

FALL 2016 M408N Differential Calculus for Science**Unique numbers 53780 & 53785****Text** James Stewart, 7th edition, Calculus: Early Transcendentals**Instructor Evelyn Schultz** schultz@math.utexas.edu

RLM 13.146 512-232-6188 (do not leave a message) Office hours: MWF 12-1 pm

E-mail policy: A great deal of information is given in this Syllabus. Read it carefully. I most likely will not answer an e-mail asking a question answered here. If you do e-mail me, please include your name, UT EID and the unique number of the section you are in.

Unique #	Lecture Time / Room	TA Session	TA Name, Information
53780	MWF 8-9 am ECJ 1.202	T Th 8-9 am CPE 2.212	
53785		T Th 2-3 pm CPE 2.206	

Important websites: QUEST <https://quest.cns.utexas.edu>**CalcLab** <https://www.ma.utexas.edu/academics/undergraduate/calculus-lab/>**Grades**

Grades will be based on homework grades, midterm exam grades and the grade on the final exam. Grades will use +/- at my discretion.

MIDTERM EXAMS 60%

Midterm exam problems cover material that appears in lecture, on homework and in discussion. Each of the two midterm exams will consist of two tests: ExamQ on Wednesday and ExamFR on Friday.

ExamQ consists of multiple choice questions from Quest with no partial credit given. There is no negative penalty for multiple choice incorrect answers on exams; it pays to guess on these problems on exams.

ExamFR consists of free response questions for which you may receive partial credit if your work is legible and clearly written out.

Students take the midterm exams during lecture time. No makeup exams are given.

No calculators or notes are allowed during exams.

The lowest score of ExamQ1 and ExamQ2 will be dropped.

The lowest score of ExamFR1 and ExamFR2 will be dropped.

Midterm Exams:

Date	Exam type	Sections covered
Wed., October 5	ExamQ1	1.5, 6; 2.1, 2, 3, 5, 6, 7, 8; 3.1, 2, 3, 4, 5
Fri., October 7	ExamFR1	1.5, 6; 2.1, 2, 3, 5, 6, 7, 8; 3.1, 2, 3
Wed., November 16	ExamQ2	3.6, 9, 10; 4.1, 2, 3, 4, 5, 7, 9; 5.1
Fri., November 18	ExamFR2	3.4, 5, 6, 9, 10; 4.1, 2, 3, 4, 5, 7

- ⤴ No books, notes, or cheat sheets at any Exams, including the Final.
- ⤴ No calculators allowed at any Exams, including the Final.
- ⤴ Bring pencils to each exam, including the Final. No pencils will be provided.
- ⤴ Bring a photo ID to each exam, including the Final. Your exam will not be accepted without a photo ID.
- ⤴ This course is cumulative, so earlier material may appear on later exams.

FINAL EXAM 28%

Wednesday, December 14, 9 a.m.- noon

Location to be announced.

Students must take the final exam at the date and time set on the university's final exam schedule. The final exam will include only multiple choice questions. No calculators or notes are allowed during the final exam. No early or late final will be given for any reason. The final exam will cover material on all midterms PLUS sections 4.9, 5.1, 5.2, 5.3.

HOMEWORK 12%

Homework will be assigned from Quest (Learning Modules and Post-HW) and the text book.

Working many problems is a key to success in calculus. The assigned homework is the minimum practice needed by most students. Additional practice problems can be found in the textbook.

You are encouraged to work with other students on your homework. Your TA and instructor hold office hours during which you can get help with homework problems. The Calc Lab is another place to get help.

The three lowest homework grades in each category will be dropped. No late homework will be accepted for any reason. It is very important to pay attention to the dues dates and times for all HW.

Learning Module Homework (LM) will be assigned via the Web using Quest, the UT Homework Service. These assignments include the basic concepts covered in each section as slides and videos. After viewing these, there will be a few questions to answer that will help students determine if they understand the basics. This LM homework will count 4% of the grade.

Post-HW will be assigned via the Web using Quest. It consists of more challenging problems which can be addressed after attending lecture. This post-HW will count 4% of the grade.

All answers and grades to LM and post-HW will be returned via the Web also using Quest. The Quest HW will be posted by Friday for the following week's material. Usually there will be one LM and one post-HW for each section. It is assumed that you will attempt a post-HW only after the lecture covering that material, but you may choose to work ahead. LM assignments will be due by 8 a.m. on the day that section is covered in class. Post-HW for a section will be due by 8 a.m. the next lecture day after the material is covered in class. *There may be some exceptions.* For example, if a section is covered in lecture on a Monday then the LM for that section is due by 8 a.m. on that Monday and the post-HW for that section will be due Wednesday by 8 a.m. Due dates and times are clearly stated on Quest for each assignment.

