Mahatma Education Society's

Pillai College of Arts, Commerce & Science (Autonomous)

Affiliated to University of Mumbai

'NAAC Accredited 'A' grade (3 cycles)'
'Best College Award' by University of Mumbai
ISO 9001:2015 Certified

SYLLABUS

Program: B.Sc. Economics

F.Y. B.Sc. Economics

PCACS/BSE/SYL/2024-25/FY

As per National Education Policy
Choice Based Credit & Grading System

Academic Year 2024-25

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pcacs

S.N.	Name	Designation	Signature
1	Dr. Rinkoo Shantnu	HOD / Chairperson	
2	Dr. Aarti Sukheja	Member	
3	Ms. Praniti Rajapure	Member	
4	Dr. B. S. Patil	Vice Chancellor Nominee	
5	Mr. Sunil Ghadge	Subject Expert	
6	Ms. Saleha	Subject Expert	
7	CA Mr. Abhilash Tewari	Industry Representative	
8	Ms. Priti Mishra	Alumni Representative	

Dr. Rinkoo Shantnu
Co-ordinator B.Sc. Economics

1. Introduction to the Program

B.Sc. Economics programme of Pillai College of Arts, Commerce and Science (Autonomous) will equip you with a nuanced understanding of economic models and the ability to devise policy interventions to economic problems. Our carefully designed degree combines compulsory units in core economics, econometrics, applied mathematics and other Courses which will be able to develop deep insights into the dynamics of global and national economies.

Employers look for candidates who can produce reports that make use of advanced quantitative skills in analysis and modeling. The analytical reasoning and quantitative techniques provided by the said course will give the best employment prospects to the students.

This degree will open up myriad career options. Students will not only enjoy a substantial edge when applying for prestigious postgraduate programmes in Economics around the world, but will also become a highly competitive applicant for working in areas such as policy-making, data science, consulting, finance and economic research.

2. Programme Outcomes (POs) for B.Sc. Programme

Sr. No.	PO Brief
PO1	Develop a strong foundation in the core principles and theories of their chosen field of study to pursue a profession of choice by understanding fundamental concepts, methodologies, and key terminologies.
PO2	Trigger the research aptitude by developing basic research skills, including the ability to conduct literature reviews, design experiments, collect and analyze data, and draw meaningful conclusions.
PO3	Communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing and also ability to present their work through written, oral, and visual presentations, including an original research proposal in a clear and understandable manner to both technical and non-technical audiences.
PO4	Understand and adhere to ethical standards by recognizing the importance of integrity, honesty and ethical responsibility in scientific research and professional practice.
PO5	Ability to work cohesively to achieve common goals, solve problems and contribute to the success of a project or task paving way to individual and collective growth.
PO6	Engage themselves in lifelong learning to keep up with the pace of changing technology.
PO7	Acquisition of specialized technical skills and expertise relevant to the specific field of study i.e advanced laboratory techniques, computational skills, or other specialized methodologies.
PO8	Equipped with the ability to analyze information critically, think logically, and solve complex problems by applying scientific methods, mathematical reasoning, and logical approaches to real-world situations.

3. Programme Specific Outcomes (PSOs) for B.Sc Economics Programme

PSO-1	Apply quantitative skills and its application in economic analysis and modeling.
PSO-2	Exhibit in-depth practical skills for working in areas such as policy-making, data science, consulting, finance and economic research.
PSO-3	Develop understanding of economic models and the ability to devise policy interventions to economic problems.
PSO-4	Develop a research mindset by aiding deep insights into the dynamics of global and national economies.

Course Structure

Semester I						
Course Code	Course Type	Course Title	Theory/ Practical	Marks	Credits	Lectures / Week
PUSEC101	**Major**	Introduction to Macro Economics	Theory	100	4	4
PUSEC102	**Major**	Basic Mathematics for Economics	Theory	100	4	4
PUSEC103	**Minor**	Introduction to Micro Economics	Theory	100	3	4
PUSEC104	**SEC (FLIPPED CLASSROOM)**	PROBLEM SOLVING & PROGRAMMING	Theory	100	2	3
PUAEC10-	**AEC**	Basic Communication Skills	Theory	100	2	3
PUVAC10-	**VAC**	To be taken from the Pool	Theory	100	2	3
PUIKS101-	**IKS**	General IKS-I	Theory	100	2	3
PUIDC10-	**IDC**	To be taken from the Pool	Theory	100	3	4
Total				**800**	**22**	**29**

Abbreviations:
SEC: Skill Enhancement Course
AEC: Ability Enhancement Course
VAC: Value Added Course
IKS: Indian Knowledge System
IDC: Interdisciplinary Course

Semester II						
Course Code	**Course Type**	**Course Title**	**Theory/ Practical**	**Marks**	**Credits**	**Lectures/ Week**
PUSEC201	**Major**	Intermediate Macro Economics	Theory	100	4	4
PUSEC202	**Major**	Basic Statistics for Economics	Theory	100	4	4
PUSEC203	**Minor**	Intermediate Micro Economics	Theory	100	3	4
PUSEC204	**SEC (FLIPPED CLASSROOM)**	NPTEL archived course	Theory	100	2	3
PUAEC20-	**AEC**	Indian Languages from the pool	Theory	100	2	3
PUVAC20-	**VAC**	To be taken from the Pool	Theory	100	2	3
PUIKS20-	**IKS**	General IKS-II	Theory	100	2	3
PUIDC20-	**IDC**	To be taken from the Pool	Theory	100	3	4
Total				**800**	**22**	**29**

Abbreviations:
SEC: Skill Enhancement Course
AEC: Ability Enhancement Course
VAC: Value Added Course
IKS: Indian Knowledge System
IDC: Interdisciplinary Course

Evaluation Pattern

Marking Code	Marking Scheme
A	60 Marks Final Exam, 20 Marks Internal Exam, 20 Marks Field Project.
B	60 Marks Final Exam, 40 Marks Internal Exam.
C	100 marks distributed within report /case study/ project/ presentation etc.
D	50 Marks Practical Examination.

