ABOUT THE DEPARTMENT

The Department of Mathematics was established in the year 1975 with under graduate programme and upgraded as PG Department in the year 1986. The Department consists of 10 teaching staff. The Department has been producing exemplary results and university rank holders right from its inception. The Department is constantly concentrating on the overall development of students. So far forty–three batches of UG students and thirty–three batches of PG students have successfully finished their courses and professionally placed as Auditors, Income tax officers, Assistant commissioner of police, Lawyers, Project leaders, HR in various MNC. Many students have joined in prestigious institutions like M.I.T., I.I.T., C.M.I., M.K.U., Sourashtra College, etc., for their higher studies and have been well placed in various field in India and abroad. The Department library consists of approximately 1500 books which are useful for lending purpose to students and staff. Department is equipped with 2 computers and one printer. The Department has well–furnished classrooms and a separate room with LCD Projector for conducting seminars. The Department motivates the students to take part in all the job oriented competitive examinations like UPSC., SSC., TNPSC., RRB., NET, SLET, Bank exams etc., The Department has separate library (Donors book bank) with more than 200 books related to job oriented competitive examinations donated by the Staff members of the Department and Alumni. The Department is providing RO water to all students which is sponsored by our Alumni.

VISION

Aims to create an erudite, disciplined and well–rounded mathematician by imparting high quality subject knowledge and life values to excel both academically and professionally.

MISSION

- To guide, teach mathematical knowledge and support the students towards mathematical excellence by embracing them into our group of mathematicians, share ideas, grow in knowledge and thus improving their capabilities and apply all learned concepts to excel in all fields.
- To develop quantitative, computational, reasoning, problem solving skills and critical thinking for the upcoming mathematicians to model, formulate and solve real life applications.
- To encourage the students with strong foundational skills and abilities to pursue higher studies and research.

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GRADUATE ATTRIBUTES

1. **(KB) A knowledge base for Mathematics**: Demonstrated competence in university level Mathematics, fundamentals of Mathematic, and specialized Mathematics knowledge appropriate to the program.

2. **(PA) Problem analysis**: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve Mathematical problems in order to reach substantiated conclusions

3. **(Inv.) Investigation**: An ability to conduct investigations of complex problems by methods that include appropriate analysis and interpretation of data and synthesis of information in order to reach valid conclusions.

4. **(Tools) Use of mathematical tools**: An ability to create, select, apply, adapt, and extend appropriate techniques, resources to a range of mathematical activities, from simple to complex, with an understanding of the associated limitations.

5. **(Team) Individual and teamwork**: An ability to work effectively as a member and leader in teams, preferably in a multi–disciplinary setting.

6. **(Comm.) Communication skills**: An ability to communicate mathematical concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and documentation, and to give and effectively respond to clear instructions.

7. **(Prof.) Professionalism**: An understanding of the roles and responsibilities of the professional Mathematician in society, especially the primary role of protection of the public and the public interest.

8. **(Ethics) Ethics and equity**: An ability to apply professional ethics, accountability, and equity.

9. **(LL) Life–long learning**: An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	gain knowledge in foundational areas of mathematics.
PEO 2	communicate mathematics accurately, precisely and effectively.
PEO 3	develop mathematical thinking.
PEO 4	apply mathematical knowledge.
PEO 5	be able to solve mathematical problems using technology.
PEO 6	develop teaching skills, subject knowledge in the course of their study which will help them to shine in various fields including education, IT sector etc.,

UNDERGRADUATE (UG) PROGRAMME OUTCOMES (POs)

Undergraduate (B.A., **B.Sc.,** B.Com., B.C.A., B.B.A., etc.,) is a 3–year degree programme with 6 semesters consisting the following Programme Outcomes (POs) under various criteria including critical thinking, problem solving, effective communication, societal/ citizenship/ ethical credibility, sustainable growth and employable abilities.

PO 1	**Critical Thinking**: Intellectual exploration of knowledge towards actions in clear and rational manner by understanding the logical connections between ideas and decisions.
PO 2	**Problem Solving**: Understanding the task/ problem followed by planning and narrow execution strategy that effectively provides the solution.
PO 3	**Effective Communication**: Knowledge dissemination by oral and verbal mechanisms to the various components of our society.
PO 4	**Societal/ Citizenship/ Ethical Credibility**: Realization of various value systems/ moral dimensions and demonstrate the empathetic social concern as well as equity in all the decisions, executions and actions.
PO 5	**Environmental Concern and Sustainable Growth**: Understanding the emerging environmental challenges and provide the possible contribution in sustainable development that integrates environment, economy and employment.
PO 6	**Skill Development and Employable Abilities**: Adequate training in relevant skill sector and creating employable abilities among the under graduates.

