



**Mother Teresa Women's University, Kodaikanal**  
**Department of Mathematics**  
**Choice Based Credit System (CBCS) (2021-2022 onwards)**  
**B.Sc. Mathematics**

**1. Programme Outcomes:**

<b>PO.No.</b>	<b>Upon completion of this course the students will be able to</b>
<b>PO 1</b>	Think critically, evaluate analytically and apply the acquired knowledge of their discipline in related scenario.
<b>PO 2</b>	Formulate hypothesis, design experiments, use appropriate tools and interpret the results.
<b>PO 3</b>	Demonstrate the precise understanding of the principles and theories of their discipline through experiments.
<b>PO 4</b>	Enhance the communicative skills and gain confidence to disseminate knowledge through oral/verbal communications effectively at various situations.
<b>PO 5</b>	Identify the different roles in an organizational structure of the work place and carry out multiple roles in social responsibilities.

**2. Programme Specific Outcomes:**

<b>PSO No</b>	<b>upon completion of this course the students will be able to</b>	<b>PO MAPPED</b>
<b>PSO-1</b>	Perceive the relevance of the subject in various fields such as science, technology, business and industries.	PO-3
<b>PSO-2</b>	Interpret the graphical and numerical data and apply the analytical, theoretical and computational skills to solve problems.	PO-1 PO-2 PO-3
<b>PSO-3</b>	Acquaint with the knowledge on the effects of changing conditions in real life systems to construct mathematical models and excel in various decision making tasks	PO-2 PO-3
<b>PSO-4</b>	Understand mathematical ideas and foundations of mathematics to develop proficiency in Mathematics	PO-4
<b>PSO-5</b>	Engage in activities directly benefiting the broader community and acquire job oriented knowledge	PO-3 PO-5

## B.SC. MATHEMATICS CURRICULUM

S. No.	Course Code	Title of Course	Credits	Hours		Maximum Marks		
				T	P	CIA	ESE	Total
Semester I								
1.	U21LTA11	Part-I Tamil I	3	6	-	25	75	100
2.	U21LEN11	Part-II English I	3	6	-	25	75	100
3.	U21MTT11	Core – I Calculus	4	5	-	25	75	100
4.	U21MTT12	Core – II Classical Algebra	4	6	-	25	75	100
5.	U21PHA11	Allied I Ancillary Physics	4	5	-	25	75	100
6.	U21EVS11	Environmental Studies	2	2	-	25	75	100
7.	U21PEPS11	Professional English –I	4	6	-	25	75	100
Total			24	36				700
Semester II								
8.	U21LTA22	Part-I Tamil II	3	6	-	25	75	100
9.	U21LEN22	Part- II English II	3	6	-	25	75	100
10.	U21MTT21	Core-III Analytical Geometry 3D	4	5	-	25	75	100
11.	U21MTT22	Core- IV Differential Equations & Laplace Transforms	4	5	-	25	75	100
12.	U21PHA22	Allied –II Physics Practical	4	-	5	25	75	100
13.	U21VAE21	Value Education	3	3	-	25	75	100
14.	U21PEPS22	Professional English – II	4	6	-	25	75	100
Total			25	36				700
Semester III								
15.	U21LTA33	Part I Tamil-III	3	6	-	25	75	100
16.	U21LEN33	Part II English- III	3	6	-	25	75	100
17.	U21MTT31	Core - V Vector Calculus, Fourier Series & Fourier Transforms	4	5	-	25	75	100
18.	U21MTA33	Allied III Ancillary Mathematical Statistics –I	4	5	-	25	75	100
19.	U21MTE311 / U21MTE312 / U21MTE313	Elective I Numerical Methods/ Stochastic Process/ Principles of Experimental Design	3	4	-	25	75	100
20.	U21MSS31	SBE I-Managerial skills	2	2	-	25	75	100

