Course Title : Additional Maths-I			
Course Code : P18MADIP31	Semester : 3	L:T:P:H : 4:0:0:4	Credits: 0
Contact Period: Lecture: 52 Hr, Exam: 3 Hr		Weightage: CIE:50%, SEE:50%	

Course Content
Unit -1
Complex Trigonometry: Complex Numbers: Definitions & properties. Modulus and amplitude of a complex number, Argand's diagram, De-Moivre's theorem (without proof). Roots of complex number - Simple problems.
Vector Algebra: Scalar and vectors. Vectors addition and subtraction. Multiplication of vectors (Dot and Cross products). Scalar and vector triple products-simple problems.

12 Hours

Unit -2
Differential Calculus: Review of successive differentiation. Formulae for n^{th} derivatives of standard functions- Liebnitz's theorem(without proof). Polar curves –angle between the radius vector and the tangent pedal equation- Problems. Maclaurin's series expansions-Illustrative examples. Partial Differentiation: Euler's theorem for homogeneous functions of two variables. Total derivatives-differentiation of composite and implicit function. Application to Jacobians, errors & approximations.

10 Hours

Unit –3
Integral Calculus: Statement of reduction formulae for $sin^n x, \ cos^n x, \ and \ sin^m x cos^m x$ and evaluation of these with standard limits-Examples. Differentiation under integral sign(Integrals with constants limits)-Simple problems.Applications of integration to area, length of a given curve, volume and surface area of solids of revolution.

10 Hours

Unit-4
Vector Differentiation: Differentiation of vector functions. Velocity and acceleration of a particle moving on a space curve. Scalar and vector point functions. Gradient, Divergence, Curl and Laplacian (Definitions only).Solenoidal and irrotational vector fields-Problems.

10 Hours

Unit-5
Ordinary differential equations (ODE's): Introduction-solutions of first order and first degree differential equations: homogeneous**,** exact, linear differential equations of order one and equations reducible to above types. Applications of first order and first degree ODE's - Orthogonal trajectories of cartesian and polar curves. Newton's law of cooling, R-L circuits-Simple illustrative examples from engineering field.

10 Hours

Text Book:
1. B.S.Grewal: Higher Engineering Mathematics, Khanna Publishers, New Delhi, 42nd Ed. 2012.

Reference Books :
1. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 6th Ed., 2007.
2. N.P.Bali and Manish Goyal: Engineering Mathematics, Laxmi Publishers, 7th Ed., 2007.