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ROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of **B.Sc. Mathematics** Programme, the students are expected to

PSO1	develop required skills such as arithmetical/analytical/computer programming skills etc., and provide a systematic understanding of the fundamental concepts and theories of mathematics.
PSO2	get expertise with skills to handle data, problems, to frame hypothesis, evaluate and validate results, and apply various concepts.
PSO3	gain advanced knowledge in the field of various applications of mathematics and apply knowledge of principles, concepts and results in specific subject area to analyse.
PSO4	develop the mathematical ability and abstract intelligence and to become good academician
PSO5	pursue higher studies which in turn will offer them job opportunities in various sectors like banks ,central government institutions etc.,
PSO 6	receive a systematic understanding of the concepts and theories of mathematics and analyze the situations.

DISTRIBUTION OF CREDITS (UG PROGRAMME)

PART	SEM	COURSES	NUMBER OF COURSES	HOURS	CREDITS	TOTAL CREDITS
I	I–IV	LANGUAGE	4	6	3	12
II	I–IV	ENGLISH	4	6	3	12
III	I–II	CORE	4	6	4	16
III	III–IV	CORE	4	6	5	20
III	V,VI	CORE	6	6	5	30
III	V,VI	CORE	2	6	3	6
III	I–II	ALLIED – ANCILLARY	2	6	5	10
III	III–IV	ALLIED	2	4	3	6
III	V,VI	ELECTIVE	2	6	5	10
IV	I–IV	SKILL BASED SUBJECTS (SBS)	6	2	2	12
IV	I	VALUE EDUCATION	1	2	2	2
IV	II	ENVIRONMENTAL STUDIES	1	2	2	2
IV	III,IV	NON MAJOR ELECTIVE (NME)	2	2	2	4
V	IV	EXTENSION ACTIVITY	1	0	1	1
TOTAL CREDITS						143

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B.Sc. MATHEMATICS – COURSE STRUCTURE

SEMESTER – I

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.	24UACT11	**Part – I: Tamil** – பொதுத் தமிழ் – I	6	3	25	75	100	3
	24UACH11	**Hindi** – General Hindi – I						
	24UACS11	**Sanskrit** – Poetry, Grammar and History of Sanskrit Literature						
2.	24UACE11	**Part – II: English** – General English – I	6	3	25	75	100	3
3.	24UMSC11	**Part – III: Core – 1:** Differential Calculus	4	3	25	75	100	4
4.	24UMSC12	**Part – III: Core – 2:** Theory of Equations	4	3	25	75	100	4
5.	24UMSA11	**Part – III: Allied – 1:** Ancillary Mathematics – I	6	3	25	75	100	5
6.	24UMSS11	**Part – IV: SBS – 1:** Trigonometry	2	3	25	75	100	2
7.	24UACVE1	**Part – IV:** Value Education	2	3	25	75	100	2
	TOTAL		30					23

SEMESTER – II

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.	24UACT21	**Part – I: Tamil** – பொதுத் தமிழ் – II	6	3	25	75	100	3
	24UACH21	**Hindi** – General Hindi – II						
	24UACS21	**Sanskrit** – Prose, Grammar and History of Sanskrit Literature						
2.	24UACE21	**Part – II: English** – General English – II	6	3	25	75	100	3
3.	24UMSC21	**Part – III: Core – 3:** Integral Calculus	4	3	25	75	100	4
4.	24UMSC22	**Part – III: Core – 4:** Analytical Geometry of Three Dimensions	4	3	25	75	100	4
5.	24UMSA21	**Part – III: Allied – 2:** Ancillary Mathematics – II	6	3	25	75	100	5
6.	24UMSS21	**Part – IV: SBS – 2:** Vector Calculus	2	3	25	75	100	2
7.	24UACES1	**Part – IV:** Environmental Studies	2	3	25	75	100	2
	TOTAL		30					23

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SEMESTER – III

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.		**Part – I: Tamil** – காப்பியமும் நாடகமும் **Hindi** – Hindi – III **Sanskrit** – Sanskrit – III	6	3	25	75	100	3
2.		**Part – II: English** – English For Enrichment – III	6	3	25	75	100	3
3.		**Part – III: Core – 5:** Mechanics	5	3	25	75	100	5
4.		**Part – III: Core – 6:** Graph Theory And Laplace Transform	5	3	25	75	100	5
5.		**Part – III: Allied** – 3: Astronomy	4	3	25	75	100	3
6.		**Part – IV: SBS** – 3: MS – Office – **Lab**	2	3	40	60	100	2
7.		**Part – IV: NME – 1**: Fundamentals of Mathematics – I	2	3	25	75	100	2
		TOTAL	**30**					**23**

