

## **MATH 153**

### **CALCULUS FOR MATHEMATICS STUDENTS I, Fall 2018**

#### **Schedule:**

**Section I:** Tolga Karayayla, M-Th 13:40-15:30, Recitation: F 13:40-15:30 at M104

**Section II:** M.Fırat Arıkan, M-Th 13:40-15:30, Recitation: F 13:40-15:30 at M105

**Section III:** Özcan Yazıcı, M-Th 13:40-15:30, Recitation: F 13:40-15:30 at M103

#### **Office Hours:**

Tolga Karayayla, Tuesday, 09.40-11.40 & Monday, 11.00-12.20 (M222)

M.Fırat Arıkan, Monday-Tuesday, 11.40-12.30 (M130)

Özcan Yazıcı, Wednesday, 10.40-12.30 (M127)

#### **Teaching Asistants' Office Hours:**

Nisa Tuğrul, Tuesday, 14.40-15.30 & Friday, 15.40-16.30 (Z36)

Pınar Çomak, Tuesday, 12.40-13.30 & Fiday, 11.40-12.30 (Z48)

Özgür Karabayır, Wednesday, 10.40-12.30 (Z42)

#### **Course Objectives:**

At the end of this course, the student will learn the concepts limit, continuity, derivative of a function of one variable and some of their applications to real life problems.

#### **Reference Books**

Michael Spivak, Calculus

Robert A. Adams, Christopher Essex CALCULUS A Complete Course Calculus.

#### **Exams and Grading:**

**Midterm I:** 30 Points (**November 14**),

**Midterm II:** 30 Points (**December 12**),

**Final Exam:** 40 Points

**Quiz-Homework:** 10 Points

**Attendance:** 5 Points

**Attendance Policy:** Students must attend to the lectures and recitations regularly. Students whose attendance is at least 75% will get extra 5 points.

**Course Description:**

**Week 1:** Preliminaries: Real numbers and their properties, solving (in)equalities, cartesian coordinates,

**Week 2:** Preliminaries: Functions and their basic types, graphs, shifting and scaling

**Week 3:** Limits of functions, properties of limit

**Week 4:** Limit types, Sandwich Theorem, Continuity

**Week 5:** Properties of continuity, Extreme Value and Intermediate Value Theorems and applications

**Week 6:** Derivative of a function, differentiability, tangent line,

**Week 7:** Chain Rule, implicit differentiation, higher order derivatives

**Week 8:** Tangent line (linear) approximation, Mean Value Theorem and its applications

**Week 9:** Inverse functions, natural logarithmic and exponential functions, Logarithmic differentiation, general logarithmic and exponential functions

**Week 10:** Indeterminate forms, L'Hospital Rule, exponential growth and decay

**Week 11:** Hyperbolic and inverse trigonometric functions and their derivatives, critical, singular and end points

**Week 12:** 1st and 2nd Derivative Tests, concavity, asymptotes, sketching the graphs of functions

**Week 13:** Extreme value problems

**Week 14:** Related rates