

Math 211 – Calculus and Analytic Geometry III

Spring 2013 Syllabus

Instructor: Kevin Hartshorn
Class Meetings: PPHAC 330, MWF 11:45am–12:55pm
Office Hours: PPHAC 215
Mon 2:30-4:00, Thu 10:00-12:00, *or by appointment*
e-mail: hartshorn@math.moravian.edu
Website: <http://math.moravian.edu/hartshorn/211>

1 Required Materials

The required text is Susan Colley's *Vector Calculus* (4th Edition). This course will likely cover most of the first 7 chapters of the text.

In addition, I recommend a copy of a textbook covering the material from Calculus I and II. Any edition of Rogawski's *Calculus* (used in Math 170/171) would be fine. You can view Strang's calculus text for free at the MIT OpenCourseware¹ site.

This course will make use of *Maple* for computations and visualization. *Maple* is available on all campus network computers, though if you would like to purchase a student copy for your own computer, you can find information at <https://webstore.maplesoft.com>. Freeware alternatives to *Maple* are Sage (<http://sagemath.org>) or SpaceTime (<http://www.spacetime.us>), or the web-based WolframAlpha (<http://wolframalpha.com>).

2 Goals and Objectives

This course is a continuation of Math 170/171. We will focus on calculus of several variables. Thus we will revisit many of the techniques and ideas from first year calculus (limits, derivatives, optimization, integration), but in the context of higher-dimensional vector spaces.

This course will focus on developing reading and communication skills in mathematics. Much of the learning will be done *outside the classroom*, as you carefully read the material from the book and prepare for the in-class discussions. Time in class will be spent exploring the ideas presented in the reading and developing problem-solving strategies for the homework problems. While I will provide some mini-lectures on particularly tricky or important material, the bulk of the learning will take place between you and your classmates.

Through I work in the course, we will progress toward the following goals:

- Be able to read new material critically and apply the reading to new problems.
- Be able to express complete solutions and small proofs both orally and in writing.
- Be able to bring multiple ideas and techniques together to solve problems.
- Develop the capacity to utilize *Maple* in an effective manner, recognizing when it is and when it is not helpful.

¹<http://ocw.mit.edu/resources/res-18-001-calculus-online-textbook-spring-2005/textbook/> provides a direct link.

3 Grading and Assessment

Your course grade will be computed based on a raw percentage score, broken down as shown in the table below. Note that these numbers are to serve only as a general guide and your grade may be adjusted based on the judgement of your professor.

25%	Daily homework submissions
20%	Class presentations and participation
25%	Weekly problem sets
15%	Average of two midterms
15%	Final exam
100%	Total

When computing your score at the end of the semester, an A (+ or –) is typically given to a score of 85% or above, a B (+ or –) to a score between 70% and 85%, a C (+ or –) to a score between 60% and 70%, and a D (+ or –) to a score between 50% and 60%. These values are subject to change and are meant only as a rough guideline, and the final assignment of grades will be determined based on the performance of the entire class and the judgement of the professor.

Class format

The day-to-day plan for the class is as follows. Details are provided in the following sections.

1. Each week, I will provide an agenda of problems to be completed. We will determine day-by-day how many problems will be due in the next class.
2. At the beginning of class, I will call on volunteers to present the problems for the day. I will help facilitate discussion of the presented solution, allowing everyone time to mark their own homework with a supplied felt-tip pen.

Written homework (with felt-tip corrections) will be collected at the end of every class.

3. Once per week, you will need to submit fully written solutions to a subset of the daily homework problems. These solutions will be e-mailed to me in PDF format by 11:59pm on Thursday.

3.1 Daily Homework

To prepare for each class, you will need to complete several homework problems. Each problem will be scored as follows:

- ✓+ Essentially correct, with only the very smallest of errors (100%)
- ✓ Right idea, but contains at least one significant problem or is incomplete (80%)
- ✓– Significant problems with the solution, or little progress toward an answer (50%)
- 0 The problem was not attempted (0%)

At the beginning of class, everyone will grab a felt-tip pen with which to mark up their homework. Once class begins, any marks on your homework must be done with the supplied pen.

