

MTH301 Fundamentals of Complex Analysis

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JAN

Synopsis:

Complex numbers, complex functions and the analysis of functions of one complex variable are introduced. The understanding of the basic theory and the techniques of complex analysis is the key to successful applications. The course aims to introduce the basic fundamental concepts and show how they are woven together to provide a powerful tool for application.

Topics:

- Complex number field.
- Complex functions.
- Sequences.
- Subsets of the complex plane.
- Continuous functions.
- Limits.
- Complex differentiation.
- Paths, rectifiable path, smooth path, length of a path.
- Contour and contour integration.
- Cauchy's integral theorem.
- Cauchy's integral formula.
- Taylor and Laurent series, and residues.

Textbooks:

E.B. Saff and A.D. Snider: Fundamentals of Complex Analysis. (eTextbook) 3rd edition Pearson
ISBN-13: 9781292036885

Learning Outcome:

- Calculate contour integrals, Laurent series or Taylor series of functions of one complex variable.
- Determine the points of functions of one complex variable which are continuous/differentiable/analytic.
- Show how to prove a mathematical statement in complex analysis.
- Indicate the nature of singularities of complex functions.
- Compute limits and/or residues of functions of one complex variable.
- Demonstrate mathematical reasoning through proving mathematical statements in complex analysis.

Assessment Strategies - Regular Semester (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	COMPUTER MARKED ASSIGNMENT 1	10
	TUTOR-MARKED ASSIGNMENT 1	20
Overall Examinable Components	Written Exam	70
Total		100

*The information listed is subject to review and change.