



**DEPARTMENT OF ECONOMETRICS  
UNIVERSITY OF MADRAS**

**M.A. ECONOMETRICS**

**SYLLABUS FOR 2017-18**

***DEPARTMENT OF ECONOMETRICS***

The Department of Econometrics was established in July 1980. Since its inception, the Department has been specialising on teaching and research in quantitative economics, emphasising theoretical, methodological and conceptual aspects of economic theory along with econometric applications to socially relevant economic issues and policies. Quantitative analysis of economic data with computer applications has been the strength of the Department.

Recognising the growing importance of quantitative economics in teaching and policy decisions, the M.A Econometrics programme in 1978 along with the Ph.D. programme with a focus on applied econometrics. With the increasing demand for econometric analysis, M.A. Financial Economics and M.Phil. in Applied Economics are also offered by the Department. The Department teaching focuses on training students in computer applications and econometric softwares to impart quality learning in quantitative analysis.

The Department at present has 4 well trained faculty with specialisations in a wide range of topics.

**Dr. T. Lakshmanasamy, M.A., Ph.D.**

Professor and Head

**Dr. D. Sathiyavan, M.A., M.Phil., Ph.D.**

Associate Professor

**Dr. P. Mahendra Varman, M.S., M.Phil., Ph.D.**

Assistant Professor

**Dr. R. Mariappan, M.A., M.B.A., M.Phil., Ph.D.**

Assistant Professor

The Department has an Air-conditioned Computer and Econometrics Lab with accessories and is equipped with licensed software such as Windows, Linux, MS Office and Econometric/Statistical software packages such as SPSS, STATA, LIMDEP, SHAZAM & Eviews.

**M.A. ECONOMETRICS 2017-18**

Sem.	Sub. Code	Courses	C/E	Credits	Faculty
I	Eco C 101	Mathematical Methods	C	4	D.Sathiyavan
	Eco C 102	Statistical Methods	C	4	R.Mariappan
	Eco C 103	Data Analysis using Computers	C	4	P.Mahendra Varman
	Eco C 104	Micro Economics – I	C	4	T.Lakshmanasamy
	Eco E 101	Indian Financial System	E	3	P.Mahendra Varman
	Eco E 102	Indian Economic Development	E	3	R.Mariappan
	Eco E 103	Monetary Economics	E	3	Faculty
	UOM S***	Soft Skill*	S	2	University
II	Eco C 105	Mathematical Economics	C	4	R.Mariappan
	Eco C 106	Micro Economics – II	C	4	T.Lakshmanasamy
	Eco C 107	Macro Economics	C	4	P.Mahendra Varman
	Eco C 108	Econometric Theory – I	C	4	D.Sathiyavan
	Eco E 104	International Economics	E	3	Faculty
	Eco E 105	Development and Planning	E	3	R.Mariappan
	Eco E 106	Data Base for Econometric Analysis	E	3	P.Mahendra Varman
	UOM S***	Soft Skill	S	2	University
UOM ****	Internship	S	2	Department	
III	Eco C 109	Econometric Theory – II	C	4	D.Sathiyavan
	Eco C 110	Time Series Econometrics	C	4	P.Mahendra Varman
	Eco C 111	Applied Econometric Methods	C	4	R.Mariappan
	Eco C 112	Public Finance	C	4	T.Lakshmanasamy
	Eco E 107	Financial Economics	E	3	Faculty
	Eco E 108	Industrial Economics	E	3	Faculty
	Eco E 109	Advances in Economic Theory	E	3	T.Lakshmanasamy
	UOM S***	Soft Skill	S	2	University
IV	Eco C 113	Econometric Applications	C	4	D.Sathiyavan
	Eco C 114	Panel Data and Non-parametric Econometrics	C	4	T.Lakshmanasamy
	Eco C 115	Project	C	4	Faculty
	Eco E 110	Agricultural Economics	E	3	Faculty
	Eco E 111	Indian Economic Issues	E	3	Faculty
	Eco E 112	Industrial Organisation	E	3	Faculty
	UOM S***	Soft Skill	S	2	University

Note: Soft skill courses are conducted by the University and students choose from the list of soft skill courses offered by the University.

Eco C 101	Mathematical Methods	4	D. Sathiyavan
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- Unit 1:** Basics – exponents, polynomials, functions, limits, continuity, and derivatives – rules – partial derivatives – differential and total differential – integration – rules – economic applications.
- Unit 2:** Set theory – convex and concave sets and functions – local and global maximum and minimum.
- Unit 3:** Optimisation – maxima and minima – constrained – Lagrangian multiplier method – first and second order conditions – solving numerical problems.
- Unit 4:** Linear algebra – vectors – matrix – definition – types – relations and operations – trace, partitioned matrices – determinants – rank – properties – inverse – properties of inverse – solution to a system of linear equations – existence of uniqueness of solution – Cramer’s rule – inversion method.
- Unit 5:** Characteristic roots and vectors – properties – quadratic forms – definiteness – distribution of quadratic function.

**Books for Reference:**

- Edward T. Dowling: Introduction to Mathematical Economics, Tata McGraw Hill.
- G.Hadley: Linear Algebra, Narosa Publishing House.
- A.C.Chiang: Fundamental Methods of Mathematical Economics, McGraw-Hill.
- M.D.Intriligator: Mathematical Optimization and Economic Theory, Prentice Hall Inc. Chapters 5, 7 and 8 and Appendices A and B.

