

FR. Conceicao Rodrigues College of Engineering

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Department of Humanities & Sciences

F.E. (Common) (Semester I) (2020-2021)

Lesson Plan

Subject: Engineering Mathematics I (FEC101)

Credits-4

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Syllabus

Module No	Topic	Hours Planned
01	Complex Numbers 1.1 Statement of D'Moivre's theorem 1.2 Expansion of sine and cosine function from power to multiple and from multiple to power 1.3 Powers and roots of complex numbers	05
02	Hyperbolic functions and Logarithm of a complex number 2.1 Circular and hyperbolic functions, inverse circular and inverse hyperbolic	05

	functions, separation into real and imaginary parts 2.2 Logarithm of a complex numbers, separation of real and imaginary parts of logarithmic functions	
03	Partial Differentiation 3.1 Functions of several variables, partial derivatives of first and higher order, differentiation of composite functions 3.2 Euler's theorem (with proof) and its deductions for homogeneous functions of two Variables	05
04	Applications of partial differentiation and successive differentiation 4.1 maxima and minima of functions of two variables and Lagrange multiplier of functions of two variables 4.2 nth derivative, Leibnitz theorem without proof and problems	05
05	Matrices 5.1 Types of matrices (symmetric, skew-symmetric, hermitian, skew-hermitian, orthogonal and unitary), Rank of a matrix using row-echelon form, normal form and PAQ form 5.2 Non-homogeneous and homogeneous system of linear equations and their solutions	05
06	Numerical solutions of transcendental equations, system of equations and expansion of functions 6.1 Numerical solutions of transcendental equations: Regula-Falsi and Newton Raphson methods 6.2 Numerical solutions of system of equations: Jacobi method, Gauss-Seidal method 6.3 Expansion of functions: Taylor's series, Maclaurin's series, expansions of exponential, logarithmic functions, circular trigonometric and hyperbolic functions	05

Course Outcomes:

CO	Course Outcome At the end of the course student will be able to:	Cognitive Level (Bloom's Taxonomy)	Hours Planned
CO 1	Use the concept of rank of matrix to solve the given system of homogeneous and non-homogeneous linear equations.	Apply (Level 3)	07
CO 2	Understand the basics of Complex numbers, obtain roots of complex numbers using De Moivre's theorem and also real and imaginary parts of a given complex number.	Understand (Level 2)	06
CO 3	Use partial differentiation to obtain the extremum value of the given function of two or three variables.	Apply (Level 3)	07
CO 4	Find the nth derivative of a given function using Leibnitz theorem [Successive differentiation).	Apply (Level 3)	07

Total Hours Planned

27

CO- PO mapping

Course	PO1
FEC101.1	3
FEC101.2	2
FEC101.3	3
FEC101.4	2
TOTAL	10
Direct Attainment	2.5 (M)

Justification:

Above CO's are mapped to the following PO's as explained below:

PO1 Provides the basic knowledge required for identifying and analyzing problems in Engineering Program.

CO Assessment Tools:

FEC101.1: Direct Methods (80%): Test 1+Tutorial 1+ Tutorial 2+ End Exam
CO1 dm = 0.3xtest1+0.2xtutorial1+0.2xtutorial2+0.3x end exam
Indirect Methods (20%): Course Exit Survey(CES)
CO1 idm =1xCES
FEC101.1 = (0.8 x CO1 dm) + (0.2 x CO1 idm)

FEC101.2: Direct Methods (80%): Test 2+Tutorial 3+ Tutorial 4+ End Exam
CO2 dm = 0.3xtest2+0.2xtutorial3+0.2xtutorial4+0.3x end exam
Indirect Methods (20%): Course Exit Survey(CES)
CO2 idm =1xCES
FEC101.2 = (0.8 x CO2 dm) + (0.2 x CO2 idm)