The score assigned to your problem will be independent of the marks you make with the felt-tip pen. The felt-tip markings are for your own benefit in preparation for completing the weekly homework assignment.

3.2 Presentations and Participaton

At the beginning of each class I will call on volunteers to present the daily homework problems on the board. Our class discussion will then focus on working out the ideas behind the problems and ensuring everyone is able to correct their homework and learn the new material.

For every three class periods that include presentations, I will assign a presentation grade as follows (those who present more than once in a given week will be scored based on the average of their presentation scores).

- 4 Completely correct and clear proof or solution (100%)
- 3 Solution or proof has minor technical flaw, some unclear language, or lacks important details. Essentially correct (75%)
- 2 Partial solution or proof, but significant gap(s) exist (50%)
- 1 Minimal progress or little relevant information that might lead to solution (25%)
- 0 No presentation was given in the given time period

See the class calendar for the schedule of grading periods for presentations. Note that the calendar is subject to change due to class cancellations.

3.3 Weekly Problem Sets

Each week, you will be asked to formally write up solutions to several of the daily homework problems. As with the presentations, these problems will be scored on a 4-point scale, but with more exacting criteria:

- 4 Correct and well-written mathematics. (100%)
- 3 A good piece of work, but there are some mathematical errors or writing issues that need to be addressed. (75%)
- 2 There is at least on serious flaw or the writing does not meet acceptable standards. (50%)
- 1 You have clearly worked on the problem, but I cannot see what you are trying to accomplish. (25%)
- 0 No attempt was made on the problem.

These homework problems must be submitted in PDF format and e-mailed to me by Thursday at 11:59pm. Your e-mail should have the subject line *Math 211 Weekly Homework*. To write your homework, I suggest one of the following:

- *Word*: If you decide to use *Word* to complete your work, you need to become acquainted with the Equation Editor feature, as well as the export-to-PDF function. If you are unsure how to appropriately format your document using *Word*, be sure to come to my office with questions.
- *L^AT_EX*: This is the recommended format. An easy (and free!) way to start using *L^AT_EX* is ShareLaTeX (<https://www.sharelatex.com>). This site will process *L^AT_EX* documents for you, allowing you to download the final PDF document to your computer. Registration is free.

You can also access *L^AT_EX* on campus using the program FIXME.

From time to time through the semester, I will offer tips and short-cuts for creating *L^AT_EX* documents.

I will mark your PDF document directly and e-mail the scored document back to you. If you have a preferred account other than the official Moravian account, be sure to let me know with your first homework submission.

PLEASE NOTE: I will be looking more carefully at the weekly homework for both mathematical accuracy and effective writing. That means that a problem that merited a 4 for your presentation may only merit a 2 or 3 in the written homework if you do not flesh out your proof or write a clear exposition.

Late work: Work submitted after 11:59 Thursday but before 11:59 Saturday will be accepted with a 20% penalty. Work submitted more than 48 hours after the initial deadline will not be accepted.

3.4 Maple

There will be several problems through the semester that will require the use of *Maple*. For the daily homework assignments, I will ask that you e-mail your work before the start of class so that we can present the work on the projector.

For the weekly homework, I will provide a separate document describing how to include information from *Maple* in your *Word* or \LaTeX document.

3.5 Midterms and Final Exam

Each midterm will have two parts, each contributing to half of the score.

- *In-class:* This will test basic skills and knowledge (computing derivatives, performing simple vector computations, etc.).
- *Take-home:* These will be problems comparable to the homework problems. You will be expected to submit the completed problems in PDF format (as with the weekly homework).

The dates for the midterms are **Friday, February 15** and **Wednesday, March 27**.

