



AMBEDKAR COLLEGE OF ARTS & SCIENCE, WANDOOR

(Aided by Govt. of Kerala & Affiliated to University of Calicut)

Ran By Indiraji Memorial Society

Academy, Wandoor, Pin-670121

Phone: 98463-00000, 98463-00001

Email: ambedkarcollege@rediffmail.com Website: www.ambedkarcollege.edu.in

COURSE PLAN

Course code and title	EC03 B99 MATHEMATICAL ECONOMICS		
Class	III year B.A. Economics	Semester	V / ODD
Regulation	R-2019	Academic year	2024-25
Course prerequisites	EC03 B99 Quantitative Methods for Economic Analysis - I BCM1001 Quantitative Methods for Economic Analysis - I & Basic Mathematics in High School Education		
Course objectives	To understand the basics statistical methods to familiarize student with the use quantitative techniques in economic decision making		
	To provide an overview of how statistical methods are used to formulate data into information for Managerial decision-making processes		
	To impart knowledge on effective usage of statistical analysis for market and business applications of domestic and international business management and commerce.		

COURSE OUTCOMES

At the end of the course the student would be able to good proficiency in the fundamental methods of mathematical economics

CO1	This course is intended to provide students an introduction to quantitative methods and tools that are used in the study of economics at the undergraduate level.									
CO2	The aim of this course is to develop skill in statistical and mathematical techniques that are required for a meaningful study of applied economics and for carrying out empirical their further study in most branches of economics									
CO3	Develop proficiency in mathematical techniques such as solving equations, understanding functions, and optimizing functions for economic analysis									
CO4	Learn and apply key statistical concepts, including probability distributions, descriptive statistics, hypothesis testing, and regression analysis.									
CO5	Understand and apply basic quantitative methods used in economics, including algebra, calculus, and basic statistical techniques.									

MAPPING OF PROGRAM OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	√			√			√		√	√
CO2	√		√			√		√		√
CO3		√	√		√		√		√	
CO4	√		√			√	√			√

CO5	√	√			√	√		√	√	
PO1	Knowledge Acquisition					PO6	Ethics & Social Responsibility			
PO2	Communication & Leadership					PO7	Research, Innovation & Entrepreneurship			
PO3	Professional Skills					PO8	Lifelong Learning			
PO4	Digital Intelligence					PO9	Global Perspective			
PO5	Scientific awareness & Critical Thinking					PO10	Democratic Co-existence			

PROGRAM SPECIFIC OUTCOMES

PSO1	Examining the socio-economic problems and find out the strategies to overcome these problems through community engagement
PSO2	Develop appropriate skills and knowledge to address the real world economic issues in familiar and unfamiliar contexts
PSO3	Apply analytical thinking to various economic phenomena, including analysis and evaluation of economic policies, practices, evidences, arguments, claims and beliefs

MAPPING OF COURSE OUTCOMES TO PROGRAM EDUCATIONAL OUTCOMES

PROGRAM EDUCATIONAL OUTCOMES	COURSE OUTCOMES				
	CO1	CO2	CO3	CO4	CO5
PEO1: Development of Leadership Qualities Graduates will demonstrate leadership qualities by utilizing their full intellectual potential, engaging with their communities, and contributing to the social, cultural, and economic development of society	√	√	√		√
PEO2: PEO 2: Lifelong Learning and Societal Contribution Graduates will be equipped with core values and intellectual capabilities, enabling them to pursue lifelong learning and meaningfully contribute to societal well-being through innovative thinking and service		√	√	√	
PEO3: Entrepreneurial and Global Competence Graduates will possess entrepreneurial skills and a global perspective, promoting sustainable national growth through ethical leadership, innovative ventures, and responsible citizenship		√	√		√

References

TEXT BOOKS:

1. J K Sharma, Quantitative Methods- Theory and applications, Mac Millan
2. S.P Gupta, Statistical Methods, Sultan Choud, latest edition

REFERENCES:

1. Richard I. Levin and David S. Rubin, Statistics for Management, Prentice Hall of India, latest edition
2. R.P Hooda, "Statistics for Business", Mc Millan
3. Levine Krebier & Berenson, "Business Statistics", Pearson edition, Delhi

e-learning resources	https://onlinecourses.phd.ips2.ac.in/courses/2024/18/preview https://ips2.ankosh.ac.in/
Mode of Evaluation	Internal Examination (20%) End Semester Examination (80%)
Faculty	Dr. Anish Mathew, Assistant Professor Economics Department
e-mail id	anishkarn@gmail.com

