COURSE PLAN

Department :	MATHEMATICS				
Course Name & code :	ENGINEERING MATHEMATICS IV_ MAT 2256				
Semester & branch :	IV SEMESTER	Second year common to CSE/ICT/CCE			
Name of the faculty :	**SHS,VM,SHK, KK,ABB,SKV,DN ,SP, SME**				
No of contact hours/week:	**L**	**T**	**P**	**C**	
	2	**1**	**0**	**3**	

COURSE OUTCOMES (COS)

At the end of this course, the student should be able to:		No. of Contact Hours	Marks	Program Outcomes (POs)	PSO	BL (Recommended)
CO1	Discuss the relevance of probability in engineering problems..	5	7	1,2,8,12		1,2,3,4
CO2	Explain the concepts of random variable and probability distribution.	7	10	1,2,8,12		1,2,3,4
CO3	Identify situations where different discrete probability distributions can be applied and use suitable continuous distributions to various situations.	7	14	1,2,8,12		1,2,3,4
CO4	Understand the measures of probability distributions, point estimation and interval estimation.	12	13	1,2,8,12		1,2,3,4
CO5	Understand and apply the concept of forming a hypothesis and testing it.	7	6	1,2,8,12		1,2,3,4
	Total	**50**	**50**			

*** COURSE LEARNING OUTCOMES (CLOS)

At the end of this course, the student should be able to:		No. of Contact Hours	Marks	Program Outcomes(POs)	Learning Outcomes (LOs)	BL (Recommended)
CLO1	Discuss the relevance of probability in engineering problems.	5	7	1,2,8,9		**1,2,3,4**
CLO2	Explain the concepts of random variable and probability distribution.	7	10	1,2,8.9		**2,3,4**
CLO3	Identify situations where different discrete	7	14	1,2,8,9		**1,2,3**

	probability distributions can be applied and use suitable continuous distributions to various situations.					
CLO4	Understand the measures of probability distributions, point estimation and interval estimation.	12	13	1,2,8,9		**1,2,3**
CLO5	Understand and apply the concept of forming a hypothesis and testing it.	**7**	**6**	1,2,8,9		**3,4**
	Total	**50**	**50**			

***** Applicable to programs applied for IET accreditation only.**

Assessment Plan

IN – SEMESTER ASSESSMENTS									
S. No.	**Assessment Mode**		**Assessment Method**	**Time Duration**	**Marks**	**Weightage**	**Typology of Questions (Recommended)**	**Schedule**	****Topics Covered**
1	**MISAC**	**1**	**In-semester Exam 1**	**60 Mins**	**15**	**Objective:** 5M 10 MCQs × ½ = 5 marks **Descriptive:** 10 M (2 Questions of 2 marks +2 Questions of 3 marks)	Bloom's taxonomy (B) level of the question should be L3 and above.	Yet to be announced	L1 – L15
		2	**Assignment 1**	**15 days**	**5**	10 MCQs × ½ = 5	Bloom's taxonomy (BT) level of the question should be L3 and above.		L1—L10
		3	**Assignment 2**	**15 days**	**5**	2 STQ× 2½= 5	Bloom's taxonomy (BT) level of the question should be L3 and above.		L11—L20
		4	**Assignment 3**	**15 days**	**5**	2 STQ× 2½= 5	Bloom's taxonomy (BT) level of the question should be L3 and above.		L21—L26
		3	**Assignment 4**	**15 days**	**5**	2 STQ× 2½= 5	Bloom's taxonomy (BT) level of the question should be L3 and above.		L27—L34

		4	**In-semester Exam 2**	**60 Mins**	**15**	**Objective:** 5M 10 MCQs × ½ = 5 marks **Descriptive:** 10 M (2 Questions of 2 marks +2 Questions of 3 marks)	Bloom's taxonomy (BT) level of the question should be L3 and above.	Yet to be announced	L16—L31
END – SEMESTER ASSESSMENT									
1	**Regular/Make–Up Exam**			180 Mins	50	Answer all 5 full questions of 10 marks each. Each question can have 3 parts of 2/3/4/5/6 marks.	Bloom's taxonomy (BT) level of the question should be L3 and above.	17th week of the semester	Comprehensive examination covering full syllabus.

