Syllabus under Autonomy

Shri Vile Parle Kelavani Mandal's

MITHIBAI COLLEGE OF ARTS, CHAUHAN INSTITUTE OF SCIENCE & AMRUTBEN JIVANLAL COLLEGE OF COMMERCE AND ECONOMICS (AUTONOMOUS)

NAAC Reaccredited "A" grade, CGPA: 3.57,
Granted under FIST-DST & Star College Scheme of DBT, Government of India
Best College, University of Mumbai 2016-17

SYLLABUS

Program : M.A.

Course : ECONOMICS

Credit Based Semester and Grading System (CBSGS) with effect from the Academic year 2021-22

Affiliated to the

UNIVERSITY OF MUMBAI

PROGRAMME OUTCOMES:

PO1: well versed with the core theoretical and empirical foundations of economics.

PO2: understand that economists are and what they do.

PO3: demonstrate economic way of thinking.

PO4: exercise specialized knowledge and skills to articulate facts, beliefs and methods of inquiry used for economic analysis.

PO5: respect conflicting views as economists can agree to disagree and use various analytical skills acquired to contest them.

PO6: creatively explore, formulate, implement and examine public policies for addressing economic challenges.

PO7: employ effective modes of communication within the discipline that respond to the purpose, context, and audience.

PO8: evaluate various career choices based on specializations available.

PROGRAMME SPECIFIC OUTCOMES:

PSO1: acquisition of subject knowledge and understanding of the principles of both micro and macroeconomics and its applications in the real world.

PSO2: demonstrate higher order cognitive skills beyond memorization, such as formulating questions, interpreting data, and constructing and deconstructing arguments.

PSO3: display an array of discipline specific competencies - to explain, analyze, predict, engage in critical discussions with respect to various electives offered such as environmental economics, public economics, demography, international finance etc.

PSO4: read popular press writings on economic issues and review research articles published in reputed economic journals to develop an insight into the working of Indian economy.

PSO5: possess a working knowledge of basic tools of econometrics and statistical software like Python and cultivate the necessary attitude for machine learning.

PSO6: undertake and execute a live research project on contemporary issues and exercise research communication skills.

PSO7: acquisition of quantitative skills for application to real life economic problems.

PSO8: develop a global perspective on growth and development.

COURSE STRUCTURE FOR M.A. ECONOMICS PROGRAMME

Class	Semester	Paper No	Paper Title	Credits
M.A. – I	I	BC	BRIDGE COURSE IN STATISTICS USING R	20 HOURS
M.A. – I	I	I	MICROECONOMICS – I	4 Lectures / week (6 credits)
M.A. – I	I	II	MACROECONOMICS – I	4 Lectures / week (6 credits)
M.A. – I	I	III	MATHEMATICS FOR ECONOMISTS	4 Lectures / week (6 credits)
M.A. – I	I	IV	ECONOMETRICS USING R	4 Practicals / week (6 credits)
M.A. – I	II	I	MICROECONOMICS – II	4 Lectures / week (6 credits)
M.A. – I	II	II	MACROECONOMICS – II	4 Lectures / week (6 credits)
M.A. – I	II	III	DEVELOPMENT ECONOMICS	4 Lectures / week (6 credits)
M.A. – I	II	IV	DATA SCIENCE WITH PYTHON	4 Practical / week (6 credits)
M.A. - II	III	BC	BRIDGE COURSE IN RESEARCH METHODOLOGY	20 HOURS
M.A. - II	III	I	INDIAN ECONOMY	4 Lectures / week (6 credits)
M.A. - II	III	II	TIME SERIES FORECASTING	4 Lectures / week (6 credits)
M.A. - II	III	III	ENVIRONMENTAL ECONOMICS (ELECTIVE 1)	4 Lectures / week (6 credits)

M.A. - II	III	IV	PUBLIC ECONOMICS (ELECTIVE 2)	4 Lectures / week (6 credits)
M.A. - II	III	V	FINANCIAL ECONOMICS (ELECTIVE 3)	4 Lectures / week (6 credits)
M.A. - II	IV	I	INTERNATIONAL TRADE : THEORY AND POLICY	4 Lectures / week (6 credits)
M.A. - II	IV	II	INTERNATIONAL FINANCE (ELECTIVE 1)	4 Lectures / week (6 credits)
M.A. - II	IV	III	BEHAVIOURAL ECONOMICS (ELECTIVE 2)	4 Lectures / week (6 credits)
M.A. - II	IV	IV	INTRODUCTION TO FORMAL DEMOGRAPHY, BIOSTATISTICS AND HEALTHCARE (ELECTIVE 3)	4 Lectures / week (6 credits)
M.A. - II	IV	V	RESEARCH PROJECT	4 Lectures / week (10 credits)
				TOTAL CREDITS = 100

COURSE STRUCTURE:

1. Bridge Course (One in Beginning of each year of the programme.
2. Compulsory Four Courses each in Semester I & II
3. Compulsory Two Courses in Semester III & ANY TWO ELECTIVES out of Three based on the minimum required criterion as per college policy.
4. Compulsory Two Courses in Semester IV & ANY TWO ELECTIVES out of Three based on the minimum required criterion as per college policy.

Syllabus under Autonomy

Shri Vile Parle Kelavani Mandal's

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SYLLABUS

Program : M.A. PART – I

Course : ECONOMICS

Credit Based Semester and Grading System (CBSGS) with effect from the Academic year 2021-22

Affiliated to the
UNIVERSITY OF MUMBAI

Preamble: **The M.A. Syllabus will be revised to enable students to understand the current trends in the discipline of Economics. All papers will be revised from the academic year 2021-22 to be taught under Autonomy to cater to the specific needs of our learners and enhance their employability. A broad overview of the structure followed by the detailed syllabi of individual papers is given below.**

Learning Objectives:

- To understand the relevance of microeconomic and macroeconomic phenomena in the real world.
- To develop an understanding of the application of mathematical, statistical and econometric tools for economic analysis and time series forecasting.
- To equip students with the skill of using software packages like Python for statistical applications and evaluation of models; encouraging the aptitude for machine learning.
- To introduce concepts, theories and policies regarding growth and development while developing a sound world view of what constitutes development by exploring the contributions of Nobel Laureates and analyzing the success stories of developing economies.
- To develop a systematic exposition of models that explains the composition, direction, and consequences of international trade and the determinants and effects of trade policy.
- To acquaint students with various concepts of population science, biostatistics and formal demography, trends in recent years and scope for research.
- To give students a working knowledge of foreign exchange markets and the interaction of various factors affecting international finance.
- To enable students to understand the concepts and functioning of financial markets, derivatives products and sources of corporate finance.
- The main objective of research project is to strengthen a student's critical thinking and reasoning ability at planning and conducting economic research and to enable them to communicate the outcomes of their research effectively.

