Syllabus
Brookhaven College

Instructor Information
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Course Information
Course Title: Calculus I
Course Number: MATH 2413
Section Number: 26401
Semester/Year: Summer 2020/ Summer 2
Class Meeting Time/Location: Online – Go to class in Ecampus to get started

Required Course Materials
1. WebAssign Website: Students must purchase access to WebAssign as all homework is completed online at this site. Use the following class key when registering: brookhaven.dcccd 4440 2053
2. Essential Calculus: Early Transcendentals - 2e Stewart ; Cengage Learning. IMPORTANT: Students do not need to purchase a separate paper text, as WebAssign includes an electronic text.
3. TI Graphing calculator is required and should be brought to class. TI-84 PLUS calculator recommended. NO TI-89 OR TI-92 OR TI-NSPIRE.

Graded Work
The tables below provide a summary of the graded work in this course and an explanation of how your final course grade will be calculated.

Summary of Graded Work

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Details</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Tests</td>
<td>5 Tests Lowest test grade is dropped</td>
<td>60%</td>
</tr>
<tr>
<td>WebAssign Homework</td>
<td>1 Assignment per section</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Cummulative at end of term</td>
<td>20%</td>
</tr>
</tbody>
</table>

Final Grade

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100%</td>
<td>A</td>
</tr>
<tr>
<td>80-89%</td>
<td>B</td>
</tr>
<tr>
<td>70-79%</td>
<td>C</td>
</tr>
<tr>
<td>60-69%</td>
<td>D</td>
</tr>
<tr>
<td>0-59%</td>
<td>F</td>
</tr>
</tbody>
</table>

Key Dates
**Course Schedule:**

*IMPORTANT:* A good practice strategy for extra homework is to try every *third* problem. Pay attention to the ones you struggle with or get wrong, and do more of these.

All work in this course is done ONLINE & you should refer to WebAssign for due dates.

<table>
<thead>
<tr>
<th>DAY</th>
<th>SECTION/TOPIC</th>
<th>SUGGESTED TEXT PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation Homeworks</td>
<td>Course Introduction</td>
</tr>
<tr>
<td>2</td>
<td>1.3 The Limit of a Function</td>
<td>1-19 odd, 23, 24, 25, 26</td>
</tr>
<tr>
<td>3</td>
<td>1.4 Calculating Limits</td>
<td>2, 11 - 27 odd, 24, 28, 31, 35, 43, 44, 49-55</td>
</tr>
<tr>
<td>4</td>
<td>1.5 Continuity</td>
<td>5-8, 13-21 odd, 25, 27, 35, 39, 41</td>
</tr>
<tr>
<td>5</td>
<td>1.6 Limits to Infinity</td>
<td>1, 5, 7, 13-17, 19-31, 35, 37, 49, 51</td>
</tr>
<tr>
<td></td>
<td><strong>TEST 1</strong></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2.1 Derivatives and Rates of Change</td>
<td>3, 5, 7, 9, 15, 19, 21, 25</td>
</tr>
<tr>
<td></td>
<td>2.2 The Derivative as a Function</td>
<td>1, 3, 4, 15, 19-23 odd, 33, 35, 43</td>
</tr>
<tr>
<td>7</td>
<td>2.3 Basic Differentiation Formulas</td>
<td>1-24, 28, 29, 31, 33, 37-43 odd, 49, 51, 53, 61</td>
</tr>
<tr>
<td></td>
<td>2.4 The Product and Quotient Rules</td>
<td>1-25 odd, 29, 31, 34, 39, 47, 48</td>
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<tr>
<td>8</td>
<td>2.5 The Chain Rule</td>
<td>7-51 odd, 65, 70</td>
</tr>
<tr>
<td>9</td>
<td>2.6 Implicit Differentiation</td>
<td>3-15 odd, 19, 20, 21, 27, 29, 33, 45, <em>(challenge 44)</em></td>
</tr>
<tr>
<td>10</td>
<td>2.7 Related Rates</td>
<td>3, 11, 13, 15, 18, 19, 23, 27, 28, 37, 39</td>
</tr>
<tr>
<td>11</td>
<td>2.8 Linear Approximations and Differentials</td>
<td>1, 3, 5, 6, 17, 19, 21, 23, 27</td>
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<tr>
<td></td>
<td><strong>TEST 2</strong></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>3.3 Derivatives of Logarithmic and Exp Functions</td>
<td>1-23 odd, 33, 37, 45, 47, 51-57 odd, 61, 62</td>
</tr>
<tr>
<td>14</td>
<td>3.5 Inverse Trigonometric Functions</td>
<td>1, 3, 5, 9, 11, 15, 17, 19, 25, 32, 34</td>
</tr>
<tr>
<td>15</td>
<td>3.6 Hyperbolic Functions</td>
<td>1, 3, 7, 9, 11, 29-39 odd, 47, 53</td>
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<tr>
<td></td>
<td>3.7 Indeterminate Forms and L'Hospital's Rule</td>
<td>1, 13-35 odd, 47, 49</td>
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<tr>
<td></td>
<td><strong>TEST 3</strong></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>4.1 Maximum and Minimum Values</td>
<td>1-7 odd, 11, 13, 25-35 odd, 41-49 odd, 54, 56, 61</td>
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<tr>
<td>18</td>
<td>4.2 The Mean Value Theorem</td>
<td>1-11 odd, 14, 15</td>
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<tr>
<td></td>
<td>4.3 Derivatives and the Shapes of Graphs</td>
<td>1, 4, 5, 7, 9, 11, 13, 14, 16, 17, 19, 20, 27, 31, 33, 36, 41, 45, 49</td>
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<tr>
<td>19</td>
<td>4.4 Curve Sketching</td>
<td>31, 39</td>
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<tr>
<td></td>
<td>4.5 Optimization Problems</td>
<td>3, 9, 11, 12, 14, 19 (use side 6 instead of L), 25, 27, 29 (use R=4 inches), 30, 48, 54</td>
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<tr>
<td>20</td>
<td>4.7 Anti-derivatives</td>
<td>1-11 odd, 15, 17, 21, 25, 31, 33, 41, 43, 46, 50, 53</td>
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<tr>
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<td><strong>TEST 4</strong></td>
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<tr>
<td>22</td>
<td>5.1 Areas and Distances</td>
<td>1, 3, 4, 5, 9, 13, 14</td>
</tr>
<tr>
<td>23</td>
<td>5.2 The Definite Integral</td>
<td>1, 5, 7, 13, 15, 16, 21, 23, 25, 29, 31, 32, 35</td>
</tr>
<tr>
<td>24</td>
<td>5.3 Valuating the Definite Integral</td>
<td>1-27 odd, 35, 37, 39, 53, 55, 65</td>
</tr>
<tr>
<td>25</td>
<td>5.4 The Fundamental Theorem of Calculus</td>
<td>1-7 odd, 10, 15, 16, 17, 22, 25</td>
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<tr>
<td>26</td>
<td>5.5 The Substitution Rule</td>
<td>3, 5, 7-51 odd, 53, 55, 63</td>
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<tr>
<td></td>
<td><strong>TEST 5</strong></td>
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<td></td>
<td><strong>FINAL EXAM</strong></td>
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Instructor may adjust schedule during semester
Course Prerequisites
MATH 1348, MATH 2412, or equivalent

