

M 408D: Sequences, Series, and Multivariable Calculus

Course Format: Online, Self-Paced

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Course Credits: 4

Prerequisites: Mathematics 408C, 408L, or 408S with a grade of at least C-; or consent of the University Extension advisor. Students must have the approval of the University Extension advisor to enroll in this course.

How This Course Works

This course is online and is self-paced. Students have five months from their date of enrollment to complete the course. All coursework and proctored exams are submitted or taken online.

While this course is self-paced in terms of when you complete the work and submit assignments, periodic assessments are critical to ensuring that students receive adequate support and are able to achieve the intended learning outcomes. Thus, this course is organized into modules that must be completed in order. Students will only be able to move forward once they have received a grade on all assessments within a given module.

Review the course outline and assignment descriptions carefully. Computer-graded assignments are scored immediately. You can expect to receive feedback on instructor-graded assignments or exams within three business days following submission. This does not include weekends or holidays. Requests for expedited grading are not accommodated, so please plan accordingly. During certain times (end of semester, spring break, etc.), instructors may experience higher-than-usual demands on their time and may need additional time for evaluation. Students should reach out to University Extension at <u>uex@austin.utexas.edu</u> with any concerns regarding grading turnaround.

University Extension strongly advises students to be aware of when they may need a course grade to be recorded on their transcript. It can take up to two weeks after the final exam is complete for a grade to be officially recorded with the Office of the Registrar.

Course Overview

M408D is the second course in UT's standard first-year calculus sequence. It is directed at students in the natural and social sciences and at engineering students. The emphasis in this course is on problem solving, not on the presentation of theoretical considerations. While the course necessarily includes some discussion of theoretical notions, its primary objective is not the production of theorem-provers. M408D contains a treatment of infinite series, and an introduction to vectors and vector calculus in 2-space and 3-space, including parametric equations, partial derivatives, gradients and multiple integrals.

Required Materials

Required Text: *Calculus Early Transcendentals, 8th edition*. Stewart, J. Belmont, CA: Brooks Cole. ISBN: 9781285741550.

You must also purchase a non-refundable Quest subscription for this course. Payment is made within Quest. Please login at <u>quest.cns.utexas.edu</u> and locate your course.

Course Organization

There are five modules containing 12 lessons, each covering 2–3 sections of book content in this course. There is also a midterm exam and a final exam. In each lesson you will find these sections: objectives and reading assignment, Quest learning modules, computer-graded Quest assignments, homework hint videos, and instructor-graded book homework assignments.

You must receive a grade on all assignments in a module before the next module will open.

Computer-Graded Assignments

In each lesson you'll be asked to complete several Quest assignments. For each book section, there is a Quest learning module, which is essentially a YouTube lecture with examples, and a Quest homework assignment where you can practice lots of problems. All Quest items, whether they are learning modules or homework assignments, will be lumped into one group in Canvas and will be worth 10% of your course grade. Computer-graded assignments may only be taken once.

Instructor-Graded Assignments

There is one written homework assignment in each lesson. You can write or type up these assignments in any way you wish, and your instructor will grade your homework and offer feedback through Canvas.

Exams

This course requires you to complete a midterm exam and a final exam. The midterm exam covers material from the first six lessons and is worth 35% of your course grade. The final exam is comprehensive, covering all 12 lessons, and is worth 40% of your course grade.

You must pass the final exam to pass the course.

Course Outline

Module	Topics	Assessments	
1	Lesson 1: The Substitution Rule; Integration by	 Computer-Graded Assignment 1 	
	Parts; Trigonometric Integrals; Trigonometric	 Computer-Graded Assignment 2 	
	Substitution	 Computer-Graded Assignment 3 	
		 Computer-Graded Assignment 4 	
		 Computer-Graded Assignment 5 	
		 Computer-Graded Assignment 6 	
		 Computer-Graded Assignment 7 	
		 Computer-Graded Assignment 8 	
		 Instructor-Graded Assignment 9 	
	Lesson 2: Integration of Rational Functions by	 Computer-Graded Assignment 10 	
	Partial Fractions; Strategy for Integration;	 Computer-Graded Assignment 11 	
	Improper Integrals	 Computer-Graded Assignment 12 	
		 Computer-Graded Assignment 13 	
		 Computer-Graded Assignment 14 	
		 Computer-Graded Assignment 15 	
		 Instructor-Graded Assignment 16 	
	Lesson 3: Modeling with Differential Equations;	 Computer-Graded Assignment 17 	
2	Direction Fields and Euler's Method; Separable	 Computer-Graded Assignment 18 	
	Equations	 Computer-Graded Assignment 19 	
		 Computer-Graded Assignment 20 	
		 Instructor-Graded Assignment 21 	
	Lesson 4: Models for Population Growth; Linear	 Computer-Graded Assignment 22 	
	Equations	 Computer-Graded Assignment 23 	
		 Computer-Graded Assignment 24 	
		 Instructor-Graded Assignment 25 	
3	Lesson 5: Curves Defined by Parametric Equations;	 Computer-Graded Assignment 26 	
	Calculus with Parametric Curves; Polar	 Computer-Graded Assignment 27 	
	Coordinates; Areas and Lengths in Polar	 Computer-Graded Assignment 28 	
	Coordinates	 Computer-Graded Assignment 29 	
		 Computer-Graded Assignment 30 	
		 Computer-Graded Assignment 31 	
		 Computer-Graded Assignment 32 	
		Instructor-Graded Assignment 33	
	Lesson 6: Conic Sections; Conic Sections in Polar	 Computer-Graded Assignment 34 	
	Coordinates	 Computer-Graded Assignment 35 	
		 Computer-Graded Assignment 36 	
		 Computer-Graded Assignment 37 	
		 Instructor-Graded Assignment 38 	
MIDTERM EXAM			

