MATH 181- PROJECT-BASED CALCULUS I
Section 03: 12:00 pm - 1:50 pm MWF
Fall Semester 2022

Catalog Description

This is the first in a two-course sequence intended for students majoring in mathematics, science, or engineering. It emphasizes the understanding of concepts, and using them to solve physical problems. The course covers functions, limits, continuity, the derivative, rules of differentiation, applications of the derivative, Riemann sums, definite integrals, and indefinite integrals.

Meeting Place and Time

GOS-2305 ; 12:00pm -1:50 pm

Instructor and Contact Information

Dr. Ephraim Agyingi eoasma@rit.edu
GOS-2222 585-475-2513 (office)

Office Hours

GOS-2222 or zoom meeting room https://rit.zoom.us/j/8216420137:

(1) MW: 2pm – 3pm (2) Other times: ***By appointment***.

Required Textbooks and Materials

Required: Stewart, J. *Calculus Early Transcendentals*, 9th edition (hardcopy or ebook)
Required*: WebAssign* Access

A. TOPICS (outline)

1.0 Review of Functions
1.1 Functions and Their Graphs (1.1)
1.2 Trigonometric Functions (1.2)
1.3 Algebra of Functions (1.3)
1.4 Exponential Functions (1.4)
1.5 Hyperbolic Functions (3.11)
1.6 Inverse Functions and Logarithms (1.5)

2 .0 Limits
2.1 Limits: Motivation and Intuition (2.1)
2.2 The Limit of a Function (2.2)
2.3 Properties of Limits and Their Use (2.3)
2.4 Continuity and Types of Discontinuity (2.5)
2.5 Limits at Infinity and Asymptotes (2.6)

3.0 Differentiation
3.1 Tangent lines and derivative at a point (2.7)
3.1 Derivative as a Function (2.8)
3.2 Diff. Rules for Elementary Functions (3.1)
3.3 The Product and Quotient Rules (3.2)
3.4 Derivatives of Inverse Trig. Functions (3.3)
3.5 The Chain Rule (3.4)
3.6 Implicit Differentiation (3.5)
3.7 Derivatives of Logarithmic Functions (3.6)

4.0 Applications of Differentiation
4.1 Rate of Change (3.7)
4.2 Related Rates (3.9)
4.3 Linear Approximations & Differentials (3.10)
4.4 Extreme Values of Functions (4.1)
4.5 Rolle's and The Mean Value Theorem (4.2)
4.6 Increasing and Decreasing Functions (4.3)
4.7 Concavity and Curve Sketching (4.3)
4.8 Indeterminate Forms & L'Hospital's Rule (4.4)
4.9 Curve Sketching (4.5)
4.10 Optimization (4.7)
4.11 Newton's Method (4.8)

5.0 Integration
5.1 Antiderivatives (4.9)
5.2 Areas and Distances (5.1)
5.3 The Definite Integral (5.2)
5.4 The Fundamental Theorem of calculus (5.3)
5.5 Indefinite Integrals (5.4)
5.6 The Substitution Rule (5.5)

B. COURSE OBJECTIVES:

See COS-MATH-181 outline

Course Web Site

https://mycourses.rit.edu/d2l/le/content/843469/Home

C. LECTURES FORMAT

This is an in-person class with lectures on Monday , Wednesday and Friday. Workshops will be held during the second hour on Monday and Wednesday. The workshop class will be directed jointly with a TA. During workshop classes you will be broken up into groups consisting of about 4 persons and given problems to work on as a group. Power-point lecture notes for the week ahead will be posted at Mycourses by Friday. It is your responsibility to make time to go over the notes before class time. During class time, I will mostly highlight items from each note set and spend considerable time on example problems. The power-point lecture notes are also available at WebAssign together with tidbit videos ranging from 2 minutes to about 10 minutes depending on the topic. If the lecture is recorded (which is very unlikely since this is an in-person class) then a zoom video link of the lesson will be posted at Mycourses immediately after the class.

D. COURSE REQUIREMENTS

(1) **Homeworks**: All homeworks will be administered through required WebAssign. There will be at least one homework due every Sunday by 11:59pm. You will have about a week to complete each homework from the date it is posted. You can do the homework at your pace but make sure you finished by due deadline.