21.	U21MTN31	Non Major Elective –I	2	2	-	25	75	100
22.	U21PEPS33	Professional English III	4	6	-	25	75	100
<b>Total</b>			<b>25</b>	<b>36</b>				<b>800</b>
<b>Semester IV</b>								
23.	U21LTA44	Part I Tamil IV	3	6	-	25	75	100
24.	U21LEN44	Part II English IV	3	6	-	25	75	100
25.	U21MTT41	Core-VI Statics	4	4	-	25	75	100
26.	U21MTT42	Core-VII Sequence & Series	4	4	-	25	75	100
27.	U21MTA44	Allied- IV Ancillary Mathematical Statistics – II	4	4	-	25	75	100
28.	U21MTE421/ U21MTE422/ U21MTE423	Elective- II Programming in C & C++/ Automata Theory/ Knowledge for Industry	3	3	-	25	75	100
29.	U21CSS42	SBE II-Computer Skills for Office Management	2	2	-	25	75	100
30.	U21MTN42	Non Major Elective –II	2	2	-	25	75	100
31.	U21PEPS44	Professional English IV	4	6	-	25	75	100
<b>Total</b>			<b>29</b>	<b>37</b>				<b>800</b>
<b>Semester V</b>								
32.	U21MTT51	Core-VIII Dynamics	4	5	-	25	75	100
33.	U21MTT52	Core-IX Abstract Algebra	4	5	-	25	75	100
34.	U21MTT53	Core-X Real Analysis	4	5	-	25	75	100
35.	U21MTT54	Core- XI Operations Research –I	4	5	-	25	75	100
36.	U21MTT55	Core- XII Theory Of Numbers	4	5	-	25	75	100
37.	U21MTE531/ U21MTE532/ U21MTE533	Elective III Fuzzy Sets and Fuzzy Numbers / Mathematical Modeling / Data Structures and Algorithms	3	3	-	25	75	100
38.	U21MTS53	SBE:III Mathematical Aptitude	2	2	-	25	75	100
<b>Total</b>			<b>25</b>	<b>30</b>				<b>800</b>
<b>Semester VI</b>								
39.	U21MTT61	Core- XIII -Linear Algebra	4	5	-	25	75	100
40.	U21MTT62	Core- XIV Complex Analysis	4	5	-	25	75	100
41.	U21MTT63	Core- XV Operation Research – II	4	5	-	25	75	100
42.	U21MTT64	Core- XVI Graph Theory	4	5	-	25	75	100
43.	U21MTT65	Core -XVII Discrete Mathematics	4	5		25	75	100

44.	U21MTE641/ U21MTE642	Elective-IV Astronomy / Mathematical Cryptography	3	3	-	25	75	100
45.	U21MTS64	SBE- IV- Operations Research Lab	2	2	-	25	75	100
46.	U21EAS61	Extension Activities(NSS/NCC/RRC/ YRC/ PYE)	3	-	-	25	75	100
<b>Total</b>			<b>28</b>	<b>30</b>		<b>200</b>	<b>600</b>	<b>800</b>
<b>Total Credits</b>			<b>156</b>	<b>205</b>		<b>Total Marks</b>	<b>4600</b>	

### Non Major Elective

The candidates, who have joined the UG Programme, can also undergo Non Major Elective offered by other Departments

#### Non Major Elective- For Other Department

##### Semester –III

NME	Course code	Course Name
I	U21MTN31	Resource Management Techniques

##### Semester –IV

NME	Course code	Course Name
II	U21MTN42	Numerical Methods

### Additional Credit Courses (Two Credit courses)

U21MA031: Online Course – III Semester-2 Credits

U21MAI41: Internship – IV Semester-2 Credits

### Value added course – V Semester: 2 Credits

<u>S.No</u>	Course code	Course Name
1	U21MAV51	Numerical Methods Lab Using C++

### B.Sc. Physics / Chemistry: Ancillary Mathematics I & II

Course code: U21MAA11      Semester I      Ancillary Mathematics I

Course code: U21MAA22      Semester - II      Ancillary Mathematics II

## Semester – I

**COURSE CODE: U21MTT11**

**CALCULUS**

### Course Outcome:

CO	On the successful course completion, students will be able to:	Cognitive Level
CO1	Identify areas in Mathematics and study of functions expansion	K1
CO2	Understand the concepts of Radius of Curvature, Cartesian Form, p - r equations	K2
CO3	Apply the concept of change of variables in double and triple integrals.	K3
CO4	Apply double, triple integral to find the area and volume respectively.	K3
CO5	Apply the Beta and gamma function to solve the multiple integrals.	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	M	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE : U21MTT12**

**CLASSICAL ALGEBRA**

**Course Outcome:**

CO	On the successful course completion, students will be able to:	Cognitive Level
CO1	Knowledge in Binomial, Exponential, Logarithmic series and summation of series	K1
CO2	Knowledge in methods to find an approximate roots of the equations	K2
CO3	Apply the all tests to find the convergence or divergence of an infinite series.	K3
CO4	Find the number of positive and negative roots of polynomial equation	K3
CO5	Analyze the relation between roots and coefficients of the polynomial equations	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	S	S	S	S	M	S
CO2	S	M	M	S	S	S	S	S	M	M
CO3	S	M	S	S	S	S	S	S	S	S
CO4	S	M	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21PHA11**