Course Description
This course is a study of limits and continuity; the Fundamental Theorem of Calculus; definition of the derivative of a function and techniques of differentiation; applications of the derivative to maximizing or minimizing a function; the chain rule, mean value theorem, and rate of change problems; curve sketching; definite and indefinite integration of algebraic, trigonometric, and transcendental functions, with an application to calculation of areas. (4 Lec.)

Student Learning Outcomes
Upon successful completion of this course, students will:
1. Develop solutions for tangent and area problems using the concepts of limits, derivatives, and integrals.
2. Draw graphs of algebraic and transcendental functions considering limits, continuity, and differentiability at a point.
3. Determine whether a function is continuous and/or differentiable at a point using limits.
4. Use differentiation rules to differentiate algebraic and transcendental functions.
5. Identify appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems.
6. Evaluate definite integrals using the Fundamental Theorem of Calculus.
7. Articulate the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.

MATH 2413 is a Tier I course in the Quantitative Reasoning learning category. Knowledge and skills that are important to your success in other college courses will be introduced and reinforced in Tier I. The Quantitative Reasoning category promotes the application of mathematics to increase your ability to solve “real-world” problems. When you are quantitatively literate, you can use logic and critical thinking in new way. [Link to Core Curriculum](http://www.brookhavencollege.edu/syllabipolicies)

Texas Core Objectives
The College defines essential knowledge and skills that students need to develop during their college experience. These general education competencies parallel the Texas Core Objectives for Student Learning. In this course, the activities you engage in will give you the opportunity to practice two or more of the following core competencies:

1. **Critical Thinking Skills** - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. **Communication Skills** - to include effective development, interpretation, and expression of ideas through written, oral, and visual communication
3. **Empirical and Quantitative Skills** - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
4. **Teamwork** - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
5. **Personal Responsibility** - to include the ability to connect choices, actions, and consequences to ethical decision-making
6. **Social Responsibility** - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

Institutional Policies
Institutional Policies relating to this course can be accessed using the link below. These policies include information about tutoring, Disabilities Services, class drop and repeat options, Title IX, and more. [Brookhaven Institutional Policies](http://www.brookhavencollege.edu/syllabipolicies)

Instructor’s Right to Modify
The instructor has the right to add, delete, or revise segments of this course syllabus.