MH 121: Calculus I

Prerequisite
MH 114 – Pre-Calculus Trigonometry or the equivalent or appropriate placement scores.

Text

Description
Topics include the limit of a function: the derivative of algebraic, trigonometric, exponential, and logarithmic functions; and the definite integral and its basic application to area problems. Applications of the derivative are covered in detail, including approximations with differentials, maximum and minimum problems, and curve sketching using calculus. Three lecture and two laboratory hours per week.

Objectives (SLO)
At the end of Calculus, a student who has studied and learned the material should be able to:

a. Find limits using graphs, algebraic techniques, and limit rules.
b. Demonstrate an understanding of the connection between limits and asymptotic behavior in functions.
c. Recognize and construct continuous functions.
d. Connect the definitions of the derivative and definite integral to their geometric interpretations and applications.
e. Find derivatives and antiderivatives of algebraic and transcendental functions, including compositions of functions.
f. Use implicit differentiation to solve related rates problems and to determine derivative rules for inverse transcendental functions.
g. Use information revealed by limits and derivatives to sketch graphs of functions and find extreme values of functions on given intervals.
h. Convey the connections between limits, derivatives, and integrals.
i. Use the Fundamental Theorem of Calculus to evaluate definite integrals.

Also, the following objectives, as prescribed by the Alabama State Department of Education, are included:

j. Basic concepts of arithmetic; algebra; elementary and trigonometric functions; Euclidean and non-Euclidian geometry; analytic geometry; integral and differential calculus; probability; statistics; linear and abstract algebra; discrete mathematics; and computers.
k. Concepts of number (such as equivalency, greater than, and less than), number theory; and number systems, and computational algorithms, including estimation and approximation.
l. Mathematics vocabulary and symbols and mathematics as the basic language of science and the relationship of mathematics to emerging technologies.

Course Content:
Chapter 1: Limits and Rates of Change
Chapter 2: Derivatives
Chapter 3: Applications of Differentiation
Chapter 4: Integrals
Selected sections of Chapter 6

Course Requirements:
1. A laboratory exercise will be assigned during lab time. A report will usually be required for each lab, and will be due the following lab period. It should be in good grammatical form.
2. A graphing calculator is required at each class meeting.
3. Homework assignments will be given one chapter at a time. There will ‘homework checks’ in which the instructor will ask for work on particular problems. So, do your homework.

**Evaluation & Grading Policy**

<table>
<thead>
<tr>
<th>Test</th>
<th>Points</th>
<th>Range</th>
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<tbody>
<tr>
<td>Test 1 Ch.1</td>
<td>100</td>
<td>627-700 points A</td>
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<tr>
<td>Test 2 Ch.2</td>
<td>100</td>
<td>557-626 points B</td>
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<tr>
<td>Test 3 Ch.3</td>
<td>100</td>
<td>487-556 points C</td>
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<tr>
<td>Test 4 Ch.4</td>
<td>100</td>
<td>417-486 points D</td>
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<tr>
<td>Labs (cumulative)</td>
<td>100</td>
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<td>Final Exam</td>
<td>200</td>
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**Total 700 points**

**Student Conferences:**

Any student making a failing grade during the course of the semester is urged to make a conference with the instructor.

**Absence Policy:**

Your presence is required in order to learn the course material. You must attend 2/3 of all scheduled classes days. Let the instructor know if you are going to be absent in order that you may get the assignments ahead of time. You MUST make arrangements with the instructor if you know you are going to miss a test.

**Assessment Day:** As a part of the University’s plan to assess institutional effectiveness, a day is set aside each semester (except Summer Semester) for assessment activities. Although no day classes meet on this designated day, students are required to participate in assessment activities when they are called upon to do so.

**Disability:** The University of West Alabama strives to make its programs accessible to qualified persons defined as disabled under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Students who have special needs that require accommodation are responsible for notifying instructors in each course in which they are enrolled and appropriate staff members, who in turn will refer the student to the ADA Compliance Coordinator. Following verification of the student’s status, the ADA Compliance Coordinator will work with the instructor or staff member in implementing an appropriate plan for accommodation of the student’s needs. Support documentation of special needs from a physician or other qualified professional will be required if deemed necessary. For additional information, students should contact the Student Success Center, Foust Hall Room 7, (205) 652-3651, or the Office of Student Life, Webb Hall, Room 311, (205) 652-3581.

**Content/Schedule Change:** The instructional schedule reflects expected class progress in course subject matter and is considered tentative. The schedule is subject to change in content and scope at the instructor’s discretion. The instructor will make corrections as needed and will announce changes in the class.

**Honesty/Integrity:** The UWA Academic Dishonesty policy stated in the *General Catalogue* and the student handbook will be followed in this course.