Eco C 102	Statistical Methods	4	R.Mariappan
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- Unit 1:** Basics – frequency distribution – graphs and histograms – measures of central tendency – mean, median, mode, geometric mean, harmonic mean – merits and demerits – measures of dispersion – range, mean deviation, semi-interquartile range and variance – moments, skewness and kurtosis – grouped and ungrouped data – numerical problems.
- Unit 2:** Probability – concept of probability – discrete and continuous random variables – probability and cumulative distribution functions – joint probability and cumulative distribution functions – mathematical expectations and variance – concepts and theorems – moment generating and characteristic functions – problems.
- Unit 3:** Special probability distributions – binomial, poisson, exponential, normal, chi square, t and F distributions – probability and distribution functions – properties – relations among binomial, poisson and normal distributions – central limit theorem.
- Unit 4:** Sampling theory – definitions of sampling with and without replacement – type-I and Type-II errors – level of significance – rules of hypotheses testing – one-tailed and two - tailed test – sampling distributions of means and variances – theorems – sampling distribution of proportions – sampling distributions of sums – numerical problems.

**Unit 5:** Estimation theory and testing of hypothesis – properties of estimates – confidence interval for population parameters and sample statistics – confidence interval for variances – maximum likelihood estimates – special tests of significance for large and small samples – numerical problems.

**Books for Reference:**

1. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes: Introduction to the Theory of Statistics. Third Edition, McGraw-Hill.
2. Murray R. Spiegel: Theory and Problems of Probability and Statistics. McGraw-Hill Schaum’s Outline Series.
3. Seymour Lipschutz and John Schiller: Introduction to Probability and Statistics, Schaum’s Outlines, McGraw Hill.
4. P.K.Viswanathan: Business Statistics: An Applied Orientation, Pearson.
5. Damodar Gujarati: Essentials of Econometrics, McGraw Hill.

<b>Eco C 103</b>	<b>Data Analysis using Computers</b>	<b>4</b>	<b>P.Mahendra Varman</b>
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**Unit 1:** Overview of data characteristics – key terms and definitions –population – sample – variable – parameter – statistic – types of Data – metric – non-metric – nominal – ordinal – interval and ratio – sources of data – step by step approach to statistical investigation – methods of data analysis –descriptive method – inferential method – data-base availability.

**Unit 2:** Data processing using Microsoft Excel – fundamentals of spreadsheets – fill handles – absolute positioning – cell operations – data sorting and filter – specific functions – frequencies – charts and chart Options – mathematical functions – transformations – matrices – solving linear equations using spreadsheet – linear programming using Excel solver – statistical functions – measures of central tendencies and dispersions – data analysis –regression – forecasting – chi-square test.

**Unit 3:** Introduction to Stata – Stata Description – Stata Windows – creating new data set – importing ASCII data – creating log, cmdlog and do files – generating and replacing variables – summary statistics and exploratory data analysis – frequency tables and two-way cross tabulations – regression – dummy variables and interaction effects.

**Unit 4:** Multivariate data analysis using SPSS – basics data management – importing data – recoding variables – creating new variables using compute command – selecting and weighting cases – univariate analysis – cross tabulations – multiple regression analysis – LSDV regression and interaction effects.

**Unit 5:** Working with E-views – creating work file and importing data – creating new series – running simple statistical and econometric tools using E-views.

**Books for Reference:**

1. David P. Doane and Lori E. Seward: Applied Statistics in Business and Economics, Tata McGraw Hill.
2. Kultar Singh: Quantitative Social Research Methods, Sage.
3. STATA Version 8.0; Base Reference Manuals, Volume 1-4.
4. P.K.Viswanathan: Business Statistics: An Applied Orientation, Pearson.
5. Web Resources: [http://www.sabine.k12.la.us/class/excel\\_resources.htm](http://www.sabine.k12.la.us/class/excel_resources.htm).

<b>Eco C 104</b>	<b>Micro Economics – I</b>	<b>4</b>	<b>T.Lakshmanasamy</b>
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**Unit 1:** Resource allocation – economic laws – market and market mechanism – demand and supply – market equilibrium – existence, uniqueness and stability of equilibrium – changes, shifts and dynamic adjustments – constrained optimisation.

**Unit 2:** Relationship between marginal, average and total quantities – short run and long run cost curves – optimum output – classification of goods – demand functions – restrictions and properties – compensated and uncompensated demand curves – elasticity – Engel curve.

**Unit 3:** Theory of individual decision making – preference and choice – consumer equilibrium – Slutsky equation – derivation of demand curves – utility functions – direct, indirect, additive, separable, homogenous and homothetic functions – duality – applications of indifference curve analysis – consumer surplus, taxes, subsidy, labour supply, welfare.

**Unit 4:** Revealed preference theory – intertemporal choice – choice under uncertainty – expected utility analysis – mean-variance approach – characteristic approach – quality choice – asymmetric information and decision making – random utility – prospect theory.

**Unit 5:** Theory of firm – theory of production and production functions – returns to scale – technology and technical change – optimization – duality – alternative objectives of firm – Cobb-Douglas and CES production functions – properties of production functions – multiple inputs and outputs.

