CSSR & SRRM DEGREE & PG COLLEGE
(Autonomous)

Kamalapuram - 516289, Kadapa, A.P.

Minutes of the Meeting- II
Board of Studies
AY: 2024-25
Department of Mathematics

Dated: 19/12/2024

CONTENT

AGENDA

1. To approve the Applied Mathematics as a minor paper for I B.Sc. Honours (Computer Science) from II semester.
2. To approve for the Mathematical Methods for Economics paper to be taught by mathematics department.
3. To approve the course structure, Continuous Internal Assessment **(CIA)**, Semester End Examination **(SEE)** Patterns
4. To approve course outcomes, revised syllabus, Blue Print, Model Question Paper, for
   (i) **Applied Mathematics**- Differential Equations (**Minor Paper**) for I Year, Semester -II, B.Sc. Honours (Computer Science) in the academic year 2024-25

   and

   (ii) Mathematical Methods for Economics (Major Paper-II) for I Year, Semester -II B.A. Honours (Economics)for the academic year 2024-2025.
5. To approve other academic activities of the department.
6. Any discussions with approval of the chair.

RESOLUTION

In BoS meeting, all the panel members have discussed and unanimously approved the following agendas:

1. The members of BoS Unanimously approved to take Applied Mathematics as a Minor Paper for B.Sc. Honours (Computer Science) and made minor modifications as mentioned below. Also, the panel approved to teach the Mathematical Methods for Economics as Course-II in semester-II for I BA Honours (Economics) by the department.

2. The Members also approved the pattern of course structure, Continuous Internal Assessment, and Semester End Pattern, course outcomes, revised syllabus, Blue Print, Model Question Paper.

3. The panel members have appreciated for organising STTP and encouraged to conduct more academic activities like conferences, seminars etc.

The Modified syllabus by the panel members in the BoS Meeting are:

Sl. No.	Semester, Group& Title of the Paper	Modifications	Remarks
1	B.Sc. Computer Science-Semester -II, Minor Paper-Applied Mathematics-Differential Equations:	**UNIT I:** Added the new topics: Define differential Equation and Types: Ordinary differential Equation, Partial Differential Equation, Order and Degree of Differential Equation,	To learn Differential Equations, it is mandate to learn basics of differential equations

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Applied Mathematics: Course Structure

Year	Semester& Group	Course Code	Title of Paper	No. Hours/ week	Credits	CIA	SEE	Total
I	II B.Sc. Honours (Computer Science)	MAT201	**Applied Mathematics** (Minor): Differential Equations	5	4	30	70	100
	II BA Honours (Economics)	ECO203	Mathematical Methods for Economics	4	4	30	70	100

Continuous Internal Assessment:

In each semester, for every subject there are two Internal Examination with 30 marks each and time duration of 1 Hour. The Thirty marks are divided as:

Sl. No.	Name of the Activity	Marks Allotted
1	**Internal Examination**	**20**
2	**Co Circular Activities:** Seminar/Assignment/JAM/Group Discussion/Poster Presentation	**5**
3	**Extra Circular Activities:** NSS/NCC/Sports/Clean & Green Activities/Community Services	**5**

Semester End Examinations:

The semester end examination is for 70 marks with the time duration of 3 Hours.

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I B.Sc. Honours (Computer Science)

Semester-II

Minor- Applied Mathematics

Title: Differential Equations

COURSE OUTCOMES

After successful completion of this course, the student will be able to understand and gain the knowledge on

CO1: Solve Linear Differential equations

CO2: Convert non exact homogeneous equations to exact differential equations by using integrating factors.

CO3: Know the methods of finding solutions of differential equations of the first order but not of the first degree.

CO4: Solve higher-order linear differential equations, both homogeneous and non-homogeneous, with constant coefficients.

CO5: Understand the concept and apply appropriate methods for solving differential equations.

