

# MA 231 Course Syllabus

Calculus for Life and Management Sciences B

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## INSTRUCTOR INFORMATION

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| Name       | Office Phone | Email            | Office Location    |
|------------|--------------|------------------|--------------------|
| Molly Fenn | 919-513-2288 | mafenn2@ncsu.edu | SAS Hall room 2108 |



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## COURSE INFORMATION

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**Course Website:** <https://wolfware.ncsu.edu/>

**Course Credit Hours:** 3

**Course Meetings:** Fridays--12:50-1:40, 1:55-2:45, or 3:00-3:50

### 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.

### Prerequisites/Corequisites

MA 131 or MA 141

### General Education Program (GEP) Information

This course satisfies the Mathematical Sciences GEP Category.

### GEP Category Fulfilled

Mathematical Sciences

### GEP Corequisites

None

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## **COURSE DELIVERY AND STRUCTURE**

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This section of MA 231 will be taught in a blended format. This means that instead of meeting in-person three days a week for an hour, two of those "lecture hours" will be done online. There will be a collection of short videos and self-assessment questions on Moodle you'll be responsible for completing each week BEFORE we meet on Fridays. Expect to spend two hours a week working through these online lessons.

Note that you will be responsible for watching videos and doing graded homework through WebAssign on new material BEFORE we meet each week. This means you will need to keep yourself on track and will be learning a fair amount of material on your own. In using the online material, you will learn new concepts and check your knowledge. During the face-to-face class each week we will focus on more difficult applications of the material you've learned.

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## **COMMUNICATION**

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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 emails and posts within 24 hours. Email messages or posts left on Friday will be responded to on the following Monday.
- 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 your instructor to schedule a time that is convenient. Include several time slots that would work for you in your email.
- Feedback for many assignments is automatic, either via self-check questions in Moodle or WebAssign.
- During our face-to-face class you will work in groups with opportunities to ask questions of your instructor and get feedback about your work.
- For tests, grades and comments are returned within approximately one week.

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 email to another account.

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.

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## **COURSE LEARNING OUTCOMES**

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Upon completion of this course, students will be able to:

1. Use varying techniques, including 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.

## COURSE SCHEDULE

| Week           | Date Range     | Online Lesson Topic   | Online Lesson Due Date | Face-to-Face (F2F) Topic  |
|----------------|----------------|---|------------------------|---|
| <b>Week 1</b>  | Jan 7-14       | Course Orientation  | Jan 10                 | Predict next year's student fees                                      |
| <b>Week 2</b>  | Jan 14-21      | Lesson 1: Multivariable Functions                                     | Jan 17                 | Graphing functions of two variables                                   |
| <b>Week 3</b>  | Jan 21-28      | Lesson 2: Partial Derivatives   | Jan 24                 | Computing and interpreting partial derivatives                        |
| <b>Week 4</b>  | Jan 28 - Feb 4 | Lesson 3: Maxima and Minima   | Jan 31                 | Predicting height using age   |
| <b>Week 5</b>  | Feb 4-11       | Lesson 4: Lagrange Multipliers  | Feb 7                  | Construction for minimal heat loss                                    |
| <b>Week 6</b>  | Feb 11-18      | <b>Test 1</b>   | <b>Feb 11-13</b>       | Introduction to differential equations and modeling                   |
| <b>Week 7</b>  | Feb 18-25      | Lesson 5: Introduction to Differential Equations                      | Feb 21                 | Modeling the population of Raleigh                                    |
| <b>Week 8</b>  | Feb 25 - Mar 4 | Lesson 6: Introduction to Modeling                                    | Feb 28                 | Hormone replacement therapy   |
| <b>Week 9</b>  | Mar 4-11       | Lesson 7: Separation of Variables                                     | Mar 7                  | Solving separable differential equations and initial value problems   |
|                | Mar 11-18      | <b>Spring Break</b>   |                        |   |
| <b>Week 10</b> | Mar 18-25      | Lesson 8: Numerical and Graphical Solutions of Differential Equations | Mar 21                 | Sketching solutions to differential equations with qualitative theory |

|                |                |                                  |                       |                            |
|----------------|----------------|----------------------------------|-----------------------|----------------------------|
| <b>Week 11</b> | Mar 25 - Apr 1 | Differential Equations Review    |                       | Review for Test 2          |
| <b>Week 12</b> | Apr 1-8        | <b>Test 2</b>                    | <b>Apr 1-3</b>        | Modeling Yeast Growth      |
| <b>Week 13</b> | Apr 8-15       | Lesson 9: Logistic Growth        | Apr 11                | Fishery Permits            |
| <b>Week 14</b> | Apr 15-22      | Lesson 10: Two Population Models | Apr 18                | No meeting: Spring holiday |
| <b>Week 15</b> | Apr 22-29      | Cumulative Review                |                       | Final exam review          |
| <b>Week 16</b> | Apr 29 - May 1 | <b>Final Exam</b>                | <b>Apr 29 - May 1</b> |                            |

Please note: course schedule is subject to change.