Evaluation Pattern

The performance of the learner will be evaluated in two components. The first component will be a Continuous Assessment with a weightage of 25% of total marks per course. The second component will be a Semester end Examination with a weightage of 75% of the total marks per course. The allocation of marks for the Continuous Assessment and Semester end Examinations is as shown below:

a) Details of Continuous Assessment (CA)

25% of the total marks per course:

Continuous Assessment	Details	Marks
Component 1 (CA-1)	ASSIGNMENT/PRESENTATION	15 marks
Component 2 (CA-2)	CLASS TEST	10 marks

b) Details of Semester End Examination

75% of the total marks per course. Duration of examination will be two and half hours.

Question Number	Description	Marks	Total Marks
1	Any Two Out Of Three	7.5 x 2	15
2	Any Two Out Of Three	7.5 x 2	15
3	Any Two Out Of Three	7.5 x 2	15
4	Any Two Out Of Three	7.5 x 2	15
5	Any Three Out Of Four	5 x 3	15
		Total Marks	**75**

Signature
Manish Gogari
HOD, Economics

Signature
Dr. Mahesh Bhagwat
Approved by Vice –Principal (ARTS)

Signature
Dr. Krutika Desai
Approved by I/C Principal

M.A. PART I COURSE STRUCTURE

Program: M.A. (2021-22)	**Semester: I**
BRIDGE COURSE : STATISTICS USING R COMPULSORY 20 Hours	

Learning Objectives:

This course is designed to enhance the basic knowledge of statistical tools which are used in data analysis in the field of Economics.
After this course the students will be able to use the statistical tools very efficiently and effectively so that they will be familiar with the data type and data analysis and they will be capable of using these skills to understand the technicality of R programming language and how to interpret the outputs of R programming language.

Outline of Bridge Course : (per session plan)

Session	Description - Topics	No of Hours
I	• Meaning of data and data types • Data measurement scales: Nominal, Ordinal, Interval and Ratio • Measures of central tendency: AM, Median, Mode, GM & HM and partition values • Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard deviation and coefficient of variation	4
II	• Theory of Probability: Definitions, concepts, addition and multiplication theorems and problems • Random variable, discrete and continuous variables, idea of E(X), V(X) • Probability Distributions: Bernoulli, Binomial, Poisson, Normal and Exponential	4
III	• Correlation analysis: Types of correlation, Scatter diagram, product moment correlation coefficient. • Regression analysis: Simple linear regression and multiple regression. • Coefficient of determination R^2, R^2 adjusted and its interpretation	4
IV	• Sampling: Definitions of sample, population, statistic and parameter	4

	• Simple Random Sampling • Stratified Random Sampling • Systematic Sampling • Idea of Non – probability sampling • Idea of Standard Error	
V	• Testing of Hypothesis: • Large sample testing: Z test • Small sample testing: t – test • Chi – square test • F test • ANOVA one – way and two – way	4
	Total	20
PRACTICALS		-

BASIC REFERENCE:

1. Sancheti D. C. and V. K. Kapoor; *Statistics-Theory, Methods and Applications*, S. Chand, New Delhi
2. Ajai S. Gaur & Sanjaya S. Gaur, *Statistical Methods For Practice & Research*, SAGE Publications Ltd
3. B. N. Mandal, *Introductory R for Beginners*, Viva
4. Rand R. Wilcox, *Understanding and Applying Basic Statistical Methods Using R*, Wiley

ADDITIONAL REFERENCE:

Gujarati Damodar, *Basic Econometrics*, McGraw-Hill

Cornillon Pierre Andre Et Al, *R for Statistics*, T and F India

Andy Field, Jeremy Miles & Joe Field, *Discovering Statistics Using R*, SAGE Publications LTD

Gareth James, Daaniela Witten, Trevor Hastie, Robert Tibshirani, *An Introduction to Statistical Learning with Applications in R*, Springer

D K Samuel, *R Statistics*, New India Publishing Agency

Gareth James, DanielaWitten, Trevor Hastie & Robert Tibshirani, *An Introduction to Statistical Learning: With Applications in R*, Springer

M.A. PART I (SEMESTER – I)

Paper I MICROECONOMICS – I ***6 CREDITS***

Preamble

This course is designed to introduce the students to the concepts and theories of consumer behavior, production and costs in microeconomics. The student should be able to use these concepts to understand the relevance of microeconomics to the real world. The student should be able to build on these concepts in the future to develop a deeper understanding of the economy.

Program: M.A. (2021-22)				**Semester: I**	
Course: MICROECONOMICS - I				**Course Code: PAMAECO101**	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical** (Hours per week)	**Tutorial** (Hours per week)	**Credit**	**Continuous Assessment (CA) (Marks - 25)**	**Semester End Examinations (SEE) (Marks- 75 in Question Paper)**
04	**-**	**-**	**06**	**25**	**75**

Learning Objectives:

1. **To introduce the students to the fundamental concepts in microeconomics.**
2. **To understand the relevance of microeconomic phenomena in the real world.**
3. **To develop an understanding of the application of mathematical tools for microeconomic analysis.**

Course Outcomes:

CO1: understand the fundamental principles of microeconomics and decision making behavior of microeconomic agents.

CO2: describe the relevance of microeconomic phenomena in the real world.

CO3: apply advanced mathematical tools for microeconomic analysis.

CO4: understand the theories of consumer behaviour and develop tools for representation of optimal consumer choice.

CO5: interpret the nature of consumer choices and advances to the consumer theories.

CO6: describe the theories of production behaviour and develop tools for representation of efficiency and optimality in production.

CO7: comprehend the application of consumer theories to the modern structure of the firm.

