Module code	SM-2207			
Module Title	Complex Analysis			
Degree/Diploma	Bachelor of Science (Mathematics)			
Type of Module	Major Core			
Modular Credits	4	**Total student Workload**	10	hours/week
		Contact hours	4	hours/week
Prerequisite	SM-2202 Multivariate Calculus			
Anti-requisite	None			

Aims

To learn main principles of complex analysis and its applications in other fields of mathematics

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	30%	- work with complex numbers, describe various sets in the complex plane and actions of elementary functions on the characteristic sets.
Middle order :	60%	- know the analyticity conditions and properties of analytic functions. Differentiate and integrate complex valued functions.
Higher order:	10%	-Be familiar with residues of analytic functions and their applications for evaluation of real and complex integrals.

Module Contents

-Representation of complex numbers in algebraic and polar form. Complex conjugation and main properties of complex numbers. Roots of complex numbers.

-Topology of complex plane. Open and closed subsets. Compact sets. Continuous arcs. Connected sets. Multi-valued and single-valued functions. Branches of multi-valued functions. Limit theorems. Continuous functions.

-Differentiability. Properties of differentiable functions. Differentiation rules. Cauchy-Riemann equations. Analytic functions. Conformal mappings. Harmonic functions. Elementary complex functions

-Line and contour integrals. Cauchy theorem and its consequences. Cauchy integral formula and properties of analytic functions. Series representation of analytic functions.

-Singular points. Laurent series and classification of singularities. Properties of analytic functions around singular points..

-Calculus of residues. Cauchy theorem. Applications. Evaluation of real integrals and summation of series.

Assessment	Formative assessment	Tutorial and feedback.
	Summative assessment	Examination: 60%
		Coursework: 40% - 1 class test (20%) - 1 assignment (20%)