SEMESTER – IV

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.		**Part – I: Tamil** – சங்க இலக்கியமும் அற இலக்கியமும் **Hindi** – Hindi – IV **Sanskrit** – Sanskrit – IV	6	3	25	75	100	3
2.		**Part – II: English** – English For Enrichment – IV	6	3	25	75	100	3
3.		**Part –III: Core – 7:** Differential Equations	5	3	25	75	100	5
4.		**Part – III: Core – 8:** Sequence and Series	5	3	25	75	100	5
5.		**Part – III: Allied – 4:** Programming in C – Theory	4	3	25	75	100	3
6.		**Part – III: SBS – 4:** Programming in C – **Lab**	2	3	40	60	100	2
7.		**Part – IV: NME – II:** Fundamentals of Mathematics – II	2	3	25	75	100	2
8.		**PART –V:** Extension Activities	–	–	–	–	100	1
		TOTAL	**30**					**24**

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SEMESTER – V

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.		**Part – III: Core – 9:** Modern Algebra	6	3	25	75	100	5
2.		**Part – III: Core – 10:** Real Analysis	6	3	25	75	100	5
3.		**Part – III: Core – 11:** Operations Research – I	6	3	25	75	100	5
4.		**Part – III: Core – 12:** Programming C++ Theory	4	3	25	75	100	3
5.		**Part – III: SBS – 5:** **LAB** – Programming in C++	2	3	40	60	100	2
		Part – III: Elective *						
6.		Statistics I	6	3	25	75	100	5
7.		Number Theory	6	3	25	75	100	5
8.		Theory	4	3	25	75	100	3
9.		**LAB** – Python	2	3	40	60	100	2
10.		Soft skill (Self – Study)	–	–	50	50	100	–
	TOTAL		**30**					**25**

*One elective will be selected from S. No. 6, 7, 8

SEMESTER – VI

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.		**Part – III: Core – 13:** Linear Algebra	6	3	25	75	100	5
2.		**Part – III: Core – 14:** Complex Analysis	6	3	25	75	100	5
3.		**Part – III: Core – 15:** Operations Research – II	6	3	25	75	100	5
4.		**Part – III: Core – 16:** **Theory** – Programming in JAVA	4	3	25	75	100	3
5.		**Part – III:SBS – 6:** **LAB** – Programming in Java	2	3	40	60	100	2
		Part – III: Elective *						
6.		Statistics II	6	3	25	75	100	5
7.		Discrete Mathematics	6	3	25	75	100	5
8.								
9.		General Knowledge (Self – Study)	–	–	–	–	100	–
	TOTAL		30					25

*Two electives will be selected from S. No. 6, 7, 8

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COURSE STRUCTURE – I SEMESTER

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.	24UACT11	**Part – I: Tamil** – பொதுத் தமிழ் – I	6	3	25	75	100	3
	24UACH11	**Hindi** – General Hindi – I						
	24UACS11	**Sanskrit** – Poetry, Grammar and History of Sanskrit Literature						
2.	24UACE11	**Part – II: English** – General English – I	6	3	25	75	100	3
3.	24UMSC11	**Part – III: Core – 1:** Differential Calculus	4	3	25	75	100	4
4.	24UMSC12	**Part – III: Core – 2:** Theory of Equations	4	3	25	75	100	4
5.	24UMSA11	**Part – III: Allied – 1:** Ancillary Mathematics – I	6	3	25	75	100	5
6.	24UMSS11	**Part – IV: SBS – 1:** Trigonometry	2	3	25	75	100	2
7.	24UACVE1	**Part – IV:** Value Education	2	3	25	75	100	2
TOTAL			**30**					**23**

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

NME – Non –Major Elective

T – Theory

P – Practical

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSC11	**DIFFERENTIAL CALCULUS**	**CORE – 1**	**4**	**–**	**4**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	**I**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

      This course is designed to explain various concepts, basic definition and applications of Differentiation.

COURSE OBJECTIVES:

- To apply the differentiation methods for higher derivatives and n^{th} order differentiation using Leibnitz formula.
- To define polar subtangent and subnormal and angle between the curves.
- To explain curvatures and pedal equation of curves.
- To calculate the evolutes and envelopes.
- To explain the maxima and minima value of functions of two variables.

