M.TECH VLSIDESIGN & EMBEDDEDSYSTEMS
ChoiceBasedCreditSystem(CBCS)and OutcomeBasedEducation(OBE)
SEMESTER-I

ADVANCEDENGINEERINGMATHEMATICS

Course Code	22ELD11	CIEMarks	50
TeachingHours/Week(L:T:P)	3:0:0	SEEMarks	50
Credits	03	ExamHours	03

Course Learning objectives:

This course will enable students to

1. Demonstrate understanding of the concepts of vector space, subspace and linear transformations.
2. Evaluate mathematical expressions to compute quantities that deal with linear systems and eigenvalue problems
3. To provide students with the foundations of probabilistic and statistical analysis mostly used in varied applications in engineering
4. Understand the classifications of random processes and concepts and Apply the concepts uses to analyze statistical problems in Electrical and Telecommunication Engineering fields.

Module 1: LinearAlgebra-I

Introductiontovectorspacesandsub spaces,definitions,illustrativeexample.Linearlyindependentanddependentvectors-Basis-definitionandproblems.Lineartransformations-definitions.MatrixformoflinearTransformations-Illustrativeexamples(TextBook:1)

RBT Level: L1, L2 & L3 **8 Hours**

Teaching-Learning Process	Power-point Presentation, Video demonstration or Simulations, Chalk and Talk are used for Problem Solving, Laboratory Demonstrations and Practical Experiments

Module 2: LinearAlgebra-II

Computation of eigenvalues and eigenvectors of real symmetric matrices-Given's method. Orthogonal vectorsand orthogonal bases. Gram-Schmidtorthogonalization process.QR decomposition, singular value decomposition (Text. Book:1)

RBT Level: L1, L2 & L3 **8 Hours**

Teaching-Learning Process	Power-point Presentation, Video demonstration or Simulations, Chalk and Talk are used for Problem Solving, Laboratory Demonstrations and Practical Experiments

Module-3: ProbabilityTheory

Reviewofbasicprobabilitytheory.Definitionsofrandomvariablesandprobabilitydistributions, probability mass and density functions, expectation,moments, central moments, characteristicfunctions,probabilitygeneratingandmomentgeneratingfunctions-illustrations.Poisson,GaussianandErlangdistributionsexamples.(TextBook:3)

RBT Level: L1, L2 & L3 **8 Hours**

Teaching-Learning Process	Power-point Presentation, Video demonstration or Simulations, Chalk and Talk are used for Problem Solving, Laboratory Demonstrations and Practical Experiments

Module-4: Joint probability distributions

Definition and properties of Joint CDF, PDF, PMF, conditional distributions. Expectation, covariance and correlation. Independent random variables. Central limit theorem-Illustrative examples. (TextBook:3)

RBT Level: L1, L2, L3	**8 Hours**
Teaching-Learning Process	Power-point Presentation, Video demonstration or Simulations, Chalk and Talk are used for Problem Solving, Laboratory Demonstrations and Practical Experiments

Module-5: Randomprocesses

Random processes. Classification of random processes. Wide sense stationarity. Point processes. Poisson processes. Markov chains. Ergodicrandomprocess.Auto-correlationfunction -properties,Gaussianrandomprocess.(TextBook:3)

RBT Level: L1, L2, L3	**8 Hours**

Courseoutcomes:

Attheend ofthecourse, thestudent willbeableto:

1. Understandvectorspaces,basis,lineartransformationsandtheprocessofobtainingmatrixoflinear transformationsarisinginmagnificationandrotationofimages.
2. Applythetechniqueofsingularvaluedecompositionfordatacompression
3. Learn theideaofrandomvariables(discrete/continuous)andprobabilitydistributionsinanalyzingthepr obabilitymodelsarisingincontrolsystemsandsystemcommunications.
4. Analyzerandomprocessesthroughparameter-dependentvariablesin variousrandomprocesses.

Questionpaperpattern:

TheSEEquestionpaperwillbesetfor100marksandthemarksscoredwillbeproportionatelyreducedto 50.

- Thequestionpaper will havetenfullquestionscarryingequalmarks.
- Eachfullquestionisfor20marks.
- Therewillbetwofullquestions(withamaximumofthreesub-questions)fromeachmodule.
- Eachfullquestionwillhavesub-questioncoveringallthetopicsundera module.
- Thestudentswillhavetoanswer five fullquestions,selectingonefullquestionfromeach module.

Textbook/ Textbooks

Sl No	Titleofthebook	NameoftheAuthor/s	PublisherName	Edition andyear
1	LinearAlgebraanditsApplications	DavidC. Lay,StevenR. LayandJ. J. McDonald	PearsonEducation Ltd.	5th Edition, 2015
2	AdvancedEngineeringMathematics	E.Kreyszig	Wiley	10thedition, 2015
3	ProbabilityandRandomProcesswith applicationtoSignalProcessing	ScottL. Miller,Donald G.Childers	ElsevierAcademic Press	2ndEdition, 2013

Reference Books

1	Schaum'sOutlinesofTheoryand ProblemsofMatrixOperations	RichardBronson	McGraw-Hill	1988
2	Probability,StatisticsandRandom Process	T. Veerarajan	Tata McGraw-Hill Co.	3rdEdition, 2008