C08: understand the determination of equilibrium under different market structures, price regulation through taxation and different degrees of discrimination.

C09: analyse the principal agent problem and concepts of market failure with real applications.

Outline of Syllabus: (per session plan)

Module	Description - Title	No of Hours
I	**THEORY OF CONSUMER BEHAVIOUR**	15
II	**THEORY OF FIRM**	12
III	**THEORY OF MARKET: PERFECT COMPETITION, MONOPOLY, AND MONOPOLISTIC COMPETITION**	18
IV	**INFORMATION ECONOMICS**	15
	Total	60
PRACTICALS		-

Unit	Topic	No. of Hours
Module I	**THEORY OF CONSUMER BEHAVIOUR** • Choice of a representative consumer – Budget Constrained Choice - Utility Maximization Problem (UMP), Interior and Corner Solutions, Ordinary Demand Functions, Comparative Statics of UMP, Indirect Utility function, • Theory of Revealed Preference, Expenditure Minimization Model - Expenditure Minimization, Compensated Demand Functions, Expenditure Function properties: Concavity and Shephard's Lemma; Revision of Demand Theory by Hicks • Properties of Consumer Demand – Homogeneity, Price, Substitution and Income Effects, Duality and Modern Derivation of Slutsky Equation, Elasticity Relations, choice under uncertainty - problem of aggregation – social choice.	**15**
Module II	**THEORY OF FIRM** • What is a Firm? - Firm as a transformer of inputs into outputs, production sets, production functions, Different types of Technology: Cobb-Douglas, Fixed Proportion, Linear, CES, Multi-product production set. • Decision-Making By Price-Taking Firms: Input prices and marginal cost, laws of firm demand and supply, short v. long run response to a price change, Cost Function, Output effect, Convexity of the Production Set and Increasing Marginal Cost, Effect of price changes on inputs and outputs. • Firm and Industry Analysis - optimality of marginal cost pricing, equilibrium with free entry, scale of competitive firms.	**12**

Module III	**THEORY OF MARKET: PERFECT COMPETITION, MONOPOLY AND MONOPOLISTIC COMPETITION** • **Perfect competition:** short run and long run equilibrium of a firm and competitive industry, long run supply curve of a competitive industry: increasing, constant and decreasing cost industry; taxation under perfect competition: lump sum tax, profits tax, specific tax. • **Monopoly**: short run equilibrium, long run equilibrium – monopolist operating with sub optimal plant, over optimal plant and optimal plant, monopolist equilibrium with zero marginal cost, supply curve of monopolist, equilibrium of a multi-plant monopolist- graphical and mathematical derivation, Monopoly power and its measurement, monopoly regulation through taxation- specific tax, lump sum tax under monopoly, price regulation under monopoly- marginal and average cost pricing. Price discrimination – First order, Second order & Third order price discrimination; Bundling, • **Monopolistic Competition**: short run analysis (partial equilibrium), long run analysis (group equilibrium)- with entry of new firms into industry, with price competition, with price competition and free entry.	**18**
Module IV	**INFORMATION ECONOMICS** • The Principal Agent Problem: Hidden actions (Moral hazard) problem, hidden information problems, monopolistic screening, • **Adverse Selection**-Concept, lemons problem, signalling Separating and Pooling equilibrium, Insurance market, cheap talk, • **Screening**: Second degree price discrimination, Screening in Competitive Insurance Market, Monopoly screening in insurance Market.	**15**

TEXT BOOK:

1. Gravelle H. and Rees R., *Microeconomics*, Pearson Edition Ltd, New Delhi
2. Mas Collel Whinston and Green (1995), *Microeconomic Theory (MWG)*, Oxford University Press.
3. Walter Nicholson Christopher Snyder, *Microeconomic Theory*, OXFORD International Student Edition

REFERENCES:

- Geoffrey A. Jejle and Philip J. Reny, *Advanced Microeconomics Theory*, Pearson Education
- Varian H., *Intermediate Microeconomics: A Modern Approach*, W.W. Norton and Company
- Archibald, G. C, *Theory of the Firm*, Harmondsworth, Penguin.
- Bain, J. (1958), *Barriers to New Competition*, Harvard University Press, Harvard.
- Robert S Pindyck, Daniel L Rubinfield and Prem L Mehta, *Microeconomics*, Pearson Education
- Campbell R. McConnell, Stanley L. Brue, Sean M. Flynn & Randy Grant, *Economics, Indian Edition*, McGraw Hill
- David M. Kreps, *A Course in Microeconomic Theory*, Princeton University Press
- Case Fair & Oster, *Principles of Microeconomics*, Pearson Education
- Dominick Salvatore, *Principles of Microeconomics*, OXFORD University Press
- Paul Krugman & Robin Wells, *Microeconomics*, Worth Publishers
- Paul G. Keat, Philip K. Y. Young and Sreejata Banerjee, *Managerial Economics*, Pearson Education

M.A. PART I (SEMESTER – I)

Paper II MACROECONOMICS – I ***6 CREDITS***

Preamble

This paper is designed to introduce the student to the evolution of macroeconomic theory from the classical to Keynesian approaches. The objective of this paper is to enable the student to understand how interest rates and income levels are determined and how the macroeconomics tools of fiscal and monetary policies interact in the context of IS-LM framework.

<table>
<tr><td colspan="4">Program: M.A. (2021-22)</td><td colspan="2">Semester: I</td></tr>
<tr><td colspan="4">Course: Macroeconomics – I</td><td colspan="2">Course Code: PAMAECO104</td></tr>
<tr><td colspan="4">Teaching Scheme</td><td colspan="2">Evaluation Scheme</td></tr>
<tr><td>Lecture (Hours per week)</td><td>Practical (Hours per week)</td><td>Tutorial (Hours per week)</td><td>Credit</td><td>Continuous Assessment (CA) (Marks - 25)</td><td>Semester End Examinations (SEE) (Marks- 75 in Question Paper)</td></tr>
<tr><td>04</td><td>-</td><td>-</td><td>06</td><td>25</td><td>75</td></tr>
<tr><td colspan="6"><u>Learning Objectives:</u>
To understand the relevance of microeconomic and macroeconomic phenomena in the real world.</td></tr>
<tr><td colspan="6"><u>Course Outcomes:</u>

CO1: gain a fundamental understanding of the Classical approach to determination of money, prices and interest.

