MA131-002: Calculus for Life and Management Sciences (3 units, Spring 2016)

Course website: [http://www4.ncsu.edu/~cldurden/ma131](http://www4.ncsu.edu/~cldurden/ma131)

Spring 2016, MoWeFr 12:50-1:40 PM, SAS 2203

Instructor: Chris Durden (Mr. Durden), office: 406 Cox Hall, email: cldurden@ncsu.edu

Syllabus: [Syllabus](http://www4.ncsu.edu/~cldurden/ma131/syllabus)

Office Hours: Monday 11:30AM-12:30PM, Tuesday 3:00-4:00PM, Wednesday 2:00-3:00PM, 406 Cox Hall

Schedule: [Schedule](http://www4.ncsu.edu/~cldurden/ma131/schedule)

Link to WebAssign: [WebAssign](http://www4.ncsu.edu/~cldurden/ma131/webassign)

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Course Description

First order finite difference models; derivatives — limits, power rule, product rule, quotient rule, chain rule; tangent line approximation; graphing, optimization; exponential and logarithmic functions — growth and decay models; integrals — computation, area, total change; applications in life, management, and social sciences.

Course Objectives and Approach

Students will understand the key ideas of calculus and how the ideas apply to models that are used in the life and management sciences. Lectures will emphasize key concepts and present examples of their use. Problem sessions will present opportunities for students to practice applying the concepts. This work will consist of exercises similar to those presented in class and inquiry-based learning activities intended to deepen conceptual understanding. Inquiry-based learning requires students to apply ideas from class to answer a question that requires a different method of solution than what they have already seen. Since part of solving a problem is recognizing when the solution is adequate, students will be expected to make efforts to convince themselves that a solution makes sense.

Course Materials

- MA 131 Supplement (available online for free).
- Webassign access (available for $32.95 at [http://webassign.ncsu.edu](http://webassign.ncsu.edu))

Prerequisites:

**Prerequisite:** C- or better in MA 107 or MA 111, or 520 or better on the SAT Subject Test in Mathematics, Level 2 on the NCSU Math Skills Test, or 2 or better on an AP Calculus exam.

**Restrictions:** Credit is not allowed for both MA 131 and MA 121 or MA 141.
Class Expectations

This is a college level math course. I expect students to actively participate in learning — this means attending and paying attention in all lectures and problem sessions, reviewing course materials outside of the classroom, and asking for help when needed. This class will operate best on a basis of cooperation, sincere effort, and mutual respect.

Attendance Policy

In accordance with university policy, attendance will be taken. Besides the obvious not showing up at all, missing at least one half of lecture, having your laptop out, texting, reading the newspaper, or sleeping during class will also count as an absence. All anticipated absences must be excused in advance of a test day. These include University trips, required court attendance, or religious observances. Emergency absences must be reported within one week of returning to class. Students with four or fewer absences over the course of the semester will have their lowest test grade dropped. Please note that absences from both lectures and problems sessions count toward this number.

Evaluation

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<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
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<tr>
<td>Tests</td>
<td>50%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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Homework (WebAssign)

Homework for this course will consist of online problem sets using WebAssign. You are expected to check WebAssign regularly for the due dates, which may change depending on class progress. Extensions may be granted under reasonable circumstances via e-mail request to the course instructor, although late assignments may incur a penalty. All WebAssign assignments that are listed as “Homework” will count toward the Homework grade.

Tests

Four tests are scheduled during class time. The dates of the tests are listed on the course schedule. If you anticipate a scheduling conflict that prevents you from taking a test or the final exam on the scheduled date, you are responsible for contacting the instructor during the first two weeks of class to make arrangements. The lowest of these test grades will be dropped if the total number of absences (excused or unexcused) does not exceed four.

Test corrections  After receiving your corrected test, correction disputes must be presented to me within one class week of being handed back.

Technology

You will need paper and a writing utensil. Please use a pencil, blue ink, or black ink to write solutions to tests. You will need access to WebAssign in order to complete the homework. You do not need a calculator for this course. In fact **calculators are not permitted on tests and exams**. However, if during class or while
working on homework, you would like to check your arithmetic (addition, subtraction, multiplication, division, and so forth) with a scientific calculator, please feel free.

**Academic Integrity Standards**

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at http://policies.ncsu.edu/policy/pol-11-35-01.

**Honor Pledge**

Your signature on any test or assignment indicates “I have neither given nor received unauthorized aid on this test or assignment.”

**Letter Grade Cut-offs**

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<thead>
<tr>
<th>Grade</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
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<tr>
<td>A+</td>
<td>98</td>
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<tr>
<td>A</td>
<td>93</td>
<td>≤ 98</td>
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<tr>
<td>A-</td>
<td>90</td>
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<td>≤ 90</td>
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<tr>
<td>B</td>
<td>83</td>
<td>≤ 88</td>
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<tr>
<td>B-</td>
<td>80</td>
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<tr>
<td>C+</td>
<td>78</td>
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<td>68</td>
<td>≤ 70</td>
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<tr>
<td>D</td>
<td>63</td>
<td>≤ 68</td>
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<tr>
<td>D-</td>
<td>60</td>
<td>≤ 63</td>
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**Students with Disabilities**

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (http://www.ncsu.edu/dso), 919-515-7653. For more information on NC State’s policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at http://policies.ncsu.edu/regulation/reg-02-20-01.

**Nondiscrimination Policy**

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national
origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State’s policies and regulations covering discrimination, harassment, and retaliation may be accessed at http://policies.ncsu.edu/policy/pol-04-25-05 or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

Tentative Course Schedule (Subject to Change)

Sections Topics
10.1-10.4 Difference equations and applications (supplementary text)
1.1-1.4 Limits and Derivatives (main text)
Test 1 on Friday, January 29th
1.5-1.8 Differentiability, continuity and rates of change
2.1-2.7 Applications of the derivative
Test 2 on Monday, February 22nd
3.1-3.2 Rules of differentiation
4.1-4.6 Exponential and logarithmic functions
5.1-5.2 Applications to population growth and compound interest
Test 3 on Wednesday, March 23rd
6.1-6.5 The definite integral
9.1, 9.3-9.4 Integration by substitution, evaluation of integrals
Test 4 on Friday, April 15th
9.5-9.6 Applications of integration, improper integrals
Final exam on Wednesday, May 4th 1:00-4:00PM