COURSE HANDOUT

ENGINEERING MATHEMATICS-II (BSC-201)

Electrical Engineering – 2ND SEMESTER

ACADEMIC YEAR (2024-25)

Dr. Ria Gupta

Assistant Professor

Department of Applied Science & Humanities

Department of Electrical Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

www.mietjmu.in

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
BSC-201	Engineering Mathematics II	Core	5	4	1	0	50	100	150

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	To understand probability and random variables and various discrete and continuous probability distributions and their properties
CO2	Calculate probabilities, and derive the marginal and conditional distributions of Bivariate random variables
CO3	Analyze statistical data using measures of central tendency, dispersion and location
CO4	Understand and discuss the issues surrounding sampling and significance
CO5	Develop analytical skills in structuring and interpreting the business problems statistically

Unit-I

Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables; Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality.

(9 Hours)

Unit-II

Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma densities. Bivariate distributions and their properties, distribution of sums and quotients, conditional densities, Bayes' rule.

(12 Hours)

Unit-III

Measures of Central tendency: Moments, skewness and Kurtosis - Probability distributions. Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions, Correlation, and regression – Rank correlation.

(10 Hours)

Unit- IV

Hypothesis – Introduction, Format and Types; Procedure of Hypothesis Testing; Errors in Hypothesis; Two- tail and One-tail Test of Hypothesis; Tests of Significance for Attributes; Tests of Significance for Variables; Tests of Significance for Small Samples; t-distribution and its application.
.

(11 Hours)

Unit-V

Difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attribute.

(10 Hours)

Textbooks

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley	10th (2015)
2	A first Course in Probability	S. Ross	Pearson Education India	6th (2002)
3	Introduction to Probability and Statistics for Engineers and Scientists	Sheldon M. Ross	Academic Press	5th (2009)

Reference Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Advanced Engineering Mathematics	R.K. Jain, S.R.K. Iyenger	Narosa Publishing House Pvt. Ltd.	5th (2016)
2	Higher Engineering Mathematics	Dr B. S. Grewal	Khanna Publications	43rd (2017)
3	Engineering Mathematics	N. P Bali	Laxmi Publications	13th (2009)

COURSE PLAN		
Unit-I Theory of Computation		
S. No	**Topics**	**Recommended Books**
1	Probability spaces, conditional probability and independence	Book 1, Ch.1
2	Discrete random variables, Independent random variables and Expectation of Discrete Random Variables,	Book 1, Ch.1
3	The multinomial distribution and Poisson approximation to the binomial distribution	Book 1, Ch.1
4	Infinite sequences of Bernoulli trials and sums of independent random variables	Book 2, Ch.2
5	Moments and Variance of a sum	Book 2, Ch.2
6	Correlation coefficient	Book 2, Ch.2
7	Chebyshev's Inequality	Book 2, Ch.2
Unit-II Introduction to Continuous Random Variables		
8	Continuous random variables and their properties	Book 1, Ch.2
9	Distribution functions and densities	Book 1, Ch.2
10	Normal, exponential and gamma densities	Book 1, Ch.1
11	Bivariate distributions and their properties	Book 2, Ch.2
12	Distribution of sums and quotients, conditional densities and Bayes' rule	
Unit-III Correlation & Regression		
13	Measures of Central tendency: Moments, skewness and Kurtosis	Book 2, Ch.2
14	Probability distributions. Binomial, Poisson and Normal	Book 2, Ch.2
15	Evaluation of statistical parameters for these three distributions	Book 2, Ch.2
16	Correlation, and regression – Rank correlation.	Book 2, Ch.2
Unit-IV Statistics-I		
17	Hypothesis – Introduction, Format and Types	Book 2, Ch.3
18	Procedure of Hypothesis Testing and Errors in Hypothesis	Book 1, Ch.4
19	Two- tail and One-tail Test of Hypothesis	Book 1, Ch.4
20	Tests of Significance for Attributes and for Variables	Book 2, Ch.3
21	Tests of Significance for Small Samples- t-distribution and its application.	Book 1, Ch.3
Unit-V Statistics-II		
22	Difference of means and correlation coefficients	Book 2, Ch.8
23	Test for ratio of variances - Chi-square test for goodness of fit and independence of attribute	Book 1, Ch.8

ADDITIONAL WEB RESOURCES

1.	**NPTEL LINK: https://youtu.be/69oJWHkOOk** This site contains video lectures on **Central tendency and Dispersion intro.**
2.	**https://youtu.be/ITX10eS_cuU/** This site contains video lectures **on Correlation and Regression.**
3.	**https://youtu.be/IqeUEVVIDD0** This site contains video lectures on **Normal Distribution.**
4.	**https://archive.nptel.ac.in/courses/111/104/111104098/** This site contains video lectures on various topics of **simple linear regression analysis.**

GRADING AND ASSESSMENT

- **Sessional Test**: 20 marks
- **Assignment**: 20 marks
- **Attendance**: 10 marks
- **Final Examination**: 100 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity**: MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions: Assignments and projects must be submitted by the specified timelines.**

FACULTY INFORMATION

- **Office Hours**

  Monday (12:55 PM - 1:45 PM)
  Friday (12:55 PM - 1:45 PM)

- **Contact Information**
  ria.ash@mietjammu.in