COURSE OUTCOMES (COs):

    After the completion of this Course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	calculate the differentiation of any type of functions.	**Upto K3**
CO2	describe the concepts of subtangent and subnormal and length of arc.	**Upto K3**
CO3	find the radius of curvature and pedal equation to the given curves.	**Upto K3**
CO4	calculate the evolutes and the envelopes of the given curves.	**Upto K3**
CO5	find the maximum and minimum values to the functions and Jacobian	**Upto K3**

K1 – KNOWLEDGE (REMEMBERING), K2- UNDERSTANDING, K3-APPLYING

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DIFFERENTIAL CALCULUS

UNIT – I:

Higher derivatives–n^{th} derivative of some standard functions – Leibnitz theorem.

UNIT – II:

Applications of differentiation – Tangent, normal, subtangent, subnormal, polar subtangent, polar subnormal, polar curves– Angle of intersection of two polar curves.

UNIT – III:

Pedal equation of a curve – Curvature.

UNIT – IV:

Evolutes – Centre and circle of curvature – Envelopes.

UNIT – V:

Maxima and minima of functions of two variables (Examples only) – Jacobians

TEXT BOOK:
Calculus by Arumugam and Isaac   (New gamma publishing house – January 2011)
      UNIT I – Chapter 2 : sec 2.11 to 2.13 (page no 43 to 71)
      UNIT II – Chapter 2 : sec 3.1,3.2 (page no. 91 to 110)
      UNIT III – Chapter 3 : sec 3.3,3.4 (page no. 111 to 143)
      UNIT IV – Chapter 3 : sec 3.5,3.6 (page no. 144 to 164).
      UNIT V – Chapter 3 :sec 3.7, 3.9 (page no. 165 to179) (page no. 195 to 202).

REFERENCE BOOKS:
1. *Calculus Volume – I* by T. K. Manickavasagam Pillai, Natarajan
   (S.Viswanathan Publications)
2. *Differential Calculus* by Santhi Narayanan (S. Chand Publications)

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	–	–	–	–	2
CO2	1	2	–	–	3	–
CO3	–	–	2	–	–	1
CO4	–	2	2	1	–	3
CO5	2	–	–	3	–	1

3. Advanced Application   2. Intermediate Development   1. Introductory Level
COURSE DESIGNER: Prof. G. R. SHYAMALA

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSC12	**THEORY OF EQUATIONS**	**CORE – 2**	**4**	**–**	**4**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	**I**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:

This Course talks about algebraic equations, which are equations defined by a polynomial and the method of solving a polynomial in one variable.

COURSE OBJECTIVES:
- To understand the methods of forming an equations
- To understand the symmetric functions of roots and Newton's theorem.
- To solve the reciprocal equations.
- To get the knowledge about the increase or decrease the roots.
- To find the roots using Newton's, Horner's, Cardon's and Ferrari methods.

COURSE OUTCOMES (COs):
After the completion of the course, the students will be able to

No	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the methods of forming equations	**Upto K3**
CO2	understand the symmetric functions of roots and Newton's theorem.	**Upto K3**
CO3	solve the reciprocal equations	**Upto K3**
CO4	discuss the increase or decrease the roots.	**Upto K3**
CO5	find the roots using Newton's, Horner's, Cardon's and Ferrari methods	**Upto K3**

K1 – KNOWLEDGE (REMEMBERING), K2- UNDERSTANDING, K3-APPLYING

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THEORY OF EQUATIONS

UNIT – I:

Formation of equations – relation between the roots and coefficients of equation.

UNIT – II:

Symmetric functions of the roots – sum of the powers of the roots of an equation – Newton's theorem.

UNIT – III:

Transformations of equations – roots multiplied by a given number – reciprocal roots – reciprocal equations.

UNIT – IV:

Standard form to increase or decrease the roots of the given equation by the given quantity – removal of terms – Horner's method

UNIT – V:

Descarte's rule of sign – Cardon's method – Ferrari's method.

