**Course Title:** Calculus with Analytic Geometry I  
**Course Number:** MTH 229 -- Section 102 -- CRN 3221 -- Credit: 5 Hours  
**Textbook:** Calculus, Early Transcendental, by Stewart, Sixth Edition  
**Sections Covered:** 1.1-1.6, 2.1-2.3, 2.5-2.8, 3.1-3.10, 4.1-4.9, 5.1-5.5  
**Course Description:** An introduction to analytic geometry. Limits, derivatives, and integrals of the elementary functions.  
**Calculator:** TI-83 or higher, graphing calculators may not be allowed for some problems in exams.  
**Prerequisites:** ACT of 27 or above, or MTH 132  
**Meeting Time:** MTWRF: 12:00 – 12:50 PM  
**Classroom:** Smith Hall 513  
**Instructor:** Dr. Basant Karna  
**Office:** Smith Hall 741B  
**Office Hours:** 1:00-2:00PM MTWRF, Others by appointment  
**Phone/Email:** Phone: (304) 696-4332, Email: karna@marshall.edu  
**Webpage:** http://www.science.marshall.edu/karna/  

**Course Objectives:** The objectives of this course are to provide students with a clear understanding of limits, derivatives of functions of one variable (interpret them as rates of change), integrals (interpret them as limits of sums). Students will also learn how to optimize functions using derivatives, -- to relate a function’s graph behavior to the function’s first and second derivatives, --- to apply derivatives to word problems.  

**Course Contents:**  
- Review of college algebra  
- Limits of functions of one variables  
- Derivatives of functions of one variable  
- Applications of Derivatives  
- Integrals of functions of one variables  

**Attendance Policy:** Attendance is required and you must come with your text. Attendance will be taken every class day either by sign-in-sheet or by quiz. Having more than 20 absences (excused or unexcused) may result in a course grade of F! Absences which can be excused include illness, emergencies, or participation in another university activity. Documentation from an outside source must be provided.  

**Grading Policy:**  
**A. Quizzes:** Throughout the semester, there will be 11 quizzes given during the last 15 minutes of the class on Fridays. Problems in quizzes will be given from assigned homework problems (textbook will not be allowed). The lowest quiz score will be dropped.  
**B. Exams:** There will be 3 exams given in class during the semester.  
**C. Homework Problems:** Homework problems will be assigned and collected. You are responsible for reading the text, working the exercises, coming to office hours for help when you’re stuck, and being aware of the dates for the major exams.  
**E. Final Exam:** There will be a two-hour final exam on December 10.
### Points Distribution:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (10)</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>3 Major Exams</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Final Exam</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>Attendance</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td>600%</td>
</tr>
</tbody>
</table>

### Grades

The semester grade will be based on the percentage of the 600 total possible points, using the following scale:

- A: 90 - 100%
- B: 80 - 89%
- C: 70 - 79%
- D: 60 - 69%
- F: 0 - 59%

### Make-ups:

- **A. Quizzes:** For unavoidable missed quizzes with valid documentation, I will give you a make-up quiz within a week of the original quiz date (up to two quizzes).
- **B. Exams:** Making up a missed exam is possible only if you receive prior permission from me and only for serious and unavoidable circumstances. Make-ups are likely to be more difficult than the original exam and must be taken within a week of the original exam date. You can’t make up a make-up exam.
- **C. Final:** If you don’t take the final exam, you will receive “F” for the class.

### Exam Dates:

- **Quizzes:**
  - August 27, September 3, 10, 24, October 1, 8, 22, 29, November 5, 19, December 3 (Fridays)
  - Exam 1 - Sep 17, Exam 2 - Oct 15, Exam 3 - Nov 12 (Fridays)
  - Final Exam: December 10 @ 10:15 PM (Friday)

### Important Dates:

- August 30, Monday – “W” Withdrawal period begins
- September 6, Monday – Labor day – No Class
- October 29, Friday – Last day to drop
- Nov 22, Mon – Nov 27, Sat – Thanksgiving / Fall Break – No Class
- December 7, Tuesday – Last class day

### Cell Phones:

All electronic devices should be shut off during class.

### Academic Honesty:

Students should not cheat on exams or on assignments. It is not difficult to catch cheating. Those found cheating will be dealt seriously. Please read pages 105 – 110 of the undergraduate catalogue for details. Or follow the link [http://www.marshall.edu/ucomm/catalog/ug_05-07.pdf](http://www.marshall.edu/ucomm/catalog/ug_05-07.pdf)

### Free Tutoring:

Free tutoring in Smith Hall 523. See the tutoring schedule in classroom board or contact the math department.

### Disable Students:

The Disabled Student Services web site is now available. You may visit it at [http://www.marshall.edu/disabled](http://www.marshall.edu/disabled). Students seeking special accommodations need to follow the university policy detailed at this web site. It is their responsibility to initiate the process for receiving accommodations based upon their disability. If you have any questions or comments, please contact Sandra Clements, the Director of Disabled Student Services.

