B.Sc. Mathematics

Motto

Improve to Empower, Sustain to Success.

Math Metrons:

Vision

To be a dynamic hub of mathematical exploration, where the Math Metrons Association nurtures analytical thinkers, problem solvers, and mathematical enthusiasts who shape the future through the power of mathematics.

Mission

- Foster Mathematical Excellence and Curiosity.
- Promote Real-World Applications and Interdisciplinary Engagement.
- Enhance Community Outreach and Education.

Euclid's Club

Vision

To foster a community of passionate mathematicians who explore the limitless beauty and applications of mathematics, inspiring a profound understanding and appreciation for the subject.

Mission

- To foster collaborative research, creativity and exploration in all areas of mathematics.
- To develop skilled, community-focused leaders through mathematical engagement and outreach.

Preamble

The B.Sc. Mathematics programme at St. Joseph's College of Arts and Science for Women, Hosur (Autonomous) is designed to provide a strong academic foundation in mathematical theory, logical reasoning and analytical thinking. It aims to empower women through quality education in mathematics, nurturing their potential for careers in academia, research, industry and education.

The curriculum offers a rigorous and holistic study of mathematical disciplines including Algebra, Calculus, Real and Complex Analysis, Differential Equations, Linear Algebra, Number Theory and Mathematical Statistics. Alongside core theoretical subjects, the programme integrates practical applications through mathematical modelling, computational tools and project work.

To support diverse learners, Bridge Courses are conducted at the entry level to strengthen fundamental mathematical concepts. The department also offers Certificate Courses in applied and interdisciplinary areas like Mathematical Software Tools, Data Analytics, and Operations Research to boost student employability and enhance domain-specific skills.

Industrial visits, academic seminars, and intercollegiate competitions are regularly organized to enrich student exposure and promote mathematical communication. Internships and real-world problem-solving tasks further bridge the gap between academic knowledge and industry expectations.

Skill enhancement and capacity-building activities such as training in communication, logical aptitude and leadership are integrated throughout the programme. Outreach and social engagement activities encourage students to apply mathematical thinking to solve community-based challenges, fostering social responsibility.

Interdisciplinary papers such as Environmental Studies, Human Rights, Women Studies, and Indian Knowledge System are embedded in the curriculum to instill ethical values, inclusiveness and civic awareness. These broaden the students' understanding beyond mathematical boundaries and prepare them to make meaningful contributions to society.

With the guidance of experienced faculty and access to modern learning resources, students are nurtured in a learner-centered, intellectually stimulating environment. The programme strives to develop mathematically proficient graduates who are research-oriented, socially committed and ready to meet the challenges of the 21st century.

Nature and Extent of the Programme

The **Bachelor of Science – Mathematics (B.Sc. Mathematics)** is a foundational undergraduate programme that introduces learners to the field of **higher mathematics**, offering pathways to both **advanced academic study** and **professional careers**. This degree is structured to align with **national and global academic standards**, equipping students with a strong foundation in theoretical depth, abstract reasoning, and problem-solving abilities.

As a versatile and enduring discipline, mathematics supports a wide range of fields such as physical sciences, computer science, engineering, economics and data science. Upon successful completion of the programme, graduates are **well-equipped to pursue careers in education, research, data analysis, banking, actuarial science, analytics**, and other mathematics-driven domains. They are also prepared to continue higher studies in Mathematics, Statistics, Applied Sciences or Computer Applications.

The curriculum, developed under the **Learning Outcomes-based Curriculum Framework (LOCF)**, encompasses a comprehensive and balanced integration of pure and applied mathematics. Emphasis is placed on **enhancing analytical thinking, quantitative reasoning, logical inference** and **computational proficiency**.

The programme promotes **independent learning**, **mathematical curiosity** and **interdisciplinary application**, encouraging students to explore **innovative solutions** to real-world and theoretical

problems. It also cultivates **ethical responsibility, critical thinking**, and **communication skills** through value-based education and **community engagement initiatives**, producing graduates who are not only **mathematically competent** but also **socially responsible** and **professionally committed**.

Aim of the Programme

The primary aim of the **B.Sc. Mathematics** undergraduate programme is to develop in students a **deep understanding of mathematical principles**, logical reasoning, and analytical thinking. The programme is designed to foster **mathematical literacy**, **problem-solving ability** and **academic excellence**, enabling students to apply mathematical concepts effectively in both theoretical and real-world contexts.

To achieve this, the programme integrates:

- A **systematic teaching-learning approach** that imparts both foundational and advanced knowledge in pure and applied mathematics;
- **Practical training and computational tools** to enhance skills in mathematical modelling, statistical analysis and interpretation;
- **Opportunities for academic enrichment** through seminars, workshops, intercollegiate events and project-based learning;
- Platforms to build **communication, collaboration and critical thinking skills**, essential for research, education, and professional success.

Duration of the Programme

The B.Sc. Mathematics programme shall extend over a period of **three academic years,** comprising of **six semesters**. Each academic year shall consist of **two semesters**:

- **Odd Semester**: June to November
- **Even Semester**: December to May

Each semester shall have **a minimum of 90 working days**, exclusive of examination days.

Eligibility for Admission

A candidate shall be eligible for admission to the **B.Sc. Mathematics** programme if she has passed the **Higher Secondary Examination conducted by the Government of Tamil Nadu** or any other **equivalent examination recognized by the University**, **with Mathematics as a compulsory subject** and in any one of the following combinations:

- Mathematics with Biology
- Mathematics with Computer Science
- Mathematics with Information Technology

This includes both **Academic** and **Vocational** streams, as per the eligibility norms prescribed by the **Government of Tamil Nadu**.

Credit Requirements and Eligibility for Award of Degree

A candidate shall be eligible for the **award of the B.Sc. Mathematics degree** only if she has:

- Successfully completed the prescribed **course of study** in a college affiliated to the University for a **minimum duration of three academic years (six semesters)**.
- Passed all prescribed **semester examinations**.
- **Earned a minimum of 140 credits** as distributed under the following Parts:
    - **Part I** – Language
    - **Part II** – General English / Advanced English
    - **Part III** – Discipline Specific Core, Generic Specific Elective, Discipline Specific Elective, Professional Enhancement Course and Project
    - **Part IV** – Skill Enhancement Courses, Non-Major Electives, Internship, Environmental Studies, Digital Literacy, Women Studies and Indian Knowledge System
    - **Part V** – Extension Activity

The candidate must also have fulfilled any other requirements as prescribed by the College/University regulations for the award of the degree.

PROGRAMME OUTCOMES (POs)

PO1: Graduates will apply logical reasoning and mathematical thinking to formulate, analyze and solve real-world and abstract problems.

PO2: Graduates will communicate mathematical ideas clearly and effectively through verbal, written, symbolic and graphical forms.

PO3: Graduates will demonstrate proficiency in using mathematical tools, techniques and computational software for data analysis and modelling.

PO4: Graduates will integrate knowledge from pure and applied mathematics with concepts from science, technology and economics to solve interdisciplinary problems.

PO5: Graduates will design and develop mathematical models and algorithms to address academic, industrial and societal challenges.

PO6: Graduates will work effectively as team members or leaders, demonstrating collaboration, responsibility and organizational skills in diverse and interdisciplinary environments.

PO7: Graduates will adhere to ethical principles and demonstrate professional integrity in academic and applied mathematical practices.

PO8: Graduates will recognize the importance of lifelong learning and engage in continuous professional development to stay current with evolving mathematical applications.

PO9: Graduates will develop an understanding of environmental and societal issues and apply quantitative methods to support sustainable development.

PO10: Graduates will use digital tools and mathematical software effectively in academic, research, and professional settings.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Graduates will apply core concepts of pure and applied mathematics, including algebra, calculus, differential equations and statistics, to solve theoretical and real-world problems.

PSO2: Graduates will demonstrate proficiency in using mathematical tools, logic, and technology (such as MATLAB, Mathematica, Python & R) for modeling, computation, and data analysis.

PSO3: Graduates will develop mathematical models and apply abstract reasoning and analytical methods to address complex problems across academic and interdisciplinary domains.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Graduates will attain a strong foundation in mathematical theory and application, enabling them to pursue higher education, research, or professional careers in mathematics and allied fields.

PEO2: Graduates will remain academically and professionally relevant by adapting to evolving mathematical tools, technologies, and interdisciplinary applications.

PEO3: Graduates will demonstrate ethical responsibility, teamwork, and leadership in academic, research, and societal contexts, contributing to inclusive and sustainable development.

MAPPING OF PEO WITH PO AND PSO:

PEO \ Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO 3
PEO1	3	2	3	3	3	2	2	2	2	3	3	3	3
PEO2	3	2	2	3	3	2	2	3	2	3	3	3	3
PEO3	2	2	2	2	3	3	3	2	3	2	2	2	2

3 = Strongly Related, 2 = Moderately Related, 1 = Slightly Related

Course Components and Credit Distribution

The curriculum framework for the B.Sc Mathematics programme under the autonomous structure is designed to ensure holistic academic development, skill enhancement, and societal contribution. The credit distribution across the various components is as follows:

S. No.	Study Components	Part	Sem I		Sem II		Sem III		Sem IV		Sem V		Sem VI		No. of Hours	Total Credit
			No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit		
1	Language	I	6	3	6	3	6	3	6	3					24	12
2	English	II	6	3	6	3	6	3	6	3					24	12
3	Core Course / DSC	III	9	7	8	7	8	7	8	7	20	16	14	11	67	55
4	Allied / GSE	III	5	4	5	4	5	4	5	4					20	16
5	Elective / DSE	III									8	8	8	8	16	16
6	PEC	III											2	2	2	2
7	Project	III											4	4	4	4
8	SEC	IV	2	2	3	2	3	2	3	2					11	8
9	NME	IV	2	2	2	2									4	4
10	Environmental Studies / IDC	IV					2	2							2	2
11	Digital Literacy / IDC	IV							2	2					2	2
12	Women Studies	IV									2	2			2	2
13	Indian Knowledge System / IDC	IV											2	2	2	2
14	Internship	IV										2				2
15	Extension Activity	V												1		1
	Total		**30**	**21**	**30**	**21**	**30**	**21**	**30**	**21**	**30**	**28**	**30**	**28**	**180**	**140**

Details of Course of Study for Parts I–V

PART I – Tamil and Other Languages

Students shall study Tamil or one of the other approved languages (e.g., Hindi or French), as per their choice and subject to availability. The syllabus and prescribed textbooks for these languages shall be periodically updated by the respective Boards of Studies and approved by the Academic Council of the College.

PART II – General English / Advanced English

Courses in English aim to improve students' proficiency in language, literature, communication, and critical thinking. The curriculum and instructional materials are prepared by the Board of Studies of English and approved through the academic governance structure.

PART III – Core, Allied and Project

This part comprises the Core Discipline Courses, Generic Specific Elective, Discipline Specific Elective, Professional Enhancement Course and a Project in the final semester. The content and structure of these courses are prescribed by the respective Board of Studies in Computer Science and approved by the Academic Council to align with current academic and industry standards.

PART IV – Value and Skill-Oriented Courses

i. Non-Major Elective (NME):

- Students must choose **Non-Major Elective (NME)** comprising from the options offered by other departments.

ii. Additional Courses under Part IV:

- Skill Enhancement Courses (SEC)
- Environmental Studies
- Digital Literacy
- Women studies
- Indian Knowledge System
- Internship

PART V – Extension Activity

Students shall earn **a maximum of 1 credit** through participation in **Compulsory Extension Services**. Every student must enrol in **NSS, Red Ribbon Club, Youth Red Cross, Field Work, Outreach Activities or any other Clubs** recognized by the College.

Inclusion of Massive Open Online Courses (MOOCs) via SWAYAM and NPTEL

MOOC Courses for Credit Mobility

As part of the credit-based curriculum design and in alignment with the guidelines of higher education regulatory bodies, students are encouraged to enrol in Massive Open Online Courses (MOOCs) offered on SWAYAM or NPTEL platforms. These courses can be opted under Core, Elective, or Soft Skill categories. The student shall be eligible for award of the degree only upon submission of a valid certificate as proof of successful completion of the chosen MOOC course. **Two credits** will be given to candidates who successfully complete the course.