C02: understand the starting point of macroeconomics with the help of indicators of production and employment.

CO3: familiar with the advances to macroeconomic theories in understanding the nature and circulation of money.

CO4: understand the simple Keynesian model and policies of stabilization.

CO5: apply the IS-LM model to study the impact of real and monetary influences on the economy.

CO6: analyze macroeconomic controversies.</td></tr>
<tr><td colspan="6"></td></tr>
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Outline of Syllabus: (per session plan)		
Module	**Description - Title**	**No of Hours**
I	**CLASSICAL MACROECONOMICS**	15
II	**THE KEYNESIAN SYSTEM**	15
III	**THE MONETARIST COUNTER REVOLUTION**	15
IV	**OUTPUT, INFLATION AND UNEMPLOYMENT**	15
	Total	60
PRACTICALS		-

Unit	Topic	No. of Hours
Module I	**CLASSICAL MACROECONOMICS** • The Classical Revolution • Production • Employment • Equilibrium Output and Employment • The Quantity Theory of Money • The Classical Theory of the Interest Rate • Policy Implications of the Classical Model	**15**
Module II	**THE KEYNESIAN SYSTEM** • The Keynesian Aggregate Demand Curve • The Keynesian Aggregate Demand Schedule Combined with the Classical Theory of Aggregate Supply • The Keynesian Contractual View of the Labour Market • Labour Supply and Variability in the Money Wage • The Effects of Shifts in the Aggregate Supply Schedule • Keynesian versus the Classics (Theories of Aggregate Demand and Supply Perspectives: Severe Supply Disruption	**15**

Module III	**THE MONETARIST COUNTERREVOLUTION** • Four Monetarist Propositions • The Reformulation of the Quantity Theory of Money • Monetarists versus Keynesians • Unstable Velocity and the Declining Policy Influence of Monetarism Perspective: The Monetarist View of the Great Depression	**15**
Module IV	**OUTPUT, INFLATION AND UNEMPLOYMENT** • A Monetarist View • A Keynesian View of the Output-Inflation Trade-Off • Evolution of the Natural Rate Concept • The New Classical Position • Perspectives: The Great Depression-New Classical Views • Perspectives: Money in Hyperinflation	**15**

TEXT BOOK:

1. Froyen R., *Macroeconomics: Theories and Policies*, Pearson Education
2. Levacic, R. and A. Rebman, *Macroeconomics*, Mac Millan Press Ltd.
3. Heijdra, B. J., *The Foundations of Modern Macroeconomics*, Oxford University Press.

REFERENCES:

- Romer, D., *Advanced Macroeconomics*. McGraw-Hill.
- Rudiger Dornbusch, Stanley Fischer and Richard Startz, *Macroeconomics*, McGraw-Hill.
- Wickens, M., *Macroeconomic Theory*, Princeton University Press
- Ackley, G., *Macroeconomic Theory*, Macmillan.
- Allen, R.G.D., *Macroeconomic Theory: A Mathematical Treatment*, Palgrave Macmillan.
- Blanchard, O., *Macroeconomics*, New Delhi, Pearson Education.
- Blanchard, O.J. & Fischer, *Lectures on Macroeconomics*, Delhi: PHI Learning Pvt. Ltd.
- William Branson, W. H., *Macroeconomic Theory and Policy*, Pearson Education.
- D'Souza, E., *Macroeconomics*, Pearson Education.
- Snowden, B & Vane, H. R., *Modern Macroeconomics: Its Origin, Development and Current Stat.*, UK: Edward Press.
- Gordon, R. J., *Macroeconomics*, Delhi, PHI Learning Pvt. Ltd.
- Miller, R. L. & Pulsinelli R., *Macroeconomics*, New York: Harper & Row.
- Ola Olsson, *Essentials of Advanced Macroeconomic Theory*, Routledge.
- Frisch, H., *Theories of Inflation*, Cambridge University Press.

M.A. PART I (SEMESTER – I)

Paper III MATHEMATICS FOR ECONOMISTS ***6 CREDITS***

Preamble

With the rapid rise of data science as a field of specialisation and generation of large quantum of data, the description and interpretation of these data for the purpose of analysis is imminent. The objective of this paper is to provide students with the understanding of mathematical and statistical skills to be applied for various purposes to draw inferences from different types of data presented to them.

Program: M.A. (2021-22)				**Semester: I**	
Course: Mathematics for Economists				**Course Code: PAMAECO102**	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA) (Marks - 25)**	**Semester End Examinations (SEE) (Marks- 75 in Question Paper)**
04	**-**	**-**	**06**	**25**	**75**

Learning Objectives:

To develop an understanding of the application of mathematical tools to economic theory.

Course Outcomes:

CO1: understand the basic mathematical techniques of economic analysis.

CO2: use basic calculus for univariate and multivariate functions.

CO3: comprehend economic applications of calculus and linear algebra.

Outline of Syllabus: (per session plan)

Module	**Description - Title**	**No of Hours**
I	**SETS, CONTINUITY AND DIFFERENTIATION**	15
II	**DIFFERENTIAL AND DIFFERENCE EQUATIONS**	15

III	**DIFFERENTIAL AND INTEGRAL CALCULAS**	15
IV	**LINEAR ALGEBRA**	15
	Total	60
PRACTICALS		-

Unit	**Topic**	**No. of Hours**
Module I	**SETS, CONTINUITY AND DIFFERENTIATION** • The concept of Sets; Subsets and Equality of sets, Set operations (Union, Intersection and Difference). Ordered Pair and Cartesian Products, De Morgan's law, Types of functions (constant, polynomial, rational and non-algebraic). • Functions of one Variable: Limits, continuity and differentiation of functions of a single variable. Derivative of a composite function, Parametric function, Logarithmic function, Exponential and Inverse functions. Concave and Convex functions, Derivative of higher order, Partial Derivatives and total derivative • Homogenous functions and Euler's Theorem, Maxima and Minima of functions of single variable. Profit maximization and cost minimization. Constrained optimization of function with two variables. Constrained utility maximization, constrained minimization and the interpretation of the Lagrange multiplier.	**15**
Module II	**DIFFERENTIAL AND DIFFERENCE EQUATIONS** • Introduction, non-linear and linear differential equations of the first order and first degree. Solutions of differential equations when variables are separable, homogenous equations and non-homogenous equations, exact differential equations and linear equations. • Solution of linear differential equations of second with constant coefficient. Finite difference, difference equations. Solutions of homogeneous linear difference equation with constant coefficients, linear first-order difference equations, Linear second order difference equations with constant coefficients. • Application of differential and difference equations in economic models (dynamics of market price, Solow growth model, cob-web model, Samuelson Multiplier Acceleration Model, Domar Economic Growth Model).	**15**