Homework will also be assigned from the **text book** which will count 4% of the grade. Textbook HW must be turned in at the start of your discussion section with your TA on Tuesdays. Usually

one or two problems per section will be graded plus a grade will be given for working all the problems. These graded HWs will be returned in discussion. Only the total grade for textbook HW will show up on Quest (at the end of the semester). This written free-response HW, must be legible, clearly ***labeled with student's name, each problem labeled with the section and problem number. Unclaimed homeworks should be picked up during your TA's office hours; the feedback from these graded problems should be helpful.***

Attendance and Participation: You are expected to attend all lectures with me and all discussion sessions with the TA. I plan to take attendance. You will not be directly penalized for absences but you will not do as well in this course if you miss instruction. I will be calling on students randomly to come to the front and demonstrate calculus problems.

Quest: The Homework Server

Log into Quest at <https://quest.cns.utexas.edu> and read through the instructions.

Homework assignments for this course, as well as parts of the exams, will be generated via Quest from a data bank of questions developed specifically for the course. These questions are based for the most part on ones in the text. Each question in the bank is really an algorithm that produces many different versions of the same question, hence is ideally adapted to producing *individualized* homework assignments and exams.

At the heart of Quest is a very sophisticated, computer program that takes the data bank and generates homework assignments which you download from the web, work on, and then return your answers again using the web. Answers can be returned one at a time or several at a time. These answers are checked by the computer, and you are then notified immediately of the correctness (or incorrectness!) of your answer. Multiple attempts at answering a given question are allowed, though there is a penalty for incorrect answers; a correct answer submitted at a later attempt scores less than one that is correct at the first attempt. After the due date of an assignment, you can download from the web complete worked solutions to *your particular version* for study in preparation for later parts of the course and for exams. The computer also keeps track of your scores on the various assignments and exams so that you know what your performance is at any stage during the course.

Since the numerical values in the questions in your homework assignment will be different from those in the same assignment for other students, you can work jointly with other students in understanding and solving homework problems. Some homework questions have several parts that lead you through a particular way – frequently the best, but not the only, way - of solving a specific problem.

Most questions have 5 or more possible answers, but there are some numerical questions requiring a numerical answer. To be scored as correct, a numerical answer must be within 1% of the computer's answer. Numerical answers must be in decimal form.

You will be told immediately whether your answer is correct or not. If your answer is wrong, additional tries are allowed as indicated. However, to discourage guessing, there is a negative penalty for incorrect answers.

It is your responsibility to submit your Quest homework before the due date. No late homework is accepted. The web may be slow at times, especially when thousands of students are submitting their HW at the last minute. It is advisable to submit answers as you work the problems. Waiting until the last minute or hour may result in an inability to submit answers.

While every attempt has been made to eliminate mathematical errors, typos, and ambiguities from questions, such errors will inevitably be found. If you think a problem is dysfunctional, please send E-mail to instructor. Suggestions for improvements to the system are welcome.

Quest Instructional Charge

This course makes use of the web-based Quest content delivery and homework server system maintained by the College of Natural Sciences. This homework service will require a \$30 charge per student for its use, which goes toward the maintenance and operation of the resource. Please go to <http://quest.cns.utexas.edu> to log in to the Quest system for this class. After the 12th day of class, when you log into Quest you will be asked to pay via credit card on a secure payment site. You have the option to wait up to 30 days to pay while still continuing to use Quest for your assignments. If you are taking more than one course using Quest, you will not be charged more than \$60/semester. Quest provides mandatory instructional material for this course, just as does your textbook. For payment questions, email quest.fees@cns.utexas.edu.

Calculators

Calculators may be used on homework. However, calculators may NOT be used during exams.

Special Needs Students

Students who fall under the University's Learning Disability Policy must present certification of that fact to the student's instructor prior to the first test. The University of Texas at Austin provides, upon request, appropriate academic accommodations for qualified students with disabilities. For more information and certification letter, contact the Division of Diversity and Community Engagement, Services for Students with Disabilities:

<http://www.utexas.edu/diversity/ddce/ssd/>, 512-471- 6259, 512-471-6441 TTY. Upon presenting a letter from the Office for Students with Disabilities to the instructor, student should arrange to take midterm exams and final exam in the SSD office at a time as close to the regularly scheduled exam as possible (but not prior to the regularly scheduled exam). Student must inform instructor of date and time of these SSD exams at least 2 class days prior to the exam. Ideally, these SSD exams should be scheduled as early in the semester as possible as space is limited.