**Books for Reference:**

1. J.M.Henderson and R.E.Quandt: Micro Economic Theory, Tata McGraw Hill.
2. Hal R.Varian: Intermediate Micro Economics, East West Press.
3. A. Koutsoyiannis: Modern Microeconomics, Macmillan.

<b>Eco E 101</b>	<b>Indian Financial System</b>	<b>3</b>	<b>P.Mahendra Varman</b>
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**Unit 1:** Components of financial system – functions – design and structure – financial system and macroeconomy – national income accounts – flow of funds accounts – financial system and economic growth.

**Unit 2:** Indian financial system – pre and post reform developments – money market – institutions – instruments – capital market – instruments – shares – debts –

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derivatives – primary market – IPO – process – institutional mechanism – secondary market - listing - trading – index – stock exchange – depositors – demat account.

**Unit3:** Debt market – corporate bonds – government securities – primary dealers – disinvestment of PSUs – PSU bonds.

**Unit 4:** Derivatives – commodities types – financial types – commodity exchanges.

**Unit 5:** Mutual funds – types – risk – NAV – SEBI guidelines – UTI – insurance – IRDA – health – life – other insurance products – credit rating and agencies.

**Books for Reference:**

1. Bharati V. Pathak: The Indian Financial System, Pearson Education Ltd.
2. M.Y.Khan: Indian Financial System, Tata McGraw Hill.
3. L.M.Bhole: Financial Institutions and Markets, Tata McGraw Hill.

<b>Eco E 102</b>	<b>Indian Economic Development</b>	<b>3</b>	<b>R.Mariappan</b>
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**Unit 1:** Concepts of economic growth and development – major features of the Indian economy – economic and non-economic factors in economic development – obstacles to economic growth and development measures of development – GDP – Per capita income – human development index.

**Unit 2:** Trends and growth in GDP – agriculture, industry and service sectors – production, exports and imports – capital formation – capital-output ratio – productivity – heavy industries – small scale industries – ICT and Indian economic development – employment – infrastructure.

**Unit 3:** Indian economic planning – plan models – five year plans – monetary and fiscal policies – public debt and deficit financing – trade and investment policies – industrial and labour regulations.

**Unit 4:** Foreign trade – importance, composition, foreign trade policy, direction, balance of payments and economic reforms – trade, export and import policies – trends in imports and exports – prices and money supply – causes and policies.

**Unit 5:** India and international relations – WTO, bilateral relations, environment and climate change issues, trade issues – globalisation issues and global standards.

**Books for Reference:**

1. R.Dutt and K.P.M.Sundaram: Indian Economy, S. Chand & Company.
2. S.K.Misra and V.K.Puri: Economics of Development and Planning, Himalaya.
3. Government of India, Economic Surveys.
4. Reserve Bank of India Annual Reports.

<b>Eco E 103</b>	<b>Monetary Economics</b>	<b>3</b>	<b>Faculty</b>
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**Unit 1:** Money - definition – measures – central bank balance sheet – flow of funds approach – money multiplier – central bank and commercial bank – coordination – combined balance sheet.

**Course List & Syllabus**

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**Unit 2:** Demand for money – quantity theories – general theory – Tobin’s portfolio model – monetarism – microeconomic transactions approach.

**Unit 3:** Transmission of monetary policy – channels – interest rate – expected inflation – exchange rate – asset prices – Philips cure – money supply, aggregate demand – independence of central bank.

**Unit 4:** Theory of monetary policy – goals – instruments – rules and discretion – choice of instruments – targets and indicators – policy rules.

**Unit 5:** Monetary policy with fixed exchange rate – floating exchange rate – policy coordination – capital mobility and Tobin tax.

**Books for Reference:**

1. Keith Bain and Peter Howells: Monetary Economics, London: Palgrave.
2. Jagdish Handa: Monetary Economics, London: Routledge.

<b>UOM S***</b>	<b>Soft Skill</b>	<b>2</b>	<b>University</b>
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<b>Eco C 105</b>	<b>Mathematical Economics</b>	<b>4</b>	<b>R.Mariappan</b>
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**Unit 1:** Optimisation methods and economic analysis – application of constrained and unconstrained optimization methods to consumer and producer behaviour – production function – Cobb-Douglas production function-properties.

**Unit 2:** Linear programming – primal – dual – graphic method – simplex method – application to production and diet problems – Non-linear programming – Hawkin-Simon conditions – method and applications.

**Unit 3:** Input – output analysis – structure of an economy – assumptions – technical co-efficient – outputs and price determination – static and dynamic input-output analysis.

**Unit 4:** Game theory – basic concepts – two person zero sum game – saddle point – examples of co-operative and non-co-operative games – Prisoner’s dilemma.

**Unit 5:** Difference and differential equations – first and second order linear differential and difference equations – application to growth and trade cycle models – Cobbweb model – Domar model.

**Books for Reference:**

1. A.C. Chiang: Fundamental Methods of Mathematical Economics, McGraw Hill.
2. J. Henderson and R.E. Quandt: Micro Economic Theory, Tata McGraw Hill.
3. M.D.Intrilligator: Mathematical Optimization and Economic Theory, Prentice Hall.