B.Sc. Mathematics
Curriculum Design

First Year
Semester – I

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language	25UTAM101 25UFRE101 25UHIN101 25UKAN101 25UTEL101 25UURD101	Tamil - I French - I Hindi - I Kannada - I Telugu - I Urdu – I	6	3	25	75	100
2	II	English	25UGEN101 25UAEN101	General English I Advanced English I	6	3	25	75	100
3	III	DSC I	25UMA1C01	Algebra & Trigonometry **(Skill Development)**	5	4	25	75	100
4		DSC II	25UMA1C02	Differential Calculus **(Skill Development)**	4	3	25	75	100
5		GSE I Allied	25UCS1A02	Allied Paper I Problem Solving through C **(Skill Development)**	5	4	25	75	100
			25UCH1A02	Allied Chemistry for Physical Sciences I **(Employability)**					
6	IV	SEC I	25UMA1SE1	Quantitative Aptitude **(Employability)**	2	2	25	75	100
			25UMA1SE2	Logical Skills and Reasoning **(Employability)**					
7		SEC II NME I		Non Major Elective I	2	2	25	75	100
Total					**30**	**21**	**175**	**525**	**700**

Semester – II

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language	25UTAM202 25UFRE202 25UHIN202 25UKAN202 25UTEL202 25UURD202	Tamil - II French - II Hindi - II Kannada - II Telugu - II Urdu – II	6	3	25	75	100
2	II	English	25UGEN202 25UAEN202	General English II Advanced English II	6	3	25	75	100
3	III	DSC III	25UMA2C03	Integral Calculus **(Skill Development)**	4	3	25	75	100
4		DSC IV	25UMA2C04	Analytical Geometry 2D & 3D **(Skill Development)**	4	4	25	75	100
5		GSE II Allied	25UCS2A03	Allied Paper II Office Automation for Business **(Skill Development, Employability)**	3	3	25	75	100

			25UCH2A04	Allied Chemistry for Physical Sciences II **(Employability)**					
6	III	GSE II Allied Practical	25UCS2AP2	Office Automation for Business Lab **(Skill Development, Employability)**	2	1	40	60	100
			25UCH2AP1	Chemistry for Physical and Biological Sciences (Practical) **(Skill Development)**					
7	IV	SEC III	25UMA2SP1	Financial Data Analysis with Excel (Practicals) **(Entrepreneurship)**	3	2	40	60	100
			25UMA2SP2	Spreadsheet Techniques in Business Mathematics (Practicals) **(Entrepreneurship)**					
8		SEC IV NME II		Non Major Elective - II	2	2	25	75	100
Total					**30**	**21**	**230**	**570**	**800**

Second Year
Semester – III

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language	25UTAM303 25UFRE303 25UHIN303 25UKAN303 25UTEL303 25UURD303	Tamil - III French - III Hindi - III Kannada - III Telugu - III Urdu – III	6	3	25	75	100
2	II	English	25UGEN303 25UAEN303	General English III Advanced English III	6	3	25	75	100
3	III	DSC V	25UMA3C05	Vector Calculus **(Skill Development)**	4	4	25	75	100
4		DSC VI	25UMA3C06	Differential Equations **(Skill Development)**	4	3	25	75	100
5		GSE III Allied	25UPH3A01	Allied Fundamentals of Physics: Elasticity, Heat, Waves, and Electromagnetism **(Skill Development)**	5	4	25	75	100
			25UCS3A06	Allied Internet & Web Designing **(Employability)**					
6	IV	SEC V	25UMA3SP1	Quantitative Data Analysis with Excel (Practicals) **(Entrepreneurship)**	3	2	40	60	100
			25UMA3SP2	Mathematics using Maxima Practicals) **(Employability)**					

7		IDC 1	25UEVS301	Environmental Studies	2	2	25	75	100
8				Health and Wellness*					
Total					**30**	**21**	**190**	**510**	**700**

Semester – IV

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language	25UTAM404 25UFRE404 25UHIN404 25UKAN404 25UTEL404 25UURD404	Tamil - IV French - IV Hindi - IV Kannada - IV Telugu - IV Urdu – IV	6	3	25	75	100
2	II	English	25UGEN404 25UAEN404	General English IV Advanced English IV	6	3	25	75	100
3	III	DSC VII	25UMA4C07	Industrial Statistics **(Employability**)	4	3	25	75	100
4		DSC VIII	25UMA4C08	Mechanics (**Employability)**	4	4	25	75	100
5		GSE IV Allied	25UPH4A02	Allied Advanced Physics and Electronics **(Skill Development)**	3	3	25	75	100
			25UCS4A07	Core Python Concepts **(Skill Development)**					
6		GSE IV Allied Practical	25UPH4AP1	Allied Material Properties and Electronics Experiments (**Employability)**	2	1	40	60	100
			25UCS4AP4	Core Python Concepts Lab (**Employability)**					
7	IV	SEC VI	25UMA4SP1	Numerical Methods with C++ (Practical) **(Skill Development)**	3	2	40	60	100
		SEC VII	25UMA4SP2	Operations Research using Excel Solver (Practical) **(Skill Development)**					
8		IDC-II	25UDL401	Digital Literacy	2	2	25	75	100
Total					**30**	**21**	**230**	**570**	**800**

Third Year
Semester – V

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	III	DSC IX	25UMA5C09	Abstract Algebra **(Employability)**	6	5	25	75	100
2		DSC X	25UMA5C10	Elements of Mathematical Analysis **(Employability)**	5	4	25	75	100

3		DSC XI	25UMA5C11	Complex Analysis **(Employability)**	5	4	25	75	100
4	III	DSC Lab	25UMA5CP1	R for Statistical Modelling (Practicals) **(Skill Development)**	4	3	40	60	100
5		DSE I	25UMA5E01	Elective I Discrete Mathematics **(Employability)**	4	4	25	75	100
			25UMA5E02	Computational Mathematics **(Employability)**					
			25UMA5E03	Co-ordinate Geometry **(Employability)**					
6		DSE II	25UMA5E04	Elective II Mathematical Statistics **(Employability)**	4	4	25	75	100
			25UMA5E05	Numerical Analysis **(Employability**)					
			25UMA5E06	Formal Language & Automata Theory **(Employability)**					
7	IV	IDC III	25UWOS501	Women Studies	2	2	25	75	100
8		Internship	25UMA5INT	Internship	-	2	-	-	-
Total					**30**	**28**	**190**	**510**	**700**

Semester – VI

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	III	DSC XII	25UMA6C12	Linear Algebra **(Employability)**	5	4	25	75	100
2		DSC XIII	25UMA6C13	Real Analysis (**Employability)**	5	4	25	75	100
3		DSC Lab	25UMA6CP2	Mathematical Modelling (Practicals) **(Skill Development)**	4	3	40	60	100
4		DSC XIV	25UMA6PRV	Core-Project	4	4	50	50	100
5	III	DSE III	25UMA6E01	Elective III Graph Theory **(Employability)**	4	4	25	75	100
			25UMA6E02	Difference Equations (**Employability)**					
			25UMA6E03	Number Theory **(Employability)**					
6		DSE IV	25UMA6E04	Elective IV Fuzzy Sets and Logical Theory	4	4	25	75	100
			25UMA6E05	Optimization Techniques **(Employability)**					
			25UMA6E06	Financial Mathematics (**Entrepreneurship)**					
7		PEC	25UPEC601	Essential Aptitude and Logical Thinking	2	2	25	75	100

8	IV	IDC IV	25UIKS601	Indian Knowledge System	2	2	25	75	100
9				Extension Activity	-	1	-	-	-
Total					**30**	**28**	**240**	**560**	**800**
Grand Total					**180**	**140**	**1255**	**3245**	**4500**
		Extra Credit	**Mandatory**	**Extra Credit - Swayam/MOOC/NPTEL Online Course/ Self Study**	**-**	**2**	-	-	-
		Extra Credit	**Not Mandatory**	**Self-Study**	**-**	**2**	-	-	-
	*	**Extra Credit**	**Mandatory**	**Health and Wellness**	**-**	**1**	-	-	-

DSC	Discipline Specific Core
GSE	Generic Specific Elective - Allied
DSE	Discipline Specific Elective
NME	Non-Major Elective
IDC	Inter Disciplinary Course
SEC	Skill Enhancement Course
PEC	Professional Efficiency Course

Discipline Specific Elective Courses

Semester	Part	Nature of the Course	Course Code	Name of the Course
V	III	DSE I	25UMA5E01	Elective I Discrete Mathematics **(Employability)**
			25UMA5E02	Computational Mathematics **(Employability)**
			25UMA5E03	Co-ordinate Geometry **(Employability)**
		DSE II	25UMA5E04	Elective II Mathematical Statistics **(Employability)**
			25UMA5E05	Numerical Analysis **(Employability)**
			25UMA5E06	Formal Language & Automata Theory **(Employability)**
VI	III	DSE III	25UMA6E01	Graph Theory **(Employability)**
			25UMA6E02	Difference Equations **(Employability)**
			25UMA6E03	Number Theory **(Employability)**
		DSE IV	25UMA6E04	Fuzzy Sets and Logical Theory **(Employability)**
			25UMA6E05	Optimization Techniques **(Employability)**
			25UMA6E06	Financial Mathematics **(Entrepreneurship)**

Skill Enhancement Courses

Semester	Nature of the Course	Course Code	Name of the Course
I	SEC I	25UMA1SE1	Quantitative Aptitude **(Employability)**
		25UMA1SE2	Logical Skills and Reasoning **(Employability)**
II	SEC III	25UMA2SP1	Financial Data Analysis with Excel (Practical) **(Entrepreneurship**)
		25UMA2SP2	Spreadsheet Techniques in Business Mathematics (Practical) **(Entrepreneurship)**
III	SEC V	25UMA3SP1	Quantitative Data Analysis with Excel (Practical) **(Entrepreneurship)**
		25UMA3SP2	Mathematics using Maxima (Practicals) **(Employability)**
IV	SEC VI	25UMA4SP1	Numerical Methods with C++ (Practical) **(Skill Development)**
		25UMA4SP2	Operations Research using Excel Solver (Practical) **(Skill Development)**

Non-Major Elective Courses

Subjects offered by the Department of Mathematics

Semester	Part	Nature of the Course	Course Code	Name of the Course
I	IV	NME I	25UMA1NM1	Mathematics for Competitive Examinations-I **(Employability)**
			25UMA1NM2	Mathematics for Everyday Life **(Skill Development)**
II	IV	NME II	25UMA2NM1	Mathematics for Competitive Examinations-II **(Employability)**
			25UMA2NM2	Recreational Mathematics **(Employability)**

Allied Courses offered to the Department of Mathematics

Semester	Part	Nature of the Course	Course Code	Name of the Course
I	III	GSE I	25UCS1A02	Allied Paper I-Problem Solving through C **(Skill Development)**
			25UCH1A02	Allied Chemistry for Physical Sciences- I **(Employability)**

II	III	GSE II	25UCS2A03	Allied Paper II- Office Automation for Business **(Skill Development, Employability)**
			25UCH2A04	Allied Chemistry for Physical Sciences- II **(Employability)**
			25UCS2AP2	Office Automation for Business Lab **(Skill Development, Employability)**
			25UCH2AP1	Chemistry for Physical and Biological Sciences (Practical) **(Skill Development)**
III	III	GSE III	25UPH3A01	Allied-Fundamentals of Physics: Elasticity, Heat, Waves, and Electromagnetism **(Skill Development)**
			23UCS3A06	Allied –Internet & Web Designing **(Employability)**
IV	III	GSE IV	25UPH4A02	Advanced Physics and Electronics **(Skill Development)**
			25UCS4A07	Core Python Concepts **(Skill Development)**
			25UPH4AP1	Material Properties and Electronics Experiments (**Employability)**
			25UCS4AP4	Core Python Concepts Lab (**Employability)**

Allied Courses offered by the Department of Mathematics

Semester	Part	Nature of the Course	Course Code	Name of the Course
I	III	GSE I	25UMA1A01	Linear Algebra-I **(Skill Development)**
			25UMA1A02	Allied Mathematics - I **(Skill Development)**
			25UMA1A03	Allied Mathematical Statistics- I **(Skill Development)**
II	III	GSE II	25UMA2A04	Linear Algebra-II **(Skill Development)**
			25UMA2AP1	Linear Algebra Practicals **(Employability)**
			25UMA2A05	Allied Mathematics - II **(Skill Development)**
			25UMA2AP2	Allied Mathematics - Practicals **(Employability)**
			25UMA2A06	Allied Mathematical Statistics- II **(Skill Development)**
			25UMA2AP3	Allied Mathematical Statistics Practicals **(Employability)**
III	III	GSE III	25UMA3A07	Discrete Mathematics- I **(Skill Development)**

			25UMA3A08	Optimization Techniques- I **(Employability)**
			25UMA3A09	Numerical Methods- I **(Skill Development)**
			25UMA3A10	Business Quantitative Techniques-I **(Employability)**
			25UMA3A11	Mathematics for Management **(Employability)**
IV	III	GSE IV	25UMA4A12	Discrete Mathematics- II **(Skill Development)**
			25UMA4AP4	Discrete Mathematics Practicals **(Employability)**
			25UMA4A13	Optimization Techniques II **(Employability)**
			25UMA4AP5	Optimization Techniques Practicals **(Employability)**
			25UMA4A14	Numerical Methods-II **(Skill Development)**
			25UMA4AP6	Numerical Methods Practicals **(Employability)**
			25UMA4A15	Business Quantitative Techniques-II **(Employability)**
			25UMA4A16	Optimization Techniques for Management **(Employability)**

B.Sc. MATHEMATICS LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1C01	**ALGEBRA & TRIGONOMETRY**	**DSC THEORY**	**I**	**75**	**5**	**Y**	**-**	**4**

Objective:

To enable learners to understand and solve reciprocal equations and apply Horner's method for approximating polynomial roots. To develop skills in summation of series (binomial, exponential, logarithmic) and their applications in approximations. To equip students with techniques in matrix algebra, including inverse, eigenvalues, eigenvectors, and diagonalization. To apply expansions of trigonometric functions for solving analytical and engineering problems. To introduce hyperbolic functions, logarithm of complex numbers, and trigonometric series, enhancing problem-solving proficiency.

