# Department of Mathematics Faculty of Science

**MATH 733 (206733) COMPLEX ANALYSIS 3(3-0-6)  
Prerequisite** Consent of the instructor

**Course Descriptions :**

Preliminary properties of analytic functions. The residue theorem. The Riemann Mapping theorem. Analytic continuation.

**Course Contents No. of Lecture Hours**

1. Preliminary properties of analytic functions 9

- Function of complex variable

- Complex differentiation and integration

- Cauchy’s therem, Cauchy’s integral formula, Taylor’s series

- Cauchy’s inequality. Liouville’s theorem

- The zeros of an analytic function

- Laurent series. Singularities

2. Residue theorem 10

- Residue Contour integration

- Integral functions

- Poisson’s integral. Jensen theorem

3. Analytic continuation 10

- General theory

- Singularities

- Function with natural boundaries

- The circle of convergence

- Convergence of series and regularity of the function

- Gap theorem

4. Conformal representation 8

- General theory

- Linear theory

- Univarent function

5. Some other topics 6

- The maximum-modulus theorem

- Scharz’s Lemma

- Hadamard’s three-circles theorem

- The Borel-Caratheodory inequality