COURSE PLAN EC05 B10 MATHEMATICAL ECONOMICS

No of lecture hours	Planned Date	Topics to be covered				Reference/ Teaching aids and methods	Actual date	Weekl y review
MODULE I - INTRODUCTION TO MATHEMATICAL ECONOMICS								
1	1.08.24	Mathematical Economics: Meaning and Importance-				T1/BB	1.08.24	
2	02.08.24	Mathematical Representation of Economic Models				R2/PPT	02.08.24	
3	03.08.24	Economic functions				T1/BB	03.08.24	
4	04.08.24	Demand function				R3/ PPT	04.08.24	
5	05.08.24	Supply function				R3/ PPT	05.08.24	
6	06.08.24	Utility function, Consumption function				R2/ PPT	06.08.24	
7	12.08.24	Production function				T1/ PPT	12.08.24	
8	14.08.24	Cost function				T1/BB	14.08.24	
9	15.08.24	Revenue function				T1/BB	15.08.24	
10	21.08.24	Profit function				T1/ PPT	21.08.24	
11	29.08.24	saving function, Investment function				CBS(NPTE L)	29.08.24	
Planned hours	Actual hours	Date	Sign of Faculty	Review by HoD		Review by Principal		
MODULE II - MARGINAL CONCEPTS								
12	02.09.24	Marginal utility, Marginal propensity to Consume,				T1/BB	02.09.24	
13	04.09.24	Marginal propensity to Save, Marginal product,				R2, T1/BB	04.09.24	
14	09.09.24	Marginal Cost, Marginal Revenue				R2, T1/BB	09.09.24	
15	11.09.24	Marginal Rate of Substitution, Marginal Rate of Technical Substitution				T1/BB	11.09.24	
16	12.09.24	Relationship between Average Revenue and Marginal Revenue				R3/BB	12.09.24	
17	13.09.24	Relationship between Average Cost and Marginal Cost				T1/BB	13.09.24	
18	24.09.24	Elasticity: Price elasticity				T1/BB	24.09.24	
19	26.09.24	Income elasticity, Cross elasticity				CBS	26.09.24	
Planned	Actual	Date	Sign of Faculty	Review by		Review by Principal		

hours	hours			HoD		
Module III: Optimization						
20	01.10.24	Optimization of single / multi variable functions		T1/BB	01.10.24	
21	03.10.24	Constrained optimization with Lagrange Multiplier		R2/BB	03.10.24	
22	04.10.24	significance of Lagrange Multiplier		T1/BB	04.10.24	
23	09.10.24	Economic applications		R3/BB	09.10.24	
24	21.10.24	Utility Maximization		R3/BB	21.10.24	
25	22.10.24	Cost Minimization		R2/BB	22.10.24	
26	28.10.24	Profit Maximization		T1/BB	28.10.24	
27	30.10.24			CBS	30.10.24	
Planned hours	Actual hours	Date	Sign of Faculty	Review by HoD		Review by Principal
8	8					
Module IV: Production Function, Linear Programming and Input Output analysis						
28	01.11.24	Production function- homogeneous and non-homogeneous		T1/BB	01.11.24	
29	4.11.24	Degree of homogeneity and returns to scale		R2/BB	04.11.24	
30	6.11.24	Properties of Cobb-Douglas production function		T1/BB	06.11.24	
31	8.11.24	Production possibility curve Linear programming		R3/BB	08.11.24	
32	12.11.24	Basic concept, Nature of feasible, basic and optimal solution		R3/BB	12.11.24	
33	18.11.24	Graphic solution		R2/BB	18.11.24	
34	21.11.24	Input-output analysis		T1/BB	21.11.24	
35	25.11.24	Matrix of technical coefficients		T1/BB	25.11.24	
36	28.11.24	The Leontief matrix		T1/BB	28.11.24	
37	29.11.24	Computation of total demand for a two/ three sector economy		CBS	29.11.24	
Planned hours	Actual hours	Date	Sign of Faculty	Review by HoD		Review by Principal
MODULE V: MARKET EQUILIBRIUM MARKET EQUILIBRIUM						
41	02.12.24	Perfect Competition-		T1/BB	02.12.24	
42	03.12.24	Monopoly		R2/BB	03.12.24	
43	04.12.24	Discriminating Monopoly		T1/BB	04.12.24	
44	05.12.24	Online content from Egnankosh		CBS	05.12.24	
Planned hours	Actual hours	Date	Sign of Faculty	Review by HoD		Review by Principal