SEMESTER I

Course Code	Course Type	Course Title	Evaluation Pattern
PUSEC101	Major	Introduction to Macro Economics	A
PUSEC102	Major	Basic Mathematics for Economics	A
PUSEC103	Minor	Introduction to Macro Economics	A
PUSEC104	SEC (FLIPPED CLASSROOM)	NPTEL archived course	C
PUAEC10-	AEC	Basic Communication Skills	C
PUVAC10-	VAC	To be taken from the Pool	C
PUIKS101-	IKS	General IKS-I	C
PUIDC10-	IDC/ GE	To be taken from the Pool	C

SEMESTER II

Course Code	Course Type	Course Title	Evaluation Pattern
PUSEC201	Major	Intermediate Macro Economics	A
PUSEC202	Major	Basic Statistics for Economics	A
PUSEC203	Minor	Intermediate Micro Economics	A
PUSEC204	SEC (FLIPPED CLASSROOM)	NPTEL archived course	C
PUAEC20-	AEC	Indian Languages from the pool	C
PUVAC20-	VAC	To be taken from the Pool	C
PUIKS20-	IKS	General IKS-II	C
PUIDC20-	IDC/ GE	To be taken from the Pool	C

SEMESTER I

BOS	B.Sc. Economics
Class	F.Y. B.Sc. Economics
Semester	I
Course Name	Introduction to Macro Economics
Course Code	PUSEC101
Course Type	Major
Level of the Course	Basic
Credits	4

Course objectives:
1. The course aims to make students understand the major models of macroeconomics, their assumptions and economic implications.
2. The aim is to prepare students in achieving a deeper understanding of macroeconomics which will be an important formative element for those who intend to develop careers in economics field.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Introduction	1.1	Macro Economics: Meaning & Scope, Distinction between Macroeconomics and Microeconomics, Micro- Macro Paradox.	15
		1.2	Origin & Growth of Macro Economics, Macro-Economic Objectives & Conflicts.	
		1.3	Major Macro-Economic Variables: Savings, Investment, Output, Balance of Payments, Inflation, Economic Growth & Unemployment.	
2	Indian Knowledge System	2.1	Economic System of Ancient India: Maurya and Gupta Empire	15
		2.2	Economic System of pre and post independent India	
		2.3	Prospects for the future of indigenous economies, Opportunities and challenges for incorporating indigenous knowledge into global economic frameworks	
3	National Income	3.1	National Income: Meaning and Concepts - GDP, NNP, GNI, NNI.	15
		3.2	National Income at market price and constant price, GVA, Green GDP, Measurement and Limitations of National Income.	
		3.3	Circular flow of income - Closed and Open Economy Models.	
4	Theories of Macro Economics	4.1	Trade Cycles: Features and Phases.	15

		4.2	Say's Law of Markets: Features, Implications and Criticism.	
		4.3	Principle of Effective Demand: Aggregate Demand and Aggregate Supply, Equilibrium.	
			Total number of Lectures	**60**

Course Outcomes: By the end of the course the student will be able to:
1. Define the concepts of national income, saving function and investment function.
2. Explain circular flow of income, principle of effective demand and consumption function.
3. Illustrate the working of multiplier.
4. Examine macro-economic objectives & conflicts, major macro-economic variables.
5. Evaluate Say's Law of markets, micro- macro paradox,
6. Create an example related to national income at market price and constant price.

Reference Books:
1. Chaturvedi, D. D., & Gupta, S. L. (2010). Business Economics Theory & Applications. New Delhi: International Book House Pvt. Ltd.
2. Dwivedi, D. N. (2019). Macro Economics. Chennai: Mc G raw Hill Education.
3. Mankiw, N. G. (2012). Principles of Macroeconomics. Boston: Cengage Learning.
4. Mithani, D. M. (2019). Macro Economics. Mumbai: Himalaya Publishing House Pvt. Ltd.
5. Jhingan, M. L. (2019). Macro Economics Theory. Delhi: Vrinda Publications Pvt. Ltd.
6. Samuelson, P. A., & Nordhaus, W. D. (2015). Macro Economics. New York: McGraw Hill Education.