**ALLIED - I - ANCILLARY PHYSICS**

**Course Outcomes (CO):**

CO	Learning outcome	Remarks
CO1	Analyze center of gravity	K4
CO2	Learn about modulus, viscosity and surface tension of materials	K2
CO3	Study the characteristics of diode and transistor	K1
CO4	Understand about aberration and different properties of lenses	K2
CO5	Gain knowledge about atomic model and basic nuclear properties	K2

K1- Remember K2- Understand K3- Apply K4- Analyze K5-Evaluate

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	M	S	S	S
CO3	S	M	S	M	M	S	S	S	S	S
CO4	S	M	S	S	S	M	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

\*S-Strong; M-Medium; L-Low

**Semester – II****COURSE CODE: U21MTT21****ANALYTICAL GEOMETRY 3D****Course Outcome:**

CO	On the successful course completion, students will be able to:	Cognitive Level
CO1	Familiarize the concept of direction cosines and projections	K1
CO2	Identify different forms of equations of plane.	K1
CO3	Analyze the symmetric form of equations of a line and the angle between a line and a plane.	K3
CO4	Acquire the knowledge of coplanar lines, skew lines and its properties.	K3,K4
CO5	Apply concept of a sphere and circle to determine their equations.	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	M	S	S	S
CO3	S	M	S	M	M	S	S	S	S	S
CO4	S	M	S	S	S	M	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

\*S-Strong; M-Medium; L-Low



**COURSE CODE : U21MTT22**

**DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS**

**Course Outcome:**

<b>CO</b>	<b>On the successful course completion, students will be able to:</b>	<b>Cognitive Level</b>
CO1	Solve linear equations with variable coefficients.	K2
CO2	Understand the fundamental properties of the Laplace transforms	K1&K2
CO3	Apply the Laplace inverse transforms to solve simultaneous equations	K3
CO4	Solve partial differential equations using Lagrange's method and Charpit's method	K3&K4
CO5	Create real life problems into ordinary differential equations.	K4 &K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO4	PO3	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	M	S	M	M	S	S
CO2	S	M	S	S	S	S	M	M	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	M	S	S	S	S	M	S	S	S
CO5	S	S	S	S	S	S	S	S	S	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21PHA22**

**ALLIED II- PHYSICS PRACTICAL**

**Course Outcomes (CO):**

CO	Learning outcome	Remarks
CO1	Able to Estimate Errors	K3
CO2	Analyze dimensional change of bar	K4
CO3	Determine viscosity of liquid	K4
CO4	Study the characteristics of diode and ICs	K3
CO5	Determine surface tension of liquids	K4

K1- Remember      K2- Understand      K3- Apply      K4- Analyze      K5-Evaluate

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	M	S	S	S
CO3	S	M	S	M	M	S	S	S	S	S
CO4	S	M	S	S	S	M	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

\*S-Strong; M-Medium; L-Low

### Semester - III

**COURSE CODE : U21MTT31**

### **VECTOR CALCULUS, FOURIER SERIES AND FOURIER TRANSFORM**

#### **Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Demonstrate the operator of vector	K1
CO2	Apply double and triple integration	K2
CO3	Demonstrate the Fourier Transforms	K3
CO4	Analysis half range series	K3
CO5	Integral equations of Fourier Transforms	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	S	S	M	M	S	S
CO2	S	S	S	S	M	S	S	M	M	S
CO3	M	S	S	S	M	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	M	M	S	S	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE : U21MTA33 ANCILLARY MATHEMATICAL STATISTICS-I****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Calculate mean, median and mode.	K1
CO2	Be familiar with elementary statistical methods of analysis of data and interpret them.	K1,K2
CO3	Understand the concept of correlation and regression.	K3
CO4	Relate Binomial, Poisson and Normal distributions.	K3
CO5	Develop problem solving skill on applying statistical methods to real problems.	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	S	S	M	M
CO2	S	S	S	M	M	M	M	S	M	M
CO3	S	S	S	M	M	M	M	S	S	S
CO4	M	M	S	M	M	M	S	M	M	M
CO5	M	S	S	S	M	M	M	S	S	M

