Additional Mathematics-I (18MATDIP31)
(Common to all Programmes)
(Effective from the academic year 2019-20)

Topics	Topics To be Covered	Hours
MODULE - I		
COMPLEX TRIGONOMETRY AND VECTOR ALGEBRA		
1. Complex Numbers: Definitions & properties. Modulus and amplitude of a complex number. Argand's diagram, De-Moivre's theorem (without proof).	Discussion restricted to problems as suggested in Article No. 19.1, 19.2, 19.3, 19.4 of Text Book 1	**3L**
2. Vector Algebra: Scalar and vectors. Vectors addition and subtraction.	Discussion restricted to problems as suggested in Article No. 3.1 of Text Book 1	**1L**
3. Multiplication of vectors (Dot and Cross products).	Discussion restricted to problems as suggested in Article No. 3.4, 3.5, 3.6 of Text Book 1	**3L**
4.Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1 & L2) **Total**		**09**
MODULE - II		
DIFFERENTIAL CALCULUS		
1. Review of successive differentiation-illustrative examples.	Discussion restricted to the Article No. 4.1 of Text book 1.	**3L**
2. Maclaurin's series expansions-Illustrative exemples.	Discussion and problems restricted to article No. 4.4 of Text Book 1.	**1L**
3. Partial Differentiation: Euler's theorem-problems on first order derivatives only. Total derivatives-differentiation of composite functions. Jacobians of order two-Problems	Discussion and problems restricted to article No. 5.1 to 5.7 of Text Book 1.	**3L**
4. Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1 & L2) **Total**		**09**
MODULE - III		
VECTOR DIFFERENTIATION		
1. Differentiation of vector functions. Velocity and acceleration of a particle moving on a space curve.	Discussion restricted to problems on Article No. 8.1, 8.2, 8.3 of Text book 1	**2L**

2. Scalar and vector point functions. Gradient, Divergence, Curl – problems.	Discussion and problems restricted to Article No. 8.4 to 8.7 of Text Book 1.	**3L**
3. Solenoidal and irrotational vector fields- Problems.	Discussion and problems restricted to Article No. 8.18 of Text Book 1.	**2L**
4.Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1 & L2)	**Total**	**09**

MODULE - IV		
INTEGRAL CALCULUS		
1. Reduction formulae for $\sin^n x$, $\cos^n x$ (with proof) and $\sin^m x \cos^n x$ (without proof) and evaluation of these with standard limits-Examples	Discussion restricted to problems on Article No. 6.1, 6.2, 6.3 of Text book 1	**5L**
2. Double and triple integrals-Simple examples.	Discussion restricted to problems on Article No. 7.1 and 7.5 of Text book 1	**2L**
4.Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1 & L2)	**Total**	**09**

MODULE - V		
ORDINARY DIFFERENTIAL EQUATIONS (ODE'S)		
1. Introduction-solutions of first order and first degree differential equations: exact, linear differential equations.	Discussion restricted to problems on Article No. 11.1, 11.4, 11.5, 11.9, 11.11 of Text book 1	**4L**
2. Equations reducible to exact and Bernoulli's equation.	Discussion and problems as suggested in Article No. 11.10, 11.12(4-a, b only) of Text Book 1.	**3L**
4.Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1, L2 & L3)	**Total**	**09**

TextBook:

1.B.S.Grewal: Higher Engineering Mathematics, Khanna Publishers, New Delhi, 43rd Ed., 2015.

Reference Books:

1. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed., 2015.

2. N.P.Bali and Manish Goyal: Engineering Mathematics, Laxmi Publishers,7th Ed., 2007.