EMT 401: TIME SERIES ECONOMETRICS

Time series Econometrics can be useful to see how a given asset, security, or economic variable changes over time. It can also be used to examine how the changes associated with the chosen data point compare to shifts in other variables over the same time period.

Course Objectives

The objective of the course is to provide knowledge on Econometric applications of Economic theory Especially time series econometrics.

- This course explains concepts of Panel data regression models and what are the challenges faced during the Time series analysis.
- This course describes the concept of Stationarity and non-stationary stochastic process and their test. Discuss about Spurious regression.
- This course explores the concept of Co-integration, Vector Error correction Model (VECM), Granger Causality test.
- The course discovers Linear time series Models; MA, AR, ARMA and ARIMA models,
  also discuss VAR Models.

Unit 1: Basic concepts
Introduction – Stationary Stochastic Process – Non-stationary Stochastic Process; Unit root Stochastic Process, Integrated Stochastic Process, tests of Stationarity.

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.

Learning Objectives

After successfully completing the course Time Series Econometrics the graduate is able to:

At the end of the course the students will acquire additional specialization through the Time series Econometrics Analysis. Skill to judge the reliability of estimation in case of Stationarity and Non-Stationarity test, Co-integration test. Students will be able to execute in-depth analysis of VECM model and Granger Causality test. Student can perform the 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. Finally, student will be able to calculate VAR model which most important in macro-economic models.

EMT 402: OPTIMIZATION IN ECONOMICS

The purpose of optimization is to achieve the "best" design relative to a set of prioritized criteria or constraints. These include maximizing factors such as productivity, strength, reliability, longevity, efficiency, and utilization, this decision-making process is known as optimization.

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.

- This course explains concepts of Transportation Problem which is most important for the feasible Solution.
- This course describes the concept of Assignment Problem and Game theory.
- This course explores the concept of Techniques of Inventory control with known demand, 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

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.

Learning Outcomes

After successfully completing the course Optimization in Economics the graduate is able to:

At the end of the course the students find the values of decision variables that result in a maximum or minimum of a function called objective function, the objective function which is used as a measure of effectiveness of a decision. Students can make the process of making a trading system more effective by adjusting the variables used for technical Optimization analysis.

EMT 403
PRACTICAL-IV

TIME SERIES ECONOMETRICS AND OPTIMIZATION IN ECONOMICS

The course EMT 403 to provide the Practical knowledge of Time Series Analysis and Optimization, which is useful information, research conclusions, and supporting decision-making for business leaders.

Course Objectives

The course has a strong focus on Practical skills and train students in the collection and analysis of the data using their software skills Especially, EViews for Time series analysis.The entire Practical course divided into two parts first part can made Time series analysis through EViews software and second part will be covered Optimization technique in Economics.

- The First part; course describes Practical Knowledge of Time series Analysis, Mainly, focus on Unit root [ADF] test, Co-integration test.
- This course explores practical approach of Spurious Regression, Johanson Co-integration test, Granger Causality test, and VECM model.
- The course offered ARMA and ARIMA models, also discuss VAR Models.
- The second part of the course describes Optimization techniques, such as Transportation problem and Assignment problem.

Concepts are covered in this Practical Approach follows;

- Unit root test [ADF-Augmented Dicky-Fuller test].
- Spurious Regression.
- Co-integration Test.
- Vector Error Correction Mechanism [VECM].
- Granger Causality test.
- VAR Model.
- ARMA and ARIMA Model.
- Optimization-Transportation problem; Balanced Transportation Problem, Unbalanced Transportation Problem North-West Corner Rule.
- Assignment problem; Hungarian Algorithm Branch and Bond Techniques for Assignment Problem.

Learning Outcomes

After successfully completing the course students must have practical reveal the following:

- At the end of this course student will gain practical knowledge of Time Series Analysis by using EViews.
- Student gained and evaluate Stationarity test by using ADF Test.
- After complete this course student will able to test of Spurious Regression, Co-integration test and Granger Causality test.
- Finally, student will be able to made feasible solution in optimization.

Generic Elective – 1

EMT 404:INTERNATIONAL TRADE AND FINANCE

The objectives of this course are: To Gain understanding of the basic concepts and principles of International trade, role of the government through its policy, balance of payment accounts and BOP crisis. To help in understanding EXIM policy, FDI regulations, role of trade credit agencies and FEMA. The Standard international trade models universally consider maximizing the availability of inexpensive goods as the objective of international trade. They then go on to show that tariffs and other impediments to trade cause a loss of economic efficiency.

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. All however, share the following goals and objectives: to reduce global poverty and improve people's living conditions and standards; to support sustainable economic, social and institutional development; and. to promote regional cooperation and integration.

