

**MATH 153--CALCULUS for MATHEMATICS STUDENTS**  
**2016-2017 Spring Semester**

**Instructor** : Mustafa Korkmaz  
**Office** : M135  
**Assistant** : Kamil Otal  
**Lectures** : Tuesday 08:40 - 10:30, Thursday 11:40 - 13:30 ( M104 )  
**Recitation** : Friday 10:40 - 12:30 ( M104 ).

**Textbook:** Thomas' Calculus, Early Transcendentals, twelfth, international edition, by G.B. Thomas, M.D. Weir, J.R. Hass

**References:** Any book on calculus

**Grading and attendance**

There will be two midterm exams each of which will affect the total grade by 30%, the final exam 35%, and homework assignments and quizzes %10. Students are required to attend the lectures.

There will be **ONLY ONE MAKE-UP EXAM**, It will be given after the final exam, which will relatively be harder than the regular exams.

**Exam Dates**

Midterm 1: 3 April 2017, Monday, 17:40.

Midterm 2: 15 May 2017, Monday, 17:40

Final Exam: To be determined

**Course Content (Academic Catalog)**

Functions, limit and derivative of a function of a single variable. A thorough discussion of the basic theorems of differential calculus: Intermediate value, extreme value, and the Mean Value Theorem. Applications: Graph sketching and problems of extrema.

**Weekly Outline of the Course:**

1. Real numbers and their properties, solving (in)equalities, Cartesian coordinates
2. Functions and their basic types, graphs, shifting and scaling, Limits of functions
3. Properties of limit, Limit types, Sandwich Theorem
4. Continuity, Properties of continuity
5. Extreme Value and Intermediate Value Theorems and applications
6. Derivative of a function, differentiability, tangent line
7. Chain Rule, implicit differentiation, higher order derivatives
8. Tangent line (linear) approximation, Mean Value Theorem and its applications
9. Inverse functions, natural logarithmic and exponential functions
10. Logarithmic differentiation, general logarithmic and exponential functions
11. Indeterminate forms, L'Hospital Rule, exponential growth and decay
12. Hyperbolic and inverse trigonometric functions and their derivatives
13. Critical, singular and end points, 1st and 2nd Derivative Tests, Concavity
14. Asymptotes, sketching the graphs of functions, Related rates