

## **MATH 555**

### **Theory of Functions of a Complex Variable, Spring 2026**

**Instructor:** Özcan Yazıcı

#### **Course Description:**

**Basic properties of analytic functions:** Cauchy theory, power series, analytic continuation,

**Singularities:** Laurent series, classification of singular points, Residue theorem

**Zeros of analytic functions:** argument principle, Rouché's theorem, Hurwitz's theorem, open mapping theorem

**Global properties of analytic functions:** Schwarz lemma, conformal mappings, Riemann mapping theorem, reflection principle

**Compact families of functions:** Montel and Picard theorems. Approximation theorems: Runge theorem, Mittag-Leffler theorem, infinite products,

**Textbook** Complex Analysis, by T. Gamelin, Springer-Verlag, New York, Inc., 2001. We will cover most of the chapters II-XIII.

Other reference books:

David Ullrich, Complex Made Simple, AMS.

John B. Conway, Functions of One Complex Variable.

L.V.Ahlfors, Complex Analysis, McGraw Hill (1966).

S.G.Krantz, Complex Analysis : The Geometric Viewpoint, MAA (1990).

**Exams and Grading:** Midterm 30% , homework 30% (Late hw will not be accepted) , final exam 40%

**Attendance Policy:** Students must attend to the lectures regularly.