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 (6th 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) Kierzkwoski, H., ed. Protection and competition in international trade. New York: Blackwell, 1987.
9) Bhagwati, J, ArvindPanagariya, & T.N. Srinivasan: Lectures on International Trade, 2nd ed. MIT Press 2001.
10) Grossman, G. M. and Rogoff, K., eds. Handbook of international economics. Vol III. Elsevier, 1995.

Learning Outcomes

After successfully completing the course students must have practical reveal the following:

To reduce global poverty and improve people's living conditions and standards; to support sustainable economic, social and institutional development; and. to promote regional cooperation and integration. The elements of international trade. They are Balance of payments, Visible trade, Invisible trade, Trade gap, Correcting a deficit, Exchange rates and Why countries trade. Standard international trade models universally consider maximizing the availability of inexpensive goods as the objective of international trade. They then go on to show that tariffs and other impediments to trade cause a loss of economic efficiency.

EMT 405: INDIAN ECONOMY

Indian economy is termed as the developing economy of the world. Some features like low per capita income, higher population below poverty line, poor infrastructure, agriculture based economy and lower rate of capital formation, tagged it as a developing economy in the world. Today, India is considered a mixed economy: the private and public-sectors co-exist and the country leverages international trade. India, as a developing country, features a mixed economy in the world. The major characteristics of developing economy are low per capita income, overpopulation, maximum population below the poverty line, poor infrastructure, agro-based economy and a lower rate of capital formation. The secondary sector is the backbone of the Indian economy. There is a promising future for this sector with more development and growth in the coming years. The Tertiary sector is similar to the secondary sector in terms that it too adds to the value of the products.

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.

Unit 1: Structure of the Indian Economy

Indian Economy on the Eve of Independence- Basic Characteristics of the Indian Economy as Developing Economy- Major issues of Development in Indian Economy- Growth and Structural Changes in the Indian Economy- Population-Poverty –Measurement of Poverty, Anti PovertyProgrammes - Inequality- Natural Resources-Infrastructure- Human Development in India-Prices, Price Policy and Economic Growth- Balanced Regional Development-Unemployment in India.

Unit 2: Agricultural Sector

Role Agriculture in Indian Economy- Share of Agriculture - Interrelationship between Agriculture and Industry –Land Tenure System - Farm Size and Productivity -Institutional and Technological Aspects- New Agricultural Policy-Food Security in India-Rural Credit-Agricultural Marketing- Regional Disparities in Indian Agriculture- Irrigation and other Agricultural Inputs.

Unit 3: Industrial Sector

Industrial Structure and Economic Growth- Large and MSMEs - Industrial Labour Problems and Labour Policy -Industrial Sickness Causes and Remedial Measures- Economic Reforms and Industrial Growth-Pattern of Industrialization-Public and Private Industrial Finance in India- Unorganized Sector and Informalisation of the Indian Economy.

Unit 4: Tertiary and Foreign Sectors

Service Sector - Role, Growth and Structure of Service Sector in India –Growth, Composition and Direction of India's Foreign Trade – Trade Policy and its Reforms in India – India's Balance of Payments - WTO and Indian Economy.

Unit 5: Planning and Development

Objectives and Strategy of Planning- Public Sector and Indian Planning- Re-Organization of Planning Commission (NITI Aayog) - Privatization and Globalization and its impact on India-Government Subsides in India - Problems of Capital Formation- Foreign Capital, Foreign aid and Economic Development in India.

TEXT AND REFERENCE BOOKS:

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

Learning Outcomes

After successfully completing the course Indian economy the graduate is able to:

At the end of the programme, the students will have knowledge of 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. Here we detail about the six major objectives of planning in India, i.e., (a) Economic Growth, (b) Attaining Economic Equality and Social Justice, (c) Achieving Full Employment, (d) Attaining Economic Self-Reliance, (e) Modernisation of Various Sectors, and (f) Redressing Imbalances in the Economy.
The objectives of industrial policy were: a high growth rate, national self-reliance, reduction of foreign dominance, building up of indigenous capacity, encouraging small scale industry, bringing about balanced regional development, prevention of concentration of economic power, reduction of income inequalities.

Generic Elective - 3

EMT 406: 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, (2nd 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.

Learning Outcomes

After successfully completing the course Indian economy the graduate is able to:

Analyse theoretical and empirical research in environmental and natural resource economics. Prepare an analytical policy report that develops knowledge and practical implementation of relevant economic theory in understanding and addressing an environmental or natural resource issue. Environmental Studies (EVS) at the primary stage envisages exposing children to the real situations in their surroundings to help them connect, be aware of, appreciate and be sensitized towards the prevailing environmental issues (natural, physical, social and cultural).