Case Studies	1	The neoclassical economists who emphasize the role of supply in the macroeconomy often refer to Say's law: supply creates its own demand. The reasoning behind Say's law is that each time output is produced and sold, the revenues represent an equivalent amount of income generated. This income allows the owners to purchase the amount of output that was produced. While widget workers may not want to spend their entire paycheck on widgets, they will want to buy something, if not what they produced then something some other workers produced. In the aggregate, supply creates its own demand, or more generally, aggregate supply drives the economy while aggregate demand responds passively.
	2	Arthaśāstra is an ancient treatise on statecraft, economics, politics, diplomacy, military strategy, law, ethics, and governance. It is attributed to Kauṭilya, also known as Chāṇakya, was a scholar, teacher, advisor, and King-maker of King Candragupta Maurya, the founder of

		the Mauryan Empire. Arthaśāstra provides many insights on leadership that are applicable for any organization or society. One of them is Artha. It means wealth or material well-being. A leader should aim to achieve artha for oneself and one's people by following dharma, righteousness and avoiding adharma, unrighteousness. That is why Kauṭilya's Arthaśāstra is also known as a book on Dharmanomics. A leader should also balance artha with kāma and mokṣa, which are the other three goals of human life.

BOS	Mathematics & Statistics
Class	F.Y. B.Sc. Economics
Semester	I
Course Name	Basic Mathematics for Economics
Course Code	PUSEC102
Course Type	Major
Level of the Course	Basic
Credits	4

Course Objectives:
1. Enable the students to have a good knowledge in working practice of mathematical tools for taking appropriate decisions
2. Enable the students to have thorough knowledge in daily life mathematical calculations.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Simple & Compound Interest	1.1	Simple Interest :- Terminology, Examples, Simple Interest for fractional years	15
		1.2	Compound Interest: - Terminology, Examples, Interest compounded more than once a year	
		1.3	Nominal & Effective Rate of Interest, Continuous Rate of Interest,	
		1.4	Annuity, EMI & Sinking Fund	
2	Functions, Derivatives & their Applications	2.1	Definition, Types of functions Functions in Economics, Equilibrium Point, Break- Even Point	15
		2.2	Derivatives: - Rules of Differentiation	
		2.3	Higher order Derivatives: - Second Order Derivatives	

		2.4	Application of Derivatives: - Rate of Change, Maxima and Minima, Average & Marginal concepts, Elasticity of Demand	
3	Matrices & Determinants	3.1	Definition, Types of Matrices	15
		3.2	Algebra of Matrices	
		3.3	Determinants, Properties, Cramer's Rule for 2 & 3 variables	
		3.4	Inverse of Matrix by Adjoint method, Input & Output Analysis	
4	Numerical Interpolations	4.1	Forward Difference Method	15
		4.2	Newton's Forward Interpolation Method, Newton's Forward Interpolation for Polynomials	
		4.3	Backward Difference Method	
		4.4	Newton's Backward Interpolation Method, Newton's Backward Interpolation for Polynomials	
TOTAL LECTURES				**60**

Course Outcomes: By the end of the course the student will be able to:

1. Evaluate interest and annuity and calculate the Equated Monthly Instalments using Flat Interest and Reducing Balance.
2. Define mathematically the concepts and uses of various economic functions.
3. Explain and interpret the diagrammatic representation of various economic functions.
4. Demonstrate the working procedure in the form of rows and columns using matrices and determinants.
5. Examine and analyse the input and output techniques applicable under different market conditions
6. Illustrating and estimating using the forward and backward differences interpolation

Reference books :

1. Mathematics for Economics and Finance, Martin Anthony, Norman Biggs, Cambridge lowprice editions, 2000.
2. Business Mathematics, D.C. Sancheti, V.K. Kapoor, Sultan Chand & Sons Publications, 2006.
3. Business Mathematics, J.K. Singh, 2009,Himalaya Publishing House.
4. Mathematics for Business and Economics, J.D. Gupta, P.K. Gupta, Man Mohan, Tata McGrawHill Publishing Company Ltd.

5. Mathematics of Finance 2nd Edition Schaum's Outline Series Peter Zima, Robert Brows Tata McGrawHill Publishing Company Ltd.

Case Studies	I	The owner of an Electric Bike company have determined that if they charge their customers Rs. x/- per day to rent a bike where $50 \leq x \leq 200$, then number of bikes they rent per day will be f(x) = 2000 – 10x. If they charge RS. 50/- or less then they rent all their bikes and if they charge Rs. 200/- or more then they will not rent any bike. Based on the above information, answer the following questions:
	II	Mr. Sinha wants to take a loan of Rs. 2 lakhs, to be repaid in 3 years. Bank X offers him a loan at 10% p.a., flat interest rate and Bank Y offers him loan at 12% p.a. on reducing balance. Based on the above information, answer the following questions:

BOS	B.Sc. Economics
Class	F.Y. B.Sc. Economics
Semester	I
Course Name	Introduction to Micro Economics
Course Code	PUSEC103
Course Type	Discipline Minor
Level of the Course	Basic
Credits	3

Course objectives:

1. To give the students a thorough understanding of the principles of economics that apply to the decisions of both consumers and producers.

2. To give the students a knowledge of product markets and factor markets and the role of government in promoting greater efficiency and equity in the economy.