\*S-Strong; M-Medium; L-Low

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the equations using different methods under different conditions and numerical solutions of system algebraic equation	K1
CO2	Apply various interpolation methods and finite difference concepts	K3
CO3	Analyses differentiation and integration whenever and where ever routine methods are not applicable	K4
CO4	Evaluate the ordinary differential equations using different methods through the theory of finite differences.	K5
CO5	Evaluate the partial differential equations using different methods through the theory of finite differences.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	S	M	M	S	M	S
CO2	S	S	S	M	S	S	M	M	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	M	S
CO5	S	M	S	S	M	S	M	S	S	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21MTE312**

**ELECTIVE I- STOCHASTIC PROCESS**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Remember random variables with Probabilistic condition	K1
CO2	Understand Markov chains , Markov process and alternate approach	K2
CO3	Apply the concepts in Birth and Death Distribution Process	K3
CO4	Identify the type of the Differential Equations for A Wiener Process -Kolmogorov Equation	K3
CO5	Prove the sampling distribution theory	K3, K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	S	S	S	M	M	M
CO2	M	S	M	M	M	M	S	S	S	M
CO3	S	S	S	S	S	M	M	M	S	S
CO4	M	S	S	S	S	S	S	S	M	S
CO5	M	S	S	S	S	S	S	S	S	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21MTE313 ELECTIVE I -PRINCIPLES OF EXPERIMENTAL DESIGN****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Acquire skills in statistical analysis.	K1
CO2	Calculate values through designs.	K2
CO3	Apply the concepts through models.	K3
CO4	Comparing results in Latin square design.	K3, K4
CO5	Calculating standard errors.	K3, K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	M	M	M	S	M	M
CO2	M	M	S	M	M	S	M	M	S	M
CO3	M	S	S	S	M	M	M	S	S	S
CO4	M	M	M	M	M	M	M	M	M	S
CO5	M	M	M	M	M	M	M	M	S	M

\*S-Strong; M-Medium; L-Low

## Semester – IV

**COURSE CODE : U21MTT41**

**STATICS**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the action of forces on rigid bodies.	K1
CO2	Analyze the concept of parallel forces and moments.	K2
CO3	Compute equation of central orbit.	K3
CO4	Understand the concept of friction.	K2
CO5	Compute equation of equilibrium of strings.	K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO4	PO3	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	S	S	M	M	S	S
CO2	S	M	S	S	M	M	M	M	M	S
CO3	S	M	S	S	M	M	S	S	S	S
CO4	S	M	S	S	S	S	M	S	S	S
CO5	S	S	S	S	S	M	S	S	S	M

\*S-Strong; M-Medium; L-Low



**COURSE CODE :U21MTT42**

**SEQUENCE AND SERIES**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the fundamental principles of Analysis	K2
CO2	Identify convergence and divergence of series	K2
CO3	Apply various tests to find the limit of a series	K3
CO4	Distinguish between absolute convergence and ordinary convergence of a Series.	K4
CO5	Compute the radius of convergence of the power series.	K4, K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	M	S	S	M
CO2	S	S	S	M	M	M	M	S	S	M
CO3	S	S	M	S	M	M	M	S	M	M
CO4	M	M	M	M	M	S	M	S	S	M
CO5	S	S	M	M	M	M	S	M	M	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21MTA44    ANCILLARY MATHEMATICAL STATISTICS - II****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand Theoretical Continuous Distributions	K2
CO2	Estimate the parameters of population on the basis of given information, Correlation and regression.	K3
CO3	Make decision using t- test and F- test, z - test.	K4
CO4	Analyze the association between two or more groups and populations.	K4
CO5	Evaluate sample distributions	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	M	S	M	M
CO2	M	M	M	M	S	M	M	S	S	M
CO3	M	S	S	S	M	M	M	M	M	M
CO4	S	S	S	M	M	M	S	M	M	M
CO5	S	S	S	M	M	M	S	S	M	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTE421**

