



## Hankuk University of Foreign Studies

### 2019 Summer Session

### MATH 122 Calculus 2

### Course Outline

**Term:** July 01-August 02,2019

**Class Hours:** 14:00-15:50PM (Monday through Friday)

**Course Code:** MATH 122

**Instructor:** TBA

**Office Hours:** TBA

**Email:** TBA

**Credit:** 4

**Class Hours:** This course will have 72 class hours, including 40 lecture hours, 10 lecturer office hours, 10-hour TA discussion sessions, 2-hour review sessions, 10-hour extra classes.

#### **Course Description:**

This is the second course in calculus for engineers, physicists, computer scientists, and mathematicians. You will learn more advanced integration techniques, convergence of sequences and series, power series, and basics of differential equations. Calculus studies the limiting behavior of functions. Functions themselves are among the most important discoveries in history, because they describe the dependence of objects and phenomena in nature. Most functions of interest exhibit a rather regular behavior which makes it possible to understand their infinitesimal properties. This enables us to describe the nature and predict its behavior. The proper understanding of calculus plays a crucial role in careers of mathematicians, physicists, economists, engineers, programmers, and in recent years biologists and other life scientists. This course will teach you how to think and understand the reasons behind formulas. The calculus will give meaning to your future courses and life.



**Required Textbooks:**

*Stewart: Calculus – Early Transcendentals*

**Grading & Evaluation:**

Homework and quizzes: 30%

Midterm: 30%

Final: 40%

**Course Schedule:**

**Week 1:**

Session 1: Areas and Distances; The Definite Integral; The Fundamental Theorem of Calculus

Session 2: Indefinite Integrals and the Net Change Theorem; The Substitution Rule

Session 3: Areas Between Curves; Volumes

**Week 2:**

Session 1: Integration by Parts; Trigonometric Integrals

Session 2: Trigonometric Substitution; Integration of Rational Functions by Partial Fractions

Session 3: Strategy for Integration; Improper Integrals

**Week 3:**

Session 1: Arc Length; Area of a Surface of Revolution

Session 2: Applications to Physics and Engineering

Session 3: Sequences; Series

**Week 4:**

Session 1: The Integral Test and Estimates of Sums; The Comparison Tests; Alternating Series



Session 2: Absolute Convergence and the Ratio and Root Tests; Strategy for Testing Series; Power Series

Session 3: Representations of Functions as Power Series; Taylor and Maclaurin Series; Applications of Taylor Polynomials

**Week 5:**

Session 1: Modeling with Differential Equations; Direction Fields and Euler's Method

Session 2: Separable Equations

Session 3: Models for Population Growth

