

## MA 231: Calculus for Life and Management Sciences B

<b>Sections:</b>	<b>010, 012, 014</b>	<b>011, 013, 015</b>
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<b>Office Hours:</b>	<b>TBA</b>	<b>TBA</b>

**Textbook**     Calculus and Its Applications by Goldstein, Lay, Asmar, Schneider. 13<sup>th</sup> edition. 2013. Pearson. ISBN# 978-0321848901. Cost: \$150.

### Course Description

Functions of several variables - partial derivatives, optimization, least squares, Lagrange multiplier method; differential equations - population growth, finance and investment models, systems, numerical methods; MA 121 is not an accepted prerequisite for MA 231.

### Course Design

This class is a hybrid course. This means 2/3 of the “lecture time” will occur online, via Moodle, and 1/3 of it will happen in a face-to-face (F2F) class. You will be responsible for using the online lessons to get comfortable with the new material before coming to your F2F class. During the F2F class, you will be actively working on the more difficult skills and applications of the material.

### Course Learning Outcomes

After successfully completing this course, students will be able to:

1. Use the techniques of partial differentiation to explore the properties of a function of two or more variables;
2. Set up and solve optimization problems in various contexts;
3. Use least squares to fit linear and nonlinear functions to a given data set;
4. Give examples of how and why different disciplines use differential equations and mathematical models;
5. Create a mathematical model that describes a given problem from biology, economics, or business;
6. Carry out numerical simulations and mathematical analyses of a model.

For a schedule of topics to be covered and the detailed learning objectives for the course, please see the course Moodle page.

## Grades

This course uses standard NCSU letter grading, with no rounding.

$90 \leq A^- < 93$	$93 \leq A < 97$	$97 \leq A^+ \leq 100$
$80 \leq B^- < 83$	$83 \leq B < 87$	$87 \leq B^+ < 90$
$70 \leq C^- < 73$	$73 \leq C < 77$	$77 \leq C^+ < 80$
$60 \leq D^- < 63$	$63 \leq D < 67$	$67 \leq D^+ < 70$
$0 \leq F < 60$		

Grade Component	Weight	Details
Online Participation	5%	The online participation score is the percentage of Moodle lessons submitted. It is independent of the number of self-check questions answered correctly.
Before Class Homework	15%	Before class homework is done through WebAssign. An assignment corresponding to the online lesson is due before class each week, <b>Thursdays at midnight</b> .
After Class Homework	20%	During class students will actively work with their peers to apply the concepts learned in the online lessons to more detailed problems. Students are expected to print and bring the class worksheets. Many assignments will be done through WebAssign and some may be turned in on paper. Assignments are due after class each week, <b>Mondays at midnight</b> .
Attendance	5%	Attendance at F2F classes on <b>Fridays</b> is required. Up to 2 absences (excused or unexcused) are permitted before impacting your attendance grade.
Midterm Tests	35%	Two 75-minute tests, <b>Sep 19-20</b> and <b>Nov 7-8</b> .
Final Exam	20%	Comprehensive, 180-minute exam, <b>Dec 4-6</b> .

## Homework Policies

Homework is done through [WebAssign](http://webassign.ncsu.edu) (webassign.ncsu.edu). To use WebAssign you will need to purchase an access code online via credit card. The access code costs around \$30 per course.

Extensions are requested and granted automatically through WebAssign, so long as you have not viewed the answer key for an assignment. You may request one extension per assignment at any time **within a 5-day window** of the original due date at a **penalty of 40%** on unearned points. After the extension is granted, you have **24 hours** to complete the assignment within that 5-day window.

## Exams

There are two 75-minute midterms and one 3-hour final. **Non-graphing** calculators are permitted. All exams must be taken at a [DELTA testing center](#) (or DSO, as applicable), which operates on a first-come, first-served basis. You may take each exam at any time during the designated window. Students are required to comply with university policies on academic integrity and honesty.

- Midterm Test 1: Tuesday September 19 - Wednesday September 20
- Midterm Test 2: Tuesday November 7 - Wednesday November 8
- Final Exam: Monday December 4 - Wednesday December 6

## Attendance

Participation in weekly Friday F2F classes is an integral part of the course, so attendance is required. Up to two “free” absences are permitted before impacting your grade. After your second absence, each absence will drop your course grade by 1%. Note that both excused and unexcused absences count towards this total: the “free” absences are provided to account for illness, etc.

## Course Website

We will be using the Moodle learning management system (<http://wolfware.ncsu.edu>) for this course. Log in using your Unity ID and password. (For assistance with your Unity ID, refer to <http://oit.ncsu.edu/unityid> or contact (919) 515-HELP or [HELP@ncsu.edu](mailto:HELP@ncsu.edu).) After the beginning of the semester, you will see a link to our course site. Once in the site, you can Bookmark or add the site as a Favorite in your web browser so that you can return directly to that page. We recommend that you use **Firefox** when viewing Moodle lesson videos.

## Course Communications

Modes of communication in use for this course include email, office hours, and Moodle.

- Moodle discussion forums will be used to facilitate class discussion. Check these forums often and please feel free to reply to your fellow students’ posts.
- We will do our best to respond to weekday e-mails and posts within 24 hours. Email messages or posts left after 4pm Friday will be responded to by Monday evening.
- You will be auto-subscribed to the Moodle forums, so that your @ncsu.edu email address receives a notification of every new post. Instructions will be provided for switching to a daily digest email for those interested in doing so.
- If you would like to speak with an instructor in person and you can’t make it to the posted office hours, please email me to schedule a time that is convenient. Include several time slots that would work for you in your email.

Please be aware that ALL email communications for this course will be sent to your NCSU unity email. If you do not regularly use your ncsu.edu account, there are settings within gmail that allow you to forward your e-mail to another account. For more information, please see <http://google.ncsu.edu/what-best-way-forward-my-nc-state-gmail-non-nc-state-e-mail-address>.

If you have a question that the whole class may benefit from hearing, please post on the “Course Content Q&A” or “Course Logistics” forum as appropriate. We will check these forums often to respond to open questions. You should also check frequently to answer or ask questions.

If you have a question that is very specific to the work you have done (i.e. if you nearly finished your work but got stuck towards the end), you can email your instructor with your question. Including a scan or photo of your work can help hasten the response.

If an instructor receives an email with a question more appropriate to the forum, he or she may copy and paste the question there without identifying the student who sent it.

### **Academic Integrity**

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>

The NCSU Student Code of Conduct covers all work done in this course.

Any suspected violations will be promptly reported. Academic dishonesty will result in an automatic failing grade for the course.

### **Course Evaluations**

A formal evaluation is conducted by the University at the end of the semester and the goal is to achieve 100% class participation in this survey. Online class evaluations will be available for students to complete during the last two weeks of class. Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will never know how any one student responded to any question, and students will never know the ratings for any particular instructor.

### **Accommodations for 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>.

### **Non-Discrimination 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/](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.

### **Copyrighted Materials**

The course website contains copyrighted materials and was developed for instructional purposes to be used by students at North Carolina State University. Students currently registered in this course are permitted to print or make copies of parts of this site for their own personal use in conjunction with completing the course. Text, audio files, images or design of this website may not otherwise be distributed or modified in any manner without the prior written permission of the instructor.