TEXT BOOK:
Algebra Volume I by T.K.Manicavachagam Pillai, T. Natarajan And K.S.Ganapathy – S.Viswanathan Printers and Publishers Pvt. Ltd.,

UNIT I   – Chapter 6: sec 1 to 11 (page number 282 to 303)
UNIT II – Chapter 6: sec 12 to 14 (page number 303 to 317)
UNIT III – Chapter 6: sec 15, 16 (page number 318 to 327)
UNIT IV – Chapter 6: sec 17 to 20, 30 (page number 327 to 340, 376 to 381)
UNIT V – Chapter 6: sec 24, 34.1, 35 (page number 351 to 355, 390 to 398)

REFERENCE BOOKS:
1. *Algebra* by S. Arumugam and Thangapandi Isaac (New Gamma Publications)
2. *Algebra (Part I)* by N. P. Bali (Laxmi Publications)

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	–	–	2	–	–
CO2	–	1	–	–	3	–
CO3	–	–	2	3	–	1
CO4	–	2	2	1	–	3
CO5	2	–	–	3	–	1

3. Advanced Application   2. Intermediate Development 1. Introductory Level
COURSE DESIGNER: Prof. K. N. GANESH BABU

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSA11	**ANCILLARY MATHEMATICS – I**	**ALLIED – 1**	**6**	**-**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	**I**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:

This course deals with the basic concepts of Matrices, Index Numbers, Fourier Series, Correlation and Regression.

COURSE OBJECTIVE:

To enable the students to acquire the knowledge of Correlation, Regression, Fourier series and Matrices.

COURSE OUTCOMES (COs):

After the completion of this Course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	discuss the measure of degree of association or correlation and rank correlation between the two sets of values.	**Upto K3**
CO 2	find the Fourier series expansions of various functions and half range Fourier series.	**Upto K3**
CO 3	define various types of index numbers and the application of index numbers in practical life like fixing of wages, cost of living etc,.	**Upto K3**
CO 4	define various matrices and find the rank of the matrix and the consistency of simultaneous linear equations.	**Upto K3**
CO 5	find the inverse of a square matrix using Cayley–Hamilton theorem and compute its Eigen values and Eigen vectors.	**Upto K3**

K1 – KNOWLEDGE (REMEMBERING), K2- UNDERSTANDING, K3-APPLYING

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ANCILLARY MATHEMATICS – I

UNIT – I:

Correlation – Rank Correlation – Regression.

UNIT – II:

Fourier series – Even and odd functions – Sine and cosine series.

UNIT – III:

Index numbers – Unweighted index numbers – Weighted index numbers – Consumer Price Index number – Conversion of Chain base index number into fixed base index number and conversely.

UNIT – IV:

Matrices – Rank of a matrix – Simultaneous linear equations.

UNIT – V:

Cayley Hamilton theorem – Eigen values and Eigen vectors.

TEXT BOOK:
Allied Mathematics – Paper II by ARUMUGAM and ISAAC.

      UNIT I – Chapter 6 (Section 6.1 to 6.3)
      UNIT II – Chapter 4
      UNIT III – Chapter 9 (Section 9.1 to 9.3)
      UNIT IV – Chapter 3 (Section 3.1 & 3.2)
      UNIT V – Chapter 3 (Section 3.3 & 3.4)

REFERENCE BOOK:
Statistical Methods by Manoharan.

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	–	–	–	–	–
CO2	–	3	–	–	–	–
CO3	–	–	–	–	2	–
CO4	–	–	–	3	–	–
CO5	–	–	–	–	–	3

3. Advanced Application   2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. S. K. KANCHANA

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SOURASHTRA COLLEGE, MADURAI– 625004
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B.Sc. MATHEMATICS – SYLLABUS
(Under CBCS based on OBE) (For those who joined during 2024 – 2025 and after)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSS11	TRIGONOMETRY	SBS – 1	2	-	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:
This course is designed to explain various concepts in Trigonometry using DeMoivre's theorem. It also deals with hyperbolic functions and relation between hyperbolic functions and circular trigonometric functions.

COURSE OBJECTIVES:
To enable the students to acquire the knowledge of basic trigonometric identities derived from the definitions and use them to prove other results.

COURSE OUTCOMES (COs):
After the completion of this Course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	acquire knowledge of DeMoivre's theorem and its applications.	Upto K3
CO 2	express sin nθ, cos nθ, tan nθ in series	Upto K3
CO 3	expand sinθ, cos θ and tanθ in powers of θ	Upto K3
CO 4	compute problems in Hyperbolic function and Inverse Hyperbolic function.	Upto K3
CO 5	compute Logarithm of a complex number and summation of series using difference method.	Upto K3

K1 – KNOWLEDGE (REMEMBERING), K2- UNDERSTANDING, K3-APPLYING

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TRIGONOMETRY

UNIT – I:
Applications of DeMoivre's Theorem – DeMoivre's Theorem for rational numbers.