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## **COURSE MATERIALS**

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### **Required Textbook**

Calculus and Its Applications by Goldstein, Lay, Asmar, Schneider. 14th edition. 2017.

### **Required WebAssign Purchase**

Homework is done through WebAssign (webassign.ncsu.edu). To use WebAssign you will need to purchase access online via credit or debit card. The access code costs around \$30. When you sign into WebAssign after the first day of classes, you will automatically see the course. The WebAssign roster syncs with the class roster, so if you add the class after the semester starts, you will have access to the course WebAssign after 24-48 hours. You can use WebAssign for free for approximately the first two weeks of the semester. After that you will need to purchase access.

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## **TECHNOLOGY REQUIREMENTS**

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### **Hardware**

NC State's Online and Distance Education provides [\*\*technology requirements and recommendations\*\*](#) for computer hardware.

### **Software**

- > **Moodle and Wolfware**
  - [Moodle Accessibility Statement](#)
  - [Moodle Privacy Policy](#)
  - [NCSU Privacy Policy](#)
- > **Adobe Reader** (for reading PDF files)
  - [Accessibility Statement](#)
  - [Adobe Privacy Policy](#)
- > **G Suite**
  - [Accessibility Statement](#)
  - [Privacy Policy](#)
- > **WebAssign**
  - [Accessibility Statement](#)
  - [Privacy Policy](#)

### **Minimum Computer and Digital Literacy Skills**

- > Obtain regular access to a reliable internet connection
- > Proficient typing and word processing skills (MS Word, text editors, Google Docs)

- > Ability to use online communication tools, such as email (create, send, receive, reply, print, send/receive attachments), discussion boards (read, search, post, reply, follow threads), chats, and messengers.
- > Download attachments
- > Knowledge of copy/paste and use of spell check
- > Use computer networks to locate and store files or data
- > Internet skills and ability to perform online research using various search engines and library databases. Visit [Distance Learning Services](#) at NCSU Libraries for more information.

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## ONLINE LEARNING EXPECTATIONS

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This section of MA 231 will be taught in a blended format. This means that instead of meeting in-person three days a week for an hour, two of those "lecture hours" will be done online. There will be a collection of short videos and self-assessment questions on Moodle you'll be responsible for completing each week BEFORE we meet on Fridays. Expect to spend two hours a week working through these online lessons.

Note that you will be responsible for watching videos and doing graded homework through WebAssign on new material BEFORE we meet each week. This means you will need to keep yourself on track and will be learning a fair amount of material on your own. During class each week we will focus on more difficult applications of the material you've learned.

Feedback for many assignments is automatic, either via self-check questions in Moodle or WebAssign. During our face-to-face class you will work in groups with opportunities to ask questions of your instructor and get feedback about your work. For tests, grades and comments are returned within approximately one week.

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## NETIQUETTE & ETIQUETTE

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Netiquette is the term used to describe the special set of rules for online communication.

Students should be aware that their behavior impacts other people, even online. I hope that we will all strive to develop a positive and supportive environment and will be courteous to fellow students and your instructor. Due to the nature of the online environment, there are some things to remember.

### **Tips for Success:**

- > **Do:** Follow the same standards of behavior that you subscribe to offline. Keep in mind that all online communication is documented and therefore permanent.



- > **Don't:** Flame others in discussion forums. Flaming is the act of responding in a highly critical, sarcastic, or ridiculing manner – especially if done on a personal level. Remember that these discussions are meant for constructive exchanges and learning!
- > **Do:** Ensure you are responding to forums by the due date, in order to leave time for peers to comment on your response.
- > **Don't:** Go for long periods of time without communicating to your instructors or classmates. It is important to stay a part of the online community!
- > **Do:** Remember to read over your posts before selecting "Submit."
- > **Don't:** Use slang, poor grammar, and other informal language in discussion forums or email messages to instructors or classmates.

**Additional resources**

- > [DELTA's Netiquette or Best Practices for Teaching Online](#)
- > [Netiquette – Ethics in Computing](#)

Etiquette during face-to-face class is also important. During class you will be working in groups of 3 or 4 on applying the knowledge gained in the online lesson. While collaborating with your peers, professional and respectful communication is expected.