<b>Eco C 106</b>	<b>Micro Economics – II</b>	<b>4</b>	<b>T.Lakshmanasamy</b>
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**Unit 1:** Marginalist approach – critique of neo-classical theory of firm – marginalist controversy – modern markets – alternative objectives of firm – market

**Course List & Syllabus**

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structure – classification of markets – pricing rules – equilibrium and disequilibrium analysis.

**Unit 2:** Competitive market – equilibrium of a firm – short and long run analysis – monopoly – price discrimination – inefficiency and regulation of monopoly – monopolistic competition – product differentiation.

**Unit 3:** Oligopoly – rivalry and strategic behaviour – reaction functions – Cournot and Stackleberg equilibrium – kinky demand curve – cartels, mergers and takeovers – cooperative and non-cooperative behaviour – bargaining – game theoretic solutions.

**Unit 4:** Input markets – marginal productivity theory and distribution of income – competitive markets – factor market imperfections – monopoly – monopsony – exploitation – bilateral monopoly – Euler’s theorem – Clark-Wicksteed theorem.

**Unit 5:** Theory of general equilibrium – pure exchange economy – Pareto optimality – Walrasian equilibrium – welfare analysis.

**Books for Reference:**

1. J.M. Henderson and R.E. Quandt: Micro Economic Theory, Tata McGraw-Hill.
2. Hal R. Varian: Intermediate Micro Economics, East West Press.
3. A. Koutsoyiannis: Modern Microeconomics, Macmillan.

<b>Eco C 107</b>	<b>Macro Economics</b>	<b>4</b>	<b>P.Mahendra Varman</b>
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**Unit 1:** Basic concepts in macroeconomics – stocks and flows – static and dynamic equilibrium – national income concepts – circular flow of income – different forms of national income accounting.

**Unit 2 :** Product market – classical theory of output and employment – Keynesian theory of income determination – aggregate demand and aggregate supply – closed economy model – open economy model – role of multipliers – static vs dynamic multipliers – consumption and investment functions – income consumption relationship – marginal efficiency of capital and investment.

**Unit 3:** Money market – demand for money – classical approach to demand for money – quantity theory approach – Cambridge quantity theory – Keynes liquidity preference approach – aggregate demand for money – derivation of LM curve – theory of money supply – high powered money and money multiplier.

**Unit 4:** Integration of product and money markets – interdependence of product and money market – derivation of IS and LM curves – IS-LM model in closed economy – IS-LM model in open economy – multiplier and relationship with IS-LM model – effectiveness of fiscal and monetary policies on general equilibrium.

**Unit 5:** Foreign exchange and balance of payment –foreign exchange – exchange rate determination – floating exchange market – fixed exchange rate – controversies of free and fixed exchange rate markets - balance of payments – disequilibrium in balance of payments – causes and kinds – automatic adjustment in BOP –

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adjustments by policy measures – expenditure changing and expenditure switching policies – monetary approach to BOP adjustment.

**Books for Reference:**

1. R.Dornbusch, S.Fischer.and R.Startz: Macroeconomics, Tata McGraw Hill.
2. E.Shapiro: Macroeconomic Analysis, Galgotia Publications.
3. Gregory N.Mankiw: Macroeconomics, Macmillan.
4. D.N.Dwivedi: Macroeconomics – Theory and Policy, McGraw Hill.
5. G.Ackley: Macroeconomics – Theory and Policy, Collier Macmillan.

<b>Eco C 108</b>	<b>Econometric Theory – I</b>	<b>4</b>	<b>D.Sathiyavan</b>
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**Unit 1:** Econometrics – definitions – scope – methodology – types.

**Unit 2:** Two variable regression model – assumptions – method of least squares – properties – BLUE – R-square – maximum likelihood method – testing of hypotheses using point and interval estimates – forecasting – solving problems using SPSS and STATA.

**Unit 3:** Nonlinear relationships – transformation of variables – functional forms – three variable regression model – applications using SPSS and STATA.

**Unit 4:** General linear model (matrix approach) – specification – OLS estimators – testing significance of individual and overall regression coefficients – restricted least squares – structural regression models – dummy variables – problems and application using STATA.

**Unit 5:** Violation of classical assumptions – multicollinearity – autocorrelation – hetroscedasticity – problems – causes – consequences – remedial measures – model specification and diagnostic testing.

**Books for Reference:**

1. Damodar N. Gujarathi: Basic Econometrics, New Delhi: Tata McGraw Hill.
2. J.Johnston: Econometric Methods, McGraw Hill.
3. STATA Version 8.0: User’s Guide, Texas: Stata Press.

<b>Eco E 104</b>	<b>International Economics</b>	<b>3</b>	<b>Faculty</b>
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**Unit 1:** Theories of international trade – Adam Smith – David Ricardo – Heckscher Ohlin – factor accumulation – Rybczynski theorem – technical progress and international trade.

**Unit 2:** International trade policy – partial equilibrium analysis – general equilibrium analysis – distortions in domestic markets – imperfect competition.

**Unit 3:** Protection – types – agreements – theory of customs – import substitutions vs export promotion.

**Unit 4:** BOP – market for foreign exchange – foreign trade and national income – capital movement.

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**Unit 5:** Exchange rate – determination of floating exchange rate – macro economics policy and exchange rate – exchange rate and policy coordination.

