MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

COURSE PLAN

Department	:	MATHEMATICS
Course Name & code	:	Engineering Mathematics - III & MAT2152.
Semester & branch	:	III & Common to ECE,EEE, EIE, BME
Name of the faculty	:	Dr. Prathima J

No of contact hours/week:

L	T	P	C
3	0	0	3

Course Outcomes (COs)

	At the end of this course, the student should be able to:	No. of Contact Hours	Marks
CO1:	Understand and apply the concepts of Fourier Series, Fourier transforms & their properties	10	14
CO2:	Understand and apply analyticity of a complex functions and its properties.	5	6
CO3:	Understand and apply the concepts of contour integration	7	7
CO4:	Understand the concept of vector differential and integral calculus & their properties	12	17
CO5:	Apply the concepts of linear PDEs, to solve One dimension Heat and Wave equation by different methods.	6	6
	Total	40	50

Assessment Plan

Components	Assignments	Sessional Tests	End Semester/ Make-up Examination
Duration	20 to 30 minutes	60 minutes	180 minutes
Weightage	20 % (4 X 5 marks)	30 % (2 X 15 Marks)	50 % (1 X 50 Marks)
Typology of Questions	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation	Knowledge/ Recall; Understanding/ Comprehension; Application	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation
Pattern	Answer one randomly selected question from the problem sheet (Students can refer their class notes)	MCQ: 10 questions (0.5 marks) Short Answers: 5 questions (2 marks)	Answer all 5 full questions of 10 marks each. Each question may have 2 to 3 parts of 3/4/5/6/7 marks
Schedule	4, 7, 10, and 13th week of academic calendar	Calendared activity	Calendared activity
Topics Covered	Quiz 1 (L 1-10 & T 3,6,9) **(CO1)**	Test 1 (L 1-18 & T 3,6,9,12,15,18) **(CO1 & 2)**	Comprehensive examination covering full syllabus. Students are expected to answer all questions **(CO1-5)**
	Quiz 2 (L **11-21** & T 12,15,18,21) **(CO2 &3)**		
	Quiz 3 (L 22-30 & T 12,15,18,21) **(CO3 & 4)**	Test 2 (L 19-36 & T 21,24,27,30,33,36) **(CO3 &4)**	
	Quiz 4 (L 31-36 & T 33, 36) **(CO5)**		

Lesson Plan

L. No./ T. No.	Topics	Course Outcome Addressed
L0	Introduction to the Course	CO
L1	Periodic functions, Even & odd functions and their properties. List of some standard integrals (definite integrals).	CO1
L2	Trigonometric or Fourier Series. Dirichlet's conditions. Euler's formulae for Fourier coefficients, Fourier Series, Dirichlet's conditions. Euler's formulae for Fourier coefficients	CO1
L3	Tutorial	CO1
L4	Fourier series expansion of functions with arbitrary period.	CO1
L5	Fourier series expansion of odd/even functions ,Half range expansions,	CO1
L6	Tutorial	CO1
L7	Fourier transform, basic properties	CO1
L8	Parseval's identity and applications	CO1
L9	Tutorial	CO1

L10	Fourier sine and cosine transforms, basic properties	CO1
L11	Functions of complex variable. Basic concepts on limit, continuity, differentiability and analytic functions	CO2
L12	Tutorial	CO2
L13	C-R equations in Cartesian and Polar co-ordinates	CO2
L14	Harmonic functions, properties of analytic functions, Finding analytic function whose real or imaginary part is given.	CO2
L15	Tutorial	CO2
L16	Line integrals of complex functions, Cauchy's integral theorem	CO3
L17	Cauchy's integral formula.	CO3
L18	Tutorial	CO3
L19	Basic concepts of power series, radius/ region of convergence. Taylor's theorem	CO3
L20	Taylor's series expansions of analytic functions and Laurent series expansions and related problems.	CO3
L21	Tutorial	CO3
L22	Singularities, residue, Cauchy's residue theorem and related problems	CO3
L23	Vector differential operator, gradient, divergence and curl	CO4
L24	Tutorial	CO4
L25	Physical meaning of gradient, divergence and curl and identities	CO4
L26	Line integrals	CO4
L27	Tutorial	CO4
L28	Surface integrals	CO4
L29	Volume integrals	CO4
L30	Tutorial	CO4
L31	Green's theorem with proof	CO4
L32	Divergence theorem (without proof)	CO4
L33	Tutorial	CO4
L34	Stoke's theorem(without proof)	CO4
L35	Basic concepts of PDEs / Solutions. Solutions of PDEs by direct integration and by separation of variables.	CO5
L36	Tutorial	CO5
L37	Solution of PDE by indicated transformations.	CO5
L38	Derivation of one dimensional wave equation. Solution by by separation of variables, D'Almbert's solution	CO5

L39	Derivation of one dimensional heat equation and its solution by separation of variable method	CO5
L40	Tutorial	CO5

References:

1. Erwin Kreyszig: Advanced Engineering Mathematics-, Wiley Eastern
2. Grewal B.S. - Higher Engineering Mathematics, Khanna Publishers
3. Murray R. Spiegel: Vector Analysis, Schaum Publishing Co.
4. Advanced Engineering Mathematics, Vol 3, by Narayanan, Ramaniah and Manicavachagam Pillay
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Submitted by: Dr. Prathima J

(Signature of the faculty)

Date: 14-09-2021

Approved by: Dr. Sudhakara G

(Signature of HOD)

Date: 14-09-2021

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

FACULTY	SECTION	FACULTY	SECTION
HK	ECE(A)	JP	EIE(A)
SHK	ECE(B)	HK	EIE(B)
SP	ECE(C)	Y	EEE(A)
SKC	BME	BR	EEE(B)
		BSH	EEE(C)