Unit No.	Name of Unit	Topic No.	Name of Topic	Hours
1	Introductio n	1.1	Micro Economics: Meaning, Scope & importance.	15
		1.2	Opportunity Cost, Incrementalism and Marginalism.	
		1.3	The Basics of Demand & Supply: Law of Demand & Supply.	
2	Demand & Supply Analysis	2.1	Determinants of Demand, Elasticity of demand: Concept, Importance and Types: Price, income cross and promotional.	15
		2.2	Demand forecasting: Meaning, Importance, Methods: Survey and Statistical.	
		2.3	Elasticity of Supply, Market Demand & Supply and Equilibrium price- shifts in the demand and supply curves and effect on equilibrium.	
3	Production Analysis	3.1	Production function: Meaning & Features.	15
		3.2	Law of Variable Proportions, Isoquants and Producer's Equilibrium.	
		3.3	Laws of Returns to Scale, Expansion path, Economies and Diseconomies of Scale and Economies of Scope.	
4.	Cost & Revenue Analysis	4.1	Cost concepts: Accounting cost and economic cost, social and private cost, fixed and variable cost, Types of Production Costs: total, average and marginal cost.	15
		4.2	Short Run Cost Curves and Long Run Cost Curves, Learning curve.	
		4.3	Revenue concepts: TR, AR & MR, Break even analysis and business applications.	
			Total number of Lectures	**60**

Course Outcomes: By the end of the course the student will be able to:
1. Explain the meaning and scope of micro economics and the concept of demand and supply.
2. Discuss the determinants of demand and important methods of demand forecasting.
3. Examine the types of elasticity of demand and cost concepts.
4. Analyze the law of variable proportions, isoquants and producer's equilibrium.
5. Evaluate the economies and diseconomies of scale.
6. Create an example related to break even analysis with business applications.

References:
1. Microeconomic Theory: KPM Sundharam. M.C. Vaish (Sultan. Chand Publication)
2. Managerial Economics: Dr. D.M. Mithani (Himalaya Publishing House)
3. Business Economics: Dr. R.L. Varshney, Dr. K.L. Maheshwari, Dr. R.K. Maheshwari (Sultan Chand and Sons)
4. Managerial Economics: P.L. Mehta (Sultan Chand Publication)
5. Modern Microeconomics: Koutsoyiannis A. (Macmillan Publication)

Case Studies	I	**Tata Motors Break Even Analysis**
		Tata Motors Limited is one of India's largest automobile manufacturers, producing a wide range of vehicles from passenger cars to commercial vehicles.
		Key Parameters:
		1. Fixed Costs: These include expenses such as factory overheads, administrative salaries, depreciation on machinery, and marketing expenses. As of the latest financial reports, Tata Motors' fixed costs are estimated to be around Rs. 3,000 crore per year.
		2. Variable Costs per Unit: Variable costs for Tata Motors would include the cost of raw materials, labor, and direct manufacturing expenses. Let's assume that the variable cost per vehicle is Rs. 5,00,000.
		3. Average Selling Price per Unit: Considering the diverse range of vehicles Tata Motors produces, let's assume an average selling price per vehicle of Rs.10,00,000.
		This indicates that Tata Motors needs to sell 6000 vehicles to cover all its costs and reach the break-even point.
		Implications:
		- If Tata Motors sells fewer than 6000 vehicles, it will incur a loss.
		- If it sells exactly 6000 vehicles, it will break even.
		- If it sells more than 6000 vehicles, it will start making a profit.
		This analysis helps Tata Motors understand its cost structure and make strategic decisions regarding production levels, pricing strategies, and cost control measures to achieve profitability.
	II	**Driving Growth through Advanced Demand Forecasting: A Case Study of Hindustan Unilever Limited in the Indian Consumer Goods Market**
		Hindustan Unilever Limited (HUL) is one of the largest consumer goods companies in India, HUL faces significant challenges in demand forecasting

		due to the diverse and dynamic nature of the Indian market. It produces a wide range of consumer products including personal care items, home care products, foods, and beverages. With a vast distribution network spanning urban and rural areas across the country, accurately predicting demand is crucial for optimizing production and ensuring product availability. HUL employs sophisticated data analytics tools and techniques to forecast demand. By analyzing historical sales data, market trends, and consumer behavior patterns, the company develops predictive models to anticipate future demand for its products. However, the Indian market presents unique challenges such as regional variations in demand, seasonal fluctuations, and changing consumer preferences. To address these challenges, HUL continuously refines its demand forecasting models, incorporating real-time data and market insights. By improving forecast accuracy, HUL minimizes stockouts, reduces excess inventory, and enhances customer satisfaction. This enables the company to maintain its market leadership position and drive growth in the competitive Indian consumer goods industry.

BOS	B.Sc. Economics
Class	F.Y. B.Sc. Economics
Semester	I
Course Name	Problem Solving and Programming (NPTEL/SWAYAM)
Course Code	PUSEC104
Course Type	Skill Enhancement Course
Level of the Course	Basic
Credit	2

Course Objectives:

1. To develop the students ability to study problems, understand problems, and represent the logic required to solve these problems.
2. To familiarize the students with the basic constructs and techniques used in solving problems.

Unit No.	Name of Unit	Topic No.	Content	Hours
1	Introduction to Problem Solving	1.1	Fundamentals of Problem Solving: What is a problem?, Problem with problem Solving Strategy, Strategy for problem solving. Computer hardware, computer software and its types.	7
		1.2	Linking Problem Solving concept with Programming: coding versus problem solving, Why do we write Programs? and What are they? How to think like a programmer?	
		1.3	Defining the Problem and finding the solution: define the problem, Find the solution, Evaluate alternative solutions	
2	Building blocks of Solution Representation	2.1	Primitives : Input, Process, and Output, Variables and Constants, Data Types , Using Operators	8
		2.2	Algorithm : Algorithm Definition, Types of Algorithm, Properties of Algorithm and Structure	
		2.3	Flowchart : symbols used in flowcharts, sequencing the task, Representing Decisions in a Flowchart	