Module III	**DIFFERENTIAL AND INTEGRAL CALCULUS** • **Derivatives:** - Introduction, Univariate differentiation, higher order derivatives, Implicit Differentiation, Optimisation of functions (constrained and unconstrained), Exponential and Logarithmic Functions, Multivariate Calculus and Optimisation of Multivariate Calculus, • Total Derivatives. Economic Applications: - Optimisation of Economic Functions, Exponential and Logarithmic functions in Economics; • **Integral Calculus:** - Introduction, Integration by substitution and Integration by parts, Definite and Indefinite integral, Economic Application of Integration, Definite integral and Probability.	**15**
Module IV	**LINEAR ALGEBRA** • Linear Algebra: - The Fundamentals of Linear Algebra (Addition, Multiplication, Determinant, inverse etc.), • Gaussian elimination and Cramer's Rule, The Jacobian, The Hessian, Eigen Values and Eigen Vectors, • Comparative Statics and Concave Programming.	**15**

TEXT BOOK:

1. Chiang Alpha, *Fundamental Methods of Mathematical Economics,* Tata McGraw Hill, New Delhi
2. Dowling Edward T, *Introduction to Mathematical Economics*, Tata McGraw -Hill, New Delhi
3. G S Monga, *Mathematics and Statistics for Economics*, Vikas Publishing House

REFERENCES:

- Schaum Outline Series in Economics, Tata McGraw -Hill, New Delhi
- Lerner Joel J. and Zima, P., *Theory and Problems of Business Mathematics*, McGraw Hill, New York
- Dowling Edward T., *Theory and Problems of Mathematical Methods for Business and Economics*, Tata McGraw-Hill
- Knut Sydsaeter and Peter Hammond, *Mathematics for Economic Analysis*, Pearson Education
- Pfitzner Barry C., *Mathematical Fundamentals of Microeconomics*, Biztantra, New Delhi

M.A. PART I (SEMESTER – I)

Paper IV ECONOMETRICS USING R ***6 CREDITS***

Preamble

The objective of this course is to impart a thorough understanding of Econometrics, Econometric modelling, bivariate and multivariate regression models, failures of assumptions of the classical linear regression model and simultaneous equations models. The student will be able to comprehend the theories and develop the ability to apply the theories to real world problems.

Program: M.A. (2021-22)				**Semester: I**	
Course: Econometrics Using R				**Course Code: PAMAECO105**	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA) (Marks - 25)**	**Semester End Examinations (SEE) (Marks- 75 in Question Paper)**
04	**-**	**-**	**06**	**25**	**75**

Learning Objectives:

To develop an indepth understanding of the application of econometric tools for economic analysis and forecasting.

Course Outcomes:

CO1: well versed with the basic tools of econometric analysis.

CO2: comprehend the assumptions of classical linear regression models with respect to bivariate and multivariate regression models.

CO3: familiar with the failures of classical linear regression models, their consequences detection and correction.

CO4: use of identification criteria in reduced form models and simultaneous equations modeling.

Outline of Syllabus: (per session plan)

Module	**Description - Title**	**No of Hours**

I	**TWO VARIABLE REGRESSION MODEL**	15
II	**THREE VARIABLE REGRESSION MODEL**	15
III	**FAILURE OF CLASSICAL ASSUMPTIONS**	15
IV	**SIMULTANEOUS EQUATIONS MODEL**	15
	Total	60
PRACTICALS		-

Unit	**Topic**	**No. of Hours**
Module I	**TWO VARIABLE REGRESSION MODEL** Two Variable Regression model, The concept of the Population Regression Function (PRF) and Sample Regression Function (SRF), Classical assumptions of OLS, Derivation of OLS estimators and their variance, Properties of Estimators, Tests of Hypothesis, Confidence Intervals for OLS estimators, Measures of Goodness of fit: R square and adjusted R square, F test in Regression	**15**
Module II	**THREE VARIABLE REGRESSION MODEL** The Three Variable Model, Meaning and Estimation of Partial Regression Coefficients, Multiple Coefficient of Determination: R2 and Adjusted R2, Specification Bias, The z –test, The t – test, Chi Square test and F – tests of significance of Regression. Dummy Variable Regression Models	**15**
Module III	**FAILURE OF CLASSICAL ASSUMPTIONS** Failure of Classical Assumptions, Multi-collinearity: Meaning, Implications, Detection and Correction, Heteroscedasticity: Meaning, Consequences, Detection, Goldfeld - Quandt test and Correction, Auto-correlation: Meaning, Consequences, Detection, Durbin-Watson test and Correction	**15**

Module IV	**SIMULTANEOUS EQUATIONS MODEL** Simultaneous Equation Model: Introduction, inconsistency of OLS estimators, Simultaneous Equation Bias, The problem with identification, reduced form equations, two staged least square and instrumental variables, Hausman specification test.	**15**

TEXT BOOK:

1. Gujarati Damodar, *Basic Econometrics*, Tata McGraw Hill
2. Hatekar Neeraj, *Principles of Econometrics: An Introduction (using R)*, SAGE publications

REFERENCES:

-
- Jeffrey M. Wooldridge, *Econometrics*, Cengage Learning India Edition
- Studenmund A.H., *Using Econometrics: A Practical Guide*, Pearson
- Christoph Hanck, Martin Arnold, Alexander Gerber and Martin Schmelzer, *Introduction to Econometrics with R*,
- Christian Kleiber, Achim Zeilies, *Applied Econometrics with R*, Springer
- Florian Heiss, *Using R for Introductory Econometrics*, Createspace

M.A. PART I COURSE STRUCTURE

M.A. PART I (SEMESTER – II)

Paper I MICROECONOMICS – II ***6 CREDITS***

Preamble

This course is designed to introduce the students to the theory of imperfect competition, game theory and basic concepts of game theory in microeconomics. The student should be able to use these concepts to understand the relevance of microeconomics to the real world. The student should be able to build on these concepts in the future to develop a deeper understanding of the economy.