FACULTY

Dr. PRAMOD K.M.
Asst. Professor & Head
Dept. of Economics
Ambedkar College of Arts & Science
Wandloor

PRINCIPAL
AMBEDKAR COLLEGE OF
ARTS & SCIENCE
WANDLOOR, WALAPPURAM DT

Course outcome - Program outcome Mapping Table

BCM4C04 QUANTITATIVE TECHNIQUES FOR BUSINESS		Cognitive level	Program outcomes											
			1- Moderate Correlation 2- High correlation											
			P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	PO 12
DIRECT METHOD														
CO1	This course is intended to provide students an introduction to quantities methods and tools that are used in the study of economics at the undergraduate level.	Remem ber	1	2	2		2	1	2	1	1	2	2	1
CO2	The aim of this course is to develop skill in statistical and mathematical techniques that are required for a meaningful study of applied economics and for carrying out empirical their further study in most branches of economics.	Apply	1	2			2	1		1		2	1	1
CO3	Develop proficiency in mathematical techniques such as solving equations, understanding functions, and optimizing functions for economic analysis.	Apply & Analyze	1	2			2	1	2	1				1
CO4	Learn and apply key statistical concepts, including probability distributions, descriptive statistics, hypothesis testing, and regression analysis.	Create	1			1	2		2	1		1	2	1
CO5	Understand and apply basic quantitative methods used in economics, including algebra, calculus, and basic statistical techniques.	Innovat e	1		2		2	1		1	1	2		1
INDIRECT METHOD														
Class Room contests		Analyze & Create	1					1	2					2

Course Faculty

QAC Member

Mod

Dr. PRAMOD K.M.
Asst. Professor & Head
Dept. of Economics
Ambedkar College of Arts & Science
Wandloor

COURSE PRE-ANALYSIS

Dear Students,

Welcome back to class, I would like to thank all of you for sparing your time in filling up this Course Pre-Analysis survey for the effective conduct of B A Economics. As you know that this survey is meant for knowing the knowledge level of the students with respect to this course, please fill it very carefully. At this juncture, I am glad to welcome the suggestions from you all (if any).

Rate your prior knowledge about the topics mentioned below

Course Outcomes	Description	Rate your prior knowledge about the topics			
		Excellent (4)	Good (3)	Moderate (2)	Fair (1)
CO1	This course is intended to provide students an introduction to quantities methods and tools that are used in the study of economics at the undergraduate level.	4			
CO2	The aim of this course is to develop skill in statistical and mathematical techniques that are required for a meaningful study of applied economics and for carrying out empirical their further study in most branches of economics.	4			
CO3	Develop proficiency in mathematical techniques such as solving equations, understanding functions, and optimizing functions for economic analysis.		3	2	
CO4	Learn and apply key statistical concepts, including probability distributions, descriptive statistics, hypothesis testing, and regression analysis.			2	
CO5	Understand and apply basic quantitative methods used in economics, including algebra, calculus, and basic statistical techniques.				1

Name of the student:

Prin

Signature of the student:

[Signature]

ECOS 310 MATHEMATICAL ECONOMICS

Module I: Introduction to Mathematical Economics Mathematical Economics

Meaning and Importance- Mathematical Representation of Economic Models- Economic functions Demand function, Supply function, Utility function, Consumption function, Production function, Cost function, Revenue function, Profit function, saving function, Investment function

Module II: Marginal Concepts

Marginal utility, Marginal propensity to Consume, Marginal propensity to Save, Marginal product, Marginal Cost, Marginal Revenue, Marginal Rate of Substitution, Marginal Rate of Technical Substitution. Relationship between Average Revenue and Marginal Revenue- Relationship between Average Cost and Marginal Cost - Elasticity Price elasticity, Income elasticity, Cross elasticity

Module III: Optimization

Optimization of single / multi variable functions - Constrained optimisation with Lagrange Multiplier - significance of Lagrange Multiplier Economic applications Utility Maximisation, Cost Minimization, Profit Maximization.