**Books for Reference:**

1. Carbaugh: International Economics, Thompson South – Western, New Delhi.
2. Paul Krugman and Maurice Obstfeld: International Economics: Theory and Policy, Pearson-Addison Wesley.
3. Bo Sodersten and Reed Geoffrey: International Economics, Macmillan Press Ltd.

<b>Eco E 105</b>	<b>Development and Planning</b>	<b>3</b>	<b>R. Mariappan</b>
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**Unit 1:** Economic growth and development – problem of development – causes of underdevelopment – measures of growth and development – development issues – development strategies – examples.

**Unit 2:** Early growth models – Harrod-Domar model – Neoclassical Solow model – technological change – exogenous growth – convergence – golden rule – growth accounting approach – residual approach – total factor productivity – augmented Solow model.

**Unit 3:** Unlimited growth – increasing returns – endogenous growth – innovations – learning by doing – positive spillovers – modern concept of capital – factor mobility and growth – governments and markets – public-private partnership – social issues – health and education in development.

**Unit 4:** Endogenous growth models – growth engines – knowledge capital – human capital – public utilities and infrastructure – R&D – trade – social capital – formal and informal institutions.

**Unit 5:** Modern development issues – cost-benefit analysis – planning and development – Indian plan models.

**Books for Reference:**

1. Robert J. Barro and Xavier Sala-i-Martin: Economic Growth.
2. P. Aghion and S. Durlauf: Handbook of Economic Growth.
3. Kaushik Basu: The Less Developed Economy.
4. Debraj Ray: Development Economics.

<b>Eco E 106</b>	<b>Database for Econometric Analysis</b>	<b>E</b>	<b>P.Mahendra Varman</b>
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**Unit 1:** Census – history of population census – demographic indicators – definitions – schedules – dissemination – database – types – other data sets from census – sample registration system - economic census – education census – agricultural census.

**Unit 2:** National income accounting – base year – methods of estimation – types of reporting – BoP and NI – SDP – district income.

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**Department of Econometrics**

**Unit 3:** NSSO – sample – large and small samples – rounds – reports – ASI – coverage – definition of terms – reports – price and wage statistics – socioeconomic statistics – NFHS – district handbooks.

**Unit 4:** RBI – balance sheet approach – banking statistics – money supply – foreign exchange reserve – exchange rate – stock market statistics

**Unit 5:** International data – World bank, IMF, ILO, WTO, UNCTAD, UN and other international agency data – World Value Surveys – Gallop Poll.

**Books for Reference:**

Websites and reports of respective ministries and organizations, like

1. Directorate of Census Operations, CSO, NSSO of GOI, SEBI, RBI.
2. Reports of Statistics Departments in State Governments.
3. World organisations.

<b>UOM S***</b>	<b>Soft Skill</b>	<b>2</b>	<b>University</b>
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<b>UOM ****</b>	<b>Internship</b>	<b>2</b>	<b>Department</b>
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The Internship is for 2 credits for a duration of 4-6 weeks during the summer vacation (May-June) of the first year to be carried out in an organization. Internship is intended to gain practical knowledge related to economic concepts and econometric applications. The students are expected to learn how organizations in practice apply economic concepts and econometric techniques in their operations. The students should submit their Internship report along with the nature of work done during the Internship and the certificate from the organization where the Internship was carried out. The candidates should also present their Internship report in the seminar before the Department faculty which will evaluate the Internship work.

<b>Eco C 109</b>	<b>Econometric Theory – II</b>	<b>4</b>	<b>D.Sathiyavan</b>
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**Unit 1:** Dynamic econometrics – autoregressive and distributed lag models – estimation methods – lagged variables – problem and applications using STATA.

**Unit 2:** Simultaneous equation model – specification – identification – rank and order conditions – problems.

**Unit 3:** Estimation methods – single equation and systems estimation methods – numerical problems – applications using STATA.

**Unit 4:** Qualitative and limited dependant variable models – linear probability, logit, probit and tobit models – specification – estimation methods – applications.

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**Unit 5:** Censored regression models – multinomial logit – hazard model – estimation - applications.

**Books for Reference:**

1. Gujarathi, D.N.: Basic Econometrics, New Delhi: Tata McGraw Hill.
2. Johnston, J.: Econometric Methods, McGraw Hill.
3. Greene, W.: Econometric Analysis, Pearson Education.
4. STATA Version 8.0: User’s Guide, Texas: Stata Press.

<b>Eco C 110</b>	<b>Time Series Econometrics</b>	<b>4</b>	<b>P.Mahendra Varman</b>
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**Unit 1:** Classical time series analysis – utility of time series analysis – components of time series data – measurement of trend, seasonality and cycles – moving averages and smoothing techniques to time series analysis - classical time Series decomposition models – additive and multiplicative models – forecasting using smoothing techniques and time series decomposition methods – applications in finance .

**Unit 2:** Tools of modern time series analysis – stochastic and stationary process – tests of stationary – trend vs difference stationery process – Dickey-Fuller and augmented Dickey-Fuller tests – spurious regression and co-integration of time series – Engle-Granger test – CRDW test – error correction mechanism.

**Unit 3:** Univariate time series analysis and forecasting – linear time series analysis – autocorrelation function and partial auto-correlation function – auto-regressive (AR) models, moving average (MA) models, Box-Jenkins (BJ) ARMA and ARIMA models – identification – estimation and forecasting with ARIMA models – economic applications.