Program: M.A. (2021-22)				**Semester: II**	
Course: Microeconomics – II				**Course Code: PAMAECO204**	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA) (Marks - 25)**	**Semester End Examinations (SEE) (Marks- 75 in Question Paper)**
04	**-**	**-**	**06**	**25**	**75**

Learning Objectives:

1. **To introduce the students to the fundamental concepts in microeconomics.**
2. **To understand the relevance of microeconomic phenomena in the real world.**
3. **To develop an understanding of the application of mathematical tools for microeconomic analysis.**

Course Outcomes

CO1: understand the characteristics and working of collusive and non-collusive oligopolistic markets and evaluate pricing strategies with real life case studies.

CO2: comprehend and apply the concepts of game theory for microeconomic analysis.

CO3: assess behavioral economics.

C04: understand the general equilibrium framework for determination of equilibrium across markets for all economic entities.

C05: explore the criteria of welfare and critically appreciate theories of welfare maximization.

Outline of Syllabus: (per session plan)

Module	Description - Title	No of Hours
I	**OLIGOPOLY**	15
II	**GAME THEORY**	15
III	**GENERAL EQUILIBRIUM**	15
IV	**WELFARE ECONOMICS**	15
	Total	60
PRACTICALS		-

Unit	Topic	No. of Hours
Module I	**OLIGOPOLY** • The Structure Conduct Performance (SCP) paradigm, Oligopoly and Strategic behaviour, Cournot competition with many firms. Bertrand competition with Product differentiation, Hotelling model, • Measures of market concentration and market power. *Cartels and collusion*, Explicit collusion, Size of cartel, Cheating in a cartel, Successful operation of a cartel, Tacit Co-operation • Entry Barriers: Bain: The three types of entry barriers, Conditions of entry: the Dixit Model, The Sylos Postulate and the Limit Pricing Model, Predatory pricing.	**15**
Module II	**GAME THEORY** • Games with perfect information: Strategic form games: Dominated strategy, Nash and mixed strategy Nash equilibrium, Iterated elimination; Extensive form games: Action and strategy, Nash Equilibrium, Subgame perfect Nash equilibrium, One-deviation property and backward induction; Repeated games: Finitely and infinitely repeated game; Bargaining: Alternating offers bargaining: Finite and infinite horizon • Games with Imperfect Information: Imperfect information and Sub-game perfection: Information Set, Mixed and behavioural strategies; Static games of incomplete information: Bayesian Nash equilibrium, Harsanyi transformation, Auction Dynamic games of incomplete information: Perfect Bayesian Equilibrium, Signalling games, Reputation games, Intuitive Criterion; • Games of Coordination-Battle of the Sexes, Prisoner's Dilemma, Assurance Games, Chicken; Games of Commitment-The Frog and the Scorpion, The Kindly Kidnapper, When Strength is Weakness, Savings and Social Security, Hold Up	**15**

Module III	**GENERAL EQUILIBRIUM** • Meaning of General equilibrium- Partial and General Equilibrium approach- Walrasian General Equilibrium model- Tatonnement process- The exchange economy – Equilibrium (Existence, uniqueness, stability) – Pareto Optimality - concept of core - Core equivalence theorem. One consumer one producer Economy. • The Production Model- fixed and flexible coefficients – relation between endowments and product mix – relation between commodity prices and factor prices- Graphical treatment of two factor, two commodity and two consumer equilibrium system (2*2*2 model) • Fixed point theorems- Duality principle- Contributions of Arrow and Debreu- critique of general equilibrium theory- non-tatonnement process- policy Example: Should the Government Try to Address Growing Inequality Through Taxes and Transfers?	**15**
Module IV	**WELFARE ECONOMICS** • Welfare Economics: Welfare Criteria - Fairness; Pareto optimality; Kaldor efficiency; Scitovsky Criterion; Samuelson Criterion; Cost Benefit Analysis. • Welfare Properties of Competitive Equilibria - First and Second Fundamental Theorems of Welfare Economics; Efficiency and fairness of Market wage; Factor Price Equalization Theorem- • Pareto optimality and conditions- market forms and welfare – theory of second-best welfare frontier and social problem- problem of welfare maximization- compensation principles- Social Welfare Function; Arrow's Impossibility Theorem and the related results	**15**

TEXT BOOK:

1. Varian H., *Intermediate Microeconomics: A Modern Approach,* W.W. Norton and Company
2. Gravelle H. and Rees R., *Microeconomics,* Pearson Edition Ltd, New Delhi
3. Mas Collel Whinston and Green (1995), *Microeconomic Theory (MWG),* Oxford University Press.
4. David M. Kreps, *A Course in Microeconomic Theory,* Princeton University Press

REFERENCES:

- Robert S Pindyck, Daniel L Rubinfield and Prem L Mehta, *Microeconomics,* Pearson Education
- Campbell R. McConnell, Stanley L. Brue, Sean M. Flynn & Randy Grant, *Economics Indian Edition*, McGraw Hill
- Chris Carr, *Global Oligopoly: A Key idea for Business and Society,* Taylor and Francis
- Case Fair & Oster, *Principles of Microeconomics,* Pearson Education.
- Walter Nicholson Christopher Snyder, Microeconomic Theory OXFORD International Student Edition
- Dominick Salvatore, *Principles of Microeconomics*, OXFORD University Press
- E.N Barron, *Game Theory An Introduction*, Wiley
- Glenn P. Hubbard and Anthony P. O' Brien, *Economics,* Pearson Education
- Steven Tadelin, *Game Theory: An Introduction*, Princeton University Press
- Xavier Vives, *Oligopoly Pricing,* The MIT Press
- Terry Hillman, *Economics,* Alpha

M.A. PART I (SEMESTER – II)

Paper II MACROECONOMICS – II ***6 CREDITS***

Preamble

This course takes the students from the Keynesian to monetarist approach of modelling macroeconomic theory. It discusses various perspectives on determination of output, inflation and employment and concludes with an insight into the New Keynesian economic view on business cycles.

