MTH 252: Calculus II

Includes antiderivatives, the definite integral, topics of integration, improper integrals, and applications of differentiation and integration. Graphing technology is required, such as Desmos and/or GeoGebra which are available at no cost.

Addendum to Course Description

This class is a foundational course for many STEM majors. Some topics are of particular importance for students continuing into MTH 253 including: using L'Hospital's rule to evaluate limits, improper integrals, and error estimates for definite integrals. Students may be taking this course concurrently with calculus based physics courses. It can be beneficial for these students if the integral symbol is introduced early on to represent anti-derivatives. Partial fractions are a particularly important technique for engineering students (which will be revisited in MTH 253 and MTH 256). Students should be able to do simple partial fraction expansions by hand, but may use the "expand" command on their CAS for more complicated problems. Because this course is also a pre-requisite for MTH 261, logic and correct application of theorems should be emphasized. Students will be required to have physical graphing calculators in MTH 252. Where physically possible instructors will demonstrate using Desmos, GeoGebra, or other online programs in class. Assessments requiring the use of a graphing calculator will be done outside of the proctored exam grade component.

Course Student Learning Outcomes

Upon completion of the course students should be able to:

- Analyze real world scenarios to recognize when derivatives or integrals are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
- Recognize derivative and integral concepts that are encountered in the real world, understand and be able to communicate the underlying mathematics involved to help another person gain insight into the situation.
- Work with derivatives and integrals in various situations and use correct mathematical terminology, notation, and symbolic processes in order to engage in work, study, and conversation on topics involving derivatives and integrals with colleagues in the field of mathematics, science or engineering.

Credits: 5
Prerequisites:
MTH 251
WR 115
RD 115
Equivalent placement test scores also accepted.
Program: Mathematics