Unit	Course Content	Knowledge Levels	Sessions
I	**Reciprocal Equations****: Reciprocal Equations-Standard form–Increasing or decreasing the roots of a given equation-Removal of terms, Approximate solutions of roots of polynomials by Horner 's method – related problems. **** SDG 4 – Quality Education.** **(Book1 – Chapter6: Sections 16,17,19,30)**	K2, K3, K4	15
II	**Summation of Series**:** Binomial– Exponential – Logarithmic series (Theorems without proof) – Approximations - related problems. ****SDG 9 – Industry, Innovation, and Infrastructure.** **(Book1 – Chapter3: Sections 10,14; Chapter4: Sections-1,2,3,5,7,8,9,11).**	K2, K3, K4	15
III	**Inverse of a square matrix**:** Inverse of a square matrix up to order 3, Characteristic equation –Eigen values and Eigen Vectors Similar matrices - Cayley – Hamilton Theorem (Statement only) - Finding powers of square matrix, Diagonalization of square matrices - related problems. **** SDG 8 – Decent Work and Economic Growth.** **(Book2 – Chapter2: Sections -8,16).**	K2, K3, K4, K5	15
IV	**Expansions**:** Expansions of $\sin n\theta$, $\cos n\theta$ in powers of $\sin\theta$, $\cos\theta$ - Expansion of $\tan n\theta$ in terms of $\tan n\theta$, Expansions of $\cos^m\theta$, $\sin^n\theta$, $\cos^m\theta\sin^n\theta$– Expansions of $\tan(\theta_1+\theta_2+\theta_3+\ldots\ldots+\theta_n)$ - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in terms of θ - related problems. **** SDG 7 – Affordable and Clean Energy.** **(Book3 - Chapter3: Sections 1 to 5).**	K2, K3, K4	15

V	**Hyperbolic functions**:** Hyperbolic functions – Relation between circular and hyperbolic functions Inverse hyperbolic functions-Logarithm of complex quantities, Summation of trigonometric series - related problems. ****SDG 9 – Industry, Innovation, and Infrastructure.** **(Book3 - Chapter4; Chapter5; Chapter6: Sections 1,3,3.1 Related problems.)**	K2, K3, K4	15

Course Outcome	**CO1:** Solve reciprocal equations, modify roots, and approximate solutions using Horner's method.	K3, K4
	CO2: Compute summations of binomial, exponential, and logarithmic series and use them for approximation problems.	K2, K3
	CO3: Determine inverse of matrices, eigenvalues, eigenvectors, and apply Cayley-Hamilton theorem for powers and diagonalization.	K3, K4, K5
	CO4: Expand trigonometric functions using multiple-angle and power series expansions.	K2, K3
	CO5: Apply hyperbolic and inverse hyperbolic functions, logarithm of complex numbers, and summation of trigonometric series in problem solving.	K2, K3, K4

LEARNING RESOURCES	
Text Books	1. Manickavasagam Pillai, T.K., T. Natarajan and Ganapathy KS – Algebra Vol-I, Viswanathan Publishers and Printers Pvt Ltd., -2008. 2. Manickavasagam Pillai, T.K., T. Natarajan and Ganapathy KS – Algebra Vol-II, Viswanathan Publishers and Printers Pvt Ltd., - 2008. 3. Manichavasagam Pillai, T.K. and S. Narayanan, Trigonometry– Viswanathan Publishers and Printers Pvt. Ltd. 2013.
Reference Books	1. W.S. Burnstine and A.W. Panton, Theory of equations 2. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
Website Link	1. https://youtube.com/playlist?list=PLaGfYrr4-1OtnvYs69PnViPEojW9- bcfN&si=wTjuS3eUffhBUwB1 2. https://www.youtube.com/watch?v=g8VCHoSk5_o&list=PL0o_zxa4K1BVCB8iCVC GOES9pEF6byTMT
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO 1	PSO2	PSO 3
CO1	3	2	3	2	3	2	2	2	1	3	3	3	3
CO2	3	2	3	2	3	2	2	2	1	3	3	3	3
CO3	3	3	3	3	3	2	2	2	1	3	3	3	3
CO4	3	2	3	2	3	2	2	2	1	3	3	3	3
CO5	3	2	3	3	3	2	2	2	1	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Ms. A. Sowmiya	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc., MATHEMATICS LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1C02	**DIFFERENTIAL CALCULUS**	**DSC THEORY**	**I**	**60**	**4**	**Y**	**-**	**3**

Objective:

Strengthen students' understanding of differentiation concepts and their applications in various mathematical contexts. Develop skills in successive and partial differentiation for solving real-life and theoretical problems. Introduce techniques for finding maxima and minima of multivariable functions, including constrained optimization using Lagrange multipliers. Familiarize learners with envelopes, curvature, and related geometrical properties of curves. Enhance problem-solving abilities and logical reasoning in calculus applications.

Unit	Course Content	Knowledge Levels	Sessions
I	**Successive Differentiation**:** Introduction (Review of basic concepts) – The *h* derivative – Standard results – Fractional expressions –Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the *h* derivative of a product. ****SDG 4 – Quality Education.** **(Chapter3: Sections 1.1 to 1.6 and 2.1, Related problems)**	K2, K3	12
II	**Partial Differentiation**:** Partial derivatives – Successive partial derivatives – Function of a function rule – Total differential coefficient – A special case – Implicit Functions. ****SDG 9 – Industry, Innovation, and Infrastructure.** **(Chapter8: Sections 1.1 to 1.5.)**	K2, K3	12
III	**Partial Differentiation (Continued)**:** Homogeneous functions – Partial derivatives of a function of two variables – Maxima and Minima of functions of two variables - Lagrange 's method of undetermined multipliers. ****SDG 8 – Decent Work and Economic Growth.** **(Chapter8: Sections 1.6, 1.7 and Sections 4, 5.)**	K3, K4	12
IV	**Envelope**:** Method of finding the envelope – Another definition of envelope – Envelope of family of curves which are quadratic in the parameter. ****SDG 11 – Sustainable Cities and Communities.** **(Chapter10: Sections 1.1 to 1.4.)**	K3, K4	12
V	**Curvature**:** Definition of Curvature – Circle, Radius and Centre of Curvature –Cartesian formula for the radius of curvature – The coordinates of the centre of curvature- Evolutes and Involutes – Radius of Curvature in Polar Co-ordinates. ****SDG 7 – Affordable and Clean Energy.** **(Chapter10: Sections 2.1 to 2.6)**	K3, K4	12

Course Outcome	**CO1:** Apply the concept of successive differentiation, including Leibnitz's formula, to solve standard and applied problems.	K3
	CO2: Compute and interpret partial derivatives, total differentials, and handle implicit functions effectively.	K3
	CO3: Analyze and determine extrema of functions of two variables using both unconstrained and constrained optimization techniques.	K4
	CO4: Derive and interpret the envelope of a family of curves in different cases.	K4
	CO5: Calculate curvature, radius of curvature, and evolutes/involutes in Cartesian and polar coordinates.	K4

LEARNING RESOURCES	
Text Books	1. S. Narayanan and T.K. Manicavachagom Pillay, Calculus-Volume I, (2004), S. Viswananthan Printers Pvt. Ltd.
Reference Books	1. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002. 2. G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2010. 3. M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007. 4. R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989. 5. T. Apostol, Calculus, Volumes I and II. 6. S. Goldberg, Calculus and mathematical analysis.
Website Link	1. https://youtu.be/tffrrtzUhmw 2. https://youtu.be/crCKULSL1qE
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO 1**	**PSO2**	**PSO 3**
CO1	3	3	2	2	2	1	1	2	1	3	3	2	2
CO2	3	3	3	2	2	1	1	2	1	3	3	3	2
CO3	3	3	3	3	3	2	2	2	1	3	3	3	3
CO4	3	3	2	3	3	2	1	2	2	3	3	2	3
CO5	3	3	3	3	3	2	1	2	2	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Ms. A. Sowmiya	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
S. Ganesh 09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1SE1	**QUANTITATIVE APTITUDE**	**SEC THEORY**	**I**	**30**	**2**	**Y**	**-**	**2**
Objective: The objective of this course is to strengthen the fundamental mathematical and quantitative aptitude skills of students by providing a comprehensive understanding of essential topics from arithmetic, algebra, mensuration, and their practical applications. The course enhances analytical skills by introducing integrating theoretical knowledge with practical problem-solving techniques and it prepares students for competitive examinations, higher academic pursuits, and real-world decision-making situations.								

Unit	Course Content	Knowledge Levels	Sessions
I	**Number System****: Divisibility rules, Simplification, Approximation- Fractions and Decimals. ****SDG 4 – Quality Education.**	K1, K2	6
II	**Average and Percentage**:** Average, Problems on Ages. Percentage and its applications. ****SDG 8 – Decent Work and Economic Growth.**	K1, K2, K3	6
III	**Profit & Loss**:** Profit and Loss, Discount- Simple Interest and Compound Interest. ****SDG 1 – No Poverty.**	K2, K3	6
IV	**Time and Work**:** Time and Work, Pipes and Cisterns. ****SDG 9 – Industry, Innovation, and Infrastructure.**	K2, K3	6
V	**Time & Distance**:** Time Speed and Distance (including Boats & Streams, Trains). ****SDG 11 – Sustainable Cities and Communities.**	K3, K4	6

Course Outcome	**CO1:** Apply number system concepts to solve numerical problems	K1, K2
	CO2: Calculate average, percentage and solve problems	K1, K2, K3
	CO3: Solve profit ,loss ,discount and interest problems	K2, K3
	CO4: Solve time and work problems including pipes and	K2, K3
	CO5: Evaluate time and distance problems including boats, streams,and trains.	K3, K4

LEARNING RESOURCES	
Text Books	1. R.S. Aggarwal, Quantitative Aptitude – For Competitive Examinations (Full Solved), S. Chand & Company Pvt. Ltd., Reprint 2017.
Reference Books	1. Abhijit Guha, Quantitative Aptitude, Tata McGraw Hill Publishing Company Limited, New Delhi, 2005.

Website Link	1. https://rambagali.wordpress.com/wp-content/uploads/2017/05/quantitative-aptitude-ramandeep-singh.pdf 2. https://www.youtube.com/watch?v=qwh3VH5rnGA&list=PLmdFyQYShrjfX3oGYqz3Zc2BBFNuPsq9r&pp=0gcJCWUEOCosWNin
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	2	1	2	1	1	2	1	1	3	2	2
CO2	3	2	2	1	2	1	1	2	1	2	3	2	2
CO3	3	2	2	2	3	1	1	2	2	2	3	2	2
CO4	3	2	2	2	3	2	1	2	2	2	3	2	2
CO5	3	2	2	2	3	2	1	2	2	2	3	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Bhuvaneswari	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1SE2	**LOGICAL SKILLS & REASONING**	**SEC THEORY**	**I**	**30**	**2**	**Y**	**-**	**2**

Objective:

This course is designed to enhance students' logical, analytical and quantitative reasoning skills through practical problem-solving techniques. The course also trains learners in logical and analytical reasoning, including series, blood relations, direction tests, Venn diagrams, syllogisms, and statement-based reasoning. By integrating aptitude with reasoning, the course equips students to face competitive examinations, professional challenges, and real-life decision-making with confidence.

Unit	Course Content	Knowledge Levels	Sessions
I	**Game Skill**:** Races-Games of Skill-Calender - Clocks. ****SDG 3 – Good Health and Well-Being.**	K2, K3	6
II	**Marketing Aptitude**:** Stocks & Shares-Permutations & Combinations. ****SDG 8 – Decent Work and Economic Growth.**	K2, K3	6
III	**Banker's Skill**:** Probability- True Discount-Banker's Discount. ****SDG 1 – No Poverty.**	K2, K3	6
IV	**Logical Reasoning**:** Number series -Letter series-Blood Relation-Direction sense test. ****SDG 4 – Quality Education.**	K2, K3	6
V	**Analytical Reasoning**:** Venn Diagram-Syllogism-Statement Assumptions & Conclusions. ****SDG 16 – Peace, Justice, and Strong Institutions.**	K2, K3	6

Course Outcome	**CO1:** Solve problems on races, games of skill, calendar, and clocks to enhance speed and accuracy..	K2, K3
	CO2: Apply marketing aptitude in stocks, shares, and permutations & combinations.	K2, K3
	CO3: Solve Banker's Skill problems: probability, true discount, banker's discount.	K2, K3
	CO4: Develop logical reasoning through series, blood relation, and direction tests.	K2, K3
	CO5: Analyze and interpret analytical reasoning: Venn diagrams, syllogism, statements & assumptions	K2, K3

LEARNING RESOURCES	
Text Books	1. R.S. Aggarwal, Quantitative Aptitude – For Competitive Examinations (Fully Solved), S. Chand & Company Pvt. Ltd., Reprint 2017. 2. R.S. Aggarwal, A Modern Approach to Verbal and Non-Verbal Reasoning, S. Chand Publishing, Latest Edition.
Reference Books	1. Abhijit Guha, Quantitative Aptitude, Tata McGraw Hill Publishing Company Limited, New Delhi, 2005. 2. MK Pandey – Analytical Reasoning, BSC Publishing
Website link	1. https://www.indiabix.com/aptitude 2. https://www.indiabix.com/verbal-reasoning 3. https://www.indiabix.com/logical-reasoning
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO 3
CO1	3	2	2	2	3	1	1	2	1	2	3	2	2
CO2	3	2	2	2	3	1	1	2	1	2	3	2	2
CO3	3	2	2	2	3	1	1	2	2	2	3	2	2
CO4	3	2	2	1	2	2	1	2	1	2	3	2	2
CO5	3	2	2	1	2	2	1	2	1	2	3	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Bhuvaneswari	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc., MATHEMATICS LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2C03	**INTEGRAL CALCULUS**	**DSC THEORY**	**II**	**60**	**4**	**Y**	**-**	**3**

Objectives:

This subjects helps to Understand and apply reduction formulae and Bernoulli's formula to evaluate complex integrals involving algebraic, trigonometric, and logarithmic functions.