Program: M.A. (2021-22)				**Semester: II**	
Course: Macroeconomics – II				**Course Code: PAMAECO205**	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA) (Marks - 25)**	**Semester End Examinations (SEE) (Marks- 75 in Question Paper)**
04	**-**	**-**	**06**	**25**	**75**

Learning Objectives:

To understand the relevance of macroeconomic phenomena in the real world.

Course Outcomes:

CO1: compare the Classical and Keynesian theories of aggregate demand and supply.

CO2: analyze the monetarist versus Keynesian views on output, inflation, and unemployment.

CO3: familiar with real business cycles and new Keynesian economics.

CO4: describe various perspectives in relation to severe supply disruption, sticky prices and the Great Depression.

Outline of Syllabus: (per session plan)

Module	**Description - Title**	**No of Hours**
I	**OPEN ECONOMY MACRO MODEL**	15
II	**THE NEW MACROECONOMICS**	15
III	**RECENT DEVELOPMENTS IN MACROECONOMICS**	15

IV	**MICRO FOUNDED MACRO MODELS**	15
	Total	60
PRACTICALS		-

Unit	Topic	No. of Hours
Module I	**OPEN ECONOMY MACRO MODEL** • Balance of Payments and Exchange rates – International capital flows – Internal and external balance – Policy dilemma – IS-LM analysis for an open Economy – • Stabilization process with fixed and flexible exchange rates – Mundell – Fleming model –Relative Effectiveness of Monetary and Fiscal Policies under Different Situations in IS-LM-BP Framework. • International Trinity and Quadrilemma choices under IS-LM-BP framework. (Algebraic Derivation of IS-LM Model)	**15**
Module II	**THE NEW MACROECONOMICS** **The New Classical School:** Rational Expectations Hypothesis: Dynamic Time Inconsistency, Policy Ineffectiveness Proposition. **The Random Walk of GDP:** The Relative Importance of AD and AS. **Real Business Cycle Model:** Disturbances and Propagation mechanism. Macroeconomic Policy in Real Business Cycle Model. **The New-Keynesian School:** Real and Nominal Wage-Price Rigidity Models - Menu Costs Model, Implicit Wage Contract Models, Efficiency Wage Models, Insider-Outsider Models.	**15**
Module III	**RECENT DEVELOPMENTS IN MACROECONOMICS** The counter revolution – Monetarism – Rational Expectation revolution – New Classical Macro Economics – Views of Muth, Wallas, Sargent and Lucas – Supply side economics – The Dynamically Stochastic General Equilibrium model (DSGE) The Keynesian revolution – Reinterpretation of Keynes by Clower and Leijonhufvud –The dual decision hypothesis–-Post Keynesians – Minsky's financial instability theory- The New Keynesian Economics – The New Political Macroeconomics.	**15**

Module IV	**MICRO FOUNDED MACRO MODELS** The need for micro foundations – Lucas Critique, The Dynamic general equilibrium (DGE) analysis to macroeconomics. Optimization of household – Consumption smoothing, temporary and permanents shocks, Optimization of Firms.	**15**

TEXT BOOK:

1. Froyen R, *Macroeconomics: Theories and Policies*, Pearson Education
2. Hajela, *Macroeconomic Theory*, Ane Books Pvt. Ltd
3. Michael Wickens, *Macroeconomic Theory: A dynamic General Equilibrium Approach*, Princeton University Press

REFERENCES:

- Mankiw G., *Macroeconomics*, Worth Publishers
- Dornbusch R S, Fischer and R Startz, *Macroeconomics*, Tata Mc Graw Hill
- Dominick Salvatore, *International Economics*, Wiley
- Ahuja H.L., *Macroeconomics: Theory and Policy*, S Chand & Co. Pvt. Ltd., New Delhi
- Abel, A. B., B. S. Bernanke and D Croushore, *Macroeconomics*, Pearson, New Delhi
- Errol D'Souza, *Macroeconomics*, Pearson, New Delhi

M.A. PART I (SEMESTER – II)

Paper III DEVELOPMENT ECONOMICS *6 CREDITS*

Preamble

The paper aims to introduce concepts, theories and policies with respect to growth and development as it has evolved over the years. The contemporary as well as the classical theories of growth and development are elaborated and issues related to microeconomics of development such as credit and labour markets, rural and urban development are highlighted for policy discussions. The course will also develop a global view by bringing contributions of Nobel Laureates and success stories of developing countries into focus.

Program: M.A. (2021-22)				**Semester: II**	
Course: Development Economics				**Course Code: PAMAECO202**	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA) (Marks - 25)**	**Semester End Examinations (SEE) (Marks- 75 in Question Paper)**
04	**-**	**-**	**06**	**25**	**75**

Learning Objectives:

To introduce concepts, theories and policies regarding growth and development as it has evolved over the years and develop a global perspective.

Course Outcomes:

CO1: understand the nature and subject matter of development economics.

CO2: describe and critically appreciate the modern theories of development.

CO3: analyze the microeconomics of development in relation to land, labour, capital and credit markets.

CO4: discuss success stories of developing economies with reference to theories developed by Nobel Laureates.