Environmental economists study the economics of natural resources from both sides - their extraction and use, and the waste products returned to the environment. They also study how economic incentives hurt or help the environment, and how they can be used to create sustainable policies and environmental solutions. Learning outcomes are statements that 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.

Generic Elective – 4

EMT 407:PROJECT

A project objective describes the desired results of a project, which often includes a tangible item. An objective is specific and measurable, and must meet time, budget, and quality constraints. ... A project may have one objective, many parallel objectives, or several objectives that must be achieved sequentially.

Project objectives are what you plan to achieve by the end of your project. This might include deliverables and assets, or more intangible objectives like increasing productivity or motivation. Your project objectives should be attainable, time-bound, specific goals you can measure at the end of your project.

Goals and objectives are statements that describe what the project will accomplish, or the business value the project will achieve. Goals are high level statements that provide overall context for what the project is trying to achieve, and should align to business goals. In brief, project management objectives are the successful development of the project's procedures of initiation, planning, execution, regulation and closure as well as the guidance of the project team's operations towards achieving all the agreed upon goals within the set scope, time, quality and budget standards.

Learning Outcomes

The use effectively oral, written and visual communication. identify, analyze, and solve problems creatively through sustained critical investigation. integrate information from multiple sources. Demonstrate an awareness and application of appropriate personal, societal, and professional ethical standards. The value of any project cannot be measured without defining success. It requires focus on outcomes. Outcomes are the events, occurrences, or changes in conditions, behavior, or attitudes that indicate progress toward a project's goals. Outcomes are specific, measurable, and meaningful. Good outcome statements are specific, measurable, and realistic.” Think carefully about what you can realistically accomplish given the groups you want to reach and the scope of your resources. Develop outcomes as follows: Outcomes should describe what you want to happen after your activity is completed.

Open Elective-1

EMT 408

OPTIMIZATION TECHNIQUES IN ECONOMICS

The purpose of optimization is to achieve the "best" design relative to a set of prioritized criteria or constraints. These include maximizing factors such as productivity, strength, reliability, longevity, efficiency, and utilization, this decision-making process is known as optimization.

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.

- This course explains concepts of Transportation Problem which is most important for the feasible Solution.
- This course describes the concept of Assignment Problem and Game theory.
- This course explores the concept of Techniques of Inventory control with known demand, 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

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 problemand 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.

Learning Outcomes

After successfully completing the course Optimization in Economics the graduate is able to:

At the end of the course the students find the values of decision variables that result in a maximum or minimum of a function called objective function, the objective function which is used as a measure of effectiveness of a decision. Students can make the process of making a trading system more effective by adjusting the variables used for technical Optimization analysis.

Open Elective-2

EMT 409: Data Base for Indian Economy

DBIE is a 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.

Unit 1: Census – Demographic Indicators – Definitions – schedules – Dissemination – Database – Tpes – 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 Organisations.
4. Annual Economic Surveys, Minstry of Finance, Government of India.
5. http://www.commerce.nic.in/eidb/iecnttopn.asp

Learning Outcomes

After successfully completing the course Data Base for Indian Economy the graduate is able to:

On completion of the course students will be able to: CO1. Develop ideas of the basic characteristics of Indian economy, its potential on natural resources. CO2. Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development. Learning outcomes are statements that 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. These three types of learning include: Creating new knowledge (Cognitive) Developing feelings and emotions (Affective) Enhancing physical and manual skills (Psychomotor) Learning objectives can also be scaffolded so that they continue to push student learning to new levels in any of these three categories.

Open Elective – 3

EMT 410

ACTUARIAL STATISTICS

Actuarial analysis uses statistical models to manage financial uncertainty by making educated predictions about future events. Insurance companies, banks, government agencies and corporations use actuarial analysis to design optimal insurance policies, retirement plans and pension plans and to analyze investment risks.

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.

- This course describes theory of Interest rates, Basic Annuities Certain, Concepts of different annuities and Varying annuities.
- This course covered Insurance and Utility Theory, Models for individual claims, Application to Insurance, Survival function, Accurate future Life time, Force of Mortality.
- In this course student will learn Life Table and its Relation with Survival Function, Deterministic Survivorship group, Recursion formulas, Assumptions for traditional ages, Analytical Laws of Mortality.
- This course explore Life Insurance models; Level benefit insurance, Endowment insurance, Deferred insurance and Varying benefit insurance.

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 Apportionable 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, lllins, U/S.A. 2nd 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.

Learning Objectives

After successful completion of this course students will be able to:

- Describe, explain and apply the fundamental theories of actuarial science as they apply in life insurance, general insurance and superannuation;
- Assess the suitability of actuarial, financial and economic models in solving actuarial problems; and Interpret and critically evaluate articles in the actuarial research literature.
- Students Demonstrate creativity and initiative in application of knowledge to problem solving and innovation.

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