Acquire the skill to compute double and triple integrals, including changes of order and transformation to polar or other coordinate systems. Apply multiple integrals to solve real-world problems involving volume, surface area, and change of variables using the Jacobian.

Explore and apply the properties and interrelation of Beta and Gamma functions to evaluate definite integrals. Use integral calculus techniques for geometric and physical applications, including centroid, Centre of mass, and numerical integration methods.

Unit	Course Content	Knowledge Levels	Sessions
I	**Reduction formulae**:**Types, integration of product of powers of algebraic and trigonometric functions, integration of product of powers of algebraic and logarithmic functions - Bernoulli 's formula. ****SDG 4 – Quality Education.** **(Chapter1: Sections - 13 & 14)**	K3, K4	12
II	**Multiple Integrals**:** Definition of double integrals - evaluation of double integrals – double integrals in polar coordinates - Change of order of integration. **** SDG 9 – Industry, Innovation, and Infrastructure.** **(Chapter5: Sections - 1, 2.1, 2.2 & 3.1)**	K3	12
III	**Triple integrals****: Applications of multiple integrals - volumes of solids of revolution - areas of curved surfaces–change of variables - Jacobian. **** SDG 11 – Sustainable Cities and Communities.** **(Chapter5: Sections - 5.1, 5.2, 5.3, 6.1, 7 & Chapter6: 1.1, 1.2)**	K3, K4	12
IV	**Beta and Gamma functions**:** Infinite integral - definitions– recurrence formula of Gamma functions – properties of Beta and Gamma functions- relation between Beta and Gamma functions - Applications. **** SDG 8 – Decent Work and Economic Growth.** **(Chapter7: Sections - 2.1, 2.2, 2.3, 3, 4 & 6.)**	K2, K3	12

V	**Geometric Applications of Integration**:** Areas under plane curves: Cartesian coordinates-Area of a closed curve – Areas in polar coordinates-Trapezoidal rule – Simpson 's rule and Physical Applications of Integral calculus – Centroid – Centre of mass of an arc - Centre of mass of a plane area- Centroid of a solid of revolution – Centroid of a surface of revolution. ****SDG 7 – Affordable and Clean Energy.** **(Chapter2: Sections - 1.1 - 1.4, 2.1,2.2 and Chapter3: Sections - 1.1 to 1.5 Simple Applications)**	K3, K4, K5	15

Course Outcome	**CO1:** Apply reduction formulae and Bernoulli's formula to solve integrals involving products of powers of algebraic, trigonometric, and logarithmic functions.	K3, K4
	CO2: Evaluate double integrals in Cartesian and polar coordinates and change the order of integration.	K3
	CO3: Solve triple integrals and apply them to compute volumes, curved surface areas, and use Jacobian for change of variables.	K3, K4
	CO4: Define, prove recurrence relations, and apply properties of Beta and Gamma functions in solving integrals.	K2, K3
	CO5: Apply integration to geometric and physical contexts including areas, centroids, centres of mass, and use numerical integration techniques.	K3, K4, K5

LEARNING RESOURCES	
Text Books	1. Narayanan S and Manicavachagom Pillay T.K. Calculus-Volume II, (2006), S. Viswananthan Printers Pvt. Ltd.
Reference Books	1. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002. 2. G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2007. 3. D. Chatterjee, Integral Calculus and Differential Equations, Tata-McGraw Hill Publishing Company Ltd. 4. P. Dyke, An Introduction to Laplace Transforms and Fourier Series, Springer Undergraduate Mathematics Series, 2001 (second edition)..
Website Link	1. https://www.youtube.com/watch?v=cCdj0uy0v80&list=PL0o_zxa4K1BXDMB9u4YU7CGq1PDNIXn7r 2. https://youtu.be/w_KiHgultbM?si=aXnod1Ana_032-Jd
L – Lecture T – Tutorial P – Practical C – Credit	

Mapping of CO's with PO's and PSO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO 3
CO1	3	2	3	2	2	1	1	2	1	2	3	2	2
CO2	3	2	3	2	3	1	1	2	1	3	3	3	3
CO3	3	2	3	3	3	2	1	2	2	3	3	3	3
CO4	3	2	2	2	2	1	1	2	1	2	3	2	2
CO5	3	3	3	3	3	2	2	3	2	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Ms. A. Sowmiya	**Verified By HOD: Dr. B.K. Jaleesha.**
Checked By CDC: Mrs.C. Magila	**Approved By:Dr. J. Caroline Rose, Principal.**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc., MATHEMATICS LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2C04	**ANALYTICAL GEOMETRY 2D & 3D**	**DSC THEORY**	**II**	**60**	**4**	**Y**	**-**	**4**

Objective:

1. Develop the ability to solve two- and three-dimensional geometry problems using analytical methods.
2. Enable students to understand and apply the concepts of pole, polar, conjugacy, diameters, and polar coordinates to various conic sections.
3. Equip learners with the skills to handle problems related to planes, lines, spheres, and their intersections in three dimensions.
4. Foster spatial visualization and analytical reasoning in geometric problem-solving.

Unit	Course Content	Knowledge Levels	Sessions
I	**Pole, Polar & Conjugates**:** Points and conjugate lines – diameters – conjugate diameters of an ellipse - semi diameters- conjugate diameters of hyperbola. ****SDG 4 – Quality Education.** **(Book1: Chapter: 9, 10)**	K2, K3	12
II	**Polar Coordinates & Conics**:** General polar equation of straight line – Polar equation of a circle given a diameter, Equation of a straight line, circle, conic – Equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola. ****SDG 9 – Industry, Innovation, and Infrastructure.** **(Book2: Chapter: 9)**	K3, K4	12
III	**System of Planes**:** Length of the perpendicular– Orthogonal projection. ****SDG 11 – Sustainable Cities and Communities.** **(Book3: Chapter2: Sections - 2.5,2.7,2.9)**	K3, K4	12
IV	**Representation of Line & Planes**:** Angle between a line and a plane – co–planar lines–shortest distance between two skew lines –length of the perpendicular– intersection of three planes. ****SDG 7 – Affordable and Clean Energy.** **(Book3: Chapter3: Sections - 3.1, 3.2, 3.4, 3.6, 3.7, 3.8)**	K3, K4, K5	12
V	**Sphere Geometry**:** Equation of a sphere-general equation-section of a sphere by a plane-equation of the circle- tangent plane- angle of intersection of two spheres- condition for the orthogonality- radical plane. ****SDG 13 – Climate Action.** **(Book3: Chapter6: Sections - 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8)**	K3, K4, K5	12

Course Outcome	**CO1:** Understand and apply the concepts of pole, polar, conjugate points, conjugate diameters of conics.	K2, K3
	CO2: Formulate and solve problems using polar coordinates for straight lines, circles, conics, and asymptotes.	K3, K4
	CO3: Analyze and compute distances, orthogonal projections, and relationships between planes.	K3, K4
	CO4: Determine angles, coplanarity, shortest distances, and intersections involving lines and planes in 3D geometry.	K3, K4, K5
	CO5: Derive and interpret equations of spheres, tangent planes, intersections, orthogonality conditions, and radical planes.	K3, K4, K5

LEARNING RESOURCES	
Text Books	1. Vittal P.R. and Malini V, Algebra, Analytical Geometry& Trigonometry, Margam Publications, India.2018. 2. Manicavachagom Pillay T.K.and Natarajan T, A Text book of Analytical Geometry Part I-Two Dimensions, Divya Subramanian for Ananda Book Depot. 1996. 3. Shanti Narayan and Mittal P.K., Analytical Solid Geometry, S Chand Publishing, 2021.
Reference Books	1 S. L. Loney, Elements of Analytical Geometry of Three Dimensions, Arihant Publications (India) Pvt. Ltd., Meerut.. 2 P.K. Jain & Khalil Ahmad – Analytical Geometry of Three Dimensions, New Age International (P) Limited, New Delhi, 2019 Edition. 3 Bansi Lal – New Analytical Solid Geometry, Pragati Prakashan, Meerut, Revised Edition 2018.
Website Link	https://www.youtube.com/watch?v=vYnK_bsp3tE&list=PLO1y6V1SXjjNEAUk5pTXYrUgVe0J9WZJi
L – Lecture T – Tutorial P – Practical C – Credit	

Mapping of CO's with PO's and PSO's

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	2	1	1	2	1	2	3	2	2
CO2	3	2	3	3	3	1	1	2	1	3	3	3	3
CO3	3	2	3	3	3	2	2	2	2	3	3	3	3
CO4	3	2	3	3	3	2	2	2	2	3	3	3	3
CO5	3	2	3	3	3	2	2	2	2	3	3	3	3

Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Ms. A. Sowmiya	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By:Dr. J. CarolineRose, Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2SP1	**FINANCIAL DATA ANALYSIS WITH EXCEL**	**SEC PRACTICAL**	**II**	**45**	**-**	**Y**	**3**	**2**

Objective:

This course equips students with practical skills to apply financial mathematics concepts using Microsoft Excel for real-world business and investment problems. It also develops analytical skills through spreadsheet-based modeling in areas such as interest calculations, investment appraisal, bond valuation, and basic statistics.

Unit	List of Programs	Knowledge Levels	Sessions
1	**Time Value Basics****: Compute Growth and Depreciation using Excel percentage formulas. ****SDG 1 – No Poverty.**	K2	3
2	**Rate Conversions****: Transform Annual, Monthly, and Daily Rates using Excel built-in functions. ****SDG 3 – Good Health and Well-being.**	K2	3
3	**Exponential Models****: Apply Growth and Decay (continuous compounding) formulas in Excel. ****SDG 7 – Affordable and Clean Energy.**	K3	3
4	**Investment Planning Tools****: Use Excel functions PV, FV, RATE, NPER, PMT for savings and loans. ****SDG 5 – Gender Equality.**	K3	3
5	**Project Evaluation Metrics****: Apply NPV, IRR, and MIRR in Excel for project appraisal. ****SDG 10 – Reduced Inequalities.**	K3	3
6	**Irregular Cash Flow Models****: Use XNPV and XIRR for non-periodic investments. ****SDG 16 – Peace, Justice and Strong Institutions.**	K3	3
7	**Cash Flow Visualization****: Build Time-based Cash Flow Charts and Schedules in Excel. ****SDG 13 – Climate Action.**	K4	3
8	**Decision Support Tools****: Conduct What-If and Sensitivity Analysis with Data Tables and Scenario Manager. ****SDG 9 – Industry, Innovation and Infrastructure.**	K4	3
9	**Debt Instrument Valuation****: Apply PRICE, YIELD, and PV formulas for securities. ****SDG 17 – Partnerships for the Goals.**	K3	3
10	**Return Estimation Models****: Calculate Yield to Maturity (YTM) with Excel functions. ****SDG 2 – Zero Hunger.**	K3	3

11	**Repayment Planning****: Construct Amortization Schedules and EMI breakdowns in Excel. ****SDG 8 – Decent Work and Economic Growth**	K4	3
12	**Asset Depreciation Analysis****:** Apply Straight-Line and Declining Balance methods in Excel. *****SDG 6 – Clean Water and Sanitation.**	K3	3
13	**Foreign Exchange Tools****: Create Conversion Tables using Spot and Forward Exchange Rates. *****SDG 15 – Life on Land.**	K3	3
14	**Profit Arbitrage Models****:** Design Excel sheets to capture arbitrage opportunities. *****SDG 14 – Life Below Water.**	K4	3
15	**Lease Evaluation Models****: Develop Lease Cash Flow Tables and NPV-based assessments. *****SDG 11 – Sustainable Cities and Communities.**	K4	3

Course Outcome	**CO1:** Apply Excel functions to compute financial values such as interest, present value, and future value.	K2, K3
	CO2: Analyze investment decisions using NPV, IRR, and sensitivity analysis in Excel.	K3, K4
	CO3: Prepare amortization schedules and depreciation models using spreadsheet tools.	K3, K4
	CO4: Perform currency conversion and lease evaluation using Excel-based financial models.	K3, K4, K5
	CO5: Utilize Excel for statistical analysis and basic financial forecasting.	K3, K4, K5

Learning Resources	
Text Books	1. Alastair L. Day, Mastering Financial Mathematics in Microsoft Excel – A Practical Guide for Business Calculations, 2nd Edition, Pearson Education.
Reference Books	1. Chandan Sengupta, Financial Modeling Using Excel and VBA, Wiley India. 2. R. S. Bhardwaj, Mathematics of Finance, Ane Books Pvt. Ltd. 3. Ravi M. Kishore, Financial Management with Excel Applications, Taxmann Publications.
Website Link	1. https://www.exceltutorial.net/financial-functions/ 2. https://www.exceldemy.com/learn-excel/function/categories/financial/
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	3	2	2	1	1	2	1	3	2	3	2
CO2	3	2	3	3	3	2	1	2	2	3	3	3	3
CO3	3	2	3	3	3	2	1	2	2	3	3	3	3
CO4	3	2	3	3	3	2	1	3	2	3	3	3	3
CO5	3	2	3	3	3	2	1	3	2	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Bhuvaneswari	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By:Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2SP2	**SPREADSHEET TECHNIQUES IN BUSINESS MATHEMATICS**	**SEC PRACTICAL**	**II**	**45**	**-**	**Y**	**3**	**2**

Objective:

Develop the ability to formulate and analyze real-world problems using mathematical modeling techniques, apply Excel tools for visualization and computation, and solve optimization, simulation, and dynamical system models for practical decision-making.