Module	Topics	Assessments
	Lesson 7: Sequences; Series; The Integral Test and	 Computer-Graded Assignment 39
	Estimates of Sums; The Comparison Tests;	 Computer-Graded Assignment 40
	Alternating Series	 Computer-Graded Assignment 41
		 Computer-Graded Assignment 42
		 Computer-Graded Assignment 43
		 Computer-Graded Assignment 44
		 Computer-Graded Assignment 45
		 Computer-Graded Assignment 46
		 Computer-Graded Assignment 47
		 Computer-Graded Assignment 48
		 Instructor-Graded Assignment 49
	Lesson 8: Absolute Convergence and the Ratio and	 Computer-Graded Assignment 50
-	Root Tests; Strategy for Testing Series; Power	 Computer-Graded Assignment 51
	Series	 Computer-Graded Assignment 52
		 Computer-Graded Assignment 53
		 Computer-Graded Assignment 54
		 Computer-Graded Assignment 55
		 Instructor-Graded Assignment 56
	Lesson 9: Representations of Functions as Power	 Computer-Graded Assignment 57
	Series; Taylor and Maclaurin Series; Applications of	 Computer-Graded Assignment 58
	Taylor Polynomials	 Computer-Graded Assignment 59
		 Computer-Graded Assignment 60
		 Computer-Graded Assignment 61
		 Instructor-Graded Assignment 62
	Lesson 10: Functions of Several Variables;	 Computer-Graded Assignment 63
	Continuity; Partial Derivatives; The Chain Rule	 Computer-Graded Assignment 64
		 Computer-Graded Assignment 65
		 Computer-Graded Assignment 66
		 Computer-Graded Assignment 67
		 Instructor-Graded Assignment 68
5	Lesson 11: Double Integrals over Rectangles;	 Computer-Graded Assignment 69
	Iterated Integrals; Double Integrals over General	 Computer-Graded Assignment 70
	Regions	 Computer-Graded Assignment 71
		 Computer-Graded Assignment 72
		 Instructor-Graded Assignment 73
	Lesson 12: Double Integrals in Polar Coordinates;	 Computer-Graded Assignment 74
	Applications of Double Integrals; Change of	 Computer-Graded Assignment 75
	Variables in Multiple Integrals	 Computer-Graded Assignment 76
		 Computer-Graded Assignment 77
		 Computer-Graded Assignment 78
		 Instructor-Graded Assignment 79
FINAL EXAN	Λ	

Grade Calculation

Your final grade for the course will be calculated as follows:

12 Instructor-Graded Assignments 15%

68 Computer-Graded Assignments 10% Midterm Exam 35% Final Exam 40%

You must pass the final exam to pass the course. You must also earn an overall passing grade:

 A
 100-93%
 B+
 89-87%
 C+
 79-77%
 D+
 69-67%
 F
 59-0%

 A 92-90%
 B
 86-83%
 C
 76-73%
 D
 66-63%
 E

 B 82-80%
 C 72-70%
 D 62-60%
 E

Getting Help

- Technical Support: <u>uextechsupport@austin.utexas.edu</u>
- For content questions or questions about assignment and grades, use the Inbox tool within Canvas to contact the course instructor.
- For other questions (registration, transcripts, etc.), contact University Extension.

University Extension Policies

Full University Extension policies for self-paced courses may be found on the University Extension website.

Scholastic Dishonesty

Students in this course are expected to work independently, without direct supervision, and to conduct themselves responsibly in accordance with that freedom. To obtain the greatest benefit from their course work, and for the sake of everyone enrolled in our courses, students must demonstrate the willingness to exercise self-discipline, personal responsibility, and scholastic integrity.

We expect the course work and exams that you submit for course credit to be yours and yours alone. Plagiarism and other forms of scholastic dishonesty are serious academic violations that will not be tolerated. The penalties for scholastic dishonesty include the possibility of failure in the course. Scholastic dishonesty in examinations will automatically result in a grade of *F* on the exam and an *F* in the course.

University Extension Contact Information

uex@austin.utexas.edu 512-471-2900