Our final exam period is scheduled to be **Monday, April 29 at 1:30pm**. As with the midterms, the final exams will have two portions:

- *Portfolio:* You will provide an electronic portfolio of old and new problems to demonstrate the breadth of your work in the course.
- *In-class:* As with the midterms, this will check basic knowledge and computations.

Details for the format and content of the exams will be provided in a separate document.

4 Attendance and other Issues

4.1 Attendance

The core of this class is the in-class discussion. Each class meeting will be an important step in learning the material for the course.

As a rule, I am not concerned *why* you miss a class. I do not differentiate “excused” or “unexcused” absences. Instead, I provide everyone with a 3-class grace period. Whether you miss

class because you were hospitalized or because you wanted to play tag football on the first day of spring, you will not be penalized for missing class.

However, the 4th (and each subsequent) class you miss will incur an automatic 10% penalty on your presentation/participation grade. Again, this is regardless of whether you miss because your house was swallowed by a sinkhole or because you forgot to set your alarm.

A few additional points:

- Whether or not you miss class, you are responsible for presenting at least once for each three class periods.
- I will forgive the daily homework assignment if your absence falls in the grace period — I will simply not count that homework assignment toward your grade. If you have passed the grace period, you will receive a zero for the corresponding daily homework unless someone brings it to class for you.
- If you will miss class on the day of a midterm, be sure to let me know *as soon as possible*. Special consideration for allowing a make-up exam will be determined by consultation. If you are missing class due to a sporting event or other planned activity, you **must let me know before the relevant class** that you will be absent.
- You are responsible for what happens in the classroom. Contact your classmates for information about what you missed. Missing information on a day that you missed class will not be an excuse for not completing assignments.
- If there is some extenuating reason why you think you will not be able to submit a weekly homework, be sure to contact me as soon as possible to see if alternate arrangements can be made.
- If you know that you will be missing class for an extended period (e.g.: long hospitalization, recovery from concussion, etc.), be sure to contact me and Learning Services as soon as possible so that special arrangements can be made.

Get to know your classmates! If you will miss a class on a day that homework is due, have a classmate bring your homework in for you. As a rule, late work will not be accepted. Note that you can submit weekly homework assignments from home.

4.2 Academic Honesty

Students are expected to adhere to the Academic Honesty policy as described in the Student Handbook (<http://www.moravian.edu/studentLife/handbook/academic/academic2.html>). Any violations of this will result in severe penalties on the assignment, a report to the Dean, and the very real possibility of failing the course.

4.2.1 Daily Homework and Presentations

This class will be a collaborative effort — presentations will be discussed as a class. As such, I have no problems with people getting together to work on the daily homework assignments. Be sure to write your own solution to bring to class for marking up.

Weekly Problem Sets

These must be completed *on your own*. I expect each submission to reflect your own writing and your own style.

You may confer with your classmates about technical issues (“How do you make a partial derivative in T_EX ?” or “I can’t read what I wrote: what did we do at this step of the problem?”). But the writing should be on your own. If I suspect that you are using someone else’s words in a writing assignment, I will be required by the Academic Honesty policy to report you to the Academic Standards committee.

Take-home exams

These are to be done without any consultation with your friends. You may use your text, your class notes, *Maple*, and consultations with me. You are otherwise to work completely on your own.

4.3 Final reminders, tips, and disclaimers

- **Visit my office:** I am more than happy to help work through the readings, address any questions you have about the problem sets, or talk with you about the progress of the course. Feel free to stop by to ask questions about being a mathematics major, about life at Moravian, or just to let me know what’s on your mind.

You can also communicate with me via e-mail (hartshorn@math.moravian.edu).

- This syllabus is subject to change through the semester. The most recent version of the syllabus can be found at <http://www.math.moravian.edu/hartshorn/211/>.
- If you are in need of special accommodations due to a disability, please contact the Learning Services Office and me as soon as possible, so that we can make appropriate arrangements.
- Final determination of your course grade is subject to my discretion as professor of the course.