3	Solution Representation	3.1	Represent the solution as an Algorithm	7
		3.2	Convert Algorithm into flowchart	
		3.3	Converting Algorithm to Program : Understanding the program execution process, Types errors and debugging, Programming style and Quality	
4.	Fundamentals of programming	4.1	Decision making Statements: If Statement, If-Else Statement, Looping Statements: while loop, do-while, for loop.	8
		4.2	Classification and characteristics of Computer, introduction to Operating Systems and structure of a computer.	
		4.3	Types of Programming languages, History, features and application, Simple program logic, program development cycle, desirable program characteristics.	
			Total No. of Lectures	**30**

Course Outcomes: By the end of the course the student will be able to:
1. Knowledge acquired: mapping the concept of problem solving with programming.
2. Examine a problem and find a logical solution for the same.
3. Apply the logic building techniques to write actual programs.
4. Analyze that programs are no different than solving a problem.
5. Evaluate the concept of writing a good program by finding the best logical solution to solve the problem.
6. Build solutions using the basic concepts of programming.

References:

1. http://kc.niitstaff.com/NIITStaffUpgrade/CG/IEC%20Track%203%20-Information%20System/CFS/04_PLT/02_SM1_PLT_CG.pdf - UNIT II (Flowchart)
2. https://www.freecodecamp.org/news/how-to-think-like-a-programmer-lessons-in-problem-solving-d1d8bf1de7d2/   UNIT I (Problem Solving)
3. https://www.studocu.com/en-au/document/monash-university/computer-programming/lecture-notes/guide-to-problem-solving-and-program-design/1290996/view UNIT III (Solution Representation)
4. Programming in ANSI C" by E. Balagurusamy
5. Introduction to Algorithms" by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein

	Problem Solving and Programming Practical	
Sr.No	**Title**	**CO**
1.	a.Write an algorithm to find the sum of two numbers. b.Write an algorithm to find whether a number is even or odd. c.Display a set of numbers in descending order.	CO1
2.	a. Write an algorithm to find the largest number in the series. b.Write an algorithm to find the average of two numbers.	CO1
3.	a.Convert the algorithm to find the sum of two numbers. into flowchart. b. Convert the algorithm to find whether a number is even or odd into flowchart.	CO2
4.	a.Convert the algorithm to find the largest number in the series into flowchart. b.Convert the algorithm to find the average of two numbers into flowchart.	CO2, CO3
5.	a. Write pseudo code to display appropriate message for student grade. b. Write pseudo code to find the average of a series of numbers. C. Write pseudo code to find the total number of passed and failed students from a class.	CO4, CO5
6.	a.Write a pseudo code to find the area of rectangle,triangle. b.Write pseudo code to find the greatest of three numbers.	CO4, CO5
7.	Company A is competing in the business with company B, both are producing Hair oil as their main product. What can be possible solutions for Company A to gain more profit than Company B?	CO4, CO5
8.	Christmas week is a prime time for people going on vacation. A tourist agent having his office at Vashi wants to make most of it and earn heavily during this week. But at the same time, he wants to go on vacation too with his family. What can be the best solution?	CO5, CO6
9.	College ABC is planning to implement the online teaching platform. Find out possible solutions to implement the attendance module of the students.	CO5, CO6
10.	Our health care services industry has the risk to be strained to a great extent at the event of COVID-19 spreading across the country, what can be the best solution to spread awareness for the same.	CO5, CO6
	Total Lectures	**20**

SEMESTER II

BOS	B.Sc. Economics
Class	F.Y. B.Sc. Economics
Semester	II
Course Name	Intermediate Macro Economics
Course Code	PUSEC201
Course Type	Major
Level of the Course	Medium
Credits	4

Course Objectives:
1. To familiarize the student with the generally accepted concepts, principles and theories of macroeconomics.
2. To give the students a thorough macroeconomic understanding in Keynesian and Post-Keynesian economics.

Unit No.	Name of Unit	Topic No.	Name of the Topic	Hours
1	Keynesian Developments in Macro Economics	1.1	Concept of Consumption Function: Subjective and Objective Factors	15
		1.2	Investment function, Determinants of Investment.	
		1.3	Multiplier: Assumptions, Working, Leakages.	
2	Money Supply & Demand for Money	2.1	Money Supply: M1, M2, M3, M4, Determinants, Factors influencing Velocity of Circulation of Money.	15
		2.2	Keynesian Theory of Demand for Money	
		2.3	Keynes' Liquidity Preference Theory of Interest.	
3	Inflation	3.1	Inflation: Meaning & Demand Pull Inflation and Cost Push Inflation	15
		3.2	Effects of Inflation, Inflationary Gap	
		3.3	Policy measures to control Inflation- Monetary Policy and Inflation Targeting.	
4	Post Keynesian Developments in Macro Economics	4.1	The IS-LM model of integration of Commodity and Money Markets.	15
		4.2	Inflation and unemployment: Philips curve.	
		4.3	Stagflation: Meaning, Causes, Supply Side Economics.	
			Total number of Lectures	**60**

Course Outcomes: By the end of the course the student will be able to:
1. Define the concepts of money supply.
2. Explain monetary policy, functions of central bank, features and phases of trade cycles.
3. Classify Fisher's Equation of Exchange and Cambridge Cash Balance Approach.
4. Examine IS-LM model and Phillips curve.
5. Evaluate Keynes theory of demand for money and interest.
6. Create an example related to inflation and stagflation.

