

Civil Engineering Department

Semester : III

I	Course Code	MA 192001			
II	Course Title	Maths – III - Complex Analysis and Differential Equations II			
III	Credit Structure	L	T	P	C
		4	0	2	6
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	<p>Complex Analysis: Definition and properties of analytics functions; Cauchy-Riemann equations, Harmonic functions; Power series and their properties; Elementary functions; Cauchy’s theorem and its applications; Taylor series and Laurent expansions; Residues and the Cauchy residue formula; Evaluation of improper integrals; Conformal mappings.</p> <p>Differential Equations: Laplace transforms, Shifting theorems, Convolution theorem, Review of power series and series solutions of ODE’s; Legendre’s equation and Legendre polynomials; Regular and irregular singular points, method of Frobenius; Bessel’s equation and Bessel’s functions; SturmLiouville problems; Fourier series; D’Alembert solution to the Wave equation; Classification of linear second order PDE in two variables; Vibration of a circular membrane; Fourier Integrals, Heat equation in the half space.</p>			
VI	Text/References	<ol style="list-style-type: none"> 1. Kreyszig, E., Advanced Engineering Mathematics, 8th Edition, John Wiley & Sons, 1999. 2. Boyce, W.E., and DiPrima, R., Elementary Differential Equations, 8th Edition, John Wiley & Sons, 2005. 3. Churchill, R.V., and Brown, J.W., Complex variables and applications, 7th edition, McGrawHill, 2003. 4. Churchill, R.V., and Brown, J.W., Fourier series and boundary value Problems, 7th Edition, McGraw-Hill, 2006. 5. Howie, J.M., Complex Analysis, Springer-Verlag, 2004. 6. Ablowitz, M.J., and Fokas, A.S., Complex variables: Introduction and Applications, Cambridge University Press, 1998 (Indian Edition). 			