

Introductory Lecture

Engineering Mathematics-I

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Lecture outline

- Subject Introduction
- Syllabus discussion
- Module 1: Numerical Methods
- Module 2: Matrices
- Module 3: Partial Differentiation
- Module 4: Complex Numbers
- Module 5: Successive Differentiation
- Module 6: Expansion of Function
- Module 7: Self study Topics



Subject Introduction

Teaching Scheme (As per 2019 Syllabus)

Program Structure for First Year Engineering

Semester I & II

UNIVERSITY OF MUMBAI

(With Effect from 2019-2020)

Semester I

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
FEC101	Engineering Mathematics-I	3	--	1*	3	--	1	4

Semester II

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
FEC201	Engineering Mathematics-II	3	--	1*	3	--	1	4



Subject Introduction

Examination Scheme(As per 2019 Syllabus) Semester 1

Course Code	Course Name	Examination Scheme								
		Theory			Exam. Duration (in Hrs)		Term Work	Pract. /oral	Total	
		Internal Assessment								
		Test1	Test 2	Avg.	End Sem. Exam.	Exam. Duration (in Hrs)				
FEC101	Engineering Mathematics-I	20	20	20	80	3	25	--	125	

Semester 2

Course Code	Course Name	Examination Scheme								
		Theory			Exam. Duration (in Hrs)		Term Work	Pract. /oral	Total	
		Internal Assessment								
		Test1	Test 2	Avg.	End Sem. Exam.	Exam. Duration (in Hrs)				
FEC201	Engineering Mathematics-II	20	20	20	80	3	25	--	125	

Syllabus Discussion

- Modules
- Tutorial
- Scilab
- Reference book
 - (1) Higher Engineering Mathematics, Dr.B.S.Grewal, Khanna Publication
 - (2) Advanced Engineering Mathematics, Erwin Kreyszig, Wiley EasternLimited, 9thEd.
 - (3) Engineering Mathematics by Srimanta Pal and Subodh,C.Bhunia, Oxford University Press
 - (4) Matrices, Shanti Narayan, .S. Chand publication.
 - (5) Applied Numerical Methods with MATLAB for Engineers and Scientists by Steven Chapra, McGraw Hill
 - (6) Elementary Linear Algebra with Application by Howard Anton and Christ Rorres,6th edition,John Wiley and Sons,INC
 - (7) Higher Engineering Mathematics By Dr N.R.Dasre

Module 1 : Numerical Methods

- Regula Falsi Method
- Newton Raphson Method
- Gauss Jacobi Iteration Method
- Gauss Seidel Iteration Method

Module 2 : Matrices

- Prerequisite of matrices
- Rank of a Matrix
 - Rank by reducing to row echelon form
 - Rank by reducing to normal form
 - Rank by PAQ Method
- System of Linear Equations and Solution Method(Using Matrix Method and Rank)

Module 3 : Partial Differentiation

- Partial Derivatives of several variables
- Partial Derivatives of composite Functions
- Euler Theorem and examples
- Application of Partial Derivatives
 - To find Extreme values of function of two variables
 - To find Extreme values using **Lagrange Multiplier Method**



Module 4 : Complex Numbers

- Prerequisite of Complex Numbers
- D' Moivre's theorem and its examples
- Expansion of powers of sine and cosine in terms of Multiples of sine and cosine and Viceversa
- Roots and Power of Complex Numbers
- Introduction to Circular and Hyperbolic Functions and its inverse
- Logarithamic Functions
- Separation into real and imaginary parts of all functions

Module 5 : Successive Differentiation

- n^{th} Derivative of standard functions
- Liebnitz theorem and its examples

Module 6 : Expansion of Functions

- Taylor and McLaurin Series and examples
- Expansion of exponential , Trigonometric, hyperbolic, logarithmic and inverse circular functions

Module 7 : Self Study Topics

- Each modules will have self study topics
- One tutorial/ Quiz or Assignment based on all self study topic will be conducted during a semester

Thank You



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