(2) **Quizzes**: Quizzes will be administered in-person during class or through required WebAssign. There will be a quiz every Friday. If the quiz is administered through WebAssign, then it will be posted by 8:00am Friday morning and you will have till 11:59pm to complete and submit it. That gives a time window of about 16 hours to take the quiz. No extensions will be granted. **All quizzes are timed and you will only have 20 minutes to complete them. Once you begin a WebAssign quiz, you cannot pause the clock or logout to continue later**. Also when you start a WebAssign quiz, your web browser will be locked till you submit or run out of time.

(3) **Exams**: There will be three midterm exams, the first on Firday 9/16, the second Friday 10/21 and the third on Friday 11/18. All midterm exams will be administered in-person during class or through required WebAssign. If the midterm is administered through WebAssign, then it will be posted by 8:00am Friday morning and you will have till 11:59pm to complete and submit it. That gives a time window of about 16 hours to take the exam. No extensions will be granted. **The midterm exams are timed and you will only have about 1 hr 15 minutes to complete them. Similar to quizzes, once you begin an exam, you cannot pause the clock or logout to continue later**, and your web browser will be locked till you submit or run out of time. In addition to the midterms is the final exam which will hold as scheduled on SIS.

Attention: ***If you are not ready to commit the require time to take a WebAssign quiz or WebAssign exam in one sitting, do not start the quiz/exam***. *If you start the quiz/exam and then logout, you will not be able to access it again and your score will be whatever you earned before exiting*. No makeup quiz/exam will be granted for "denied access" because of violating this policy.

E. GRADING SUMMARY

Your final grade in the course will be assessed as follows:

Midterm I, II & III:	42% (14% each)
Quizzes:	14%
Homeworks:	14%
Workshops:	10%
Final Exam:	20%

Your letter grade will be determine using this scale: A = 93-100% ; A- = 89 -92%; B+ = 85-88%; B = 80-84%; B- =78-89%; C+ = 75-77%; C = 70-74%; C- = 65-69%; D = 60-64%; F = 0-59%

F. CLASS POLICIES

- Your active participation in class is very important and also encourage as it is a way for you to meet the course objectives. Attendance at all classes is required and missing more than three classes without an excuse will lead to a maximum overall grade of C.
- During lectures and workshop classes, I expect all students will engage in class discussions by paying attention to the instructor or the WI and contributions from other students. I also expect that distractions such as background noises (from phones, music, computer games etc) will not be generated by any student.
- **Deadlines for homework, quizzes and exams are very important.** Plan ahead to complete required tasks on time. ***No extensions will be granted for incomplete homeworks because you are given sufficient time to complete them. No make-up will be granted for a quiz/exam unless there is a medically documented reason provided or an acceptable underlying emergency.***
- You are expected to **maintain high standards of academic integrity**, including the honest representation of original work. **You must be the individual** completing assignments, quizzes, and exams, and must be doing so independently. You are not allowed to collaborative with others or seek input from others when taking quizzes or exams. You are allowed to discuss the homeworks with others but not outsource it for completion.

G. INTEGRITY STATEMENT

See RIT Honor Code and RIT's Academic Integrity Policy at the following website:

- https://www.rit.edu/academicaffairs/policiesmanual/p030
- https://www.rit.edu/academicaffairs/policiesmanual/d080

Some Helpful Tips: A lot needs to be covered in this course and we will move rapidly. Therefore it is essential for you to be on top of things, attend zoom classes and office hours, and endeavor to resolve questions as soon as there arise. If you have any problems or questions, please seek extra help from me, from your classmates, from the Bates tutoring center, and from others. Do not let things pile up before attempting to resolve them.

The Academic Success Center will be providing Math and Physics support for RIT students
Bates (in-person) Monday-Thursday 11am-9pm, Friday 11am-5pm
Online (via Slack) Monday-Thursday 12pm-9pm, Friday 12pm-5pm
More information about the tutoring, including the schedule will be released the first week of school.
Contact the ASC at jmoldc@rit.edu for more information.