Syllabus

Unit-I: Differential Equations of first order and first Degree

Define Differential Equation and Types: Ordinary differential Equation, Partial Differential Equation, Order and Degree of Differential Equation, Linear Differential Equations, Bernoulli's Equations, Exact Differential Equations, integrating factors, Equations reducible to Exact Equations by Integrating Factors -
(a) Inspection Method, (b) $\frac{1}{Mx+Ny}$(c) $\frac{1}{Mx-Ny}$

Unit– II: Differential Equations of first order but not of first degree

Equations solvable for p, Equations solvable for y, Equations solvable for x – Clairaut's equation - Orthogonal Trajectories: Cartesian and Polar forms.

Unit-III: Higher order linear differential equations-I

Solutions of homogeneous linear differential equations of order n with constant coefficients,

Solutions of non-homogeneous linear differential equations with constant coefficients by means of polynomial operators

(i) Q(x)=e^{ax} (ii) $Q(x)$=$Sinax$ (or) $Cosax$

Unit-IV: Higher order linear differential equations-II

Solution to a non-homogeneous linear differential equation with constant coefficients

P.I. of f(D)y=Q when Q=bx^k

P.I. of f(D)y=Q when Q=$e^{ax}V$**,** where V is a function of x

P.I. of f(D)y=Q when Q=xV**,** where V is a function of x

Unit—V: Higher order linear differential equations with non-constant coefficients

Linear differential Equations with non-constant coefficients, Cauchy- Euler Equation Legendre Equation; Method of variation of parameters

Activities
Seminar/Quiz/Assignments/Problem Solving Sessions.

Prescribed Text Books
Differential Equations, Published by S Chand, Publications, New Delhi.

Reference Books

1. Ordinary and Partial Differential Equations by Dr M. D. Raisinghania, published by S. Chand & Company, New Delhi.
2. Differential Equations, by A.R. Vasishtha, R.K. Gupta, published by Krishna Educational Publishers, Meerut.

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I B.Sc. Honours (Computer Science)

Semester-II

Minor- Applied Mathematics

Title: Differential Equations

BLUE PRINT

Duration: 3 Hrs **Total Marks: 70**

SECTION-A

Answer any **Five questions.** Each question carries **4 Marks.** **5×4 = 20 M**

Topics	Questions Given	Allotted Marks
UNIT-1	**1**	4
	2	
UNIT-2	**3**	4
	4	
UNIT-3	**5**	4
	6	
UNIT-4	**7**	4
	8	
UNIT-5	**9**	4
	10	

SECTION-B

Answer **ALL the** Questions choosing one from each unit. Each question carries **10 MARKS. 5×10 = 50 M**

Topics	Questions Given	No. of Questions to be Answered	Allotted Marks
UNIT-1	**11**	**1**	**10**
	12		
UNIT-2	**13**	**1**	**10**
	14		
UNIT-3	**15**	**1**	**10**
	16		
UNIT-4	**17**	**1**	**10**
	18		
UNIT-5	**19**	**1**	**10**
	20		

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I B.Sc. Honours (Computer Science)
Semester-II
Minor- Applied Mathematics
Title: Differential Equations

MODEL QUESTION PAPER

Time: 3 Hours **Max. Marks: 70**

Section – A

Answer any FIVE questions **(5 x 4 = 20 Marks)**

1. Find Order & Degree of Differential Equation $2xy\,dy - (x^2 + y^2 + 1)dx = 0$.
2. Solve $(1 + y^2)dx = (tan^{-1}y - x)dy$
3. Solve $x = y + p^2$
4. Solve$4y^2p^2 + 2xy(3x + 1)p + 3x^3 = 0$
5. Solve$(D^2 - 3D + 2)y = Coshx.$
6. Solve$(D^3 + 4D)y = Sin2x$
7. Solve$(D^2 - 4D + 4)y = x^3$
8. Solve $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 13y = 8e^{3x}sin2x$
9. Solve $[(1 + x)^2D^2 + (1 + x)D + 1]y = 4\cos\log(1 + x)$
10. Solve $\frac{d^2y}{dx^2} + y = cosec\ x$ by the method of variation of parameters.

