



COURSE DATA SHEET

SEMESTER	I	BATCH	2026-2029
COURSE NAME	MATHEMATICAL FOUNDATIONS FOR COMPUTING	COURSE CODE	26UMAGE1E01
COURSE UNITS	5	COURSE TYPE	GENERIC ELECTIVE-1
CONTACT HOURS (L-T-P)	4-2-0	CREDITS	4
OFFERED BY	MATHEMATICS	SHIFT-(I/II) Shift-I-8.15am - 12.50pm Shift-II-1.00pm to 5.30pm	II

COURSE OBJECTIVES

1	To inspire the students to get the knowledge in basic Mathematical concepts.
2	To present a study on a summation of series, Matrices, Trigonometry, Laplace and Inverse Laplace transform.
3	To enhance problem solving skills on above said various fields.

COURSE OUTCOMES: On completion of the course the students will be able to...

	CO Statement	Cognitive Level
CO1	Learn about summation of Binomial, Exponential and Logarithmic series.	K1-K5 (Understand, Apply, Analyze and Evaluate)
CO2	Recognize the concept of certain types of matrices, Eigen values, Eigen vectors and Cayley's Hamilton theorem.	K1-K5 (Understand, Apply, Analyze and Evaluate)
CO3	Become proficient in expansion of trigonometric series.	K1-K5 (Understand, Apply, Analyze and Evaluate)
CO4	Determine solutions by applying Laplace transform methods.	K1-K5 (Understand, Apply, Analyze and Evaluate)



CO5	Demonstrate the properties of Inverse Laplace transform and find solutions by applying the same.	K1-K5 (Understand, Apply, Analyze and Evaluate)
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SYLLABUS

UNIT	TOPICS	HOURS
1	Algebra: Summation of Binomial, Exponential and Logarithmic series (without proof) Chapter 2: Sections: 2.1.3, 2.2.1, 2.3.3	15
2	Matrices: Symmetric matrix, Skew -Symmetric matrix, Orthogonal matrix., Eigen values and Eigenvectors, Cayley-Hamilton theorem (without proof), Inverse of a matrix using Cayley-Hamilton theorem. Chapter4: Sections: 4.1.1 to 4.1.6, 4.5, 4.5.2, 4.5.3	15
3	Trigonometry: Expansions-Expansions of $\sin^n \theta, \cos^n \theta$ - Expansions of $\cos n\theta, \sin n\theta$ - Expansions of $\sin \theta, \cos \theta$ in θ (Exclude $\tan \theta$)-Simple problems. Chapter6: Sections: 6.1.1, 6.1.2, 6.1.3	15
4	Laplace Transforms -Linearity Property- Basic results in Laplace Transform- Properties of Laplace Transform(Upto derivation properties) - Simple Problems. Chapter 7: Sections: 7.1.1 to 7.1.4	15
5	Inverse Laplace Transform :Linearity Property of Inverse Laplace Transform- Basic results in inverse Laplace Transform- Properties of inverse Laplace Transform (Upto derivation properties) Chapter7:Sections:7.2,7.2.1to7.2.3	15
Note (if any)	Definitions and simple problems from all units may be asked in section A	Total Hours 75



TEXT/REFERENCE BOOKS/E - RESOURCES:

Text Books	Duraipandian P, Udayabaskaran S, Reprint 2023, Allied Mathematics- Volume I & II, S. Chand & Company Pvt.Ltd.
Books For Reference	1. Abdul RasheedA, 2008, Allied Mathematics, Vijay Nicole Imprints Private Limited, Chennai. 2. Singaravelu .A, Reprint 2018, Allied Mathematics, Meenakshi Agency, Chennai. 3. Venkatachalapathy .S.G, Reprint 2016, Allied Mathematics, Margham Publications. 4. Kandasamy . P, Thilagavathy .K,R eprint2004, Mathematics –I, II, S.Chand & Company Pvt. Ltd. 5. Chandra Sekaran, Nithya, Reprint 2017, Allied Mathematics I, Dhanam Publications.
E- Learning Resources	1. https://www.learnbse.in/trigonometry-formulas/ 2. https://www.askiitians.com/revision-notes/maths/trigonometric-functions/ 3. http://www.khullakitab.com/binomial-theorem-exponential-and-logarithmic-series/notes/mathematics/grade-12/30/practices 4. https://www.khanacademy.org/math/linear-algebra/alternate-bases/eigen-everything/v/linear-algebra-introduction-to-eigenvalues-and-eigenvectors 5. https://global.oup.com/uk/orc/biosciences/maths/reed/01student/numerical_tutorials/