**ELECTIVE –II PROGRAMMING IN C & C++**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the concepts and Programming	K2
CO2	Discuss the representation and appropriate use of primitive data types	K1
CO3	Describe the object-oriented programming approach in connection with C++	K2
CO4	Apply the concepts of object-oriented programming	K3
CO5	Evaluate the process of data file manipulations using C++	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	S	S	M	M	M	M	S
CO2	S	S	S	S	S	M	M	S	M	S
CO3	S	M	M	M	S	S	M	S	S	S
CO4	S	S	S	S	S	S	M	S	S	M
CO5	S	S	S	S	S	M	S	S	S	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTE422****ELECTIVE –II AUTOMATA THEORY****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand basic concepts in Lattices , formal language and automata theory	K2
CO2	Demonstrate abstract models of computing, including deterministic (DFA), non-deterministic (NFA), Push Down Automata(PDA)	K3
CO3	Apply theoretical knowledge relate practical problems to languages and automata	K4
CO4	Analyze the logic and methods behind grammars and recognizers for different formal languages	K5
CO5	Formalize the structure of a given formal language using regular expressions and context free grammars and implementation of a lexical analyzer.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	M	M	M	M	S	S
CO2	S	M	S	S	S	S	M	M	M	S
CO3	M	M	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTE423**

**ELECTIVE –II KNOWLEDGE FOR INDUSTRY**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Know the reason for adopting Industry knowledge 4.0 and Artificial Intelligence	K1
CO2	Understand the need for digital transformation	K2
CO3	Apply the industry 4.0 tools	K3
CO4	Analyze the applications of Big Data	K4
CO5	Examine the applications and security of IoT Applications	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	S	S	S	S	M	S	S
CO2	S	M	M	S	S	S	M	M	M	S
CO3	S	S	S	M	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	M	S	M	S	S	S	S	S	S

\*S-Strong; M-Medium; L-Low

**SEMESTER – V****COURSE CODE: U21MTT51****DYNAMICS****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	determine the path and range of a projectile in any direction.	K1
CO2	understand the concept of enveloping parabola.	K2
CO3	knowledge about collision of elastic bodies.	K2
CO4	compute equation of simple harmonic equation.	K3
CO5	understand the motion under the central forces.	K2, K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	M	M	M	S	S	M
CO2	M	M	S	M	M	M	M	M	S	M
CO3	S	S	S	S	M	M	M	S	S	M
CO4	S	S	S	M	M	M	M	S	S	M
CO5	M	M	M	M	M	S	M	M	S	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21MTT52      ABSTRACT ALGEBRA****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Knowledge of elementary concepts in Abstract Algebra	K1
CO2	Use appropriate techniques and reasoning to prove the properties of groups	K2
CO3	Understanding the concept of homomorphism and isomorphism in groups	K1,K2
CO4	Extend the results of groups to rings	K3
CO5	Extend the results of rings to fields	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	M	S	M	M	S	M
CO2	S	S	S	S	M	M	M	S	S	M
CO3	M	M	M	M	S	S	S	M	S	S
CO4	S	S	S	M	M	S	S	M	S	S
CO5	M	M	M	M	M	S	M	M	S	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTT53****REAL ANALYSIS****Course Outcome:**

<b>CO</b>	<b>On the successful course completion, students will be able to:</b>	<b>Cognitive Level</b>
CO1	Understand the fundamental properties of real numbers to the formal development of real analysis	K2
CO2	Extended real number system in the complex field developing the theory of real analysis	K3
CO3	Demonstrate an understanding limit and how they are use being sequences and series.	K3
CO4	Analysis various mathematical proofs of basic results in connectedness.	K4
CO5	Evaluate various mathematical proofs of basic results in continuity.	K4,K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	S	S	S	M	S	S
CO2	M	M	M	M	M	S	S	M	S	S
CO3	S	S	S	M	S	S	M	S	S	M
CO4	S	M	M	S	S	S	M	S	S	S
CO5	M	M	S	M	M	S	S	S	S	M

\*S-Strong; M-Medium; L-Low



**COURSE CODE: U21MTT54**

**OPERATIONS RESEARCH- I**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the application of OR and frame a LP Problem with solution – graphic and through solver add in excel	K1
CO2	Analyze and interpret results of transportation and problem using appropriate method	K2
CO3	Evaluate simple model of L.P.P.	K3
CO4	Solutions of assignment and problem using appropriate method	K3
CO5	Evaluate the dynamics of inventory managements principles, concepts of customer demand, distribution and product transformation process	K4, K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	M	M	M	M	S	S
CO2	S	S	S	M	M	M	M	S	M	M
CO3	M	M	S	M	M	M	S	M	M	M
CO4	S	S	S	S	M	M	M	S	S	M
CO5	M	S	S	S	M	M	M	S	M	M

