Calculus I Syllabus

YEAR COURSE OFFERED: 2015

SEMESTER COURSE OFFERED: Spring 2015

DEPARTMENT: Mathematics, Comp. Sci. and Coop. Engineering

COURSE NUMBER: Math 1431-B Section 1306

NAME OF COURSE: Calculus I
Tuesday and Thursday 9:35 – 10:50
Wednesday 9:10 – 10:00 Malloy 022

NAME OF INSTRUCTOR: Dr. Mary Flagg
flaggm@stthom.edu
713-525-3187
216 Math House

OFFICE HOURS: Monday 11:30 – 1:30
Tuesday 2:00 – 4:00
Wednesday 11:30 – 1:30
Thursday 2:00 – 3:00 Or by appointment

The information contained in this class syllabus is subject to change. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Course Description

This course covers the fundamentals of single-variable calculus. Topics include limits, continuity, derivatives, integrals and their applications in real physical situations. This is the first in a sequence of courses (Calculus I, Calculus II and Calculus III) that equip students with the calculus skills necessary for modern mathematics, science and engineering.

Required Reading


Learning Objectives

1. Students will define the derivative of a function of one real variable and apply the rules of differentiation to polynomial, rational, root and trigonometric functions.
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2. Students will describe the rate of change of a function using the derivative and interpret the mathematical results with respect to real physical situations.
3. Students will define the integral of a function and apply the rules of integration to polynomial, rational, root and trigonometric functions.
4. Students will understand how differentiation and integration are connected by the Fundamental Theorem of Calculus. They will use these connections to evaluate definite integrals and apply the techniques of integration to assess physical situations.

Assignments/Exams

Grades will be based on 4 tests, a final exam, weekly homework, daily in-class quizzes and participation in the class discussion according to the following formula:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>8%</td>
</tr>
<tr>
<td>Quizzes and Class Participation</td>
<td>7%</td>
</tr>
<tr>
<td>4 Semester Tests</td>
<td>60% (15% each)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

Tests

The semester tests will be given during class on the dates announced.
The final will be at the time specified by the Current Final Exam schedule
A student will not be allowed to use any notes, books or calculators during tests.

Homework

Homework will be assigned from each section of the text we cover. Homework is due ON TIME, IN CLASS on the day specified by the homework calendar.
Late homework will not be graded. Homework solutions that are copied from a solutions manual, copied from a friend or done using mathematics software WILL NOT HELP YOU LEARN.
Work with a friend, come to my office for tutoring or get help somewhere else, but work the problems YOURSELF!

Quizzes will be given in class daily and will be based on the assigned homework. Three quiz grades will be dropped to account for excused absences during the semester. More than 3 absences will result in 0’s earned on the missed quizzes. There are NO MAKEUPS for missed quizzes.

Class Participation will include daily quizzes and participation in classroom activities. We will occasionally have group problem sessions, and all students are expected to contribute to the group’s solution to the assigned problems.

Grading Scale

If your average is “x”

<table>
<thead>
<tr>
<th>Grade</th>
<th>No.</th>
<th></th>
<th>No.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93 ≤ x ≤ 100</td>
<td>A-</td>
<td>90 ≤ x &lt; 93</td>
<td>B+</td>
</tr>
<tr>
<td>B</td>
<td>83 ≤ x &lt; 87</td>
<td>B-</td>
<td>80 ≤ x &lt; 83</td>
<td>C+</td>
</tr>
<tr>
<td>C</td>
<td>73 ≤ x &lt; 77</td>
<td>C-</td>
<td>70 ≤ x &lt; 73</td>
<td>D+</td>
</tr>
<tr>
<td>D</td>
<td>60 ≤ x &lt; 67</td>
<td>F</td>
<td>x &lt; 60</td>
<td></td>
</tr>
</tbody>
</table>
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Classroom Etiquette

No cell phones during class, turn them to silent and put them away!
Respect your fellow students by refraining from excessive talking and other distracting behaviors during class. We want to becoming an active and engaged learning community in which every student is welcomed and encouraged to do their best. As such, having someone else or some computer software do your work for you defeats the purpose of learning the material. I encourage you to work together and seek help from the instructor and available tutors, but YOU MUST DO YOUR OWN WORK. Calculators WILL NOT BE ALLOWED ON TESTS, so do not rely too heavily on them while working homework!

Accommodations

The University of St. Thomas abides by the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, which stipulates that no student shall be denied the benefits of an education "solely by reason of a handicap." If you have a documented disability that may impact your performance in this class and for which you may require accommodations, you must be registered with and provide documentation of your disability to Counseling and Disability Services which is located on the second floor of Crooker Center. Contact Debby Jones at 713-525-6953 or Rose Signorello at 713-525-3162.

Blackboard Resources

This course will be managed with Blackboard. You may find the login for blackboard on your My StThom page. Use your CELT login ID and password to access blackboard. Course syllabus, calendar, reminders, announcements and discussions will be found in Blackboard.

