



Framingham State University

MATH 221 – Calculus III Framingham State University Online - Winter 2021

Disclaimer: This syllabus is intended to give the student guidance in what may be covered in the course and will be followed as closely as possible. However, the professor reserves the right to modify, supplement and make changes as needs arise.

Instructor : Professor Sandberg

Email : ssandberg@framingham.edu

Office Hours : By appointment

Credit: 4

Dates: December 23, 2021 – January 17, 2022

Time: online asynchronous

Classroom: Zoom via Canvas

Workload Expectations

For our accreditation, it is essential that all Framingham State University credit courses follow the Federal Definition of credit hour: for every one hour of classroom or direct faculty instruction, a minimum of two hours of out-of-class student work is required. Since the usual summer courses meet for two contact hours daily (10 contact hours of classroom time weekly), the expectation is that students spend 20 hours per week doing out-of-class work. For the five week 4-credit hour course, this reflects 50 hours of classroom time and 100 hours of out-of-class time since the credit hour is defined as 50 minutes. For this winter's 3.5-week asynchronous online course, the expectation is that a student will spend about 40 hours per week working on this course.

Catalog Description

A study of conic sections; vectors in two and three dimensions; dot and cross products and their applications to geometry; equations of lines and planes; quadratic surfaces; polar, cylindrical, and spherical coordinates; and functions of several variables, partial derivatives, differentials, directional derivatives, gradients, optimization problems, multiple integrals and their applications.

Prerequisite: MATH 220 Calculus II with a minimum grade of C (2.00) or higher.

Content

This course is a study of multi-variable calculus. Topics include parametric equations, conic sections and coordinate systems including polar and spherical. vectors and



geometry of space, three-dimensional vector calculus, partial derivatives, double and triple integrals, integration on surfaces, and Green's theorem.

We assume students are familiar with the standard content of Calculus I and Calculus II courses for scientists and engineers. This includes the study of limits, derivatives, optimization of functions of a single variable, using derivatives to sketch graphs, anti-derivatives and the method of substitution, Riemann sums, the fundamental theorem of calculus, indefinite integrals and definite integrals, techniques and applications of integration and differential equations.. Moreover, they should have studied this material in the context of algebraic, exponential, logarithmic, and trigonometric functions.

Learning Outcomes

By the end of the course, students will be able to:

- Extend the concepts from one variable calculus to functions of several variables and vector valued functions
- Use the ideas of differentiation and integration of functions to solve multivariable calculus problems.
- Evaluate double and triple integrals using various coordinate systems
- Carry out vector operations such as the dot product and cross product
- Understand and apply Green's Theorem

Required Textbook and Online Materials

Briggs/Cochran-Calculus: Early Transcendentals,3/e

MyLab access with etext-18 week

ISBN : 9780135904183

Coverage: Chapters 12 - 17, Select Sections

Chapter	Topic
Chapter 12	Parametric and Polar Curves
Chapter 13	Vectors and the Geometry of Space
Chapter 14	Vector-Valued Functions



Chapter 15	Functions of Several Variables
Chapter 16	Multiple Integration
Chapter 17	Vector Calculus

Course Schedule.

Approximate Weekly Schedule: This schedule is subject to change. Changes may occur in this schedule as needed to aid in the students' development.

	Due Dates	Homework Assignments	Exams
Block 1 Dec 23 – Dec 29	Sunday, December 26	12.1 – 12.4, 13.1	
	Wednesday, December 29	13.2 – 13.5	Exam 1
Block 2 Dec 30 – Jan 5	Sunday, January 2	13.6, 14.1 – 14.4	
	Wednesday, January 5	14.5, 15.1 – 15.3	Exam 2
Block 3 Jan 6 – Jan 12	Sunday, January 9	15.4-15.6, 16.1	
	Wednesday, January 12	16.2 – 16.5	Exam 3
Block 4 Jan 13 – Jan 17	Monday, Jan 17	16.7,17.1 – 17.4	Exam 4

Course Requirements and Grading

Note this is an asynchronous online course. We will use Canvas for all the course work, including reading the textbook reading, reviewing PowerPoint slides, viewing video tutorials, doing homework and taking exams. You will need to purchase the e-text and MyLab which comes with homework problems, exams and supplemental materials. The course is divided into four block. The first three blocks are one week in length and the last one is five days. As is usual for a mathematics course, the material is cumulative in the sense that what you learn in any one chapter is needed to understand the material in later chapters.