S.No	List of Programs	Knowledge Levels	Sessions
1	**Introduction to Spreadsheet Tools****:Entering data, editing, formatting cells, using formulas and cell references (relative, absolute, mixed). ****SDG4 – Quality Education**	K2	4
2	**Simple and Compound Interest****: Calculation using formulas and functions; generating summary tables for various rates and time periods. ****SDG8 – Decent Work and Economic Growth**	K3	4
3	**Depreciation Calculation****: Using Straight Line and Diminishing Balance methods ****SDG9 – Industry, Innovation and Infrastructure**	K3	5
4	**Annuities and Time Value of Money****:** Applying PV, FV, PMT, NPER, RATE functions ****SDG1 – No Poverty**	K3	4
5	**Break-Even Analysis****: Calculating cost, revenue, and profit; identifying break-even point and creating a chart. ****SDG 12 – Responsible Consumption and Production**	K4	4
6	**Payroll Preparation****:** Computing gross pay, deductions (PF, tax), and net pay using IF functions and data validation. ****SDG 8 – Decent Work and Economic Growth**	K3	4
7	**Sales and Commission Report**** **:** Preparing a sales statement with commission slabs using nested IF and conditional formatting. ****SDG 10 – Reduced Inequalities**	K4	4
8	**Descriptive Statistics****:** Finding mean, median, mode, variance, standard deviation, and correlation. ****SDG 17 – Partnerships for the Goals**	K3	4
9	**Data Visualization**** **:** Creating and formatting business charts (bar, pie, line, combo) with labeled results. ****SDG11-Sustainable Cities and Communities**	K3	4
10	**Inventory Management****:** Preparing a stock ledger, computing reorder level, EOQ, and inventory cost. ****SDG 12 – Responsible Consumption and Production**	K4	4

Course Outcome	**CO1:**Use spreadsheet tools for data entry, formatting, and cell references.	K2
	CO2: Apply financial and mathematical functions for business calculations.	K3
	CO3: Analyze payroll, sales, and inventory data using formulas and functions.	K4
	CO4: Visualize and interpret data through charts and break-even analysis.	K4
	CO5: Develop models to optimize business operations and resource management.	K5

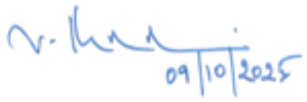
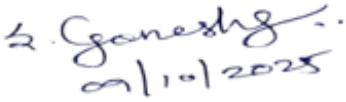
Learning Resources	
Text Books	1. S.K. Singh, Business Mathematics and Statistics using Excel, Sultan Chand & Sons.
Reference Books	1. R. Narayanasamy , Business Applications of MS Excel, PHI Learning Pvt. Ltd.
Website Link	1. https://support.microsoft.com/en-us/office/use-excel-as-your-calculator-a1abc057-ed11-443a-a635-68216555ad0a?utm= 2. https://www.open.edu/openlearn/science-maths-technology/data-analysis-visualisations-excel/content-section-3?utm
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	**3**	**3**	**1**	**1**	**1**	**1**	**2**	**1**	**3**	**1**	**1**	**1**
CO2	**3**	**2**	**3**	**3**	**1**	**1**	**1**	**2**	**1**	**3**	**1**	**1**	**1**
CO3	**3**	**2**	**3**	**3**	**1**	**1**	**1**	**2**	**1**	**3**	**2**	**1**	**1**
CO4	**3**	**3**	**3**	**3**	**1**	**1**	**1**	**2**	**1**	**3**	**2**	**1**	**1**
CO5	**3**	**1**	**3**	**1**	**3**	**1**	**1**	**2**	**1**	**3**	**3**	**1**	**1**

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Bhuvaneswari	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By:Dr. J. Caroline Rose** **Principal**

 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	 **Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. MATHEMATICS LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1NM1	**MATHEMATICS FOR COMPETITIVE EXAMINATIONS - I**	**NME / SEC THEORY**	**I**	**30**	**2**	**Y**	**-**	**2**

Objective:

1. To develop a strong foundation in quantitative aptitude, enabling students to perform well in competitive examinations.
2. To enhance problem-solving and logical reasoning abilities through mathematical concepts.
3. To train students in applying mathematical techniques to real-life and competitive scenarios effectively.
4. To cultivate accuracy and speed in solving aptitude-based questions commonly asked in entrance exams and interviews.
5. To build confidence in tackling numerical, analytical, and logical reasoning sections of various tests.

Unit	Course Content	Knowledge Levels	Sessions
I	**Number System**:** Number System - H.C.F and L.C.M of Numbers. ****SDG 4 – Quality Education.**	K1, K2, K3	6
II	**Simplifications****: Simplifications - Square Roots and Cube Roots. ****SDG 9 – Industry, Innovation, and Infrastructure.**	K1, K2, K3	6
III	**Percentage****: Percentage - Average - Ratio and Proportion. ****SDG 8 – Decent Work and Economic Growth.**	K1, K2, K3, K4	6
IV	**Profit and Loss**:** Profit and Loss – Problems on Ages. ****SDG 1 – No Poverty**	K2, K3, K4	6
V	**Time and Work****: Time and Work – Speed and Distance ****SDG 11 – Sustainable Cities and Communities.**	K2, K3, K4	6

Course Outcome	**CO1:**Understand and apply the concepts of H.C.F. and L.C.M. in solving real-life and competitive exam problems.	K1, K2, K3
	CO2: Solve simplifications and compute square roots and cube roots effectively.	K1, K2, K3
	CO3:Demonstrate proficiency in percentage, average, and ratio & proportion problems.	K1, K2, K3, K4
	CO4: Analyze and solve problems related to profit & loss and age-based scenarios.	K2, K3, K4
	CO5: Apply logical reasoning to solve time & work and boats & streams problems efficiently.	K2, K3, K4

Learning resources	
Text Books	1. R.S. Aggarwal, Quantitative Aptitude – For Competitive Examinations (Fully Solved), S. Chand & Company Pvt. Ltd., Reprint 2017.
Reference Books	1. Abhijit Guha, Quantitative Aptitude, Tata McGraw Hill Publishing Company Limited, New Delhi, 2005.
Website Link	1. https://rambagali.wordpress.com/wp-content/uploads/2017/05/quantitative-aptitude-ramandeep-singh.pdf 2. https://www.youtube.com/watch?v=qwh3VH5rnGA&list=PLmdFyQYShrjfX3oGYqz3Zc2BBFNuPsq9r&pp=0gcJCWUEOCosWNin
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO 1	PSO2	PSO3
CO1	3	2	2	2	2	1	1	2	2	2	3	2	2
CO2	3	3	2	2	2	1	1	2	1	2	3	3	2
CO3	3	3	3	3	2	1	1	2	2	2	3	3	2
CO4	3	3	3	3	2	1	1	2	2	2	3	2	2
CO5	3	2	3	3	3	2	1	2	2	2	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Ms. A. Sowmiya	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

Dr. V. Muthulakshmi,
Professor, Department of Mathematics,
Periyar University, Salem- 11.

Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.
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School of Sciences, Christ (Deemed to be University) , Bengaluru.

Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.
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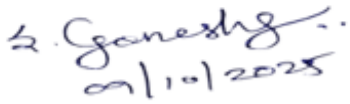

Mr. S. Ganesh Gurubaran, M.S (IT & Management)
Senior Tech Analyst, HDFC Bank, Old Airport Road,
Bengaluru.

Ms. B. Dilshad M.Sc.
Assistant Manager, State Bank of India, Mangalore.

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1NM2	**MATHEMATICS FOR EVERYDAY LIFE**	**NME THEORY**	**I**	**30**	**2**	**Y**	**-**	**2**

Objective:

1. To introduce the essential mathematical skills used in everyday activities.
2. To enhance logical and numerical reasoning in real-life contexts.
3. To develop financial literacy including budgeting, banking, and taxation.
4. To promote mathematical thinking for informed personal and societal decisions.
5. To make mathematics enjoyable and practically relevant for all learners.

Unit	Course Content	Knowledge Levels	Sessions
I	**Everyday Numbers & Estimation**:** Types of numbers used in daily life - Estimating quantities and rounding off - Basic puzzles and logical reasoning. ****SDG 4 – Quality Education.** **Text Ref: Chapter 1 of "Math for Life" by Jeffrey Bennett**	K1, K2	6
II	**Percentages, Profit & Discounts**:** Percentages in bills, tips, taxes, mark-ups - Real-life examples of profit/loss - best buy comparisons. ****SDG 12 – Responsible Consumption and Production.** **Text Ref: "Everyday Mathematics" – Consumer Math Chapter**	K2, K3	6
III	**Interest and Banking Made Easy**:** Simple and compound interest (non-formulaic approach) - ATM slips, passbooks, credit card basics - Understanding EMI, loans. ****SDG 8 – Decent Work and Economic Growth** **Text Ref: "Math for Consumers" by R. Taggart – Part I**	K2, K3	6
IV	**Measurements in Daily Life**:** Common units (metric & imperial) - Cooking, health, home usage measurements - Time, temperature, length, weight, volume. ****SDG 3 – Good Health and Well-Being** **Text Ref: NCERT Basic Mathematics – Practical Measurement Sections.**	K2, K3	6
V	**Budgeting, Bills, and Smart Spending**:** Creating monthly budgets - Reading and interpreting bills (electricity, water, mobile) - Planning travel and grocery expenses. ****SDG 1 – No Poverty** **Text Ref: Khan Academy: Personal Finance Basics.**	K3, K4	6

Course Outcome	**CO1:** Understand basic numeracy and estimation skills relevant to daily tasks	K1, K2
	CO2: Apply mathematical reasoning to shopping, budgeting, and money handling	K2, K3
	CO3: Interpret interest calculations, loan terms, and basic banking operations	K2, K3
	CO4: Use appropriate units for real-world measurements and convert between units	K2, K3
	CO5: Develop financial literacy to manage income, bills, and personal budgets	K3, K4

LEARNING RESOURCES	
Text Books	1. Jeffrey Bennett, Math for Life: Crucial Ideas You Didn't Learn in School, Roberts & Co., 2012. 2. Robert A. Taggart, Mathematics for Consumers, Glencoe/McGraw-Hill, Latest Edition.
Reference Books	1.R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S. Chand. NCERT Basic Mathematics Textbooks (Class 6 to 10 – for foundational clarity) 2. Bell et al., Everyday Mathematics, University of Chicago School Mathematics Project.
Website Link	1. https://youtu.be/U3owCzpYkMw 2. https://youtu.be/D1cI4FE0mWw *3.* https://youtu.be/QdBKa_1tedg
L -Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	1	1	2	2	2	2	3	2	1
CO2	3	2	3	2	2	1	2	2	3	2	3	3	2
CO3	2	3	3	2	2	1	2	2	2	2	3	3	2
CO4	2	2	2	1	1	1	1	2	3	2	2	2	1
CO5	3	3	3	2	2	2	3	3	3	2	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Ms. A. Sowmiya	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
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B.Sc. MATHEMATICS LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2NM1	**MATHEMATICS FOR COMPETITIVE EXAMINATIONS - II**	**NME THEORY**	**II**	**30**	**2**	**Y**	**-**	**2**

Objective:

1. To develop problem-solving skills required for competitive examinations.
2. To strengthen the understanding of fundamental mathematical concepts applied in real-life situations.
3. To enhance speed and accuracy in solving aptitude-based questions.
4. To enable learners to apply logical reasoning and quantitative techniques effectively.

