

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

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

Learning Outcome:

- Interpret properties of complex numbers and complex valued functions.
- Solve convergence problems of complex valued sequences and series.
- Employ limits, continuity of complex valued functions.
- Test the derivative of a complex valued function.
- Compute the integral of a complex valued function, and relate to various open and closed paths.
- Indicate the nature of singularities of complex functions.
- Construct a range of mathematical techniques to solve a variety of complex valued analysis problems.
- Formulate solutions to problems individually and/or as part of a group.
- Analyze and solve a number of problem sets within strict deadlines.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
COMPUTER MARKED ASSIGNMENT	10
TUTOR-MARKED ASSIGNMENT	20
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**