\*S-Strong; M-Medium; L-Low

**Course Outcome:**

CO	On the successful course completion, students will be able to:	Cognitive Level
CO1	Understand factual knowledge including the mathematical notation and terminology of number theory.	K2
CO2	Construct mathematical proofs of statement and find counter examples to false statements in Number Theory.	K2
CO3	Apply theoretical knowledge to problem of computer security	K3
CO4	Analyze the logic and methods behind the major proofs in number theory	K4
CO5	Determine multiplicative inverses , modulo n and use to solve linear congruences	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	M	M	M	M	S	S
CO2	S	S	S	M	S	S	S	M	S	S
CO3	M	M	M	M	M	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	M	S	S	S	S	M	S	S	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21MTE531**

**ELECTIVE III**

**FUZZY SETS AND FUZZY NUMBERS**

**Course Outcome:**

<b>CO</b>	<b>On the successful course completion, students will be able to</b>	<b>Cognitive Level</b>
CO1	understand concepts between classical sets and fuzzy sets.	K1
CO2	understand the membership functions.	K1
CO3	understand and Apply of basic operations on fuzzy sets.	K1,K3
CO4	analyze the properties and principles of fuzzy sets.	K4
CO5	evaluate arithmetical ability on fuzzy numbers.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	M	S	S	S	S	M
CO2	M	S	M	S	M	S	S	M	M	M
CO3	M	M	M	S	S	M	M	M	M	M
CO4	S	M	S	M	M	M	S	S	M	M
CO5	S	M	M	M	S	M	S	S	M	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTE532**

**ELECTIVE III**

**MATHEMATICAL MODELLING**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand basic definitions from Mathematical Modelling through Ordinary Differential Equations of First order	K2
CO2	Understand Mathematical Modelling through Ordinary Differential Equations of First order problems	K2,K3
CO3	Apply Mathematical Modelling through Ordinary Differential Equations of First order to applications	K2,K3
CO4	Understand simple models through Difference Equations	K2
CO5	Evaluate models through Graphs	K2,K3,K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	M	M	S	M	S	M
CO2	S	M	S	S	M	S	S	M	M	S
CO3	S	M	S	S	M	S	S	M	M	S
CO4	S	S	M	M	M	S	M	S	M	M
CO5	M	S	S	M	M	M	M	M	M	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTE533**

**ELECTIVE III**

**DATA STRUCTURES AND ALGORITHMS**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Identify the data and apply the suitable concepts of data structure in programming.	K2
CO2	Demonstrate linked list and its operations for programming.	K2
CO3	Explain and utilize the concepts of stack and queue for programming.	K2,K3
CO4	Compare the data in the required format using search and sort techniques.	K3
CO5	Ability to analyze and check the algorithms.	K3,K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	M	S	M	S	M
CO2	M	S	S	S	M	S	S	M	M	S
CO3	M	S	S	S	M	S	S	M	M	S
CO4	M	S	S	S	M	S	M	S	M	M
CO5	M	S	S	S	M	M	M	M	M	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTS53**

**SBE III MATHEMATICAL APTITUDE**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the basic concepts of Quantitative Ability	K2
CO2	Understand the basic concepts of Logical Reasoning Skills.	K2
CO3	Acquire satisfactory competency in use of Verbal Reasoning	K2
CO4	Solve campus placements aptitude papers covering Quantitative Ability, Logical Reasoning and Verbal Ability	K3,K4
CO5	Compete in Various competitive exams	K3, K4

K1- Remember; K2- Understand; K3-Apply, K4- Analyse, K5- Evaluate; K6- create  
Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	M	M
CO2	S	M	S	M	M	M	M	S	S	M
CO3	S	S	S	S	S	S	M	S	S	S
CO4	M	M	S	M	S	S	S	M	S	S
CO5	M	S	S	S	S	M	S	S	S	M

\*S-Strong; M-Medium; L-Low

**Semester – VI****COURSE CODE: U21MTT61****LINEAR ALGEBRA****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand Vector Space, Quotient space Direct sum, linear span and linear independence, basis and inner product.	K1,K2
CO2	Apply the linear transformations, rank, nullity.	K3
CO3	Find the characteristic equation, eigen values and eigen vectors of a matrix.	K3
CO4	Prove Cayley- Hamilton theorem, Schwartz inequality, Gram schmidt orthogonalisation process.	K3
CO5	Evaluate the system of simultaneous linear equations.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	M	S	S	S	S	M
CO2	S	S	S	M	M	S	S	S	M	M
CO3	S	S	S	M	M	S	S	S	M	M
CO4	S	S	S	M	S	S	S	M	M	S
CO5	S	S	S	M	S	S	S	M	M	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21MTT62**

