MATH 153
CALCULUS FOR MATHEMATICS STUDENTS I, Fall 2020

Office Hours: To be announced

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: 35 Points **(Nov 20, 2020 at 13:30)**, (Written exam over zoom with camera)
Midterm II: 35 Points **(Dec 25, 2020 at 13:30)**, (Written exam over zoom with camera)
Final Exam: 30 Points (Written / Oral exam over zoom with camera.)
Quiz-Homework: 15 Points

Attendance Policy: Students must attend to the lectures and recitations regularly. Zoom links will be sent before the semester starts.

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