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

COURSE PLAN

Department	:	MATHEMATICS
Course Name & code	:	Engineering Mathematics II & MAT 1251
Semester & branch	:	II & common to all branches
Name of the faculty	:	
No of contact hours/week:		**L** Lecture(L) / **T** Tutorial(T) / **P** Practical(P) / **C** Credit(C)

ASSESSMENT PLAN

Course Outcomes (COs)

	At the end of this course, the student should be able to:	**No. of Contact Hours**	**Marks**
CO1:	Know the partial differentiation of a given function and evaluate the limits of functions in indeterminate forms and mean value theorem.	10	10
CO2:	Expand functions in Taylor's / Maclaurin's Series, finding Maxima and Minima, and analyse the problems on right circular cone and right circular cylinder	10	10
CO3:	Apply the concept of multiple integrals to find the area and volume	12	12
CO4:	Evaluate the L.T. of periodic functions, Step functions and solving ODE using L.T.	10	10
CO5:	Check the nature (convergent / divergent / oscillate) of an infinite series	8	8
	Total	50	50

Components	Quizzes	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_{x1-x2} & T_{y1-y2}) **(CO x)**	Test 1 (L_{a1-a2} & T_{b1-b2}) **(CO x)**	Comprehensive examination covering full syllabus. Students are expected to answer all questions **(CO1-5)**
	Quiz 2 (L_{x3-x4} & T_{y3-y4}) **(CO x)**		
	Quiz 3 (L_{x5-x6} & T_{y5-y6}) **(CO x)**	Test 2 (L_{a3-a4} & T_{b3-b4}) **(CO x)**	
	Quiz 4 (L_{x7-x8} & T_{y7-y8}) **(CO x)**		

Course Plan

L. No.	Topics	Course Outcome Addressed
L0	Introduction to the course	CO1
L1	Mathematical meaning of Partial derivatives and problems	CO1
L2	Euler's theorem on homogeneous functions with Problems	CO1
L3	Total Derivatives , composite functions and Implicit functions with problems	CO1
L4	Tutorial	CO1
L5	Errors and Approximations with problems.	CO1
L6	Indeterminate forms and L- Hospital rule.	CO1
L7	Evaluation of indeterminate forms by using L-H rule.	CO1
L8	Tutorial	CO1
L9	Cauchy's Mean value theorem with problems	CO2

L10	Taylor's and Maclaurin's series for function single variable.	CO2
L11	Taylor's and Maclaurin's theorem for function of 2 variables statement and problems	CO2
L12	Tutorial	CO2
L13	Maxima and Minima for function of two variables, definition and condition for extreme values and related problems	CO2
L14	Lagrange's method of undetermined multipliers and problems	CO2
L15	Equation of sphere with problems	CO2
L16	Tutorial	CO2
L17	Intersection of sphere and orthogonality of spheres and problems	CO2
L18	Equation of right circular cone and cylinder with problems	CO2
L19	Meaning of double integral and evaluation of some double integrals	CO3
L20	Tutorial	CO3
L21	Change the order of integration with problems.	CO3
L22	Jacobian , changing the variables and related problems in double integrals.	CO3
L23	Application of double integral to find the area and related problems.	CO3
L24	Tutorial	CO3
L25	Finding the area between the curves & Evaluation of volume as double integrals.	CO3
L26	Meaning of triple integrals and evaluation of triple integrals	CO3
L27	Computational of volume by using triple intergrals.	CO3
L28	Tutorial	CO3
L29	Beta and gamma functions, properties, and problems.	CO3
L30	Legendre's duplication formula and evaluation of integrals by using beta and gamma functions.	CO3
L31	Laplace transform: Definition, transform of some elementary functions, properties and problems.	CO4
L32	Tutorial	CO4
L33	L.T of functions multiplied by t and divided by t with problems. L.T of derivatives and integrals.	CO4
L34	Laplace transform of periodic functions with problems and unit step function with problems	CO4
L35	Inverse Laplace transforms, inverse laplace transforms by using partial fractions.	CO4
L36	Tutorial	CO4
L37	Inverse laplace transforms of functions involving logerthemic and inverse trigonometric functions.	CO4

L38	Statement of convolution theorem, inverse L.T by convolution theorem	CO4
L39	Some more problems on inverse transforms,	CO4
L40	Tutorial	CO4
L41	Inverse laplace transforms involving unit step function.	CO4
L42	Solution of ordinary differential equations by using Laplace Transforms.	CO4
L43	Convergence and divergence of series, Comparison test, integral test and problems .	CO5
L44	Tutorial	CO5
L45	P-series test, Cauchy's root test and problems.	CO5
L46	D' Alembert's Ratio Test, Raabes test and related problems.	CO5
L47	Alternating Series, Leibnitz's test and related problems.	CO5
L48	Meaning of Absolute convergence and conditional convergence and related problems	CO5
L49	Problems on Absolute Convergence /conditional Convergence, power series with problems.	CO5
L50	Tutorial	CO5

References:

1. B.S.Grewal, Higher Engineering Mathematics, 42nd edition, 2012, Khanna Publishers.
2. N.Piskunov-Differential Calculus, Vol I and II, Mir Pub
3. Rainville E.D and Bedient P.E , A short course in differential equations, 7th edition, prentice hall, New New york, 1989.
4. Kreyzig E, Advanced Engineering Mathematics, 8th edition, 2006, Wiley Eastern , Delhi.
5. Shanti Narayan - Differential Calculus, 6th edition, Shyam Lal Charitable Trust, Delhi.
6.
7.

Submitted by: **DR.KUNCHAM SYAM PRASAD**

(Signature of the faculty)

Date: 05-03-2022

Approved by: DR.SUDHAKARA G.

(Signature of HOD)

Date: 05-03-2022

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

FACULTY	SECTION	FACULTY	SECTION
JP	A	HKP	M
KSP	B	DN	N
AB	C	SHS	O
IKP	D	AR	P
RBR	E	SKV	Q
BRS	F	SD	R
GMS	G	KK	S
BT	H	DS	T
MG	I	VHC	U
SSP	J	SSN	V
RGP	K	AL	W
SME	L	SU	X

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