Unit	Course Content	Knowledge Levels	Sessions
I	**Problems on Numbers****: Problems on Numbers. ****SDG 4 – Quality Education.**	K3	6
II	**Partnership:** Partnership – Chain Rule. ****SDG 8 – Decent Work and Economic Growth.**	K4	6
III	**Logarithms**:** Logarithms – Surds and Indices. ****SDG 9 – Industry, Innovation, and Infrastructure.**	K3	6
IV	**Pipes & Cistern**:** Pipes & Cistern – Time & Distance. ****SDG 6 – Clean Water and Sanitation.**	K4	6
V	**Permutations and Combinations**:** Permutations and Combinations – Probability. ****SDG 12 – Responsible Consumption and Production.**	K5	6

Course Outcome	**CO1:**Solve problems related to numbers and apply divisibility rules efficiently.	K3
	CO2: Analyze and solve partnership and chain rule problems using logical reasoning.	K4
	CO3: Simplify expressions using logarithms, surds, and indices for quick problem-solving.	K3
	CO4: Apply concepts of time & distance and pipes & cisterns to real-life aptitude scenarios.	K4
	CO5: Demonstrate understanding of counting principles to solve permutation, combination, and probability problems.	K5

LEARNING RESOURCES	
Text Books	1. R.S. Aggarwal, Quantitative Aptitude – For Competitive Examinations (Fully Solved), S. Chand & Company Pvt. Ltd., Reprint 2017.
Reference Books	1. R.S. Aggarwal, Quantitative Aptitude – For Competitive Examinations (Fully Solved), S. Chand & Company Pvt. Ltd., Reprint 2017. 2. Abhijit Guha, Quantitative Aptitude, Tata McGraw Hill Publishing Company Limited, New Delhi, 2005.
Website Link	1. https://rambagali.wordpress.com/wp-content/uploads/2017/05/quantitative-aptitude- ramandeep-singh.pdf
L –Lecture T – Tutorial P – Practical C – Credit	

Mapping of CO's with PO's and PSO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	2	1	2	1	1	2	1	2	3	2	2
CO2	3	2	2	2	2	2	1	2	1	2	3	2	2
CO3	3	1	3	1	2	1	1	2	1	2	3	3	2
CO4	3	2	3	2	3	1	1	2	1	3	3	3	3
CO5	3	2	3	2	3	2	1	2	1	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Ms. A. Sowmiya	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2NM2	**RECREATIONAL MATHEMATICS**	**SEC/NME THEORY**	**II**	**30**	**2**	**Y**	**-**	**2**

Objective:

This course introduces students to recreational mathematics through puzzles, games, and curiosities that enhance logical reasoning, creativity, and problem-solving. Covering number theory, geometry, combinatorics, and logic in an accessible way, it fosters critical thinking, mathematical communication, and appreciation of the subject's beauty, history, and real-life connections, especially for non-mathematics backgrounds.

Unit	Course Content	Knowledge Levels	Sessions
I	**Number Puzzles and Recreations**:** Types of number puzzles – Magic squares, Latin squares, Sudoku basics - Cryptarithms and alphabetic - Divisibility tests and digital roots - Recreational number properties (palindromes, perfect numbers, amicable numbers). ****SDG 4 – Quality Education.** **Chapter 1: Number Puzzles (Sections 1.1–1.4)** **Chapter 2: Magic Squares & Latin Squares (Sections 2.1–2.3)**	K3	6
II	**Mathematical Games and Strategies:** Introduction to strategy games – Nim, Towers of Hanoi, matchstick games - Winning strategies and game trees - Parity and invariants in games. ****SDG 16 – Peace, Justice, and Strong Institutions.** **Chapter 3: Games and Puzzles (Sections 3.1–3.4)**	K3	6
III	**Recreational Geometry**:** Geometrical dissections and tangrams - Optical illusions in geometry - Geometrical puzzles – shortest paths, matchstick geometry, tiling problems. ****SDG 11 – Sustainable Cities and Communities.** **Chapter 2: Geometrical Puzzles (Sections 2.1–2.3)** **Chapter 4: Dissections and Tiling (Sections 4.1–4.2)**	K4	6
IV	**Combinatorial and Logical Recreations**:** Permutations and combinations in puzzles - Seating and arrangement problems - Logical deduction puzzles (truth-tellers and liars). Selected Puzzles: Combinatorics & Logic. ****SDG 9 – Industry, Innovation, and Infrastructure.** **Selected Puzzles: Combinatorics & Logic. (pp. 45–78)**	K4	6
V	**Famous Problems and Mathematical Curiosities:** Konigsberg bridges and graph theory introduction - Four-color problem	K2	6

	(overview) - Fibonacci numbers and the golden ratio in nature and art - Fun with prime numbers and patterns. ****SDG 15 – Life on Land.** **Chapter 5: Famous Mathematical Problems (Sections 5.1–5.4)**		

Course Outcome	**CO1:** Apply logical reasoning and number theory concepts to solve numerical puzzles.	K3
	CO2: Use game strategies and combinatorial reasoning in solving recreational problems	K3
	CO3: Visualize and solve geometrical puzzles and problems using creative approaches	K4
	CO4: Develop systematic logical deduction skills through challenging puzzles.	K4
	CO5: Appreciate historical and famous problems, identifying patterns and mathematical beauty.	K2

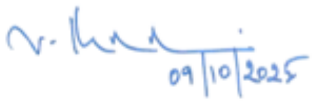
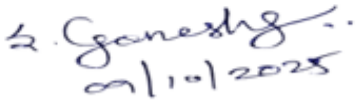
LEARNING RESOURCES	
Text Books	1. V. V. Katre & V. S. Chandrasekaran, Recreational Mathematics, Narosa Publishing House, 2018. 2. T. Sundararajan, Fun with Geometry, Universities Press, 2016.
Reference Books	1. Shakuntala Devi, Puzzles to Puzzle You, Orient Paperbacks, 2015. 2. Jagjit Singh, Mathematical Games and Puzzles, Orient Black Swan, 2014. 3. Rouse Ball & H. S. M. Coxeter, Mathematical Recreations and Essays, Macmillan India, 2010.
Website Link	1. https://www.youtube.com/watch?v=0lL7Xs0B5PI 2. https://www.youtube.com/watch?v=Wym6xreCa2k&t=2s
L – Lecture T – Tutorial P – Practical C – Credit	

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	2	1	1	2	1	2	3	2	2
CO2	3	2	2	2	3	2	1	2	1	2	3	3	3
CO3	3	3	2	3	3	2	1	2	2	3	3	3	3
CO4	3	3	2	2	3	2	1	2	1	3	3	3	3
CO5	2	3	2	2	2	1	1	2	1	2	2	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. A. Sowmiya.	**Verified By HOD: Dr. B. K. Jaleesha.**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	 **Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1A01	**LINEAR ALGEBRA-I For B.Sc. (CS) / B.C.A / B.Sc. (DS)**	**GSE THEORY**	**I**	**75**	**5**	**Y**	**-**	**4**

Objective:

To introduce the foundational concepts of matrices and linear systems. To understand the algebraic structure of vector spaces. To apply matrix operations to solve systems of linear equations.

Unit	Course Content	Knowledge Levels	Sessions
I	**Vector Spaces and Linear Equations**:** Vector spaces, subspaces -Linear combinations, linear span-Solutions of linear equations-Homogeneous and non-homogeneous systems- Elementary Matrices-Row reduced echelon form. ****SDG 4 – Quality Education.** **[Textbook.1 Chapter 1 (Sec 1.2 to 1.4), Chapter 2.7, Chapter 3.1]**	K1, K2	15
II	**Matrices and Systems**:** Types of matrices-Matrix operations, transpose-Determinants, inverse of matrices-Elementary row operations. ****SDG 9 – Industry, Innovation, and Infrastructure. [Text book 2. Chapter-5 (Page Nos: 5.1–5.17)].**	K2, K3	15
III	**Linear Dependence & Bases**:** Linear dependence & independence-Basis and dimension-Rank of a matrix. ****SDG 8 – Decent Work and Economic Growth. [Text book. 1 Chapter 1 (Sec 1.5, .6)]**	K2, K3	15
IV	**Binomial Problems**:** Partial fraction resolution-Binomial theorem (positive and negative integral indices)-Applications in simple algebraic problems. ****SDG 12 – Responsible Consumption and Production. [Text book 2. Chapters 1 and 2] .**	K3, K4	15
V	**Algebraic Functions**:** Standard expansions of exponential and logarithmic functions-Applications in algebra and CS logic. ****SDG 13 – Climate Action.** **[Textbook 2 Chapter 3 and 4]**	K3, K4	15

Course Outcome	**CO1:**Understand the structure and properties of vector spaces and subspaces.	K1, K2
	CO2: Apply matrix operations and properties in solving systems of linear equations.	K2, K3
	CO3: Analyze the concepts of linear dependence, basis, and dimension of vector spaces.	K2, K3
	CO4: Solve algebraic problems using partial fractions and binomial expansion techniques.	K3, K4
	CO5: Use standard series expansions of exponential and logarithmic functions in computation.	K3, K4

LEARNING RESOURCES	
Text Books	1. Linear algebra- Stephen H. Friedberg, Arnold J Insel and awrence E Spence, 5 TH Edition (2018) Pearson. 2. Dr. P.R. Vittal, Allied Mathematics, Margham publication, chennai-17
Reference Books	1. Seymour Lipschutz, Schaum's Outline of Linear Algebra, McGraw-Hill. 2. Stephen H. Friedberg et al., Linear Algebra, Pearson Education. David C. Lay, Linear Algebra and Its Applications, Pearson Education.
Website Link	1. https://youtu.be/7lIWGdhQ68Q?si=PuQPFiYvHjRlygMC.
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's :

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	2	2	2	2	-	-	3	2	2
CO2	3	3	-	3	3	2	2	3	-	-	3	2	3
CO3	3	3	-	3	2	3	2	2	-	-	3	3	2
CO4	2	2	-	2	2	2	1	2	-	-	2	2	2
CO5	2	2	-	3	3	2	2	2	-	-	3	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B.K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagonda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	**Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1A02	**ALLIED MATHEMATICS–I For B.SC. (CS) / B.C.A / B.SC. (DS) / B.SC. (PHYSICS) / B.SC. (CHEMISTRY)**	**GSE THEORY**	**I**	**75**	**5**	**Y**	**-**	**4**

Objective:

To develop computational and logical skills in students from non-mathematics majors by providing foundational mathematical knowledge essential for problem-solving in computer science, physics, chemistry, and data science domains.

Unit	Course Content	Knowledge Levels	Sessions
I	**Theory of Equations**:** Imaginary roots – Irrational roots – Formation of equations – Solutions of equations – Diminishing the roots of an equation & solutions – Removal of the second term of an equation & solutions – Descartes rule of sign – Problems only. ****SDG 4 – Quality Education.(Chapter 6: Sections 4,9,10 & 11).**	K2, K3	15
II	**Matrices**:** Definition of Characteristic equation of a matrix – Characteristic roots of a matrix - Eigen values and the Corresponding Eigen vectors of matrix – Cayley Hamilton theorem (Statement only) – Verifications of Cayley Hamilton Theorem – Problems only. ****SDG 9 – Industry, Innovation, and Infrastructure.** **(Chapter 5)**	K2, K3	15
III	**Radius of Curvature**:** Formula of Radius of Curvature in Cartesian coordinates, Parametric coordinates and Polar coordinates (no proof for formulae) – Problems only. ****SDG 11 – Sustainable Cities and Communities.** **(Chapter11)**	K2, K3	15
IV	**Partial Differential Equations**:** Formation of Partial Differential Equations by eliminating the arbitrary constant and arbitrary functions – Lagrange's Linear Partial Differential Equations – Problems only. ****SDG 13 – Climate Action.(Chapter26)**	K2, K3	15
V	**Integration**:** Definite Integral: Simple properties of definite Integrals (Chap -15) – Bernoulli's Formula – Integration by parts (Simple problems) –Reduction formula for $sinnx$, $cosnx$ and e^{ax} (simple problems). ****SDG 7 – Affordable and Clean Energy.(Chapter16)**	K3, K4	15

Course Outcome	**CO1:** Explain imaginary and irrational roots, form equations, solve equations including diminishing roots and removal of the second term, and apply Descartes' rule of sign.	K2, K3
	CO2: Understand characteristic equations, find characteristic roots, eigenvalues, and eigenvectors of matrices, and verify the Cayley-Hamilton theorem.	K2, K3
	CO3: Apply formulas for radius of curvature in Cartesian, parametric, and polar coordinates to solve related problems.	K2, K3
	CO4: Formulate partial differential equations by eliminating arbitrary constants and functions and solve Lagrange's linear partial differential equations.	K2, K3
	CO5: Apply definite integral properties, Bernoulli's formula, integration by parts, and reduction formulas for trigonometric and exponential functions to solve integrals.	K3, K4

Learning Resources	
Text Books	1. P.R. Vittal, Allied Mathematics, Margham publication, Chennai – 17, Reprint 2016.
Reference Books	1. S.G. Venkatachalapathi, Allied Mathematics, Margham publication, Chennai – 17, Reprint 2011. 2. P. Kandasamy, K.Thilagavathy, Allied Mathematics Volume I, S.Chand publication, July 2012. 3. P. Kandasamy, K.Thilagavathy Allied Mathematics Volume II,S.Chand publication, December 2010.
Website Link	1. https://youtu.be/IcTW6Gq5li0 2. https://youtube.com/watch?v=gB2MJeN-V74 3. https://www.youtube.com/watch?v=AEdGYEiE86Q
L – Lecture	**T – Tutorial** **P – Practical** **C - Credit**

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	2	1	1	1	1	2	3	2	2
CO2	3	2	3	2	2	1	1	1	-	2	3	3	2
CO3	3	2	3	3	3	2	1	2	-	3	3	2	3
CO4	3	2	3	3	3	2	1	2	1	3	3	3	3
CO5	3	2	3	3	3	2	2	2	1	3	3	2	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B.K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
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B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA1A03	**ALLIED MATHEMATICAL STATISTICS- I For B.Sc. (CS) / B.C.A / B.Sc. (DS)**	**GSE THEORY**	**I**	**75**	**5**	**Y**	**-**	**4**

Objective:
Introduce fundamental concepts of descriptive statistics and probability theory. Understand various types of data distributions and statistical measures. Equip students with foundational skills for data analysis and visualization.