PEDAGOGY (TEACHING METHODOLOGY):

- Chalk and Talk
- Online Coaching
- LCD
- Assignment
- Seminar
- Quiz
- Group discussion
- Reference material and videos
- Web resources



CO-PO AND CO-PSO MAPPING:

	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	3	1	2	2	1	3	2	1
CO2	3	2	2	2	1	1	3	2	1
CO3	3	2	3	2	2	1	3	3	1
CO4	3	3	3	2	2	1	3	3	1
CO5	3	3	2	2	2	1	3	2	1
Average (Use only filled in cells for calculation)	3	2.4	2.2	2	1.8	1	3	2.4	1

Correlation Level: 1-Weak 2-Moderate 3-Strong



JUSTIFICATION OF CO-PO/PSO MAPPING

CO	PO/PSO	Level of correlation	Justification
CO1	PO1	3	Applies fundamental algebraic concepts to evaluate Binomial, Exponential and Logarithmic series accurately.
	PO2	3	Uses logical reasoning and analytical skills to simplify and solve series-related problems.
	PO3	1	Employs mathematical techniques in solving simple computational problems.
	PO4	2	Builds a strong mathematical foundation required for higher studies in computing disciplines.
	PO5	2	Develops independent learning through solving diverse algebraic problems.
	PO6	1	Demonstrates accuracy, responsibility and ethical practices in mathematical computations.
	PSO1	3	Strengthens fundamental mathematical concepts required for computing.
	PSO2	2	Applies algebraic techniques in computational applications.
	PSO3	1	Develops analytical and problem-solving skills.
CO2	PO1	3	Applies matrix algebra concepts to solve computational problems efficiently.
	PO2	2	Analyses matrix properties, Eigenvalues and Eigenvectors logically.
	PO3	2	Uses matrix techniques in modelling scientific and computational problems.
	PO4	2	Enhances mathematical competency required for advanced computing courses.
	PO5	1	Encourages continuous learning through advanced linear algebra concepts.
	PO6	1	Demonstrates systematic and accurate mathematical reasoning.
	PSO1	3	Develops competency in linear algebra and its theoretical foundations.
	PSO2	2	Applies matrix methods in computational and scientific applications.
	PSO3	1	Improves analytical thinking through structured problem solving.
CO3	PO1	3	Applies trigonometric expansion techniques to solve mathematical problems.
	PO2	2	Analyses functional relationships using trigonometric expansions.



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Chromepet, Chennai - 600 044.

	PO3	3	Solves mathematical models involving approximation techniques.
	PO4	2	Reinforces mathematical knowledge required for advanced computational studies.
	PO5	2	Enhances independent learning through analytical problem solving.
	PO6	1	Demonstrates precision and responsibility in mathematical computations.
	PSO1	3	Strengthens understanding of trigonometric concepts and analytical methods.
	PSO2	3	Applies trigonometric techniques in computational applications.
	PSO3	1	Develops logical reasoning and mathematical problem-solving ability.
CO4	PO1	3	Applies Laplace Transform methods to solve mathematical and computational problems.
	PO2	3	Analyses mathematical models using transformation techniques.
	PO3	3	Develops mathematical solutions applicable to engineering and computing systems.
	PO4	2	Strengthens the mathematical foundation necessary for advanced computational studies.
	PO5	2	Promotes lifelong learning through transform-based problem solving.
	PO6	1	Demonstrates ethical and systematic approaches in mathematical analysis.
	PSO1	3	Builds strong competency in transform techniques and their applications.
	PSO2	3	Applies Laplace Transform methods in scientific and computational problems.
	PSO3	1	Enhances analytical and problem-solving abilities.
CO5	PO1	3	Applies Inverse Laplace Transform techniques to solve mathematical problems.
	PO2	3	Evaluates appropriate inverse transform methods for analytical solutions.
	PO3	2	Solves mathematical models arising in science and engineering.
	PO4	2	Supports progression to advanced mathematical and computational courses.
	PO5	2	Promotes self-learning through application of inverse transform techniques.
	PO6	1	Demonstrates accuracy, integrity and responsibility in mathematical computations.
	PSO1	3	Strengthens knowledge of advanced mathematical transformation techniques.
	PSO2	2	Applies inverse transform methods in computational problem solving.
	PSO3	1	Develops higher-order analytical and mathematical reasoning skills.