Course Outline

Course Number: MTH-252
Title: Calculus II
Date Approved: 6/5/2015

Credits: 5
Length of Course: 55
For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Grading Method: A-F or Pass/No Pass
Prerequisites: Pass MTH-251 with a C or better
Co-requisites: None
Recommended: Pass RD-090 or placement in RD-115; pass WR-095 or placement in WR-121
Required: None
Related Instruction Area: Computation
Uses Library Resources: Yes

Department: Mathematics
Outline Developed by: Mark Hull
Course Approved as: Lower Division Collegiate

Course Description:
This course is the second in a four-term Calculus sequence designed for students in science, engineering and mathematics. It will focus on integral calculus.

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. construct a function from its derivative graphically, numerically and analytically, (MA1) (MA2)
2. demonstrate the ability to use each of a variety of antidifferentiation techniques, including substitution, integration by parts, and partial fractions, (MA1)
3. recognize which antiderivative technique is appropriate for a given problem, (MA2)
4. use Riemann sums to approximate the area under a curve and to demonstrate this graphically, illustrate Riemann sums graphically, (MA1)
5. use the limit of Riemann sums to compute a definite integral, (MA2)
6. distinguish between a definite integral and an indefinite integral, (MA2)
7. use the Fundamental Theorem of Calculus to compute areas and to evaluate integrals, (MA1) (MA2)
8. illustrate a given region and find its area by using an integral, (MA1) (MA2)
9. illustrate a given three dimensional figure and find its volume by using method of disks, shells or washers, (MA1) (MA2)
10. illustrate the graph of a given arc and find its length using an integral, (MA1)(MA2)
11. use integrals to solve projectile motion, work and hydrostatic force problems and interpret your result. (MA1) (MA2)

Major Topic Outline:

1. Antidifferentiation.
2. The integral.
3. Applications of the definite integral.
Outcomes addressed by the course:

'C' - this course completely addresses the outcome. Students who successfully complete this course are likely to have attained this learning outcome.

'S' - this course substantially addresses the outcome. More than one course is required for the outcome to be completely addressed. Students who successfully complete all of the required courses are likely to have attained this learning outcome.

'P' - this course partially addresses the outcome. Students will have been exposed to the outcome as part of the class, but the class is not a primary means for attaining the outcome and assessment for general education purposes may not be necessary.

As a result of completing the AAOT/ASOT general education requirements students will be able to:

MA: Mathematics Outcomes

C  1. Use appropriate mathematics to solve problems.

C  2. Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate the results.