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Due to the nature of an asynchronous online course, you will need to be well organized and motivated to complete the course. It is important to develop a schedule and work consistently each day. If you have difficulty, please contact me for help.

Item	Percent of Overall Grade
Homework	40%
Exams	60%

Homework: The course will be structured by blocks with assignments due on Sunday and Wednesday for the first three weeks and on Monday (the last day of the course) for the final week. There will be regular homework assignments using the online MyLab. All homework will be due on the due date by one minute before midnight.

Exams : There will be four closed-book, time-limited exams, one for each block. If you are able to do the homework problems, then you should do well on the exams because the questions on the exams will look very similar to the homework. The exams will all be due on the due date by one minute before midnight.

Overall Average Grade	Letter Grade
95 - 100	A
90 - 94	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
77 - 79	C+
74 - 76	C
70 - 72	C-
67 - 69	D+
63 - 66	D
60 - 62	D-
00 - 59	F

Academic Honesty Policy

I expect that all of your work will be your own.



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Integrity is essential to academic life. Consequently, students who enroll at Framingham State University agree to maintain high standards of academic honesty and scholarly practice. They shall be responsible for familiarizing themselves with the published policies and procedures regarding academic honesty.

Academic honesty requires but is not limited to the following practices: appropriately citing all published and unpublished sources, whether quoted, paraphrased, or otherwise expressed, in all of the student's oral and written, technical, and artistic work; observing the policies regarding the use of technical facilities.

Infractions of the Policy on Academic Honesty include, but are not limited to:

1. Plagiarism: claiming as one's own work the published or unpublished literal or paraphrased work of another. It should be recognized that plagiarism is not only academically dishonest but also illegal.
2. Cheating on exams, tests, quizzes, assignments, and papers, including the giving or acceptance of these materials and other sources of information without the permission of the instructor(s).
3. Unauthorized collaboration with other individuals in the preparation of course assignments.
4. Submitting without authorization the same assignment for credit in more than one course.
5. Use of dishonest procedures in computer, laboratory, studio, or field work. Further clarification on academic honesty will be provided, when appropriate, in individual courses.
6. Misuse of the University's technical facilities (computer machinery, laboratories, media equipment, etc.), either maliciously or for personal gain. Examples include but are not necessarily limited to: (a) accessing the private files of another person or agency without express permission, and (b) the unauthorized use of technical facilities for purposes not connected with academic pursuits. When evidence indicates that a student has improperly used a technical facility, an appropriate supervisor (faculty or staff member) may take appropriate action reflecting the seriousness of the infraction, ranging from a verbal warning to, but not beyond, denial of use of the facility. If coursework may have been plagiarized, the supervisor will also inform all concerned faculty members, who may take action as described in the procedures for handling cases of alleged infractions of academic honesty.
7. Falsification of forms used to document the academic record and to conduct the academic business of the University

Accommodation Statement



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Framingham State University offers equal opportunities to all qualified students, including those with disabilities and impairments. The University is committed to making reasonable accommodations as are necessary to ensure that its programs and activities do not discriminate, or have the effect of discriminating, on the basis of disability. The [Disability/Access Services Office](#) serves students with learning and psychiatric disabilities as well as students with visual, mobility and hearing impairments. For further information about this, please contact Dr. LaDonna Bridges, Associate Dean of Academic Success and Dean of CASA (Center for Academic Success and Achievement) at 508-626-4906 or lbridges@framingham.edu.

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