Course Description: Analytic Geometry. Functions and their graphs. Limits and Continuity. Derivatives of algebraic, trigonometric and inverse trigonometric functions. Applications of the derivative. Introduction to integrals and their applications. (4-1-5) (C)

Prerequisites: Must pass departmental precalculus placement exam.

Enrollment: Required for AM majors and all engineering majors.


Other Required Materials: WebAssign Account, Mathematica

Course Objectives: The student will

1. understand and be able to apply the concept of limit, continuity, differentiation, and integration (all single variable).
2. learn to distinguish between definitions and theorems and will be able to use them appropriately.
3. know and be able to apply laws/formulas to evaluate limits, derivatives, and (some) integrals.
4. interpret the basic calculus concepts from both algebraic and geometric viewpoints.
5. be able to use calculus in basic applications, including related rate problems, linear approximation, curve sketching, optimization, Newton’s method, volume, and area.
6. use Mathematica for visualization and calculating exact and approximate solutions to problems.
7. become a more effective communicator by developing his/her technical writing skills in the preparation of several Mathematica lab reports.

Course Outline:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topics</th>
<th># Hours</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Functions and Limits</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Derivatives, Rules of differentiation, Interpretations of derivatives, Related rates, Linear approximations</td>
<td>13</td>
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<tr>
<td>3</td>
<td>Applications of the derivative</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Integrals, Fundamental Theorem of Calculus, Substitution method</td>
<td>8</td>
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<tr>
<td>5</td>
<td>Applications of Integrals</td>
<td>5</td>
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</tbody>
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Grading: Grades will be determined based on the following.

- Homework (10%)
- True-False / Explain assignments (5%)
- Quizzes (10%)
- Tests (45%)
- Mathematica Labs (15%)
- Final (15%)

Your overall percentage will be rounded to the nearest whole number percent. Final letter grades will be assigned according to the percentage scale:

A: 90 – 100%  B: 80 – 89%  C: 70 – 79%  D: 60 – 69%  F: 0 – 59%
**Classroom time:**

The MWF classes will primarily be used for discussion of new material. Material will be presented in an interactive lecture format. Participation is encouraged and expected of all students. You may ask questions regarding how to solve particular homework problems (especially at the beginning of class), however if you require help on many problems you should plan on coming to office hours or on getting tutoring.

The Thursday classes will be used for quizzes, student work on Mathematica laboratories and problem solving sessions. The Thursday classes will frequently be lead by the teaching assistant for our course.

**Other Policies:**

1. The use of graphing calculators or other technology will be restricted on most tests and quizzes. Students will be provided with a TI-30 calculator to use instead of their own calculators.

2. Students are expected to attend each class meeting and to be on time to class. Attendance will be taken at the start of class by calling roll or via a sign-in sheet. Students who are habitually late will possibly have their overall letter grade lowered because of this. Attendance will be reported in adherence with university policies.

3. Technology such as cell phones, i-pads, tablets, laptops, and desktop computers (when in the lab) should not be used for purposes other than those to relevant to classroom activities. Students who use technology in a contrary manner are a distraction to the rest of the class and may be asked to leave the classroom.

4. You are expected to come to class prepared to think and to have read the material in the textbook for the days lecture. You are not expected to understand everything upon first reading, but you are expected to have a familiarity with the terminology used and to know what topics you don’t understand. A list of the sections and the order in which we shall proceed through them can be found at the end of this syllabus. After class you should reread the sections and work on the assigned homework problems.

5. Homework will be assigned, answered, and graded using the on-line homework system called webassign. You are permitted to get help (from classmates or others) on homework assignments, however each student should be sure to understand the solutions submitted. In some sections of the text, some homework problems may also be required to be submitted on paper. Homework on a particular section in the text will generally be due (via webassign) at the time of the beginning of our next MWF class. Within 5 days of the original due date, a request for a two-day extension to a deadline will be automatically granted (via webassign), but a 30% late-penalty will be assessed on all correct answers in this extended period.

6. There will be on the order of 5 quizzes during the semester. Missed quizzes cannot be made up, however your lowest quiz score will be dropped when your quiz average is calculated.

7. Several True-False / Explain assignments will be made during the semester. Your answers to these assignments must be submitted using Mathematica. Some (perhaps all) of the assignments will be assigned as group work.

8. The tentative date of each test is listed on the course calendar (see end of syllabus). Any changes to these dates will be announced in class. If you are absent the day of a test you must have an official excuse (whether the excuse is acceptable is determined by the instructor) in order to not have a 0 recorded for the test. In the case of an excusable absence it is your responsibility to notify the instructor as soon as possible as to the reason for the absence. No make-up tests will be given after the test is returned to the class. If your final exam score is higher than your lowest test score, then your final exam score will replace your lowest test score when calculating your test average.
9. Cheating will not be tolerated in this course. Any evidence of cheating will result in an automatic failure of the assessment (a score of 0 on the quiz or test). A repeat offender of cheating will automatically fail the course. In all cases, evidence of cheating will be reported to the office of judicial affairs and become part of the student’s judicial file.

10. Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources. The Center for Disability Resources (CDR) is located in Life Sciences Room 218, telephone 312 567.5744 or disabilities@iit.edu.

11. All information in this syllabus is subject to change if circumstances warrant it. This syllabus does not constitute a contract.

**Important Dates:**

- Aug 31  Last day to Add/Drop with 100% tuition refund
- Oct 19  Midterm grades assigned
- Oct 29  Last day to withdraw
Our final exam is scheduled for Thursday December 6 from 8am to 10am. The final exam is cumulative in nature and will be in our regular classroom.