



SOCIETY OF ST. FRANCIS XAVIER, PILAR'S
FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING

(Approved by AICTE & Affiliated to University of Mumbai)

Fr. Agnel Ashram, Bandstand, Bandra (W), Mumbai - 400 050.

Phone : (022) 6711 4000, 6711 4101, 6711 4104

Website : www.frcoe.ac.in • Email : crce@fragnel.edu.in

Artificial Intelligence and Data Science (Academic Year: 2023-2024)

Course Code: CSC301	
Course Name: Engineering Mathematics III	
Course Teacher: Prof Prasad Lalit	
Course Outcomes (CO): <i>At the End of the course students will be able to</i>	
CO.1	Evaluate the Laplace Transform of a given piecewise continuous function
CO.2	Evaluate the inverse Laplace Transform of a given bounded function
CO.3	Expand the given periodic function as a Fourier series
CO.4	Apply complex variable theory in finding the orthogonal trajectory of the given family of curves
CO.5	Apply the concept of Correlation and Regression to engineering problems in data science, machine learning, and AI.
CO.6	Apply the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.



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Course Lesson Plan

Sr. No.	Proposed Date	Topics	Delivery Mode	CO	Assessment Tool	Ref. Book	Actual Date	Remark
1	17/7/23	Laplace transform: Definition, Laplace transform of standard functions	Lecture	CO1	UT1, Q1, Tutorial 1	T1, R2	17-7-23	
2	19/7/23	Laplace transform of functions that are reducible to standard functions	Lecture	CO1	UT1, Q1, Tutorial 1	T1, R2	19-7-23	
3	21/7/23	Properties of Laplace transform	Lecture	CO1	UT1, Q1, Tutorial 1	T1, R2	21-7-23	
4	24/7/23	Examples based on the properties	Lecture	CO1	UT1, Q1, Tutorial 1	T1, R2	24-7-23	
5	25/7/23	Examples based on the properties	Lecture	CO1	UT1, Q1, Tutorial 1	T1, R2	25-7-23	
6	26/7/23	Evaluation of real integral using Laplace transform	Lecture	CO1	UT1, Q1, Tutorial 1	T1, R2	26-7-23	
7	31/7/23	Inverse Laplace transform: Definition, formulas, and properties	Lecture	CO2	UT1, Q2, Tutorial 2	T1, R2	26-7-23	Tutorial slot engaged in theory
8	01/8/23	Inverse Laplace transform using the method of partial fraction	Lecture	CO2	UT1, Q2, Tutorial 2	T1, R2	31-7-23	
9	02/8/23	Inverse Laplace transform using the method of partial fraction	Lecture	CO2	UT1, Q2, Tutorial 2	T1, R2	1-8-23	
10	07/8/23	Inverse Laplace transform using the convolution method	Lecture	CO2	UT1, Q2, Tutorial 2	T1, R2	2-8-23	
11	08/8/23	Inverse Laplace transform using the convolution	Lecture	CO2	UT1, Q2, Tutorial 2	T1, R2	3-8-23	Extra class of Prof. Prachi Doshi



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		method			/23 Tutorial 2			
12	09/8/23	Inverse Laplace transform using derivative	Lecture	CO2	UT/231, Q2, Tutorial 2	T1, R2	7-8-23	08-08-23 } on 09-08-23 } on 10-08-23 } on
13	14/8/23	Fourier series: Introduction, Dirichelet's condition, expansion of a function over the interval of length 2π	Lecture	CO3	UT1, Q3, Tutorial 3	T1, R2	10-8-23	14-8-23 } on 15-8-23 } on
	15/8/23	Independence Day						
	16/8/23	Parsi New Year						
14	21/8/23	Expansion of function over the interval of length 2π	Lecture	CO3	UT1, Q3, Tutorial 3	T1, R2	17-8-23	
15	22/8/23	Fourier series of even and odd functions	Lecture	CO3	UT1, Q3, Tutorial 3	T1, R2	21-8-23	
16	23/8/23	Half-range Fourier series	Lecture	CO3	UT1, Q3, Tutorial 3	T1, R2	22-8-23	
	28/8/23	Unit Test-1		CO1,2,3				
	29/8/23	Unit Test-1		CO1,2,3				
	30/8/23	Unit Test-1		CO1,2,3				
17	04/9/23	Parseval's identity	Lecture	CO3	UT1, Q3, Tutorial 3	T1, R2	23-8-23	
18	05/9/23	The function of a complex variable	Lecture	CO4	UT2, Q1, Tutorial 4	T1, R3	4-9-23	
19	06/9/23	Analytic function: Necessary and sufficient condition	Lecture	CO4	UT2, Q1, Tutorial 4	T1, R3	5-9-23	
20	11/9/23	Examples of analytic function	Lecture	CO4	UT2, Q1, Tutorial 4	T1, R3	6-9-23	
21	12/9/23	Harmonic functions, Milne-Thomson method	Lecture	CO4	UT2, Q1, Tutorial 4	T1, R3	11-9-23	
22	13/9/23	Orthogonal trajectory	Lecture	CO4	UT2, Q1, Tutorial 4	T1, R3	12-9-23	
23	18/9/23	Karl Pearson's coefficient of correlation	Lecture	CO5	UT2, Q2,	T1	18-9-23	



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Dr. Rajul Kulkarni, Headmaster, Sanctora (W), Mumbai 400 002

Phone: 2222 0711, 2222 0711, 2222 0711, 2222 0711

Website: www.frcce.edu.in | Email: frcce@frcce.edu.in

10/9/23		Silver Jubilee Celebrations		Tutorial 1			
26	20/9/23	Pearl Pearson's coefficient of correlation	Lecture	CO5	U.P1, Q2	T1	
27	25/9/23	Spearman's Rank correlation coefficient (R_s) with reported and non-reported ranks	Lecture	CO5	U.P1, Q2	T1	
28	30/9/23	Lines of regression	Lecture	CO5	U.P1, Q2	T1	
29	7/10/23	Fitting of first and second degree curves	Lecture	CO5	U.P1, Q2	T1	
02/10/23		Mahatma Gandhi Jayanti		Tutorial 2			
30	03/10/23	Basics of probability and conditional probability	Lecture	CO6	U.P1, Q1	T1, R2	
31	06/10/23	Bayes' theorem and examples based on it	Lecture	CO6	U.P1, Q1	T1, R2	
	09/10/23			CO6, 5.4			
	10/10/23			CO6, 5.4			
	11/10/23			CO6, 5.4			
30	16/10/23	Discrete and continuous random variables, probability distribution function, probability density function	Lecture	CO6	U.P1, Q1	T1, R2	
31	17/10/23	Mean and variance of a random variable	Lecture	CO6	U.P1, Q1	T1, R2	
32	18/10/23	Mean and variance of a random variable	Lecture	CO6	U.P1, Q1	T1, R2	
33	23/10/23	Moment generating function, Bayes and central theorem of a coin toss	Lecture	CO6	U.P1, Q1	T1, R2	
	24/10/23				Tutorial 3		
24/10/23		Holiday					
		University End Examination					



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Text Books:

1. Engineering Mathematics III by G.V. Kumbhojkar, J. Jamnadas Publication

Reference Books:

1. Advance Engineering Mathematics by O'Neil, Cengage Publication
2. Advance Engineering Mathematics by H.K. Dass, S. Chand & Company Limited
3. Advance Engineering Mathematics by Erwin Kreyszig, Wiley Publication


Course Instructor: Prof Prasad Lalit