**COURSE AND INSTITUTIONAL POLICIES**

**Grading Policy**

| 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> . Your average will be calculated as a percentage of points you earn on the Before Class assignments out of the total possible 397 points.   |
| 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</b> |

|               |     |  |
|---------------|-----|--|
|               |     | <b>midnight.</b> Your average will be calculated as a percentage of points you earn on the After Class assignments out of the total possible 182 points. |
| 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 90-minute tests, <b>February 11-13</b> and <b>April 1-3</b> .  |
| Final Exam    | 20% | Comprehensive, 180-minute exam, <b>April 29 - May 1</b> .  |

### Grading Scale

This course uses this grading scale:

| Low  | Letter | High  |
|------|--------|-------|
| 97 ≤ | A+     | ≤ 100 |
| 93 ≤ | A      | < 97  |
| 90 ≤ | A-     | < 93  |
| 87 ≤ | B+     | < 90  |
| 83 ≤ | B      | < 87  |
| 80 ≤ | B-     | < 83  |
| 77 ≤ | C+     | < 80  |
| 73 ≤ | C      | < 77  |
| 70 ≤ | C-     | < 73  |
| 67 ≤ | D+     | < 70  |
| 63 ≤ | D      | < 67  |
| 60 ≤ | D-     | < 63  |
| 0 ≤  | F      | < 60  |

### Homework Policies

Homework is done through WebAssign ([webassign.ncsu.edu](http://webassign.ncsu.edu)). To use WebAssign you will need to purchase an access code online via credit card. The access code costs around \$30. When you sign into WebAssign after the first day of classes, you will automatically see the course. The WebAssign roster syncs with the class roster, so if you add the class after the semester starts, you will have access to the course WebAssign after 24-48 hours. You can use WebAssign for free for approximately the first two weeks of the semester. After that you will need to purchase access.

### **Late Assignments**

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.

### **Tests and Exams**

This course requires proctored exams facilitated through [DELTA Testing Services](#). A proctor is an impartial third-party who verifies the identity of the student and ensures the academic integrity of an exam.

Tests will be offered on the following days:

- Midterm Test 1: Monday February 11 - Wednesday February 13
- Midterm Test 2: Monday April 1 - Wednesday April 3
- Final Exam: Monday April 29 - Wednesday May 1

DELTA Testing Services will offer the exam(s) for this course on campus. Please visit the DELTA Testing Services website for [more information about on-campus testing](#).

- Step 1: [Make an Appointment](#). Exams at the DELTA Test Centers are by appointment only. To schedule your appointment, visit [go.ncsu.edu/takemytest](http://go.ncsu.edu/takemytest).
- Step 2: Come Prepared.
  - Bring a photo ID.
  - Know your UnityID.
  - If you are a DUO user, bring your registered device.

Students with Accommodations— If you have approved accommodations with NC State's Disability Resources Office (DRO), DELTA Testing Services wants to ensure that you receive the appropriate accommodations when you go to the test center.

- Email Testing Services. Send a PDF copy of your Accommodation Letter to [delta\\_accommodations@ncsu.edu](mailto:delta_accommodations@ncsu.edu) Once we have received a copy of your accommodation letter, a confirmation email will be sent informing you that your accommodations have been processed. You will then be able to schedule an appointment.

### **Attendance and Participation**

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 final course grade by 1%, up to a maximum of 5%, the attendance portion of your grade. This means if you miss 5 or more F2F classes, you will get a 0% attendance grade. Note that both excused and unexcused absences count towards this total: the “free” absences are provided to account for illness, etc. For more information, see [NC State’s Attendance Policy](#). Should you need to withdraw from the course, please read about [NC State’s Withdrawal Process](#).

### **Incomplete Grades**

At the discretion of the instructor, students may be given an IN grade for work not completed because of a serious interruption in their work not caused by the student’s negligence. An IN must not be used, however, as a substitute for an F when the student’s performance in the course is deserving of an F. An IN is only appropriate when the student’s record in the course is such that the successful completion of particular assignments, projects, or tests missed as a result of a documented serious event would enable that student to pass the course. Work undertaken to make up the IN grade will be limited to the missed work.

An IN grade must be made up by the end of the next regular semester (not including summer sessions) in which the student is enrolled, provided that this period is not longer than twelve months from the end of the semester or summer session in which the work was due. In the event that the instructor or department offering the course is not able to provide a student with the opportunity to make up the incomplete work by the end of the next regular semester in which the student is enrolled or within twelve months, whichever is shorter, the instructor or department offering the course must notify the Department of Registration and Records of the date of the extended deadline for removing the IN grade.

Any IN grade not removed by the end of the next regular semester in which the student is enrolled or by the end of twelve months, whichever is shorter, or by the extended deadline authorized by the instructor or the department offering the course and recorded by the Department of Registration and Records will automatically become a Failing (F) grade and will count as a course attempted.

### **Academic Integrity and Honesty**

Students are required to comply with the university policy on academic integrity found in the [Code of Student Conduct](#). Therefore, students are required to uphold the university pledge of honor and exercise honesty in completing any assignment.