UNIT – II:
Expression for Sin $n\theta$, cos $n\theta$ and tan $n\theta$

UNIT – III:
Expression for $\sin^n\theta$ and $\cos^n\theta$ - Expansion of $\sin\theta$, $\cos\theta$, $\tan\theta$ in powers of θ.

UNIT – IV:
Hyperbolic function – Inverse Hyperbolic function.

UNIT – V:
Logarithm of complex number – Summation of series (Difference Method only)

TEXT BOOK:

Trigonometry by Arumugam, A. Thangapandi Isaac and Somasundaram –

New Gamma Publication (1999)

UNIT – I	**:**	Chapter 1 : Section 1.1 (Page 1 to 8)
UNIT – II	**:**	Chapter 1 : Section 1.2 (Page 12 to 20)
UNIT – III	**:**	Chapter 1 : Section 1.3 (Pages 23 to 36)
UNIT – IV	**:**	Chapter 2 : Sections 2.1, 2.2 (Pages 37 to 50)
UNIT – V	**:**	Chapter 3 &4 : Sections 3.1 & 4.1 (Pages 55 to 67)

REFERENCE BOOK:
Trigonometry by T.K. Manikkavasam Pillai and Natarajan

Mapping of CO with PSO :

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	–	–	–	–	–
CO2	–	3	–	–	–	–
CO3	–	–	–	–	2	–
CO4	–	–	–	3	–	–
CO5	–	–	–	–	–	3

3. Advanced Application   2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Dr. T. R. DINAKARAN AND Dr. S. K. KANCHANA

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COURSE STRUCTURE – II SEMESTER

S. No.	Course Code	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total	Credits
1.	24UACT21	**Part – I: Tamil** – பொதுத் தமிழ் – II	6	3	25	75	100	3
	24UACH21	**Hindi** – General Hindi – II						
	24UACS21	**Sanskrit** – Prose, Grammar and History of Sanskrit Literature						
2.	24UACE21	**Part – II: English** – General English – II	6	3	25	75	100	3
3.	24UMSC21	**Part – III: Core – 3:** Integral Calculus	4	3	25	75	100	4
4.	24UMSC22	**Part – III: Core – 4:** Analytical Geometry of Three Dimensions	4	3	25	75	100	4
5.	24UMSA21	**Part – III: Allied – 2:** Ancillary Mathematics – II	6	3	25	75	100	5
6.	24UMSS21	**Part – IV: SBS – 2:** Vector Calculus	2	3	25	75	100	2
7.	24UACES1	**Part – IV:** Environmental Studies	2	3	25	75	100	2
TOTAL			**30**					**23**

CA – **Class Assessment (Internal)**

SE – **Summative Examination**

SBS – **Skill Based Subject**

NME – **Non –Major Elective**

T – **Theory**

P – **Practical**

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSC21	INTEGRAL CALCULUS	CORE – 3	4	–	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:
This course is designed to explain various concepts, basic definition, applications of Integration, fourier series and Beta Gamma functions.

COURSE OBJECTIVES:
- To calculate the reduction formula for various functions.
- To explain the method of evaluating double integral problems.
- To evaluate the triple integrals.
- To explain the beta and gamma functions.
- To get the equivalent series of functions as Fourier series

COURSE OUTCOMES (COs):
After the completion of this Course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	find the reduction formula for various functions	Upto K3
CO 2	evaluate the double integral problems	Upto K3
CO 3	evaluate the triple integrals	Upto K3
CO 4	do the problems using beta and gamma functions	Upto K3
CO 5	solve problems on Fourier series	Upto K3

K1 – KNOWLEDGE (REMEMBERING), K2- UNDERSTANDING, K3-APPLYING

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INTEGRAL CALCULUS

UNIT – I:

Reduction formulae

UNIT – II:

Evaluation of double integrals

UNIT – III:

Triple integrals

UNIT – IV:

Beta and Gamma functions

UNIT – V:

Fourier Series – full range – half range –arbitrary range.