******* ***Individual faculty will be entering the topics***

****** Individual faculty must identify the assessment method from table 3 and fill in the details.***

NOTE: ***Information provided in the table is as per the In-semester assessment plan and schedule of V and VII semester B. Tech provided from Academic Section.***

LESSON PLAN

L No	TOPICS	Course Outcome Addressed
1	Introduction to the course, Definition and Axioms of probability.	CO1
2	Addition rule , independent events, problems.	CO1
3	Conditional probability, problems.	CO1
4	Total probability, problems.	CO1
5	Baye's Theorem with proof, problems.	CO1
6	Tutorial	CO1
7	One dimensional random variables, CDF, Mode, Median, problems.	CO2
8	Mean and Variance of one dimensional random variables, Chebyshev's inequality without proof, Problems.	CO2
9	Tutorial	CO2
10	Two dimensional Random variables, Marginal Pdf's, problems.	CO2
11	Mean and variance of discrete and continuous random variables, conditional probability function and Conditional pdf's, Problems.	CO2
12	Covariance and Correlation Co-efficient, Properties, Problems.	CO2
13	Tutorial	CO2
14	Probability distributions: Binomial distribution, mean and variance with problems	CO3
15	Poisson's distribution - mean and variance, Uniform distribution - mean and variance.	CO3
16	Tutorial	CO3
17	Normal distribution, mean and variance , problems	CO3
18	Problems on Normal distribution.	CO3
19	Gamma, Exponential and Chi- Square Distribution -- mean and variance.	CO3
20	Gamma, Exponential and Chi- Square Distribution : Problems.	CO3
21	Functions of one dimensional random variables, Problems.	CO4
22	Functions of two dimensional random variables, Problems.	CO4
23	F and t- distribution (Definition only) and Problems	CO4
24	Tutorial	CO4
25	Moment generating functions (mgf), Problems	CO4
26	Problems related to mgf of both continuos and discrete random variables.	CO4
27	Introduction to Sampling Theory and related problems	CO4
28	Central limit theorem with proof, Problems.	CO4
29	Problems on Central limit theorem.	CO4
30	Point estimation, problems.	CO4
31	Maximum Likelihood estimator (MLE) , problems.	CO4
32	Significance level, critical region and power of the test, Problems.	CO5
33	Testing of Hypothesis with problems	CO5
34	Chi-square test, problems	CO5
35	Best critical region, Neyman-Pearson lemma, Problems	CO5
36	Tutorial	CO5

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3						1				1			
CO2	3	3						1				1			
CO3	2	3						1				1			
CO4	2	2						1				1			
CO5	2	1						1				1			
Articulation Level	2.4	2.4						1				1			

FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):

FACULTY	SECTION	FACULTY	SECTION
SHS	CS(A)	ABB	IT(A)
VM	CS(B)	DN	IT(B)
SHK	CS (C)	SKV	IT(C)
KK	CS(D)	SP	CCE(A)
		VM	CCE(B)
		SME	CCE(C)

References:

1. Meyer P.L. - Introduction to probability and statistical applications, 2nd edition, 1980, Oxford and IBH Publishing, Delhi.
2. Miller, Freund and Johnson - Probability and Statistics for Engineers, 8th edn, PHI, 2011.
3. Hogg and Craig, Introduction to Mathematical Statistics, 6th edition, Pearson education, New Dehli, 2012.
4. Ross Sheldon M, Introduction to Probability and Statistics for Engineers and Scientists, Elseveir, 2010.

Submitted by: Dr. Sujatha H S

(Signature of the faculty)

Date: 6.2.2023

Approved by: Dr Sudhakara G.

(Signature of HOD)