulating Research Questions and Hypotheses, Qualities of a Good Hypothesis, Hypothesis Testing, Research Design and Types, Exploratory, Descriptive, Experimental, and Causal Research Designs, Cross-sectional vs. Longitudinal Studies, Case study, Survey, and Experimental Designs.

**UNIT-2: Data Collection and Measurement**

Sources of Data, Primary and Secondary data, Quantitative and Qualitative data, Data Collection Methods, Surveys, Interviews, Observations, Content analysis, Probability Sampling methods, Simple Random, Stratified, Systematic Sampling, Non-Probability Sampling Methods, Convenience, Purposive, Snowball Sampling, Data Measurement and Scaling, Scales of Measurement, Nominal, Ordinal, Interval, Ratios and Validity and Reliability of Measurements.

**Unit-3: Data Analysis Techniques**

Descriptive Statistics, Measures of Central Tendency Mean, Median, Mode, Measures of Dispersion, Range, Variance, Standard Deviation, Inferential Statistics, Probability and Probability Distributions, Hypothesis testing, Null and Alternative Hypotheses, P-values, Significance level, Parametric and Non-parametric Tests t-tests, ANOVA, Chi-square, Mann-Whitney U test, Kruskal-Wallis test.

**Unit-4: Data Analysis using Software Tools**

Introduction to Statistical Software, Software Application in Economic Analysis, Familiarity with software like SPSS, R, and Excel for data analysis, Data Import, Cleaning, and Manipulation uses Software, Exploratory Data Analysis (EDA), Data visualization, Bar charts, Histograms, Scatter plots, Correlation analysis, Regression Analysis Simple Linear Regression, Multiple Regressions and Interpretation of Regression Output.

## **Unit-5: Report Writing and Related Techniques**

Structure and components of reports, types of reports, importance and techniques of interpretation, Significance of report writing, Steps in writing report, Ethics in Report Writing, Planning of a Research Report, Presenting Literature Review, Stages of Writing Report, Layout of the Research Report, Precaution for Writing Research Reports, Design and Preparation of the Thesis, Layout, Structure and Language of Typical Reports, Illustration and Tables, Thesis writing, Citations, Footnotes, Endnotes, Bibliography, Proof Correction, Finalisation of Thesis, Impact Factor and Citation index of Journals.

### **References**

- 1) Bhandarkar, P.L. & Wilkinson, T.S. (2016). Methodology and Techniques of Social Research. Himalaya Publishing House, Mumbai.
- 2) Elhance, D.N., Elhance V. & Aggarwal, B.M. (2018). Fundamentals of Statistics. Kitab Mahal, Mumbai.
- 3) Ferber, R. & Verdoon, P.J. (1962). Research Methods in Economics and Business. Macmillan, New York.
- 4) Ghosh, B.N. (2015). Scientific Method and Social Research. Sterling Publishers, New Delhi.
- 5) Goode, W.J. & Hatt, P.K. (2022). Methods in Social Research. McGraw Hill, London.
- 6) Gujarati, D., Porter, D.C. & Pal, M. (2017). Basic Econometrics. Tata McGraw Hill, New Delhi.
- 7) Gupta, S.P. (2021). Statistical Methods. S. Chand & Company, New Delhi.
- 8) Kothari, C.R. & Garg, G. (2019). Research Methodology: Methods and Techniques. New Age International Publishers, New Delhi.
- 9) Kurien, C.T. (1973). Research Methodology in Economics. Sangam Publishers, Madras.
- 10) Moser, C.A. & Kolton, C. (1979). Survey Methods in Social Investigation. Heinemann Educational Books, London.
- 11) Wooldridge, J.M. (2019). Introductory Econometrics: A Modern Approach. South-Western Educational Publishing, Canada.

## **OOTC – 2**

### **EMT 308: OPEN ONLINE TRANSDISCIPLINARY COURSE**

Open Online Transdisciplinary Course (OOTC)- Students can choose any relevant course of his/her choice from the online courses offered by Governmental agencies like SWAYAM, NPTEL, etc.,

\*\*\*\*\*

## **SEMESTER – IV**

### **OOSDC**

### **EMT 401: OPEN ONLINE SKILL DEVELOPMENT COURSES**

**Open Online Skill Development Course (OOSDC) - Students can choose any Two relevant courses of his / her choice from the online courses offered by governmental agencies like SWAYAM, NPTEL, etc., to get 8 credits (with 4 credits from each course)**

\*\*\*\*\*

### **EMT 402: PROJECT WORK**

**Project work carries 300 Marks (Dissertation -200 marks, Seminar- 50 marks, Viva – voice – 50 marks).**