Unit	Course Content	Knowledge Levels	Sessions
I	**Collection and Presentation of Data**:** Nature and scope of statistics- Classification and tabulation-Frequency distribution-Diagrams and graphical representation of data. ****SDG 9 – Industry, Innovation, and Infrastructure. (Chapter-2,3,4).**	K1, K2	15
II	**Measures of Central Tendency**:** Mean, Median, Mode (Geometric, Harmonic)- Merits and demerits. ****SDG 4 – Quality Education. (Chapter-5).**	K2, K3	15
III	**Measures of Dispersion**:** Range, Quartile deviation - Mean and standard deviation-Coefficient of variation ****SDG 10 – Reduced Inequalities. (Chapter-6)**	K2, K3	15
IV	**Correlation and Regression**:** Karl Pearson's correlation, Spearman's rank correlation-Scatter diagram, regression equations (two variables)- Simple problems. ****SDG 17 – Partnerships for the Goals. (Chapter-8 & 9).**	K3, K4	15
V	**Probability Concepts**:** Definition of probability-Addition & multiplication theorems-Conditional probability- Simple problems. ****SDG 3 – Good Health and Well-Being.(Chapter-1)**	K3, K4	15

Course Outcome	**CO1:** Describe and present data using tabulation, diagrams, and graphs.	K1, K2
	CO2: Compute and interpret measures of central tendency for various types of data.	K2, K3
	CO3: Calculate and compare measures of dispersion, including range, quartile deviation, standard deviation, and coefficient of variation.	K2, K3
	CO4: Analyze relationships between variables using correlation and regression techniques.	K3, K4

	CO5: Apply probability concepts and rules to solve basic problems.	K3, K4

LEARNING RESOURCES	
Text Books	1. P.R. Vittal - Mathematical Statistics, Margham Publication.
Reference Books	1. S.C. Gupta & V.K. Kapoor – Fundamentals of Applied Statistics, Ultan Chand 2. S.P. Gupta – Statistical Methods, Sultan Chand. 3. Pillai R.S.N. & Bagavathi – Statistics, S. Chand.
Website Link	1. https://youtu.be/I0u1cecfXQ4?si=X055W5xgpAoxweXW.
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	2	2	2	-	-	3	2	2
CO2	3	3	-	3	3	2	2	3	-	-	3	2	3
CO3	2	3	-	3	3	3	2	2	-	-	3	3	2
CO4	2	2	-	2	2	2	1	2	-	-	2	2	2
CO5	2	3	-	3	3	3	2	3	-	-	3	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B.K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose Principal**

09/10/2025

Dr. V. Muthulakshmi,
Professor, Department of Mathematics,
Periyar University, Salem- 11.

09/10/25

Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.
Associate Professor,
School of Mathematical Needs,
School of Sciences, Christ (Deemed to be University) , Bengaluru.

9/10/25

Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.
Associate Professor and Head,
Department of Mathematics
Providence College for Women,
Coonoor

09/10/2025

Mr. S. Ganesh Gurubaran, M.S (IT & Management)
Senior Tech Analyst, HDFC Bank, Old Airport Road,
Bengaluru.

Ms. B. Dilshad M.Sc.
Assistant Manager, State Bank of India, Mangalore.

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2A04	**LINEAR ALGEBRA-II For B.Sc. (CS) / B.C.A / B.Sc. (DS)**	**GSE THEORY**	**II**	**45**	**3**	**Y**	**-**	**3**

Objective:
Introduce the foundational concepts of linear transformations and vector spaces. Understand eigenvalues, eigenvectors, and diagonalization of matrices. Apply orthogonalization techniques like Gram-Schmidt for decomposition and dimensionality reduction. Explore inner product and normed spaces with applications. Use the Cayley-Hamilton theorem in matrix-related problem solving.

Unit	Course Content	Knowledge Levels	Sessions
I	**Linear Transformations**:** Definition and examples-Null space, range-Matrix representation-Invertibility and isomorphisms-Dual spaces. **[Chapter 2: Sec 2.1, 2.2, 2.4,2.6].** ****SDG 9 – Industry, Innovation, and Infrastructure.**	K1, K2	9
II	**Eigenvalues & Eigenvectors**:** Definition and computation - Diagonalization of matrices-Invariant subspaces - Applications in Markov chains and algorithms. **[Chapter 5: Sec 5.1, 5.2, 5.4].** ****SDG 11 – Sustainable Cities and Communities.**	K2, K3	9
III	**Cayley-Hamilton Theorem**:** Characteristic Equation-Statement and verification-Eigenvalue-based matrix problems. **[Chapter 5: Sec: 5.1, 5.2, 5.4].** ****SDG 12 – Responsible Consumption and Production.**	K2, K3	9
IV	**Inner Product & Normed Spaces**:** Definitions of inner product and norm-Orthogonality and orthogonal sets. **[Chapter 6: Sec 6.1, 6.2].** ****SDG 4 – Quality Education.**	K3, K4	9
V	**Gram-Schmidt & Orthogonalization**:** Gram-Schmidt process - Orthonormal basis - Orthogonal complements - Applications in QR decomposition and PCA. **[Chapter 6: Sec 6.4].** ****SDG 8 – Decent Work and Economic Growth.**	K3, K4	9

Course Outcome	**CO1:** Understand and analyze linear transformations, null space, and isomorphism	K1, K2
	CO2: Apply the concepts of eigenvalues and diagonalization to mathematical models and algorithms	K2, K3
	CO3: Apply the Cayley-Hamilton theorem to solve matrix problems involving characteristic polynomials.	K2, K3
	CO4: : Explore inner product spaces, orthogonality, and normed vector spaces.	K3, K4
	CO5: Utilize Gram-Schmidt process and orthonormal basis in decomposition and PCA.	K3, K4

LEARNING RESOURCES	
Text Books	1. Linear algebra- Stephen H Friedberg, Arnold J Insel and awrence E Spence, 5th Edition(2018) Pearson. 2. Dr. P.R. Vittal, Allied Mathematics, Margham publication, chennai-17
Reference Books	1. Seymour Lipschutz, Schaum's Outline of Linear Algebra, McGraw-Hill. 2. Howard Anton, Elementary Linear Algebra, Wiley. 3. Stephen H. Friedberg et al., Linear Algebra, Pearson Education. 4. David C. Lay, Linear Algebra and Its Applications, Pearson Education.
Website Link	1.https://youtu.be/dn_VXccQrJo?si=5fPhb2FiGkPM0e0p.
L – Lecture T – Tutorial P – Practical C – Credit	

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	2	2	-	-	2	2	3	2	2
CO2	3	3	-	3	3	3	-	-	2	2	3	3	3
CO3	2	3	-	3	3	3	-	-	2	2	3	2	2
CO4	2	3	-	3	3	3	-	-	2	2	3	3	2
CO5	2	3	-	3	3	3	-	-	2	2	3	3	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B.K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose Principal**

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B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2AP1	**LINEAR ALGEBRA PRACTICALS For B.Sc. (CS) / B.C.A / B.Sc. (DS)**	**GSE - PRACTICAL**	**II**	**30**	**-**	**-**	**2**	**1**

Objectives

To implement and verify properties of vector spaces, subspaces, and linear transformations computationally. To perform matrix operations, solve systems of equations, and analyze eigenvalue problems. To apply orthogonalization techniques and the Cayley-Hamilton theorem in problem- solving. To develop computational skills for algebraic expansions and series relevant to mathematics and computer science.

S.No	List of Programs	Knowledge Levels	Sessions
I	**Linear Equations **:** Solving homogeneous and non-homogeneous linear systems using Gaussian elimination. ****SDG 4 – Quality Education.**	K1, K2	6
II	**Matrices, Rank **:** Matrix operations (addition, multiplication, transpose)-Determinant and inverse of a square matrix-Conversion of a matrix into row- reduced echelon form-Computing rank of a matrix- Computing eigenvalues and eigenvectors of a given matrix- . ****SDG 9 – Industry, Innovation and Infrastructure.**	K2, K3	6
III	**Inner Product & Orthogonality**:** Computing inner product, norms, and checking orthogonality-Finding orthogonal complements-Applying Gram-Schmidt orthogonalization to a given set of vectors ****SDG 7 – Affordable and Clean Energy.**	K2, K3	6
IV	**Algebraic Expansions**:** Resolving partial fractions for given rational Expressions-Implementation of binomial expansion for positive and negative integral indices ****SDG 8 – Decent Work and Economic Growth.**	K3, K4	6
V	**Cayley-Hamilton Theorem & Applications**:** Verifying the Cayley-Hamilton theorem for a given matrix-Solving matrix equations using Cayley-Hamilton theorem. ****SDG 11 – Sustainable Cities and Communities.**	K3, K4	6

Course Outcome	**CO1:** Understand and apply computational methods for solving the system of equations.	K1, K2
	CO2: Perform matrix computations, rank finding.	K2, K3
	CO3: Work with inner product spaces, orthogonality.	K2, K3, K4
	CO4: Implement algebraic expansions and series in problem-solving.	K3, K4
	CO5: Apply Cayley-Hamilton theorem to solve matrix-related problems.	K3, K4

LEARNING RESOURCES	
Text Books	1. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, Linear Algebra, 5th Edition, Pearson, 2018. 2. Dr. P.R. Vittal, Allied Mathematics, Margham Publications, Chennai–17.
Reference Books	1. Seymour Lipschutz, Schaum's Outline of Linear Algebra, McGraw-Hill. 2. Howard Anton, Elementary Linear Algebra, Wiley. 3. David C. Lay, Linear Algebra and Its Applications, Pearson Education.
Website Link	1. https://youtu.be/QlE-7-UUdeU?si=OgqxTO5yIS5xwCnJ.
L – Lecture	**T – Tutorial** **P – Practical** **C – Credit**

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	2	2	2	2	-	-	3	2	3
CO2	3	3	-	3	3	2	2	3	-	-	3	2	3
CO3	2	3	-	3	3	3	2	2	-	-	3	3	2
CO4	2	2	-	2	2	2	1	2	-	-	2	3	3
CO5	2	3	-	3	3	3	2	2	-	-	3	2	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B.K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

09/10/2025 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	09/10/25 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	9/10/25 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
09/10/2025 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	 **Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2A05	**ALLIED MATHEMATICS – II for B.Sc. (CS) / B.C.A / B.Sc. (DS) / B.Sc. (Physics) / B.Sc. (Chemistry)**	**GSE THEORY**	**II**	**45**	**3**	**Y**	**-**	**3**

Objective:

To equip students with fundamental skills in multivariable calculus, finite difference methods, second- order differential equations, and Laplace transforms, enabling them to solve practical problems in mathematics, engineering, and applied sciences through analytical and computational techniques.