FEC101.3: Direct Methods (80%): Tutorial 5+ End Exam
CO3 dm =0.4xtutorial5+0.6x end exam
Indirect Methods (20%): Course Exit Survey(CES)
CO3 idm =1xCES
FEC101.3 = (0.8 x CO3 dm) + (0.2 x CO3 idm)

FEC101.4: Direct Methods (80%): Tutorial 6+ End Exam
CO4 dm = 0.4xtutorial6+0.6x end exam
Indirect Methods (20%): Course Exit Survey(CES)
CO4 idm =1xCES
FEC101.4 = (0.8 x CO4 dm) + (0.2 x CO4 idm)

LESSON PLAN

Sr. No.	Topic Planned	Planned Date	Actual Date	Mapped with CO	Content Delivery Method	Remarks
1	Module 05: Matrices - Types of Matrices	04/02/2021	04/02/2021	CO 1	Online	
2	Module 05: Matrices - Types of Matrices	05/02/2021	05/02/2021	CO 1	Online	
3	Module 05: Matrices - Types of Matrices	08/02/2021	08/02/2021	CO 1	Online	
4	Module 05: Matrices - Types of Matrices	09/02/2021	09/02/2021	CO 1	Online	

5	Module 05: Matrices - Examples on Types of Matrices	11/02/2021	11/02/2021	CO 1	Online	
6	Module 05: Matrices - Rank of a matrix	12/02/2021	12/02/2021	CO 1	Online	
7	Module 05: Matrices - Examples on rank of a matrix	15/02/2021	15/02/2021	CO 1	Online	
8	Module 05: Matrices - Normal form of a matrix	15/02/2021	15/02/2021	CO 1	Online	
9	Module 05: Matrices - PAQ form	16/02/2021	18/02/2021	CO 1	Online	Orientation Programme
10	Module 05: Matrices - System of non- homogeneous equations	18/02/2021	22/02/2021	CO 1	Online	19/02 Bank holiday
11	Module 05: Matrices - System of non- homogeneous equations	22/02/2021	23/02/2021	CO 1	Online	
12	Module 05: Matrices - System of homogeneous equations	23/02/2021	25/02/2021	CO1	Online	
13	Module 05: Matrices - System of homogeneous equations	25/02/2021	26/02/2021	CO1	Online	
14	Module 01: Complex Numbers - D' Moivre's theorem	26/02/2021	01/03/2021	CO 2	Online	
15	Module 01: Complex Numbers - D'Moivre's theorem (Examples)	01/03/2021	02/03/2021	CO 2	Online	
16	Module 01: Complex Numbers - Roots of a complex number	02/03/2021	04/03/2021	CO 2	Online	
17	Module 01: Complex Numbers - Roots of a complex number	04/03/2021	05/03/2021	CO 2	Online	
18	Module 01: Power to multiple and multiple to power of trigonometric functions	05/03/2021	08/03/2021	CO 2	Online	
19	Module 02: Hyperbolic function and Logarithm of Complex Numbers	08/03/2021	08/03/2021	CO 2	Online	Tutorial engaged as a theory class
20	Module 02: Hyperbolic function and Logarithm of Complex Numbers	09/03/2021	09/03/2021	CO 2	Online	

Tutorial Plan

1	Tutorial 1: Types of matrices	22/02/2021	22/02/2021			
2	Tutorial 2: Rank of a matrix and system of linear equations	01/03/2021	01/03/2021			
3	Tutorial 3: Complex Numbers 1	08/03/2021	15/03/2021			08/03 Engaged as a theory class
4	Tutorial 4: Complex Numbers 2	15/03/2021	22/03/2021			
5	Tutorial 5: Successive differentiation	05/04/2021				Home assignment
6	Tutorial 6: Partial differentiation					Home assignment

Course Outcomes Target:

FEC101.1
TARGET RANGE: 2.5

FEC101.2
TARGET RANGE: 2.2

FEC101.3.
TARGET RANGE: 2.5

FEC101.4
TARGET RANGE: 2