Reference Books:
1. Ackley. G. (1976), Macro Economic Theory and Policy, Macmillan Publishing Co. New York.
2. Ahuja. H.L., Modern Economics, S.Chand Company Ltd. New Delhi.
3. Jhingan, M.L., Principles of Economics, Vrinda Publications (P) Ltd.
4. Dornbush , Rudiger, Fisher Stanley and Startz, Richards Macroeconomics, Nineth edition 2004 Tata-Mac Graw Hill, New Delhi.
5. Gregory .N. Mankiw, Macroeconomics, Fifth Edition (2002) New York: Worth Publishers.
6. Vaish .M.C. (2010) Macro Economic Theory 14th edition, Vikas Publishing House (P) Ltd.

| Case studies | 1 | The business cycle since the year 2000 is a classic example. The expansion of activity happened between 2000 and 2007 was followed by the great recession from 2007 to 2009. It started with the easy access to bank loans and mortgages. Since new homebuyers could easily afford loans, they purchased them. More and more homebuyers kept purchasing homes resulting in an increase in demand for homes. Thus, home prices started to increase. The Federal Reserve continued to lower the interest rate and the Federal Government put specific guarantees on mortgages, allowing banks to lend money even cheaper. Since the government guaranteed the banks' money, they couldn't lose their money and started lending to anyone. They started allowing people to take two and three mortgages on a single home because the housing prices kept increases. People used this money to buy boats and cars thus increasing economic activity even more. Since expansions and other phases in the economic cycle are measured in real GDP, this inflation gave a false impression of expansion, which led to over speculation. The peak of activity was in December 2007. At this point, people noticed what happened and housing prices started to fall. Additionally, the federal funds rate increased to combat excess borrowing causing interest payments on mortgages to increase. The increased interest rates coupled with the plummeting home prices left many homeowners with sub-prime loans that they would eventually default on. The economy contracted from late 2007 until 2009 when it bottomed out and began to rebound thus completing the entire cycle. |
| | 2 | In the early 1970s, the post-World War II economic boom began to |

		decline in U.S.A. due to increased international competition, the expense of the Vietnam War, and the decline of manufacturing jobs. Unemployment rates rose, while a combination of price increases and wage stagnation led to a period of economic doldrums known as stagflation. President Nixon tried to alleviate these problems by devaluing the dollar and declaring wage and price freezes. The crisis was compounded when oil-rich nations in the Middle East declared an embargo against the United States which had a lasting effect on energy prices.

BOS	Mathematics and Statistics
Class	F.Y.B. Sc. Economics
Semester	II
Course Name	Basic Statistical Techniques
Course Code	PUSEC202
Course Type	Major
Level of the Course	Basic
Credits	3

Course Objectives:

1. To equip students to deal with statistical applications in finance.
2. To equip the students to solve the complexities involved while data collection for research activities.

Unit No.	Name of Unit	Topic No.	Name of Topic	Hours
1	Univariate Distribution	1.1	Mean , Median, Combined Mean	15
		1.2	Range, Quartile Deviation, Mean Deviation, Standard Deviation, Combined Standard Deviation.	
2	Bivariate Distribution	2.1	Correlation Co-efficient	15
		2.2	Linear Regression Analysis	
		2.3	Time Series Analysis	
3	Index Number	3.1	Introduction to Index Numbers, Economic Barometer	15
		3.2	Types of Index Numbers, Construction of Index Numbers – Simple Unweighted, Unweighted Price Relatives, Laspeyres, Paasche, Fishers, Dorbish Bowley, Marshall Edgeworth, Kellys, Cost of Living Index Numbers	
		3.3	Shifting of Base Year, Real Income, Wholesale Price Index Numbers, Chain Base Index	

			Numbers,	
4	Decision Theory	4.1	Decision Making under uncertainty	15
		4.2	Decision Making under risk	
		4.3	Formulation of Payoff Matrix	
		4.4	Decision Tree	
			Total number of lectures	**60**

Course Outcomes: By the end of the course the student will be able to:

1. Define the concepts and uses of statistics, data and its type and the methods of collection of data.
2. Evaluate numerically the existence of relationship of two variables and to express the relation as equations.
3. Explain and calculate the Price Index, standard of living, economic changes and the like using various measures.
4. Demonstrate the capability for decision making during uncertain and risk situations in a business cycle.
5. Examine and analyze the changes in economy, deflating the inflation, Real Income, etc
6. Illustrating and estimating the value of a variable when the value of its related value is known.

References:
1. Business Statistics –By Ken Black – Tata McGraw Hill.
2. Business Statistics – By V.N. Kapoor – S.Chand.
3. Operation Research- An Introduction – By H.A. Taha .
4. Operation Research – By Paneerselvan.
5. Fundamentals of Mathematical Statistics" by S.C. Gupta and V.K. Kapoor

Case Studies	I	A TV production company produces a certain brand of television sets in thousand units. The planning department of the company is planning to increase the production in the coming next year by determining the trend values. A survey was conducted and the previous seven years production details are given below.
	II	A company has to choose one of the four types of Biscuits – Glucose, Multigrain, Coconut and Cream. Sales expected during the next year are highly risky. Marketing department estimates the profits considering manufacturing cost, promotional efforts and distribution setup, etc. Following payoff matrix has been constructed by the company to tackle the risk situations.