Please refer to the [Academic Integrity](#) web page for a detailed explanation of the University’s policies on academic integrity and some of the common understandings related to those policies.

### **Trans-Inclusive Statement**

In an effort to affirm and respect the identities of transgender students in the classroom and beyond, please contact me if you wish to be referred to using a name and/or pronouns other than what is listed in the student directory.

### **Basic Needs Security**

Any student who faces challenges securing their food or housing or has other severe adverse experiences and believes this may affect their performance in the course is encouraged to notify the professor if you are comfortable in doing so. Alternatively, you can contact the Division of Academic and Student Affairs to learn more about the Pack Essentials program

<https://dasa.ncsu.edu/pack-essentials/>

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## **STUDENT SERVICES**

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### **> Academic Support**

- **NCSU Libraries:** <https://www.lib.ncsu.edu/>
  - [Research Assistance](#)
  - [List of Subject Specialists](#)
  - [Ask a Librarian](#) - Live services from NCSU Libraries
  - [RefWorks](#) (Web-based tool to organize research) This is free for NCSU students
  - [Citation Builder](#) - help with APA
- **NC State Tutorial Center:** <https://tutorial.dasa.ncsu.edu/>

### **> [Academic Advising](#)**

### **> [Registering for Classes](#)**

### **> [Financial Aid](#)**

### **> [Accessibility Support](#)**

### **> [Online and Distance Education website](#)**

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## TECHNICAL SUPPORT

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NC State University HELP Desk:

- > Website: <https://help.oit.ncsu.edu/>
- > Email: [help@ncsu.edu](mailto:help@ncsu.edu)
- > Phone: 919.515.HELP
- > Walk-in Support

Hours:

| Semester               | Monday-Friday   | Saturday                                |
|------------------------|---|---|
| <b>Fall and Spring</b> | 8 a.m. to 7 p.m.<br>After 5 p.m., please ring doorbell. | Noon to 5 p.m.<br>Please ring doorbell. |
| <b>Summer</b>          | 8 a.m. to 5 p.m.  | Noon to 5 p.m.<br>Please ring doorbell. |

Students can receive computer support in these areas:

- > **Operating system**  
Including virus and spyware removal
- > **Software**  
Most software packages are easy to install, but if you encounter difficulty, Walk-in Center staff are happy to help.
- > **Network connectivity**  
ResNet and the campus wireless network
- > **Warranty and hardware repair**  
For computers and warranties purchased through the NC State Bookstore
- > **Unity account**  
Including password resets, disabled accounts
- > **2SV support**  
Duo and Google two-step verification support

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## **ELECTRONIC COURSE COMPONENTS**

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This course uses the Moodle Learning Management System and WebAssign. Information about accessibility and privacy policies can be found above in the Technology Requirements section of the syllabus.

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

Students are responsible for reviewing the NC State University PRR's which pertains to their course rights and responsibilities:

- > [Equal Opportunity and Non-Discrimination Policy Statement](#) and [additional references](#)
- > [Code of Student Conduct](#)
- > [Grades and Grade Point Average](#)
- > [Credit-Only Courses](#)
- > [Audits](#)

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## **STUDENTS WITH DISABILITIES**

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Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the [Disability Resource Office](#) at Holmes Hall, Suite 304, Campus Box 7509, 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 \(REG02.20.01\)](#)

Students with disabilities should additionally contact their instructor about accommodations.

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## **COURSE EVALUATIONS**

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ClassEval is the end-of-semester survey for students to evaluate instruction of all university classes. The current survey is administered online and includes 12 closed-ended questions and 3 open-ended questions. Deans, department heads, and instructors may add a limited number of their own questions to these 15 common-core questions.

Each semester students' responses are compiled into a ClassEval report for every instructor and class. Instructors use the evaluations to improve instruction and include them in their promotion and tenure dossiers, while department heads use them in annual reviews. The reports are included in instructors' personnel files and are considered confidential.

Online class evaluations will be available for students to complete during the last two weeks of the semester for full semester courses and the last week of shorter sessions. Students will receive an email directing them to a website to complete class evaluations. These become unavailable at 8am on the first day of finals.

- > Contact ClassEval Help Desk: [classeval@ncsu.edu](mailto:classeval@ncsu.edu)
- > [ClassEval website](#)
- > [More information about ClassEval](#)

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## **SYLLABUS MODIFICATION STATEMENT**

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Our syllabus represents a flexible agreement. It outlines the topics we will cover and the order we will cover them in. Dates for assignments represent the earliest possible time they would be due. The pace of the class depends on student mastery and interests. Thus minor changes in the syllabus can occur if we need to slow down or speed up the pace of instruction.