**Unit 4:** Multivariate time series analysis and forecasting – vector autoregressive (VAR) models – advantages and problems – estimation and forecasting with VAR – impulse response function – Johansen Co-integration test on VAR – Granger causality test – applications in finance.

**Unit 5:** Modeling volatility and auto-correlation in time series – motivation and test for non-linearity – historical and implied volatility – auto-regressive conditional heteroscedasticity (ARCH) model – generalised ARCH model – applications in finance.

**Books for Reference:**

1. D.N.Gujarati and Sangeetha: Basic Econometrics, Tata McGraw-Hill.
2. Chris Brooks: Introductory Econometrics for Finance, Cambridge University Press.
3. T.M.J.A. Cooray: Applied Time Series – Analysis and Forecasting, Narosa Publications.

<b>Eco C 111</b>	<b>Applied Econometric Methods</b>	<b>4</b>	<b>R.Mariappan</b>
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**Unit 1:** Demand analysis – demand functions – theory, specification and estimation – duality theory – linear expenditure system – empirical studies.

**Unit 2:** Production functions – Cobb- Douglas, CES, Translog functions – specifications and estimation issues – applications with farm and firm level data – modeling of farm household behaviour – specification and estimation problems.

**Unit 3:** Labour supply – simple model –extensions – empirical studies – labour supply effects of tax and transfers.

**Unit 4:** Health and education – conceptual and measurement issues – simple econometric model – empirical studies.

**Unit 5:** Macro models – macro aggregates – trends and growths – Indian macro econometric models.

**Books for Reference:**

1. ICSSR: Survey of Economics–Vol.7: Econometrics, Allied Publishers.
2. A.Deaton and John Muellbauer; Economics and Consumer Behaviour, CUP.
3. Julia Hebden: Applications of Econometrics, Heritage Publishers.
4. Mark Killingsworth: Labour Supply, Cambridge University Press.
5. M.Desai: Macroeconomic Models for India: A Survey – Sankhya, Series - B 85.
6. K.L.Krishna: Econometric Applications in India, Oxford University Press.
7. Hollis Chenery and T.N.Srinivasan: Handbook of Development Economics.
8. Narendra Jadav: Monetary Modelling of the Indian Economy: A Survey, Reserve Bank of India Occasional Papers.

<b>Eco C 112</b>	<b>Public Finance</b>	<b>4</b>	<b>T.Lakshmanasamy</b>
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**Unit 1:** Role of government – public goods and externalities – private property and law – imperfect market and regulation – welfare state and redistribution – role of state in economic growth – public finance and public sector economics.

**Unit 2:** Principles of taxation – tax incidence – taxation and efficiency – optimal taxation – taxation of income and wealth – taxation of consumption and trade – taxation and environment – tax incentives, compliance and enforcement – Trends in Indian tax revenue.

**Unit 3:** Theories of public expenditure – measuring size of public sector – public expenditure and economic growth and development – composition of public expenditure and welfare state – public expenditure in India – trends and composition – pattern of financing deficit – FRBM – FRL – issues in union financial transfers.

**Unit 4:** Fiscal policy – process of budgeting in India –classification of budgets trends – evaluation systems – types of deficits – fiscal policy – indicators — taxation – centre, state and local – public debt and management.

**Unit 5:** Fiscal federalism in India – theories of fiscal federalism – vertical and horizontal fiscal imbalances in India – Inter-governmental financial transfers in India – political economy of Indian fiscal federalism.

**Books for Reference:**

1. R.A.Musgrave and P.Musgrave: Theory of Public Finance.
2. Joseph E Stiglitz: Economics of the Public Sector.
3. Sudipto Mundle: Public Finance: Policy Issues for India, OUP.

<b>Eco E 107</b>	<b>Financial Economics</b>	<b>3</b>	<b>Faculty</b>
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**Unit 1:** Basics of financial markets and financial environment – major players in financial markets – instruments of financial markets – financial intermediation – investment banking and brokerage services – securities – types of securities – market for securities – how and where traded – initial public offering (IPO) – secondary markets – trading on exchanges and trading with margins.

**Unit 2:** Theories of investment – time value of money – net present value – future value – interest rates – internal rate of return.

**Unit 3:** Portfolio theory and portfolio selection – risk and risk aversion – risk, speculation and gambling – trade-off between risk and return – capital allocation between risky and risk-free portfolios – risk tolerance and asset allocation – diversification of portfolio risk.

**Unit 4:** Capital asset pricing model – demand for and equilibrium prices – equilibrium prize and capital asset pricing model – why do all investors hold market portfolio – risk premium and market portfolio – security market line.

**Unit 5:** Financial market equilibrium – random walk and efficient market hypothesis – competition as a source of efficiency – implication of EMH for investment policies – technical analysis and fundamental analysis.

**Books for Reference:**

1. S.A.Ross, R.W.Westerfield, J.Jaffe and Roberts: Corporate Finance, McGraw-Hill.
2. Zvi Boodie, Alex Kane and Alan J.Marcus: Investments, McGraw-Hill.
3. John Hull: Futures, Options and Other Derivatives, Prentice Hall.