BOS	B.Sc. Economics
Class	F.Y. B.Sc. Economics
Semester	II
Course Name	Intermediate Micro Economics
Course Code	PUSEC203
Course Type	Minor
Level of the Course	Medium
Credits	4

Course Objectives:
1. To give the students a thorough understanding of the principles of economics that apply to the decisions of both consumers and producers.
2. To give the students a knowledge of product markets and factor markets and the role of government in promoting greater efficiency and equity in the economy.

Unit No.	Name of Unit	Topic No.	Name of Topic	Hours
1	Integration of Market Structures with the Indian Knowledge System	1.1	Introduction to Perfectly Competitive, Monopoly Markets and Indian Knowledge System	15
		1.2	Traditional Economic Practices and their alignment with different market structures- barter systems, cooperative farming, and community-based markets	
		1.3	Indigenous Knowledge in Modern Markets	
2	Pricing and Output Decisions under Imperfect Competition	2.1	Monopolistic Competition: Features, Short run and Long Run Equilibrium of a Firm, Wastes under Monopolistic Competition.	15
		2.2	Selling Costs and Role of Advertising, Oligopoly: Features, Non- Collusive Oligopoly: Price Rigidity.	
		2.3	Collusive Oligopoly- Cartels and Price Leadership Model, *Case Studies*.	
3	Pricing Practices	3.1	Cost Plus Pricing, Marginal Cost Pricing, Mark Up Pricing.	15
		3.2	Discriminating Pricing, Multiple Product Pricing, Transfer Pricing.	
		3.3	Going Rate Pricing, Skimmed and Penetration Pricing, Administered Pricing, *Case Studies*.	
4	Capital Budgeting & AI Revolution in Economics	4.1	Capital Budgeting: Meaning and Importance, Steps in Capital Budgeting.	15
		4.2	Methods of Capital Budgeting: Payback Period Method, Net Present Value Method, and Internal Rate of Return, *Numerical examples*.	

		4.3	Basics of artificial intelligence and its relevance to economic theory and practice, Critical evaluation of the strengths and weaknesses of AI techniques Analysis of case studies illustrating the impact of AI on different economic sectors	
			Total number of lectures	**60**

Course Outcomes: By the end of the course the student will be able to:

1. Explain the meaning and features of perfect competition, monopoly, monopolistic competition and oligopoly.
2. Discuss the short run and long run equilibrium of a firm and industry under different market structure.
3. Examine the collusive and non- collusive oligopoly models.
4. Analyse the selling costs, role of advertising, waste in monopolistic competition and importance of capital budgeting.
5. Evaluate different pricing methods.
6. Create a numerical example of capital budgeting methods.

Reference Books:

1. Microeconomic Theory: KPM Sundharam. M.C. Vaish (Sultan. Chand Publication)
2. Managerial Economics: Dr. D.M. Mithani (Himalaya Publishing House)
3. Business Economics: Dr. R.L. Varshney, Dr. K.L. Maheshwari, Dr. R.K. Maheshwari (Sultan Chand and Sons)
4. Managerial Economics: P.L. Mehta (Sultan Chand Publication)
5. Modern Microeconomics: Koutsoyiannis A. (Macmillan Publication)

Case Studies	I	**Monopoly Might: Examining Dominance in India's Energy Sector** In India's energy sector, Coal India Limited (CIL) exemplifies the dynamics of monopoly. As the largest coal producer in the country, CIL holds a virtual monopoly over the coal mining industry, supplying coal to various sectors including power generation, steel, and cement. This dominance has significant implications for the energy market, as CIL's pricing decisions and production capacity directly influence the cost and availability of coal-based energy sources. Despite efforts to introduce competition and promote alternative energy sources, CIL's entrenched position in the market persists, presenting challenges for regulatory authorities and potential competitors. This case study explores the complexities of operating in a sector dominated by a single entity, shedding light on the implications for market competition, consumer pricing, and government policy in India's energy landscape.
	II	**Disruptive Dynamics: The Rise of Jio and Monopolistic Competition in India's Telecom Industry** In India, the telecom industry serves as a prime example of monopolistic competition, characterized by a few dominant players coexisting alongside

		smaller competitors. A notable case study involves the emergence of Reliance Jio Infocomm Limited (Jio) in 2016, disrupting the established telecom market dynamics. Jio entered with aggressive pricing strategies, offering free voice calls and significantly discounted data plans, leveraging its parent company Reliance Industries' substantial financial resources.
		This move triggered intense competition among existing players like Bharti Airtel, Vodafone Idea, and others. To remain competitive, these companies were forced to match Jio's pricing or risk losing market share. However, Jio's rapid expansion and disruptive pricing led to significant losses for competitors, causing consolidation within the industry.
		While Jio gained substantial market share within a short span, its competitors struggled to maintain profitability, leading to mergers and acquisitions to sustain operations. The resulting landscape showcased characteristics of monopolistic competition, with Jio emerging as a dominant player alongside a few surviving competitors.

BOS	B.Sc. Economics
Class	F.Y. B.Sc. Economics
Semester	II
Course Name	Python Programming (NPTEL/SWAYAM)
Course Code	PUSEC204
Course Type	Skill Enhancement Course
Level of the Course	Medium
Credits	2

Course Objectives:

1. To understand why Python is a useful scripting language for developers.
2. To learn how to design and program Python applications, how to use lists, tuples, and dictionaries in Python programs.