TEXT BOOKS:

1. *Calculus* – Arumugam and Issac – New gamma publishing house – January 2011
   - **UNIT – I**   : Chapter 2 : Sec 2.8 (page no. 381 to 396)
   - **UNIT – II** : Chapter 3 : Sec 3.2 (page no. 409 to 422)
   - **UNIT – III** : Chapter 3 : Sec 3.4 (page no. 426 to 429)
   - **UNIT – IV** : Chapter 4 : Sec 4.1 (page no. 440 to 456)
   - **UNIT – V**   : Chapter 5 : Sec 1.3 to 1.5 (page no. 459 to 475)

REFERENCE BOOK:

Calculus by T.K.Manikkavasagam Pillai and Natarajan

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	–	–	–	–	–
CO2	–	3	–	–	–	–
CO3	–	–	–	–	2	–
CO4	–	–	–	3	–	–
CO5	–	–	2	–	–	1

3. Advanced Application   2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. K. N. GANESH BABU

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSC22	ANALYTICAL GEOMETRY OF THREE DIMENSIONS	CORE – 4	4	-	4

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	

COURSE DESCRIPTION:

This course is designed to learn various concepts of planes, straight lines, sphere.

COURSE OBJECTIVES:

- To explain equation of a plane, angle and distance between two planes, lengths of perpendicular, bisecting planes
- To calculate the Symmetric form of Straight line , image of a point about a plane, image of line about a plane
- To explain the Plane and straight line, angle between a plane and a straight line, coplanar lines.
- To evaluate the Shortest Distance between two lines, skew lines, intersection of three planes.
- To explain the Sphere, equation of the sphere, equation of the tangent plane orthogonal sphere.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	find the equation of a plane, angle and distance between two planes, length of perpendicular.	Upto K3
CO 2	calculate the angle bisector of two planes, Symmetric form of Straight line , image of a point about a plane, image of line about a plane	Upto K3
CO 3	explain the Plane and straight line, angle between a plane and a straight line, coplanar lines, skew lines and shortest distance between two lines.	Upto K3
CO 4	evaluate the intersection of three planes, Equation of a sphere.	Upto K3
CO 5	find the equation of the tangent plane and tangent line, orthogonal condition and section of a sphere.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY

Passed in the BoS Meeting held on 09/03/2024   **Signature of the Chairman**

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ANALYTICAL GEOMETRY OF THREE DIMENSIONS

UNIT – I:

Planes – Equation of a plane – Angle between two planes

UNIT – II:

Angle bisectors of two planes – Straight lines – Equation of a straight line

UNIT – III:

A Plane and a line

UNIT – IV:

The intersection of three planes – Sphere – Equation of a sphere

UNIT – V:

Tangent line and tangent plane – Section of a sphere

TEXT BOOK:
Analytical Geometry of 3 Dimensions by Arumugam and Isaac (New Gamma Publications)

UNIT I	– Chapter 2 (sec 2.1, 2.2)
UNIT II	– Chapter 2 (sec 2.3) and Chapter 3 (sec 3.1)
UNIT III	– Chapter 3 (sec 3.2)
UNIT IV	– Chapter 3 (sec 3.4) and Chapter 4 (sec 4.1)
UNIT V	– Chapter 4 (sec 4.2, 4.3)

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	–	–	–	–	–
CO2	–	3	–	–	–	–
CO3	–	–	–	–	2	–
CO4	–	–	–	3	–	–
CO5	–	–	–	–	–	3

3. Advanced Application   2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. M. N. SAROJA

SOURASHTRA COLLEGE, MADURAI – 625004

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B.Sc. MATHEMATICS – SYLLABUS

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSA21	**ANCILLARY MATHEMATICS – II**	**ALLIED – 2**	**6**	**-**	**5**

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	**II**	**25**	**75**	**100**

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:

This course is designed to explain various concepts and methods of solving the linear programming problem.

COURSE OBJECTIVES:

To enable the students to acquire the knowledge of LPP and solving the LPP using various methods and to find the optimal solution of transportation and assignment problems

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	formulate a linear programming problem mathematically and write it in standard form.	**Upto K3**
CO 2	acquire the knowledge of various types of solutions of LPP.	**Upto K3**
CO 3	discuss various methods of solving a LPP.	**Upto K3**
CO 4	compute the initial basic feasible solution of a transportation problem using various methods and solving a transportation problem.	**Upto K3**
CO 5	know about assignment problems and find the optimal solution by Hungarian method.	**Upto K3**

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY

Passed in the BoS Meeting held on 09/03/2024　　　　**Signature of the Chairman**

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ANCILLARY MATHEMATICS – II

UNIT – I:

Introduction – Definition of a LPP – Formulation of LPP – Mathematical formulation of LPP (simple problems only) – Slack and surplus variables – Definition of a standard linear programming problem

UNIT – II:

Solutions of an LPP – Definition of basic solution – Basic feasible solution – Optimal solution – Optimum basic feasible solution – Degenerate solution of an LPP (Theorems not included) – Graphical solutions of a LPP