<b>Eco E 108</b>	<b>Industrial Economics</b>	<b>3</b>	<b>Faculty</b>
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**Unit 1:** Firm and organisation – Hoffman’s hypothesis of market economies – Simon Kuznet’s concept of secular changes in industrial development – Chenery’s patterns of industrial change – theories of industrial location – Weber and Sargent Florence – product differentiation – market concentration – economies of scale – market structure – diversification of the firm, size and growth, profitability, productivity, efficiency and capacity utilisation of firm – theories of product pricing – pricing of public utilities.

**Unit 2:** Industrialisation in India – trends and pattern – public and private sectors – industrial growth in India – large, medium and small scale industries – capital and consumer goods industries – industrial policy – public-private partnership – exports and imports – issues in industry – productivity – concentration, employment and labour – social security – technology – industrial relations – exit policy – industrial finance – sickness – trade unions – disputes – regulation – manufacturing policies.

**Unit 3:** Institutional finance – ICICI, EXIM Bank, NHB, IDBI, IFCI, IIBI , SFCs, NIDC, SIDBI, SIDCS, UTI, LIC, General Insurance Corporations, commercial banks – international finance – FDI – joint ventures – domestic market resources.

**Unit 4:** Service sector in India – growth – pattern – share in employment, trade, exports – impact of ICT on industrialisation.

**Unit 5:** International organisations and industry – ILO – WTO – bilateral and multilateral trade agreements – MNCs – impact of globalisation, privatisation and liberalisation.

**Books for Reference:**

1. R.R.Barthwal: Industrial Economics, Wiley Eastern Ltd.
2. F.Churunilam: Industrial Economics: Indian Perspective, Himalaya.
3. S.C.Kuchhal: Industrial Economy of India, Chaitanya Publishing House.
4. Reserve Bank of India: Report on Currency and Finance.

<b>Eco E 109</b>	<b>Advances in Economic Theory</b>	<b>3</b>	<b>T.Lakshmanasamy</b>
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**Unit 1:** Consumer theory – non-market production – Lancaster’s characteristics approach – Becker’s home production model – Lewis’s time allocation model – Hirschleiffer’s analysis of Uncertainty – Akerlof’s information asymmetry and quality demand model –

**Unit 2:** Becker’s human capital theory – Mincer’s post schooling investment model – Labour supply models – valuation of time and leisure – value of life – Sen’s welfare approach – capabilities and functioning.

**Unit 3:** Public goods – Buchanan’s public choice approach – Stiglitz private use of public interest – club goods – externalities and social returns – spillovers and increasing returns.

**Unit 4:** Open economy macro models – disequilibrium analysis – environment and climate change – global impacts.

**Unit 5:** Game theory – Nash equilibrium – sequential equilibrium – signaling and sorting.

**Books for Reference:**

1. Handbook of Economics series, North Holland Elsevier.

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<b>Eco C 113</b>	<b>Econometric Applications</b>	<b>4</b>	<b>D.Sathiyavan</b>
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- Unit 1:** Consumption functions – estimation of demand functions – Engel functions – functional forms viz. linear, double-log, semi-log, quadratic, log-inverse functions – computation of price and income elasticities.
- Unit 2:** Production function – estimation of production functions viz. Cob-Douglas, CES, Translog, frontier functions – estimation of cost, profit and supply response functions.
- Unit 3:** Dynamic econometric models – Kyock, adaptive expectation and partial adjustment, Almon distributed lag models – panel models.
- Unit 4:** Qualitative response models – estimation of LPM, probit, logit and tobit models.
- Unit 5:** Simultaneous regression models – indirect least squares, two-stage least Squares – instrumental variable methods.

**Books for Reference:**

1. D.N. Gujarathi: Basic Econometrics, Tata – McGraw Hill.
2. A.Deaton and John Muellbauer: Economics and Consumer Behaviour, Cambridge University Press,
3. Julia Hebden: Applications of Econometrics, Heritage Publishers.
4. R.F.Wynn and K. Holden: An Introduction to Applied Analysis, Macmillan Press.
5. M.Upender: Applied Econometrics, Vrinda Publications.

<b>Eco C 114</b>	<b>Panel Data and Non-Parametric Econometrics</b>	<b>4</b>	<b>T.Lakshmanasamy</b>
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- Unit 1:** Data structure – cross-section, time-series, pooled and panel data – unobserved heterogeneity – endogeneity – balanced and unbalance panels – covariance structure – one and two way error components.
- Unit 2:** Panel estimation – fixed effects model – LSDV estimation – random effects model – Hausman specification test – hypothesis testing – dynamic panel models – GMM estimation – panel discrete choice model – panel limited dependent variable models.
- Unit 3:** Non-parametric approach – data generation mechanism – empirical distribution – kernel estimation – bandwidth selection – estimation – non-parametric regression – Nadaraya-Watson method – inference.
- Unit 4:** Semi-parametric method – assumptions – moments estimation – least absolute deviation method – partially linear regression – kernel density method – discrete choice models – maximum scores estimation – bootstrapping.
- Unit 5:** contemporary econometrics – Bayesian methods – Bayesian model averaging – MCMC simulation – quantile regression – SURE model – frontier methods – treatment effects – counterfactual – regression discontinuity design – DID estimation – propensity to score method – matching methods.