Section – B

Answer **ALL the** Questions. **5×10 = 50 M**

11. Solve$x(1 + xy)dy + y(1 - xy)dx = 0.$

(OR)

12. Solve$x\frac{dy}{dx} + y = y^2\log x$
13. Solve $(py + x)(px - y) = 2p$

(OR)

14. Find the orthogonal trajectories of family of curves $r = a(1 - \cos\theta)$where 'a' is parameters
15. Solve $(D^2 - 2D + 4)y = 8(x^2 + e^{2x} + \sin 2x)$

(OR)

16. Solve$(D^2 - 3D + 2)y = 2x^2$
17. Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = xe^x\sin x$

(OR)

18. Solve $(D^2 + 4)y = x\sin x\,dx$
19. Solve $(x^2D^2 - xD + 2)y = x\log x$

(OR)

20. Solve$\frac{d^2y}{dx^2} + 4y = 4\tan 2x$ by the method of variation of parameters.

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I B.A. Honours (Economics)

Semester-II

Title: Mathematical Methods for Economics

Course Objective: This course is to provide understanding about the basic mathematical methods to be applied in economics for understanding various economic issues.

Course Learning Outcomes:

After studying this course, the student shall be able to achieve the following outcomes:

CO1: Explain the role of mathematics in economics and learn simple growth rates and application of sets

CO2: Learn the importance of relations and functions, types and their applications

CO3: Learn the importance of matrix algebra, types, operations and its applications

CO4: Learn the rules of basic differentiation and their applications

CO5: Learn and use Optimization problems in economics.

Syllabus

Unit 1: Introduction and Sets

- Importance of Mathematics in Economic Analysis
- Calculation of Percentages and Simple Growth rates
- Concept and Importance of Set theory in Economics; Types and operations in Set Theory

Unit 2: Functions

- Meaning and Importance of Functions in Economics
- Types of Functions: Liner, Quadratic, Cubic, Rectangular Hyperbola, Logarithmic and Exponential Functions with Economic examples
- Graphical representation of Functions

Unit 3: Matrix Algebra

- Concept and Importance of Matrix in Economics; Types of Matrices
- Matrix Operations: Additions and Multiplications
- Determinant and Inverse of a 2×2 Matrix
- Solution to a two Linear Equation System with Economic Examples through Cramer's Rule.

Unit 4: Differentiations

- Concept and Importance of Differentiation in Economics
- Rules of Differentiation: Constant, Power, Sum, Product, Logarithmic, Exponential
- First and Second Derivatives and their Interpretations
- Economic Applications of Differentiations in deriving marginal concepts (MP, MR, MC) and Point Price Elasticity

Unit 5: Optimization

- Concept and Importance of Optimization in Economics
- Conditions for Maxima and Minima of a Function
- Simple Economic Applications of Optimization in Maximization of Output, Revenue, Profit and Minimization Cost

References:

1. Alien, R.G.D. (1974), *Mathematical Analysis for Economists*, Macmillan Press and ELBS, London.
2. Chiang, A.C. (1986), *Fundamental Methods of Mathematical Economics*, Mc Graw Hill, New York.
3. Yamane, Taro (1975), *Mathematics for Economists*, Prentice Hall of India NewDelhi.
4. Heijdra, B.J. and V.P. Fredericck (2001), *Foundations of Modern Macroeconomics*, Oxford University Press, New Delhi.
5. Knut *Sydsaeter* and Peter *Hammond* (2008), *Mathematics for Economic Analysis*. Pearson education.
6. Open-Source Online Materials & Videos: IGNOU, e-PG Pathasala, SWAYM, Khan Academy etc.

Suggested Activities:

Unit-1: Assignments on solving sets functions

Unit-2: Exercises on solving differential equation and their application in economics

Unit-3: BoardPresentationbystudentsinsolvingtheoptimizationproblemsrelatedtoeconomics.

Unit-4: Task Based Learning (TBL) for solving and application of the linear program models with economic examples

Unit-5: Group Projects on solving matrix problems, submit report and make presentation.