UNIT – III:

Simplex method (Simple problems only) – Big – M method (Method of penalties) (simple problems only) – two phase method (Simple problems only)

UNIT – IV:

Transportation problem – Finding IBFS by North West Corner, Row Minima, Column Minima, Matrix Minima and Vogel's Approximation method – Solving by MODI method (Only minimization cases)

UNIT – V:

Assignment Problems – Solving Assignment Problem by Hungarian method.
TEXT BOOK:
Topics in Operations Research – Linear Programming by Arumugam and Isaac
Unit I   : Chapter 3: Sections 3.1, 3.2(Theorems not included) (Pages 3–1 to 3–8, 3–31 to 3–41)
Unit II : Chapter 3: Sections 3.3(Theorems not included), 3.4(problems only)
          (pages 3–42 to 3–47, 3–68 to 3–81)
Unit III : Chapter 3: Sections 3.5, 3.6(Pages 3–86 to 3–101, 3–107 to 3–111,
          3–116 to 3–144, 3–149 to 3–159)
Unit IV : Chapter 4: Sections 4.0,4.1 (Pages 4–1 to 4–27, 4–38 to 4–49)
Unit V : Chapter 5: Sections 5.0,5.1,5.2 (Pages 5–1 to–5–6, 5–8 to 5–22)

REFERENCE BOOK:
Operations Research by Man Mohan, Gupta and Kanthi Swarup
Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	–	–	–	–	–
CO2	–	3	–	–	–	–
CO3	–	–	–	–	2	–
CO4	–	–	–	3	–	–
CO5	–	–	–	–	–	3

3. Advanced Application   2. Intermediate Development 1. Introductory Level
COURSE DESIGNER: Dr. S. K. KANCHANA

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
24UMSS21	VECTOR CALCULUS	SBS – 2	2	-	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

NATURE OF COURSE	Employability	✓	Skill Oriented	✓	Entrepreneurship	✓

COURSE DESCRIPTION:
This course is designed to explain various concepts and methods of solving the problem based on vectors and various theorems.

COURSE OBJECTIVES:
- To introduce the concepts of vectors
- To discuss the properties of gradient
- To describe the solenoidal
- To provide knowledge in surface integrals
- To discuss various types of theorems

COURSE OUTCOMES (COs):
After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the concepts of differentiation of vectors.	Upto K3
CO 2	understand the concepts of gradient, divergence and curl and its properties.	Upto K3
CO 3	discuss about solenoidal and irrotational of vector function.	Upto K3
CO 4	evaluate the integral of a vector valued function using line and surface integrals.	Upto K3
CO 5	understand the concepts of Green's and Gauss divergence theorem.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY

Passed in the BoS Meeting held on 09/03/2024   **Signature of the Chairman**

VECTOR CALCULUS

UNIT – I:

Scalar product – cross product – Vector differentiation – differentiation of sum of two vectors – differentiation of product of two vectors – differentiation of product of a scalar and a vector

UNIT – II:

Gradient – Divergence and Curl – Theorems and Problems

UNIT – III:

Solenoidal and irrotational of a vector

UNIT – IV:

Vector integration – Line integrals – Surface integrals

UNIT – V:

Green's theorem (statement only), Gauss Divergence Theorem (statement only) – Simple problems from Green's theorem and Gauss Divergence theorem only

TEXT BOOK:

Analytical Geometry 3D and Vector Calculus by Arumugam and Issac (New Gamma Publications – January 2014)

UNIT – I	:	Chapter 5 : Sec 5.1, 5.2 (page number 5.1 to 5.5)
UNIT – II	:	Chapter 5 : Sec 5.3, 5.4 (page number 5.6 to 5.20)
UNIT – III	:	Chapter 5 : Sec 5.3, 5.4 (page number 5.21 to 5.28)
UNIT – IV	:	Chapter 7 : Sec7.1, 7.2 (page number L and S INT 1 to L and S INT 10)
UNIT – V	:	Chapter 7 : Sec 7.3 (page number L and S INT 11 to L and S INT 27)

REFERENCE BOOK:

Analytical Geometry of Three Dimension by T.K. Manikkavachagam Pillai and others.

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	–	–	–	–	–
CO2	–	3	–	–	–	–
CO3	–	–	–	–	2	–
CO4	–	–	–	3	–	–
CO5	–	–	3	–	–	3

3. Advanced Application   2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. M. K. ESWARLAL