### Coming Late:

Students should come on time and stay in the class for the entire class. If you are late by more than 10 minutes, you will be considered to be absent.
### Teaching Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Sections covered and topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1 Four ways to represent a function, the vertical line test, piecewise functions, Symmetry, increasing and decreasing functions 1.2 Mathematical Models: Linear, polynomial, power, Rational, algebraic, Trigonometric, exponential, and transcendental functions 1.3 Transformation, combination, and composition of functions</td>
</tr>
<tr>
<td>2</td>
<td>1.4 Graphing calculators 1.5 Exponential functions, applications, the number “e” 1.6 Inverse Functions and Logarithms, one-to-one functions, Natural Logarithms, inverse trigonometric functions</td>
</tr>
<tr>
<td>3</td>
<td>2.1 The tangent problem, the velocity problem 2.2 The limit of a function, one-sided limits, infinite limits, Vertical asymptotes</td>
</tr>
<tr>
<td>4</td>
<td>2.3 Calculating limits using the limit laws 2.5 Continuity, The Intermediate Value Theorem 2.6 Limits at Infinity, horizontal asymptotes Exam 1 on 9/17</td>
</tr>
<tr>
<td>5</td>
<td>2.7 Derivative and Rate of Change 2.8 The derivative as a function, The derivative notations</td>
</tr>
<tr>
<td>6</td>
<td>3.1 Derivatives of polynomials and exponential functions 3.2 The product and quotient rules 3.3 Derivatives of Trigonometric functions</td>
</tr>
<tr>
<td>7</td>
<td>3.4 The Chain Rule 3.5 Implicit Differentiation 3.6 Derivatives of Logarithmic functions</td>
</tr>
<tr>
<td>8</td>
<td>3.7 Rates of Change in the Natural and Social Sciences 3.8 Exponential Growth and Decay Exam 2 on 10/15</td>
</tr>
<tr>
<td>9</td>
<td>3.9 Related rates 3.10 Linear approximations and differentials 4.1 Maximum and minimum values, The Extreme Value Theorem, Fermat’s Theorem, critical number</td>
</tr>
<tr>
<td>10</td>
<td>4.2 Rolle’s Theorem, The Mean Value Theorem 4.3 Increasing/Decreasing Test, The First Derivative Test, Concavity Test, The Second Derivative Test, Graph of functions 4.4 Intermediate forms and L’Hospital’s Rule</td>
</tr>
<tr>
<td>11</td>
<td>4.5 Summary of curve sketching 4.6 Graphing with calculus and calculators 4.7 Optimization problems</td>
</tr>
<tr>
<td>12</td>
<td>4.8 Newton’s Method 4.9 Antiderivatives Exam 3 on 11/12</td>
</tr>
<tr>
<td>13</td>
<td>5.1 The area problem 5.2 The definite integral, evaluating integrals, properties of the Definite integral, comparison properties of the integral 5.3 The fundamental Theorem of calculus</td>
</tr>
<tr>
<td>14</td>
<td>Thanksgiving/ Fall Break</td>
</tr>
<tr>
<td>15</td>
<td>5.4 Indefinite Integrals 5.5 The substitution rule, Definite Integrals</td>
</tr>
<tr>
<td>16</td>
<td>Review for final, Final on December 10, Friday at 10:15 AM in SH 509</td>
</tr>
</tbody>
</table>
Homework Problems

Section 1.1: 1, 2, 5-8, 21, 23, 25, 27, 28, 33, 36, 37, 41, 44, 45, 49, 51, 53, 57, 65, 66, 70
Section 1.2: 1, 2, 3, 8, 9, 15, 19, 20
Section 1.3: 1, 3, 4, 11, 12, 17, 29, 31, 33, 35, 37, 41, 42, 51
Section 1.4: 3, 8, 11, 19, 21
Section 1.5: 3, 4, 7, 13, 15
Section 1.6: 5, 6, 7, 9, 11, 15, 18, 22, 33, 35, 37, 47, 49, 59, 60
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Section 2.2: 1, 4, 6, 9, 13, 21, 25, 26, 27
Section 2.3: 1, 2, 3, 5, 12, 13, 14, 17, 18, 21, 23, 27, 36
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Section 3.8: 1, 3, 4, 9, 13
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Section 3.10: 1, 3, 11, 13, 17, 18, 19, 23
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Section 4.7: 2, 4, 5, 9, 11, 13, 17, 23, 31, 33
Section 4.9: 1, 3, 5, 7, 11, 13, 19, 21, 23, 26, 29, 32, 34, 38, 39, 42, 46, 57, 59, 61
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Section 5.2: 1, 4, 9, 17, 18, 21, 23, 33, 52, 53, 56
Section 5.3: 3, 7, 9, 11, 12, 13, 15, 19, 23, 29, 32, 38, 53
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Section 5.5: 1, 3, 5, 7, 9, 13, 14, 19, 21, 23, 25, 30, 36, 37, 39, 49, 57, 59, 67, 68

Exam Schedule with Sections

Exam 1, on September 17(Friday), will cover the sections(tentative)
Sections 1.1, 1.2, 1.3, 1.4, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6

Exam 2, on October 15(Friday), will cover the sections(tentative)
Sections 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8

Exam 3, on November 12, will cover the sections(tentative)
Sections 3.9, 3.10, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.9

Final, on December 10(Friday)@10:15AM in Room SH 513, will cover the sections (tentative)
Sections 2.2, 2.6, 2.9, 3.4, 3.5, 3.6, 3.8, 4.5, 4.7, 4.9, 5.3, 5.4, 5.5

Quizzes On: August 27, September 3, 10, 24, October 1, 8, 22, 29, November 5, 19, December 3