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I B.A. Honours (Economics)
Semester-II
Title: Mathematical Methods for Economics

BLUE PRINT

Duration: 3 Hrs **Total Marks: 70**

SECTION-A

Answer any **Five questions.** **5×4 = 20 M**

Topics	Questions Given	Allotted Marks
UNIT-1	**1**	4
	2	
UNIT-2	**3**	4
	4	
UNIT-3	**5**	4
	6	
UNIT-4	**7**	4
	8	
UNIT-5	**9**	4
	10	

SECTION-B

Answer **ALL the** Questions. **5×10 = 50 M**

Topics	Questions Given	No. of Questions to be Answered	Allotted Marks
UNIT-1	**11**	**1**	**10**
	12		
UNIT-2	**13**	**1**	**10**
	14		
UNIT-3	**15**	**1**	**10**
	16		
UNIT-4	**17**	**1**	**10**
	18		
UNIT-5	**19**	**1**	**10**
	20		

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I B.A. Honours (Economics)
Semester-II
Title: Mathematical Methods for Economics

MODEL QUESTION PAPER

Time: 3 hours **Max. Marks: 70**

SECTION – A

Answer any FIVE of following questions, each question carries 5 marks **5x4=20 Marks**

1.(a) List of the proper subsets of A= {s, i, v}

(b) If A={1,2,3} and B= {1,2,3,4,5} then find A*B and B*A

2. If A={a, b, c, d} and B={ 1,2,3,4,5} and F=((a,2)(b,5)(c,4)(d,1)) then find Range of F?

3.Prove that the function f(x) =5x+3 is continuous at x=2

4. If y= sin(2x+3) then find $\frac{dy}{dx}$

5.Find the minimum value of $x^2+y^2+z^2$ given x+y+z=3a.

6.If $f(x) =3x^2-9x^2-27x+15$.Find extreme values

7.Definition of Linear Programming.

8.If Marginal revenue if $MR =9-4x^2$, find the demand function

9.If A=$\begin{bmatrix} 3 & 4 \\ 5 & 2 \end{bmatrix}$ and B= $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then find A-B

10.If A=$\begin{bmatrix} 3 & 2 \\ 1 & -4 \end{bmatrix}$ and B= $\begin{bmatrix} 4 & -1 \\ 2 & 1 \end{bmatrix}$ then find AB

Section – B

Answer ALL the questions. Each question carries 10 marks **(5 x 10 = 50 marks)**

11. Explain the role of the mathematical methods in Economics.

Or

12. If A= {2,3,4} B= {1,3,5,7} C={2,5,9} Then

(a) $A \cup B = B \cup A$

(b) $A \cup (B \cup C) = (A \cup B) \cup C$

(c) $A \subset (A \cup B)$ state these are True or False

13.Explain the properties of Limits.

Or

14.If $u=\log (x^2+y^2)$ then prove that $\frac{\partial^2 u}{\partial y \partial x} = \frac{\partial^2 u}{\partial x \partial y}$

15.Explain the Optimization with suitable examples

Or

16. Find the points of maxima and minima of a function: $y = 2x^3 - 3x^2 + 6$.

17.Define Integration and explain the simple rules of Integration.

Or

18.Find Basic feasible solution of $x_1+2x_2+x_3=4, 2x_1+x_2+5x_3=5$.

19.Define the Matrix and Explain types of Matrices.

Or

20.Find the Inverse of the matrix $A=\begin{matrix} 11 & 5 & 6 \\ -2 & 5 & -1 \\ 3 & -4 & 6 \end{matrix}$

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Participation Link:
CSSR & SRRM Degree & PG College, (A) is inviting you to a scheduled Zoom meeting.

Topic: Mathematics BoS Meeting Minutes - II, 2024-25
Time: Dec 19, 2024 02:15 PM Pacific Time (US and Canada)
Join Zoom Meeting
https://us06web.zoom.us/j/89739692521?pwd=9VGaSJojwTvsPpRNMS8hA6eP60BIz3.1

Meeting ID: 897 3969 2521
Passcode: 112896