Unit	Course Content	Knowledge Levels	Sessions
I	**Jacobian and Maxima & Minima**:** Jacobian of two variables and three variables – Maxima and Minima functions of two variables – Problems only. ****SDG 9 – Industry, Innovation, and Infrastructure.** **(Chapter9: Sections 3 & 4)**	K2, K3	9
II	**Finite Differences**:** Finite difference – Higher differences – Construction of difference table – Interpolation of missing value – Newton's Forward and Newton's Backward difference formula (no proof). ****SDG 4 – Quality Education.** **(Chapter7).**	K2, K3	9
III	**Second Order Differential Equations**:** Second Order Differential Equation with constant coefficients – Complementary function – Particular Integral and Solution of the type: eax, xn, cosax (or) sinax– Problems only. ****SDG 7 – Affordable and Clean Energy**. **(Chapter23) .**	K3, K4	9
IV	**Laplace Transforms**:** Definition of Laplace Transforms – Standard formula – Linearity property – Shifting property – Change of Scale property – Laplace Transforms of derivatives – Problems. ****SDG 11 – Sustainable Cities and Communities.** **(Chapter27) .**	K3, K4	9
V	**Inverse Laplace Transforms**:** Standard formula- Elementary theorems (no proof) –applications and solutions of second-order differential equations with constant coefficients – simple problems. ****SDG 12 – Responsible Consumption and Production.** **(Chapter27).**	K3, K4	9

Course Outcome	**CO1:**Calculate Jacobians of functions with two and three variables and solve maxima and minima problems for functions of two variables.	
	CO2: Demonstrate understanding of finite differences,construct difference tables, and apply Newton's and Lagrange's interpolation formulas to estimate missing values.	K2, K3
	CO3: Solve second-order differential equations with constant coefficients, including finding complementary functions and particular integrals for various standard cases.	K3, K4
	CO4: Apply Laplace transform properties and formulas to compute transforms and solve differential equations involving derivatives.	K3, K4
	CO5: Develop problem-solving skills using multivariable calculus, finite differences, differential equations, and Laplace transforms to addressreal-world mathematical and engineering problems.	K3, K4

LEARNING RESOURCES	
Text Books	1. Dr.P.R. Vittal, Allied Mathematics, Margham publication, Chennai – 17, Reprint 2016.
Reference Books	1. S.G Venkatachalapathi, Allied Mathematics, Margham publication, Chennai – 17, Reprint 2011. 2. P. Kandasamy, K.Thilagavathy Allied Mathematics Volume I, S.Chand publication, July2012. 3. P. Kandasamy, K.Thilagavathy Allied Mathematics Volume II, S.Chand publication, December 2010.
Website	1. https://youtu.be/EdVHKdy0_yU. 2. https://youtu.be/i38MSuBRZa. 3. https://youtu.be/SmZngeKOgYQ. 4. https://youtu.be/c0cx6lmA8-0. 5. https://youtu.be/lPoYAXDK-8A
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	2	1	1	2	1	2	3	2	2
CO2	3	2	3	2	2	1	1	2	1	2	3	3	2
CO3	3	2	3	3	3	2	1	2	1	3	3	3	3
CO4	3	2	3	3	3	2	1	2	1	3	3	3	3
CO5	3	2	3	3	3	2	2	2	1	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. Magila	**Approved By: Dr. J. Caroline rose** **Principal**

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B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2AP2	**ALLIED MATHEMATICS PRACTICALS For B.Sc. (CS) / B.C.A / B.Sc. (DS) / B.Sc. (Physics) / B.Sc. (Chemistry)**	**GSE PRACTICALS**	**II**	**30**	**-**	**-**	**2**	**1**

Objective:

To strengthen the analytical and computational skills of students from non-mathematics backgrounds through manual problem-solving methods in key areas such as algebra, calculus, differential equations, and numerical methods, applicable in science and computer science domains.

Unit	Course Content	Knowledge Levels	Sessions
I	**Interpolation Techniques**:** Finite difference table – Newton's Forward & Backward difference formula – Lagrange's formula – Manual calculations only. ****SDG 4 – Quality Education.**	K2, K3	6
II	**Matrix Algebra**:** Characteristic equation – Eigenvalues and eigenvectors – Cayley-Hamilton theorem (statement only) – Solved manually. ****SDG 9 – Industry, Innovation and Infrastructure.**	K2, K3	6
III	**Second-Order Differential Equations**:** Complementary functions and particular integrals for standard types – Manual symbolic solutions. ****SDG 3 – Good Health and Well-being.**	K3, K4	6
IV	**Laplace Transforms****: Standard Laplace transforms – Properties (linearity, shift, derivative) – Solving ODEs using Laplace methods – Step-by-step work. ****SDG 7 – Affordable and Clean Energy.**	K3, K4	6
V	**Calculus Applications****: Radius of curvature (Cartesian, parametric, polar) – Bernoulli's formula – Integration by parts – Reduction formulas. ****SDG 11 – Sustainable Cities and Communities.**	K3, K4	6

Course Outcome	**CO1:**Construct finite difference tables and apply interpolation formulas to estimate missing values.	K2, K3
	CO2: Compute eigenvalues and eigenvectors and verify the Cayley-Hamilton theorem by manual methods.	K2, K3
	CO3: Solve second-order linear differential equations with constant coefficients manually.	K3, K4
	CO4: Apply Laplace transform techniques and properties to solve basic ODEs without computational tools.	K3, K4
	CO5: Use analytical methods to solve problems in curvature and integration using reduction and Bernoulli's methods.	K3, K4

Learning Resources	
Text Books	1. Dr. M.K. Venkataraman, Engineering Mathematics, Vol I & II, National Publishing Co., 2020.
Reference Books	1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers. 2. P. Kandasamy & K. Thilagavathy, Mathematical Methods, S. Chand Publishing. 3. S. Narayanan et al., Algebra / Calculus Series, Viswanathan Publishers.
Website and e-Learning Source	1. https://www.youtube.com/watch?v=uAYwr7pGKsw 2. https://www.youtube.com/watch?v=Jqa-aFE9-GI 3. https://www.youtube.com/watch?v=oxFxHfO4to0
L – Lecture T – Tutorial P – Practical C – Credit	

Mapping of CO's with PO's and PSO's:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	1	1	2	1	2	3	2	2
CO2	3	2	3	2	2	1	1	2	1	2	3	3	2
CO3	3	2	3	3	3	2	1	2	1	3	3	3	3
CO4	3	2	3	3	3	2	1	2	1	3	3	3	3
CO5	3	2	3	3	3	2	2	2	1	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B. K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

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B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2A06	**Allied Mathematical Statistics- II For B.Sc. (CS) / B.C.A / B.Sc.(DS)**	**GSE THEORY**	**II**	**45**	**3**	**Y**	**-**	**3**
Objective: Deepen statistical inference skills, hypothesis testing, curve fitting, and applications in analysis.								

Unit	Course Content	Knowledge Levels	Sessions
I	**Theoretical Distributions**:** Binomial, Poisson and Normal distributions- Fitting of distributions (excluding derivations)- Simple problems. **(Chapter-12,13,16)** ****SDG 3 – Good Health and Well-Being.**	K1, K2	9
II	**Sampling and Estimation**:** Population vs. Sample- Sampling techniques and sampling errors- Concepts of unbiased estimators - Confidence intervals**. (Chapter-22 & 23)** ****SDG 17 – Partnerships for the Goals.**	K2, K3	9
III	**Testing of Hypotheses**:** Hypothesis testing: null and alternate- Type I & II errors-Z-test, t-test (single mean and proportion only)-Simple problems. ****SDG 9 – Industry, Innovation, and Infrastructure.**	K2, K3	9
IV	**Chi-Square Test**:** Chi-square test for goodness of fit- Independence of attributes (concept only)-Simple problems. **(Chapter-27)** ****SDG 16 – Peace, Justice, and Strong Institutions.**	K3, K4	9
V	**Curve Fitting and Interpolation**:** Straight line and parabola (method of least squares)-Fitting a second-degree polynomial-Simple problems. **(Chapter-10)** ****SDG 11 – Sustainable Cities and Communities.**	K3, K4	9

Course Outcome	**CO1:** Fit and interpret binomial, Poisson, and normal distributions for real-world data.	K1, K2
	CO2: Apply sampling techniques and estimation methods to statistical problems.	K2, K3
	CO3: Perform hypothesis testing using Z-test and t-test for means and proportions.	K2, K3
	CO4: Use chi-square tests for goodness of fit and independence of attributes.	K3, K4
	CO5: Apply curve fitting and interpolation techniques for predictive analysis	K3, K4

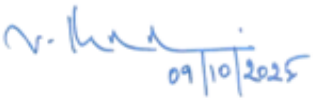
LEARNING RESOURCES	
Text Books	1. P.R. Vittal - Mathematical Statistics, Margham Publication
Reference Books	1. S.C. Gupta & V.K. Kapoor – Fundamentals of Applied Statistics, Sultan Chand 2. S.P. Gupta – Statistical Methods, Sultan Chand 3. Pillai R.S.N. & Bagavathi – Statistics, S. Chand 4. Murthy M.N. – Sampling Theory & Methods 5. Arora P.N. – Comprehensive Statistical Methods, Sultan Chand 6. Snedecor G.W. & Cochran – Statistical Methods, Oxford B.L. Agarwal – Basic Statistics
Website Link	https://youtu.be/mxfrS-By3sw?si=DsCy4ZCCNXTvhMQ-
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	2	2	2	2	-	-	3	2	2
CO2	3	3	-	3	3	2	2	3	-	-	3	2	3
CO3	2	3	-	3	3	3	2	3	-	-	3	3	2
CO4	2	2	-	2	2	2	1	3	-	-	2	2	2
CO5	2	3	-	3	3	3	2	3	-	-	3	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B.K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**



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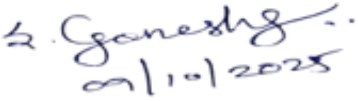

Mr. S. Ganesh Gurubaran, M.S (IT & Management)
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Bengaluru.

Ms. B. Dilshad M.Sc.
Assistant Manager, State Bank of India, Mangalore.

B.Sc. Mathematics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UMA2AP3	**ALLIED MATHEMATICAL STATISTICS –PRACTICALS For B.Sc. (CS) / B.C.A / B.Sc.(DS)**	**GSE Practical**	**II**	**30**	**-**	**-**	**2**	**1**

Objectives

To apply descriptive statistics and probability concepts to real-life datasets using computational tools. To perform estimation, hypothesis testing, and regression analysis through practical problems. To implement statistical models such as binomial, Poisson, and normal distributions. To use curve fitting and interpolation techniques for prediction and analysis

Unit	Course Content	Knowledge Levels	Sessions
I	**Descriptive Statistics & Data Presentation**:** Creating and interpreting frequency distributions-Drawing bar charts, histograms, frequency polygons, and ogives-Calculation of mean, median, mode for raw and grouped data-Computing geometric mean and harmonic mean. ****SDG 4 – Quality Education.**	K1, K2	6
II	**Dispersion, Correlation & Regression**:** Calculating range, quartile deviation, mean deviation, standard deviation-Coefficient of variation comparison between datasets-Karl Pearson's correlation coefficient-Spearman's rank correlation-Fitting regression lines (two variables). ****SDG 8 – Decent Work and Economic Growth.**	K2, K3	6
III	**Probability & Theoretical Distributions**:** Solving probability problems (addition, multiplication, conditional)-Fitting binomial distribution to discrete data-Fitting Poisson distribution to discrete data - Fitting normal distribution to continuous data. ****SDG 3 – Good Health and Well-being.**	K2, K3	6
IV	**Sampling, Estimation & Hypothesis Testing**:** Drawing random samples and computing sample statistics-Point and interval estimation (mean, proportion)- Z-test for single mean and proportion - t-test for single mean-Chi-square test for goodness of fit. ****SDG 9 – Industry, Innovation, and Infrastructure.**	K3, K4	6
V	**Curve Fitting & Interpolation**:** Fitting straight line and parabola by least squares-Fitting second degree polynomial-Simple interpolation using Newton's forward method. ****SDG 11 – Sustainable Cities and Communities.**	K3, K4	6

Course Outcome	**CO1:** Apply statistical methods for summarizing and visualizing data.	K1, K2
	CO2: Compute measures of dispersion, correlation, and regression parameters.	K2, K3
	CO3: Fit probability distributions and solve probability problems.	K2, K3
	CO4: Conduct sampling, estimation, and hypothesis testing.	K3, K4
	CO5: Perform curve fitting and interpolation for data prediction.	K3, K4

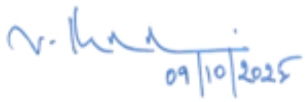
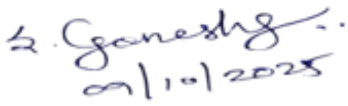
LEARNING RESOURCES	
Text Books	1. P.R. Vittal – Mathematical Statistics, Margham Publications.
Reference Books	1. S.C. Gupta & V.K. Kapoor – Fundamentals of Applied Statistics, Sultan Chand. 2. S.P. Gupta – Statistical Methods, Sultan Chand. 3. Pillai R.S.N. & Bagavathi – Statistics, S. Chand.
Website Link	https://youtu.be/Vpuv9Cq41K0?si=3x3ah1RmioAh1mIi
L – Lecture T-Tutorial P – Practical C – Credit	

Mapping of CO's with PO's and PSO's:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	2	2	2	2	-	-	3	2	2
CO2	3	3	-	3	3	2	2	3	-	-	3	2	3
CO3	2	3	-	3	3	3	2	2	-	-	3	3	2
CO4	2	2	-	2	2	2	1	2	-	-	2	2	2
CO5	2	3	-	2	2	3	2	2	-	-	3	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. M. Meenakshi	**Verified By HOD: Dr. B.K. Jaleesha**
Checked By CDC: Mrs. C. Magila	**Approved By: Dr. J. Caroline Rose** **Principal**

 **Dr. V. Muthulakshmi,** Professor, Department of Mathematics, Periyar University, Salem- 11.	 **Dr. Smita. S. Nagouda M.Sc., B.Ed., M.Phil., Ph.D.** Associate Professor, School of Mathematical Needs, School of Sciences, Christ (Deemed to be University) , Bengaluru.	 **Dr. B. Ganga M.Sc., M.Phil., P.G.D.C.A., Ph.D.** Associate Professor and Head, Department of Mathematics Providence College for Women, Coonoor
 **Mr. S. Ganesh Gurubaran, M.S (IT & Management)** Senior Tech Analyst, HDFC Bank, Old Airport Road, Bengaluru.	 **Ms. B. Dilshad M.Sc.** Assistant Manager, State Bank of India, Mangalore.	