

CourseTitle	Mathematics-III for Computer Science Engineering		
CourseCode	24MACS301	(L-T-P)C	(4-0-0) 4
Exam	3 hours	Hours/Week	04
SEE	50 marks	TotalHours	56L+64ABL=120
Course Objective: To introduce linear algebra and Probability theory which can be employed as tools in solving engineering application problems.			
Course Outcomes (COs): Upon completion of the course, students shall be able to:			
No.	CourseOutcomes	Mapping ToPOs	Mappingto PSOs
1.	Demonstrate the matrix concepts and solution techniques to solve systems of linear equations and perform geometric transformations in engineering applications.	1	-
2.	Apply concepts of Eigen values, eigenvectors, to solve engineering problems and analyze models such as elastic deformation and population growth.	1,2	-
3.	Analyze and apply various probability and joint distributions and statistical measures, including mean, variance, and cumulative distribution functions, to solve engineering and real-world problems.	1	-
4.	Analyze the problem connected with sampling theory and apply the same to engineering problems. Also model real life problems/engineering application problem and solve the same.	1,2	-
CourseContents:			
Module1			14Hours
Linear Algebra: Importance of Matrices in engineering. Rank of a matrix. Consistency of non-homogeneous and homogeneous system of equations, Solution of the system of linear equations by Gauss elimination method and Gauss – Seidel iterative method. Special matrices-matrix of rotation, reflection, translation. Eigen values and Eigenvectors Illustrative			

examples,.Diagonalization and powers of 3X3 matrices when Eigen values are already given.	
Applications: Traffic flow problem. To determine the growth of a population model.Applications- Stretching of an elastic membrane	
Self-Study-- Stability analysis of differential equations which governs the dynamical systems using the concept of Eigen value, eigenvectors.	
Module2	14Hours
Random Variables: Random variables (discrete and continuous), Probability density function, Cumulative distribution function, Mean and Variance. Probability Distributions: Binomial and Poisson distributions, Exponential distribution and Normal distribution.	
Application: Current measurement problems, Digital transmission channel. Detection of signal.	
Self-Study: Uniform distribution.	
Module3	12Hours
Joint probability distribution: Joint distribution of Discrete random variables- Marginal probability distribution, Independent random variable , Expectation, Covariance, Correlation coefficient.	
Markov chains- Regular stochastic matrices, transition-probability matrix, Higher transition-probabilities, Stationary distribution of regular Markov chains and irreducible Markov chain.	
Application: Application of Markov chain to determine the voting tendencies, Estimating the population distribution of a city due to migration.	
Self-Study: Joint probability distribution-Continuous random variables	
MODULE-4	16Hrs.
Sampling Distribution: Continuous probability distribution: Exponential pdf, Normal/Gaussian pdf. Discussion on the choice of PDF. Illustrative examples from engineering field. Population and sampling, sampling with and without replacement, sampling distribution of means, sampling distribution of proportions, sampling distribution of differences and sums.	

Confidence intervals and Hypothesis testing: Brief introduction to confidence intervals, Testing a hypothesis, central limit theorem-statement, level of significance, simple sampling of attributes, test of significance for large samples, comparison of large samples, Student's t-distribution, Chi—square Distribution

Application: Propellant burning rate, process-capacity problems, drying time problem

Self-Study—F-test Analysis of variance.

Note—Theorems and properties without proof. Applicable to all the modules.

Self-study is not included in SEE

Prescribed Text Books:

Sl. No.	Book Title	Authors	Edition	Publisher	Year
1.	Higher Engineering Mathematics	Dr. B. S. Grewal	44	Khanna Publications	2016
2.	Linear algebra	David c lay	3	Pearson education	2002

Reference Books:

Sl. No	Book Title	Authors	Edition	Publisher	Year
1.	Advanced Engineering Mathematics	E. Kreyszig	10	Wiley	2015
2.	Advanced engineering mathematics	R K Jain and S R K Iyengar	2	Pearson education	2002
3.	Calculus	Thomas Finney	9	Pearson education	2002

E Books and online course materials:

1. https://www.geneseo.edu/~aguilar/public/assets/courses/233/main_notes.pdf

Online Courses and Video Lectures:

1. <https://www.coursera.org/learn/introduction-to-linear-algebra>
2. <https://www.coursera.org/learn/stanford-statistics>
3. https://onlinecourses.nptel.ac.in/noc21_ma74
4. <https://archive.nptel.ac.in/courses/111/106/111106135/>

Teaching -Learning– Evaluation Scheme:

Sl.No	TeachingandLearningMethod	No.of Hours/ Week	No.of Weeks	Hours/ Semester
1	ClassRoomTeaching&Learning	4	14	56
2	IntegratedLabComponent	-	-	-
3	StudentStudyHours–SelfLearning	1	14	14
3	ActivityBasedLearning(ABL1&ABL2)	-	-	43
4	EvaluationofLearningProcess	-	-	07
TotalLearningHours/Semester				120

ProposedAssessmentPlan(for50marksofCIE):

Tool	Remarks	Marks
CIE	ThreeCIEsconductedfor20markseach and reduced to 10 marks	30
ActivityDetails	Detailsofactivitiestobeconducted 1) Detailsofactivity1 2) Detailsofactivity2	20
Total		50

ActivityBasedLearning(27Hours)

ABL1(14Hours) :Activity1details		Hours
Writing AssignmentwithProblemson concerned to real world applications.	Submissionofthefinalassignmentreportand evaluation.(Questionsof BloomslevelL3andHigher)	14

Total		14
ABL2(13Hours):Activity2details		
ProblemSolvingAssignment	Understand the input data requirements	1
	Formulate the methodology	4
	Design the solution	4
	Solving the problem and submission	4
Total		13