Module IV: Production Function, Linear Programming and Input Output analysis

Production function- homogeneous and non-homogeneous. Degree of homogeneity and returns to scale - Properties of Cobb-Douglas production function Production possibility curve Linear programming - Basic concept, Nature of feasible, basic and optimal solution, Graphic solution. Input-output analysis -Matrix of technical coefficients - the Leontief matrix - computation of total demand for a two/ three sector economy

Module V: Market Equilibrium Market Equilibrium

Perfect Competition- Monopoly- Discriminating Monopoly

Note to faculty / question paper setter: 1. This course is for B.A. Economics course. The students of this course may not have studied mathematics at higher secondary level. Hence questions may be confined to intermediary level. 2. Kindly give due consideration and adhere to the weightages indicated in the syllabus while setting question paper also.

References

1. Dowling E. T, Introduction to Mathematical Economics, 2nd Edition, Schaum's Outline Series, McGraw-Hill, New York, 2003(ETD)

2. Chiang A.C. and K. Wainwright, Fundamental Methods of Mathematical Economics, Tata McGraw-Hill Education, Fourth edition(2013)

3. Henderson, J. M. and R.E. Quandt (1980), Microeconomic Theory: A Mathematical Approach, McGraw Hill, New Delhi.

4. James Bradfield , Jeffrey Baldam, An Introduction to Mathematical Economics, Cengage Learning India Pvt Ltd (2008)

5 A. Koutsoyannis, Modern Microeconomics, Palgrave Macmillan, 2nd Revised edition (2003) - see mathematical appendices for each topic


Dr. PRAMOD, K.M.
Asst. Professor & Head
Dept. of Economics
Arbuda College of Arts & Science
Wardoor


Dr. PRAMOD, K.M.
Asst. Professor
In Charge of Practical
Economics

Course outcome –Program Specific outcome Mapping Table

Course outcomes	Program Specific outcomes		
	PSO1	PSO2	PSO3
CO1	2	1	1
CO2	1	2	2
CO3	2	1	1
CO4	2	2	1
CO5	1	2	2


Course Faculty


QAC Member


Dr. PRAMOD, K.M.
Asst. Professor & Head
Dept. of Economics
Arbuda College of Arts & Science
Wardoor

DIRECT ASSESSMENT OF COURSE OUTCOMES

INTERNAL ASSESSMENT TEST 50 MARKS

(made up for 100 marks then reduced to 20 marks at the end semester)

Objective	To Identify What Students Have Learned and also to identify students strength and weakness			
To file	Answer scripts	Frequency	3 times in a semester on dates specified by University	
Format	Part -A 5 x 2 =10 marks, Part -B 2 x 13 = 26 marks, Part -C 1 x 14 = 14 marks, Total marks = 50, Converted into 100 marks with 1hour and 30 minutes duration of testing, with an improvement test on the following week with different question paper and the students are allowed to improve further by submission of assignment out of questions from QP 1 & 2 for 10 marks			
Evaluation	Based on answer given in the scripts			
Marks out of 100	50-64	65- 80	81-100	0-50
Levels of attainment	1	2	3	Counseling / Coaching classes

IMPROVEMENT TEST

Objective	To make all weaker students to enrich the subject knowledge			
Product	Answer Scripts			
Frequency	After every internal assessment			
Format	Part -A 5 x 2 =10 marks, Part -B 5 x 2 = 20 marks, Part -C 1 x 10 = 10 marks, Total marks = 40, Duration : 1hour			
Evaluation	Based on answer given in the scripts			
Marks out of 100	50-64	65- 80	81-100	0-50
Levels of attainment	1	2	3	Counseling / Coaching classes

ASSIGNMENT: 10 MARKS

Objective	To enhance students understanding of a complex structural problems			
Product	Hand written assignment sheets			
Frequency	Monthly or after completing improvement test			
Format	Questions from both question papers			
Evaluation	Based on rubrics			
Criteria	No. of assignments: 3 to 5, Submit on or before the date of submission			

END SEMESTER EXAMINATION 80 MARKS

Objective	To assess the each student's knowledge of the course			
Product	Result analysis			
Frequency	Semester			
Format	Part -A 10 x 2 = 20 marks, Part -B 5 x 12 = 60 marks, Total marks = 80 Duration : 2 30 hours			
Evaluation	Based on answer given in the scripts			
Marks out of 100	30-50	50- 70	71-100	0-50
Levels of attainment	1	2	3	Counseling / Coaching classes