

<b>Programme: B. Sc.(Hons.)</b> <b>Class: B.Sc.</b>		<b>Year: IV</b>	<b>Semester: VIII</b>	
<b>Subject: Mathematics</b>				
<b>Course Code:</b>		<b>Course Title: Complex Analysis</b>		
<b>Course Outcome</b>	<p>CO1: The course is aimed at exposing the students to foundations of analysis which will be useful in understanding various physical phenomena and gives the student the foundation in mathematics.</p> <p>CO2: Upon successful completion, students will be able to understand the complex variables, analytic functions, complex integration and residues which will prepare the students to take up further applications in the relevant fields.</p> <p>CO3: After completion of this course the student will have rigorous and deeper understanding of fundamental concepts in Mathematics. This will be helpful to the student in understanding pure mathematics and in research.</p>			
<b>Unit No.</b>	<b>Course Content</b>			<b>Hours</b>
<b>I</b>	Continuity and differentiability of complex functions, Analytic and regular functions, Cauchy-Reimann equations, Necessary and sufficient conditions for a function to be analytic, some properties of conjugate functions, Construction of an analytic function, Milne Thomson's method.			12
<b>II</b>	Complex integration, Cauchy Goursat theorem, Cauchy's theorem, Morera's theorem, Cauchy's integral formulae, Cauchy inequalities, Liouville's theorem.			12
<b>III</b>	Gauss mean value theorem, Maximum & minimum modulus theorems, The Argument Theorem, Rouche's Theorem, Poisson's integral formulae.			12
<b>IV</b>	Power series, The circle of convergence of the power series, Taylor's series, Laurent's series, The zeros of an analytic function, Types of singularities, Introductory conformal mapping (Bilinear transformation).			12
<b>V</b>	Residue at a single pole, Residue at a pole of order greater than unity, Residue at infinity, Cauchy's residue theorem, Evaluation of real definite integral, Integral round the unit circle.			12
<b>Suggested Readings:</b>				
<ol style="list-style-type: none"> <li>2. B.Churchil: Fundamental of Complex Analysis</li> <li>3. Shanti Narain: Function of Complex Variable, S Chand, 2005</li> <li>4. S Ponnusamy, Functions of Complex Analysis, Narosa, 200</li> <li>5. J.H. Methews&amp;R.W.Howell: Complex Analysis for Mathematics &amp; Engineering, Narosa Pub.</li> <li>6. Murry R. Spiegel: Complex Analysis, Schaum's outline</li> <li>7. LV.Ahlfors: Complex Analysis, McGraw-Hill</li> <li>8. Z. Nehari: Conformal Mapping , Dover Pub.</li> <li>9. Suggested digital platform:NPTEL/SWAYAM/MOOCs</li> </ol>				

### Mapping of course outcomes with program outcomes & program specific outcomes

CO's No.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	2	3	3	3	3
CO2	3	3	3	2	3	3	3	2	3
CO3	3	3	3	3	2	3	2	2	3