Unit No.	Name of Unit	Topic No.	Content	Hours
1	Introduction, Conditional and Looping statements	1.1	Overview: What is Python? Interpreted languages, Advantages and disadvantages, Obtaining and installing Python , Writing your first 'Hello World!' program	7
		1.2	Variables, Comments, Data Types, Indentation, Declaring and using Numeric data types: int, float, complex, Using string data type and string operations, Operators	
		1.3	Conditionals and Loops: if statement, else Statement, elif Statement, while loop, for loop, break, continue, pass Statement, else Statement	
2	Collections	2.1	Lists: Creating lists using range() function, Updating the elements of the list, Concatenation of two lists, Repetition of lists, Membership in lists, Aliasing and Cloning lists, Methods to process List	8

		2.2	Sets and Tuples: Creating and accessing Set elements, Basic operations on Set , Functions to process Set elements. Creating and accessing Tuple elements, Basic operations on Tuples, Functions to process tuples	
		2.3	Dictionaries: Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Built-in Dictionary Methods	
3	Modules, Arrays, Functions and Files	3.1	Modules: Creating our own modules and using them, Rename a module, Built-in modules, Arrays: Advantages of Array, Creatingan Array, Importing the array module, Processing the arrays	8
		3.2	Functions: Defining – calling and returning (single and multiple) results from a function, Arbitrary arguments, Keyword arguments, Default arguments, Arbitrary Keyword arguments, Recursion	
		3.3	Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files	
4	Regular Expression, Visualization libraries and GUI Programming	4.1	Regular Expression: Using Special Characters, Regular Expression Methods, Named Groups in Python Regular Expressions, Regular Expression with glob Module.	7
		4.2	Visualization library: Gain knowledge of Python visualization libraries: matplotlib, ggplot, Seaborn, bokeh, geoplotlib etc., Create a plot of retrieved data	
		4.3	Graphics and GUI Programming – Drawing using Turtle, Tkinter and Python, Other GUIs	
Total No. of Lectures				**30**

Course Outcomes:

1. Understand the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
2. Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets
3. Illustrating the functionality of breaking down the task and reusing the code using functions.
4. Apply the functionality to store/retrieve the input and output data on the permanent basis.
5. Identify the commonly used operations on regular expressions.
6. Create the GUI applications to solve real-life problems and Develop the various graphs to visualize the data.

Reference Books:

1. Core Python Programming, Dr. R. Nageswara Rao, dreamtech, 2017
2. Fundamentals of Python: First Programs, Kenneth A. Lambert, CENGAGE Learning, 2012
3. Introduction to Computer Science Using Python, Charles Dierbach, Wiley India Pvt.Ltd
4. https://www.geeksforgeeks.org/python-gui-tkinter/
5. https://www.geeksforgeeks.org/turtle-programming-python/
6. Data Visualization with Python, Mario Dobler, Tim Grobmann , Packt Publishing, 2019
7. https://www.w3schools.com/python/

Python Programming Practical	1.
	a. Installing python and setting up the environment. Simple statements like printing the names, numbers, mathematical calculations, etc.
	b. Enter the number from the user and depending on whether the number is even or odd, print out an appropriate message to the user.
	c. Programs using break and continue statements.
	d. WAP to check if the entered number is Armstrong number or not
	e. WAP to print the following
	pattern: 1
	      12
	      123
		CO1

	2. a. WAP for calculating simple and compound interest b. WAP to accept percentage of a student and display its grade accordingly c. WAP to accept a string(sentence) and returns a string having first letter of each word in capital letter d. WAP that counts the number of alphabets and digits, uppercase, lowercase letters in the string entered	CO2

	3.
	a. Write a Python program to implement a stack and queue using a list data-structure.
	b. Take a list, say for example this one: a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89] and write a program that prints out all the elements of the list that are less than 5.
	c. WAP to display cumulative elements of a given list:
	      For eg: List is[10,20,30,40]
	      Output: [10,30,60,100]
	d. WAP to remove all odd numbers from a given list.
	e. WAP to accept values from a user and create a tuple
		CO2

	4. Program a. Write a Python script to sort (ascending and descending) a dictionary by value. b. Write a Python script to concatenate following dictionaries to create a new one. Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60} Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}	CO2
	5. Write a Python function sin(x, n) to calculate the value of sin(x) using its Taylor series expansion up to n terms. Compare the values of sin(x) for different values of n with the correct value	CO3
	6. Program	CO3

	a. Write a Python program based on importing and executing built-in functions from the time, math and random modules b. Write a recursive Python program to test if a string is a palindrome or not 7. Program a. Write a Python program to read an entire text file b. Write a Python program to append text to a file and display the text. c. Write a Python program to read last n lines of a file 8. Program a. To check whether string has alphanumeric characters or not. b. To replace all the occurrences of letter 'ai' in the string with '**', accept the string from user. c. To display the starting index for the substring 'general' in string " Python is an interpreted high-level general-purpose programming language" d. show the functionality of split(), search(), sub(), finall() functions. 9. Create a graphical application that accepts user inputs, performs some operation on them, and then writes the output on the screen. For example, write a small calculator. Use the tkinter library. 10. Program a. Write a Python program to plot the function $y = 2x+3$ using the pyplot or matplotlib or any python visualization libraries. b. Write a Python program to plot the function $y = x2$ using the pyplot or matplotlib or any python visualization libraries.	CO4 CO5 CO6 CO6
Total Lectures	**20**