**Books for Reference:**

1. William Greene: Econometric Analysis, Pearson education.
2. Woolridge: Introduction to Econometrics.
3. Racine and Li: Non-Parametric Econometrics – A Premier.
4. A.C.Cameron and P.K.Trivedi: Microeconometrics: Methods and Application, Cambridge University Press.

<b>Eco C 115</b>	<b>Project</b>	<b>4</b>	<b>Faculty</b>
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The objective of the project is to train the students to undertake empirical studies applying their knowledge in economic theory and econometric methods and provide scope to do empirical analysis. The students are expected to demonstrate the practical implementation of the economic theory to an economic problem, identify a suitable econometric method to the issue, demonstrate the empirical implementation of the econometric technique with appropriate data, and with computer applications. The project would enable them to learn the applications of the econometric techniques of preparing project reports. The project report may be 15-25 pages and consists of the statement of the problem, review of literature, theoretical and empirical methodology, sources and nature of data, econometric method and analysis, economic/statistical inferences, conclusion, and references. Faculty members will provide continuous guidance to complete the project. The topic of the research will be chosen by the students in consultation with one of the faculty members of the Department who will act as guide and supervisor. The candidates should also present their project work in the seminar before the Department faculty which will evaluate the project work.

<b>Eco E 110</b>	<b>Agricultural Economics</b>	<b>3</b>	<b>Faculty</b>
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- Unit 1:** Nature agricultural and rural economics – traditional and modernization – agriculture in economic development – cropping pattern, food supply and food security – agricultural policies – supply and pricing of inputs – subsidies.
- Unit 2:** production pattern – productivity – regional variations – resource use efficiency – small and marginal holdings – land reforms – institutional structure and reforms.
- Unit 3:** Green revolution – HYVs – irrigation – fertiliser – mechanisation – pesticide – pricing – marketing – storage – modernisation - technical change – agro industries..
- Unit 4:** Agriculture-industry linkage – terms of trade – agricultural finance – minimum support prices – commercial farming – futures markets.
- Unit 5:** Agriculture and external sector – trade in agricultural goods – WTO and trade blocks – MNCs – globalisation and agriculture.

**Books for Reference:**

1. Ashok Rudra: Indian Agriculture, Asia Publishing House.
2. R. Datt and K.P.M. Sundharm: Indian Economy, S. Chand & Co.

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3. S.K.Misra and V.K.Puri: Indian Economy, Himalaya Publication House.
4. Government of India: Economic Surveys.

<b>Eco E 111</b>	<b>Indian Economic Issue</b>	<b>3</b>	<b>Faculty</b>
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- Unit 1:** Economic and human development issues – non-economic factors in economic development – natural resource allocation issues – human and gender empowerment issues – education and health issues – environment and climate change issues – setting standards.
- Unit 2 :** Basic issues in agriculture sector – agricultural costs and pricing – land holding and productivity issues – irrigation, fertilizer, price, power subsidy issues – WTO and Indian agriculture – agricultural growth concerns – conditions and problems of agricultural laborers – measures for improvement.
- Unit 3:** Issues in industrial sector – industrial production and productivity issues – problems of industrial development – performance issues – sick industries – industrial policies – industrial finance – MNCs and FDI issues – global standards and impacts – subsidies and taxation issues.
- Unit 4:** Issues in service sector – growth and contribution of service sector in India – service sector employment growth – ICT development in India – IT and ITES industry – sustainability of service led growth in India.
- Unit 5:** Poverty and income distribution in India – concept of poverty line – incidence of poverty and multi-dimensional poverty – poverty alleviation programmes and strategies adopted in India – patterns of income distribution in India – causes of income inequalities – government policy measures to bridge gap – issues in employment programmes.

**Books for Reference:**

1. R. Dutt and K.P.M. Sundharm: Indian Economy, S. Chand & Co.
2. S.K.Misra and V.K.Puri: Indian Economy, Himalaya Publication House.
3. S.K.Misra and V.K.Puri: Economics of Development and Planning, Himalaya.
4. Debraj Ray: Development Economics.
5. Government of India: Economic Surveys.

<b>Eco E 112</b>	<b>Industrial Organisation</b>	<b>3</b>	<b>Faculty</b>
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- Unit 1:** Imperfect competition and market distortions – pricing – rent seeking – costs – strategies of firms – product quality – asymmetric information – discrimination – advertisement.
- Unit 2:** Monopoly and regulation – barriers – Oligopoly models – Cournot, Bertrand, Hotelling, Stackelberg, Spencer-Dixit models – collusion – price wars – quality competition – price rigidity.
- Unit 3:** Vertical control – product differentiation – spatial competition – dynamic price competition – tacit collusion – cartel – entry costs – accommodation – merger –

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acquisition – exit – reputation – limit pricing – Milgrom-Roberts model – predation.

**Unit 4:** Contestable markets – R&D – innovation – patent networks – networks and standards – joint ventures.

**Unit 5:** Concentration and market power – structure, conduct and performance theory – persistence of long run profits.

**Books for Reference:**

1. Jean Tirole: The Theory of Industrial Organisation, Prentice Hall.
2. Luis Cabral: Introduction to Industrial Organisation, MIT Press.
3. Dennis W. Carlton and Jeffrey M. Perloff: Modern Industrial Organisation, Cambridge University Press.

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