Outline of Syllabus: (per session plan)

Module	**Description - Title**	**No of Hours**

I	**CONCEPTS AND MEASURES OF GROWTH AND DEVELOPMENT**	15
II	**MODERN THEORIES OF GROWTH AND DISTRIBUTION**	15
III	**CONCEPTS AND POLICIES FOR DEVELOPMENT**	15
IV	**GLOBAL PERSPECTIVES ON DEVELOPMENT**	15
	Total	60
PRACTICALS		-

Unit	**Topic**	**No. of Hours**
Module I	**CONCEPTS AND MEASURES OF GROWTH AND DEVELOPMENT** The Nature of Development Economics - Why Study Development Economics? Some Critical Questions - What do you mean by Development? - Capabilities, Entitlements and Deprivation - Inequality and Growth - Measurement of Inequality and Poverty - Measurement of Development - HDI, GDI - Role of Market and State	**15**
Module II	**MODERN THEORIES OF GROWTH AND DISTRIBUTION** Harrod - Domar Model of Growth - Solow Model of Growth - Convergence - Endogenous Growth Model of Romer - Lucas Growth Model Contemporary Models of Development and Underdevelopment - Underdevelopment as a co-ordination failure - Kremer's O-Ring Theory - The Big Push Theory - Hausmann-Rodrik-Velasco Growth Diagnostics Framework	**15**
Module III	**CONCEPTS AND POLICIES FOR DEVELOPMENT** Market interlinkages- Land markets, Labour markets and households - Characteristics of Credit markets - Informal Credit markets & Microfinance - Urban policies (Utility Pricing, Health and Education, Transportation and Housing, Slums, Infrastructure) - Smart Cities/ AMRUT/ Housing for All	**15**

Module IV	**GLOBAL PERSPECTIVES ON DEVELOPMENT** - Development theories by Nobel Prize Laureates - Experimental Approach to Global Poverty Alleviation (J-Pal) - Analysis of Consumption, Poverty and Welfares - Case Studies: Singapore, Malaysia, Vietnam - Success Stories of Developing Countries 1. Microfinance in Cambodia 2. Education in Kenya 3. Famine in Ethiopia 4. Maternal and Child Health in Rwanda 5. Health hotline in Malawi	**15**

TEXT BOOK:

1. Todaro and Smith, *Economic Development*, Pearson Education
2. Ray Debraj, *Development Economics*, Oxford University Press
3. Aparajita Mukherjee & Saumya Chakrabarti, *Development Eonomics: A critical perspective*, PHI

REFERENCES:

- Basu, K., *Analytical Development Economics*, Oxford University Press, Delhi
- Bahl, R and J. Linn, *Urban Public Finance in Developing Countries*, OUP (WB)
- Ian Goldin, Kenneth Reinert, *Globalization for Development: Meeting New Challenges*, OXFORD University Press
- Erik S. Reinert, Jayati Ghosh, Rainer Kattel, *Handbook of Alternative Theories of Economic Development*, Edward Elgar Publishing
- Paul Collier, *The Bottom Billion: Why the Poor Countries are Failing and What can be Done about it*, OXFORD University Press
- Tim Allen, Alan Thomas, *Poverty and Development*, OXFORD University Press
- Jaime Ros, *Rethinking Economic Development, Growth & Institutions*, OXFORD University Press
- Dwight H. Perkins, Steven Radelet, David L. Lindauer, Steven A. Block, *Economics of Development*, W.W Norton & Company
- Relevant Academic papers
- Economic Survey
- World Bank and UN Reports

M.A. PART I (SEMESTER – II)

Paper IV DATA SCIENCE WITH PYTHON ***6 CREDITS***

Preamble

The objective of this course is to impart a practical understanding of Python software for classification of data and descriptive statistics. The student will be able to develop the skill of using the software to generate statistical output to be used for further statistical analysis. It will impart practical hands on knowledge to students as they will be trained in computer science laboratories and taught machine learning using case studies and data sets.

Program: M.A. (2021-22)				**Semester: II**	
Course: Data Science with Python				**Course Code: PAMAECO206**	
Teaching Scheme				**Evaluation Scheme**	
Lecture (Hours per week)	**Practical (Hours per week)**	**Tutorial (Hours per week)**	**Credit**	**Continuous Assessment (CA) (Marks - 25)**	**Semester End Examinations (SEE) (Marks- 75 in Question Paper)**
04	**-**	**-**	**06**	**25**	**75**

Learning Objectives:

To equip students with the skill of using software packages like Python for statistical applications and execute a live research project on contemporary problems.

Course Outcomes:

CO1: well versed with Python basics.

CO2: familiar with array indexing, operations with numpy, data frames and feature engineering.

CO3: using Python software for data presentation and exploratory data analysis.

CO4: introduce machine learning and model evaluation.

Outline of Syllabus: (per session plan)

Module	**Description - Title**	**No of Hours**
I	**PYTHON BASICS**	10

II	**OPERATIONS WITH NUMPY AND PANDAS**	15
III	**EXPLORATORY DATA ANALYSIS: INTRODUCTION TO MATPLOTLIB AND SEABORN**	15
IV	**MACHINE LEARNING**	20
	Total	60
PRACTICALS		-

Unit	**Topic**	**No. of Hours**
Module I	**PYTHON BASICS** Understanding the python environment, Jupyter Notebook versus other Virtual Environments, Introduction to Jupyter Notebook, Basic Operations and Python Commands with Jupyter Notebook [Booleans, For loops, If statements, Code indentations, packages etc.]	**10**
Module II	**OPERATIONS WITH NUMPY AND PANDAS** Numpy arrays, Array indexing, operations with numpy, Exercises with data. Introduction to pandas, series, dataframes, feature engineering [missing data, groupby, joining and concatenating etc] Exercises with data.	**15**
Module III	**EXPLORATORY DATA ANALYSIS: INTRODUCTION TO MATPLOTLIB AND SEABORN** Data visualization with Matplotlib: - Figure class, Axes, Subplots, Multiplots, Grids, Twin Axes, Bar Plot, Histogram, Pie chart, Scatter plot, Contour plot, Box plot, Violin plot etc. Seaborn: Distribution plots, Categorical Plots, Matrix Plots, Grids, Regression Plots, Style and Colour. Exercises with data.	**15**

Module IV	**MACHINE LEARNING** Machine Learning: Supervised v/s Unsupervised Learning. Evaluating performance of the Models - Linear regression, Logistic regression, K – Nearest Neighbours, Decision Trees and Random Forests, Support Vector Machines, K – mean clustering and Principle Component analysis.	**20**

REFERENCES:

- Jake Vanderplas, *Python Data science Handbook: Essential Tools for working with Data*
- Davy Cielen, Arno D. B. Meysman & Mohamed Ali, *Introducing Data Science: Big Data, Machine Learning & more using Python tools*, Dreamtech Press
- Swapnil Saurav, *Data Science and Machine Learning with Python: Learn & Practice Series*
- Swapnil Saurav, *Learn and Practice Data Visualization using Python*
- U Dinesh Kumar Manaranjan, *Machine Learning using Python*