A bit of advice

The material covered in M408N is interesting and challenging. It is strongly advised that each week you spend 10 additional hours (outside of class and discussion time) on calculus. Ideally, this would include reading the text section to be covered in class prior to the lecture to get the general idea of the material. Careful re-reading of text and lecture notes after lecture and before attempting the homework is also recommended.

If you have to miss a lecture, it is your responsibility to read the missed sections in the textbook, view the appropriate video, get notes from another student and learn the material. See the instructor during office hours for assistance with specific questions and problems. If you know in advance that you will be missing a class, consider sitting in on the lecture of another M408N instructor who is covering the material on a day when you are able to attend. It is polite to ask permission to sit in on a class - most instructors will readily grant permission to do so. If you have an ongoing conflict with many lectures, take the course when you have more time to devote to it.

Prerequisite and degree relevance

Prerequisite is an appropriate score on the mathematics placement exam. Only one of the

following may be counted: M403K, M408K, M408C, M408L or M408N.

Calculus is offered in three equivalent sequences at UT: an accelerated two-semester sequence, M408C/D, and two three-semester sequences, M408K/L/M and M 408N/S/M. The last is restricted to students in the College of Natural Sciences.

Completion (with grades of C- or better) of one of these calculus sequences is required for a mathematics major. For some degrees, the two-semester sequence M 408N/S satisfies the calculus requirement. These two courses are also a valid prerequisite for some upper-division mathematics courses, including M325K, M427K, M340L, and M362K.

M408N may not be counted by students with credit for any of Mathematics M403K, M408K, M408C, or M408L.

Course description

M408N is the first-semester calculus course of the three course calculus sequence. It is directed at students in the natural sciences, and is restricted to College of Natural Science Students. The emphasis in this course is on problem solving, not on the presentation of theoretical considerations. While the course includes some discussion of theoretical notions, these are supporting rather than primary.

The syllabus for M408N includes most of the basic topics in the theory of differential calculus of functions of a real variable: algebraic, trigonometric, logarithmic and exponential functions and their limits, continuity, derivatives, maxima and minima, as well as definite integrals and the Fundamental Theorem of Calculus.

Getting help

CalcLab is staffed by at least 2 TAs and several LAs and is open to all calculus students to get assistance with homework, test preparation, etc. For location and hours, go to <https://www.ma.utexas.edu/academics/undergraduate/calculus-lab/>

The **Sanger Learning & Career Center** (SLCC, www.lifelearning.utexas.edu) has tutors for hire and drop-in free tutoring and more. The College of Natural Sciences (CNS) coordinates the **Residential Hall Study Groups** (RHSG, <http://cns.utexas.edu/community/resident-hall-study-groups>) at Kinsolving and Jester dorms in the evenings where students can meet to study, work homework problems and help each other. The TA and instructor hold office hours – come for help with homework or understanding any aspect of the course. Do not wait until the last weeks of the semester to get help.

Counseling and Mental Health Center; Student Services Bldg (SSB), 5th Floor, M-F 8am-5pm, 512-471-3515, www.cmhc.utexas.edu offers help coping with all areas of student life

Policy on Academic Integrity

Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on academic dishonesty will be strictly enforced. For further information please visit the Student Judicial Services Web site: <http://deanofstudents.utexas.edu/sjs>.

Dropping a course Nonacademic Q drop:

After the last day for academic Q drop, students with substantiated nonacademic reasons (as determined by the Dean's Office) may be allowed to drop a course. Faculty will be asked to provide information on student performance up to the time of the nonacademic Q drop request but are not responsible for making the decision about assigning a grade of Q. If a student experiences significant nonacademic problems such as extended health related problems or family emergencies, that student is encouraged to contact the Dean's Office.

One time exception:

Students have the option once in their undergraduate degree to drop a class or drop out of all classes in a semester right up until the last class day. More information is available at <http://www.utexas.edu/faculty/council/2010>.

A student who has completed at least two long semesters here at UT can drop a class only if he or she has an average grade of D+ or below in the class at the time of the request and if there are no pending investigations of scholastic dishonesty for the course in question.