**COMPLEX ANALYSIS**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Remember sums, products, quotients, conjugate, modulus, and argument of complex numbers and exponentials and integral powers of complex numbers	K1
CO2	Understand the significance of differentiability for complex functions and be familiar with the Cauchy-Riemann equations.	K2
CO3	Find residues and evaluate complex integrals, real integrals using the residue theorem.	K3
CO4	Apply Cauchy's residue functions and problem.	K3,K4
CO5	Determine whether a given function is analytic.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create  
Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	M	S	M	M	M	M
CO2	S	M	S	S	M	S	S	S	M	S
CO3	S	S	S	S	M	S	S	S	M	S
CO4	S	S	S	S	M	S	S	S	M	S
CO5	S	M	M	S	M	M	S	S	M	M

\*S-Strong; M-Medium; L-Low



**COURSE CODE :U21MTT63**

**OPERATION RESEARCH II**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Remember the nature and feature of Operations Research	K1
CO2	Find the replacement period of equipment that fails suddenly/gradually	K2
CO3	Find EOQ problems with price breaks	K2,K3
CO4	Find inventory decisions costs using deterministic inventory problems with no shortages /with shortages	K3
CO5	Understand and evaluate of CPM and PERT Define basic components of Network and find critical path	K1, K3,K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate;  
K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	S	S	S	M	M	M	M
CO2	S	S	M	S	M	S	S	S	S	S
CO3	S	S	S	S	M	S	S	M	S	M
CO4	S	S	S	S	S	S	S	M	S	M
CO5	S	S	S	S	S	S	S	M	S	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTT64****GRAPH THEORY****Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Remember and understand the theoretical knowledge of graph theory to solve problems.	K1,K2
CO2	Understand theories and concepts to test and validate intuition and independent mathematical thinking in problem solving.	K2
CO3	Apply networks using the main concepts of graph theory.	K3
CO4	Use definitions in graph theory to Analyze examples and to distinguish examples from non-example.	K4
CO5	Evaluate graph theory in a coherent and technically accurate manner.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	M	S	S	M	M	M
CO2	S	S	M	M	M	S	M	S	S	M
CO3	S	M	S	M	M	M	M	M	S	S
CO4	S	M	M	S	M	S	S	M	S	S
CO5	S	S	M	M	M	M	S	M	S	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE U21MTT65**

**DISCRETE MATHEMATICS**

**Course Outcome:**

<b>CO</b>	<b>On the successful course completion, students will be able to</b>	<b>Cognitive Level</b>
CO1	Understanding of some Logic truth tables	K2
CO2	Prove / define basic normal forms	K3
CO3	To analyses the concepts of free and bound variable formulas	K4
CO4	Understanding the concepts of Grammars	K4
CO5	Basic concepts of Languages and basic definitions of Automata	K6

K1- Remember: K2- Understand: K3-Apply, K4- Analyse, K5- Evaluate; K6- create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	S	S	S	M	M
CO2	M	M	S	M	S	M	S	M	M	S
CO3	S	S	S	M	S	S	M	S	M	M
CO4	S	M	M	S	S	M	S	S	M	M
CO5	M	S	S	M	S	M	S	S	M	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE :U21MTE641**

**ELECTIVE -IV**

**ASTRONOMY**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understanding about natural science	K2
CO2	Knowledge about the celestial objects	K3
CO3	To analyses the equation of time and seasons	K4
CO4	Categorize various means in solving Time	K4
CO5	Basic concepts of calendar and conservation Time	K6

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	S	S	S	M	M
CO2	M	M	S	M	S	M	S	M	M	S
CO3	S	S	S	M	S	S	M	S	M	M
CO4	S	M	M	S	S	M	S	S	M	M
CO5	M	S	S	M	S	M	S	S	M	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTE642**

**ELECTIVE –IV**

**MATHEMATICAL CRYPTOGRAPHY**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Appreciate the role of mathematics in cryptography.	K1
CO2	Understand how secure communications happen over insecure channels.	K2
CO3	Appreciate how computational complexities form the basis of public-key cryptography.	K3
CO4	Understand the importance of data secrecy, data integrity, and data authentication and the ways to achieve them.	K2,K3
CO5	Understand key-agreement, public-key encryption and digital signatures.	K2,K4