List of discussion/lecture topics

Course Outline
Chapter 1 Functions and Limits
1.1 Four Ways to Represent a Function
1.2 Mathematical Models: A Catalog of Essential Functions
1.3 New Functions from Old Functions
1.4 The Tangent and Velocity Problems
1.5 The Limit of a Function
1.6 Calculating Limits Using Limit Laws
1.7 The Precise Definition of a Limit
1.8 Continuity

Chapter 2 Derivatives
2.1 Derivatives and Rates of Change
2.2 The Derivative of a Function
2.3 Differentiation Formulas
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2.4 Derivatives of Trigonometric Functions
2.5 The Chain Rule
2.6 Implicit Differentiation
2.7 Rates of Change in the Natural and Social Sciences
2.8 Related Rates
2.9 Linear Approximation and Differentials

Chapter 3 Applications of Differentiation
3.1 Maximum and Minimum Values
3.2 The Mean Value Theorem
3.3 How Derivatives Affect the Shape of a Graph
3.4 Limits at Infinity: Horizontal Asymptotes
3.5 Summary of Curve Sketching
3.7 Optimization Problems
3.8 Newton’s Method
3.9 Antiderivatives

Chapter 4 Integration
4.1 Area and Distance
4.2 The Definite Integral
4.3 The Fundamental Theorem of Calculus
4.4 Indefinite Integrals and the Net Change Theorem
4.5 The Substitution Rule

Chapter 5 Applications of Integration
5.1 Area Between Curves
5.2 Volume
5.3 Volume by Cylindrical Shells
5.4 Work
5.5 The Average Value of a Function

Important Academic Dates for Spring 2015
First Class Day January 12
Last Day to Add a Course January 20
Martin Luther King Holiday January 19
Last Day to Drop without Penalty January 28
Spring Break March 9-14
Last Day to Drop with a “W” April 17
Easter Break April 2-5
Last Class Day May 2

Final Exam for this class will be TBD
### Preliminary Course Calendar

***This Calendar is subject to change!! You are expected to keep up with the changes announced in class and on Blackboard. Test dates will be announced in class and published on Blackboard two weeks prior to each test.***

<table>
<thead>
<tr>
<th>Week</th>
<th>DATES</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 12-16</td>
<td>Pre-Requisite Quiz</td>
<td>INTRO Functions</td>
<td>1.5 Limits</td>
</tr>
<tr>
<td>2</td>
<td>Jan. 19-23</td>
<td>1.5 / 1.6</td>
<td>1.6</td>
<td>1.7</td>
</tr>
<tr>
<td>3</td>
<td>Jan. 26-30</td>
<td>1.8</td>
<td>2.1</td>
<td>2.2</td>
</tr>
<tr>
<td>4</td>
<td>Feb. 2-6</td>
<td>2.3</td>
<td>2.3/2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>5</td>
<td>Feb. 9-13</td>
<td>2.5</td>
<td>Derivative Rules Practice and Review</td>
<td>TEST 1</td>
</tr>
<tr>
<td>6</td>
<td>Feb. 16-20</td>
<td>2.6</td>
<td>2.7</td>
<td>2.7/2.8</td>
</tr>
<tr>
<td>7</td>
<td>Feb. 23-27</td>
<td>Related Rates Lab</td>
<td>3.1/3.2</td>
<td>3.2/3.3</td>
</tr>
<tr>
<td>8</td>
<td>March 2-6</td>
<td>3.4</td>
<td>Curve Sketching Lab Review</td>
<td>TEST 2</td>
</tr>
<tr>
<td>9</td>
<td>March 9-14</td>
<td>Spring Break</td>
<td>NO CLASS</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>March 16-20</td>
<td>More Curve Sketching</td>
<td>3.7</td>
<td>Optimization Lab</td>
</tr>
<tr>
<td>11</td>
<td>March 23-27</td>
<td>3.8/3.9</td>
<td>3.9 and Review</td>
<td>TEST 3</td>
</tr>
<tr>
<td>12</td>
<td>March 30- April 3</td>
<td>4.1</td>
<td>4.2</td>
<td>Easter Break NO CLASS</td>
</tr>
<tr>
<td>13</td>
<td>April 6-10</td>
<td>4.3</td>
<td>4.3</td>
<td>4.4</td>
</tr>
<tr>
<td>14</td>
<td>April 13-17</td>
<td>4.4/4.5</td>
<td>4.5</td>
<td>Integral Practice</td>
</tr>
<tr>
<td>15</td>
<td>April 20-24</td>
<td>TEST 4</td>
<td>5.1</td>
<td>5.2</td>
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<tr>
<td>16</td>
<td>April 27-May 1</td>
<td>5.3</td>
<td>5.4/5.5</td>
<td>Final Exam Review</td>
</tr>
<tr>
<td>17</td>
<td>May 4-13</td>
<td>FINAL</td>
<td>EXAM</td>
<td>PERIOD</td>
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