Quantitative Reasoning

This course carries the Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

M408N Syllabus

1 Functions and Models (3 hours)

- ⤴ 1.5 Exponential Functions
- ⤴ 1.6 Inverse Functions and Logarithms

2 Limits and Derivatives (9 hours)

- ⤴ 2.1 The Tangent and Velocity Problems
- ⤴ 2.2 The Limit of a Function
- ⤴ 2.3 Calculating Limits Using the Limit Laws
- ⤴ 2.4 The Precise Definition of a Limit (*optional*)
- ⤴ 2.5 Continuity
- ⤴ 2.6 Limits at Infinity; Horizontal Asymptotes
- ⤴ 2.7 Derivatives and Rates of Change
- ⤴ 2.8 The Derivative of a Function

3 Differentiation Rules (10 hours)

- ⤴ 3.1 Derivatives of Polynomials and Exponential Functions
- ⤴ 3.2 The Product and Quotient Rules
- ⤴ 3.3 Derivatives of Trigonometric Functions
- ⤴ 3.4 The Chain Rule
- ⤴ 3.5 Implicit Differentiation
- ⤴ 3.6 Derivatives of Logarithmic Functions
- ⤴ 3.7 Rates of Change in the Natural and Social Sciences (*optional*)
- ⤴ 3.8 Exponential Growth and Decay (*optional*)
- ⤴ 3.9 Related Rates
- ⤴ 3.10 Linear Approximations and Differentials (*optional*)
- ⤴ 3.11 Hyperbolic Functions (*optional*)

4 Applications of Differentiation (9 hours)

- ⤴ 4.1 Maximum and Minimum Values
- ⤴ 4.2 The Mean Value Theorem
- ⤴ 4.3 How Derivatives Affect the Shape of a Graph
- ⤴ 4.4 Indeterminate Forms and L'Hospital's Rule
- ⤴ 4.5 Summary of Curve Sketching (*optional*)
- ⤴ 4.7 Optimization Problems
- ⤴ 4.9 Antiderivatives

5 Integrals (4 hours)

- ⤴ 5.1 Areas and Distances
- ⤴ 5.2 The Definite Integral
- ⤴ 5.3 The Fundamental Theorem of Calculus

M408N Lecture Schedule Fall 2016

The lecture schedule may be modified slightly during the semester.

Week of	M	T	W	Th	F
Aug. 22-26			8/24 1.5 <i>First class day</i>	8/25	8/26 1.6
Aug.29 - Sept.2	8/29 2.1	8/30	8/31 2.1, 2.2	9/1	9/2 2.2
Sept. 5-9	9/5 <i>Labor Day</i>	9/6	9/7 2.3	9/8	9/9 2.3, 2.5
Sept. 12-16	9/12 2.6	9/13	9/14 2.6, 2.7	9/15	9/16 2.7, 2.8
Sept. 19-23	9/19 3.1	9/20	9/21 3.2	9/22	9/23 3.2, 3.3
Sept. 26-30	9/26 3.3	9/27	9/28 3.4	9/29	9/30 3.5
Oct. 3-7	10/3 3.6 <i>Rosh Hashanah</i>	10/4	10/5 ExamQ1	10/6	10/7 ExamFR1
Oct. 10-14	10/10 3.6	10/11 <i>Yom Kippur</i>	10/12 3.9 <i>Midterm failing reports</i>	10/13	10/14 3.10
Oct. 17-21	10/17 4.1	10/18	10/19 4.1, 4.2	10/20	10/21 4.3
Oct. 24-28	10/24 4.3	10/25	10/26 4.4	10/27	10/28 4.4
Oct 31- Nov. 4	10/31 4.5	11/1 <i>Last day to drop</i>	11/2 4.5	11/3	11/4 4.7
Nov. 7-11	11/7 4.7	11/8	11/9 4.9	11/10	11/11 5.1
Nov. 14-18	11/14 Review	11/15	11/16 ExamQ2	11/17	11/18 ExamFR2
Nov. 21-25	11/21 5.2	11/22	11/23 <i>Thanksgiving holiday</i>	11/24 <i>Thanksgiving holiday</i>	11/25 <i>Thanksgiving holiday</i>
Nov.28- Dec. 2	11/28 5.2	11/29	11/30 5.3	12/1	12/2 5.3
Dec. 5-9	12/5 Review <i>last class</i>				