K1- Remember: K2- Understand: K3-Apply, K4- Analyse, K5- Evaluate; K6- create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	M	S	S	S	S	M	M
CO2	M	M	S	M	S	M	S	M	M	S
CO3	S	S	S	M	M	S	M	S	M	M
CO4	S	M	M	S	S	M	S	S	M	M
CO5	M	S	S	M	S	M	S	M	M	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MTS64    SBE –IV    OPERATIONS RESEARCH LAB**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the basic concepts and application of operations research in various fields	K1
CO2	Know principles of construction of mathematical models of conflicting situations.	K2
CO3	Analyze the relationship between a linear program and its dual	K3
CO4	Techniques constructively to make effective decisions in business and solve problems in industry	K4
CO5	Build and solve all problems by using software.	K4

K1- Remember: K2- Understand : K3-Apply, K4- Analyse, K5- Evaluate; K6- create

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	S	S	S	M	M
CO2	M	M	S	M	S	M	S	M	M	S
CO3	S	S	S	M	S	S	M	S	M	M
CO4	S	M	M	S	S	M	S	S	M	M
CO5	M	S	S	M	S	M	S	S	M	S

\*S-Strong; M-Medium; L-Low

Non Major Elective- For Other Department  
**COURSE CODE : U21MTN31 SEMESTER – III**  
**RESOURCE MANAGEMENT TECHNIQUES**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Formulate the real life problems as Linear programming problem.	K1
CO2	Use to solve Linear programming problems	K2
CO3	Identify degeneracy in transportation problem	K3
CO4	Calculate the optimal solution from the feasible solution using MODI method	K3
CO5	Obtain the optimal solution for Assignment problems, Sequencing problem , Game Theory .	K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	S	S	S	S	S	M
CO2	S	S	S	S	S	M	M	S	M	S
CO3	S	S	S	M	S	S	M	S	S	S
CO4	M	S	S	S	S	M	S	M	S	S
CO5	M	S	S	S	M	S	M	S	S	M

\*S-Strong; M-Medium; L-Low

**COURSE CODE : U21MTN42      SEMESTER – IV**  
**NUMERICAL METHODS**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the fundamentals in finding the roots of the equation using bisection method and iteration method.	K2
CO2	Approximate solutions of algebraic and transcendental equations.	K3
CO3	Analyze and evaluate the accuracy of numerical methods	K4
CO4	Evaluate numerical solution to a system of linear equation by Gauss-Seidal method.	K5
CO5	Evaluate the problems in interpolation.	K5

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	M	S	S	M	S	M
CO2	M	S	M	S	S	M	S	M	M	M
CO3	M	S	M	M	M	M	M	S	M	S
CO4	S	M	S	M	S	M	S	M	S	M
CO5	S	S	M	S	M	S	M	S	M	M

\*S-Strong; M-Medium; L-Low



**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Remember numbers, sequences, series, basic summaries from partial fraction, equations, matrices	K1
CO2	Understand trigonometric values and Interpolations	K2
CO3	Solve problems by using theorems.	K3
CO4	Analyze homogeneous and non-homogeneous linear equations.	K4
CO5	Analyze and Evaluate inverse functions.	K4, K5

K1- Remember; K2- Understand; K3-Apply; K4- Analyse; K5- Evaluate; K6- Create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	M	S	S	S	M	M
CO2	M	M	S	M	S	M	S	M	M	S
CO3	S	S	M	M	S	S	M	S	M	M
CO4	S	M	M	S	M	M	S	S	M	M
CO5	M	S	S	M	S	M	S	M	M	S

\*S-Strong; M-Medium; L-Low

**COURSE CODE: U21MAA22**

**SEMESTER –II**

**B.Sc. Physics / Chemistry**

**- ANCILLARY MATHEMATICS II**

**Course Outcome:**

CO	On the successful course completion, students will be able to	Cognitive Level
CO1	Understand the I and II integrals	K2
CO2	Understand properties of integrals, Laplace transform.	K2
CO3	Understand first order differential equations.	K2
CO4	Analysis Theorems and proves.	K3,K4
CO5	Evaluate the importance of shifting properties.	K3, K4

K1- Remember: K2- Understand: K3-Apply, K4- Analyse, K5- Evaluate; K6- create

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	M	S	S	S	M	M
CO2	M	M	S	M	M	M	S	M	M	S
CO3	S	M	S	M	S	S	M	S	S	M
CO4	S	M	M	S	M	M	S	S	M	M
CO5	M	S	S	M	S	M	S	S	M	S

\*S-Strong; M-Medium; L-Low

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