

MA 2550: Calculus I (Fall 2009)

MWF 9:05–9:55AM, Hyde 315

T 2:00–3:15PM, Hyde 314

Instructor Information

Instructor: Dr. Dana Ernst

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Course Information and Policies

Prerequisites: A satisfactory grade in MA 2140 or Level 3 placement on the PSU Placement Test with high school precalculus mathematics. Note: if credit has been granted for either MA 2490 or MA 2500 (Applied Calculus I or Applied Calculus II, respectively), consent of the Mathematics Chair is required in order to receive credit for this class.

Course Description: A first calculus course concentrating on limits, continuity, the derivative and integration. Applications are made to classical problems in physics and other sciences. We will occasionally make use of software packages, like Lurch, which are capable of doing symbolic mathematics.

Text: *Calculus*, by James Stewart, 6th edition, (Thomson/Brooks Cole).

Purpose: The primary objective of this course is to aid students in becoming confident and competent in solving problems that require techniques developed in calculus. Successful completion of MA 2550 provides students with skills necessary for upper division mathematics courses, such as MA 2560: Calculus II. In general, calculus is a study of functions. The main tools are differentiation, which measures instantaneous change in a function, and integration, which gauges the cumulative effect of that change. The crowning achievement of first semester calculus is the Fundamental Theorem of Calculus, which explains how differentiation and integration are related. Students will have a working understanding of limits and continuity. Students will also be able to utilize various techniques to differentiate and integrate numerous functions including trigonometric functions. In addition, students will understand and be able to apply the Mean Value Theorem, the First and Second Derivative Tests, and the Fundamental Theorem of Calculus in both theoretical problems and applications. Also, the purpose of any mathematics class is to challenge and train the mind. Learning mathematics enhances critical thinking and problem solving skills.

Quantitative Reasoning Connection (QRCO): MA 2550 satisfies the Quantitative Reasoning Connection (QRCO) requirement of the PSU General Education Program. Students will enhance their ability to analyze quantitative material, and use quantitative techniques to solve problems.

Homework: Homework will usually be assigned every lecture day (typically Monday, Wednesday, and Friday) and will usually be due at the beginning of the next lecture day. Tuesdays will usually be reserved for going over homework problems, as a catch-up day, working on labs (see below), or taking exams. I will always tell you when a given homework assignment is due (so, there should never be any confusion). Your homework will *always* be graded for completion and *usually* some (2–3) of the problems will be graded for correctness. You are allowed and encouraged to work together on

homework. However, each student is expected to turn in his or her own work. Every homework assignment is worth 5 points. There will be approximately 30–33 homework assignments. Five (possibly more) of your lowest homework scores will be dropped. In general, late homework will *not* be accepted. However, you are allowed to turn in up to 5 homework assignments late with no questions asked. Unless you have made arrangements *in advance* with me, homework turned in after class will be considered late. Your overall homework and lab (see below) score will be worth 20% of your final grade.

Labs: A few times during the semester I will assign small group projects, which we will call labs. Most of the labs will be completed during class time, but occasionally some work may need to be completed outside of class. Some of the labs will be used to reinforce or synthesize previously introduced concepts while others may be used to introduce new concepts. On some of the labs we may use computer programs, like *Lurch*, which are capable of doing symbolic mathematics. There will be 3–5 labs, where each lab is worth 10 points. Your overall homework and lab score will be worth 20% of your final grade.

Exams: There will be 3 exams, which are *tentatively* scheduled for the following **Tuesdays: September 29, October 27, and November 24** (note: this last exam date is the Tuesday before Thanksgiving break). Each exam will be worth 20% of your overall grade. There will also be a *cumulative* final exam, which will be on **Tuesday, December 15 at 2:30–5:00pm**. The final exam is also worth 20% of your overall grade. Make-up exams will only be given under extreme circumstances, as judged by me. In general, it will be best to communicate conflicts ahead of time.

About calculators and other technology: I am a huge fan of technology and believe that when it is used appropriately, it can greatly enhance one's learning experience. However, when learning, technology should never replace one's own amazing cognitive abilities. When we are discussing concepts in class or when you are doing homework, you should feel free to use whatever resources you feel will help you understand the concepts better. So, feel free to use websites, like Wolfram|Alpha (<http://wolframalpha.com>), your graphing calculator, etc. when doing homework. In fact, some of the homework problems and labs questions intend for you to use a calculator. However, be warned that I am much more interested in the process by which you arrived at your answer than the answer itself. An answer to a homework, lab, or exam question that is correct but lacks justification may be worth little to no points. If you understand a concept, then barring a silly computational error, the correct answer comes along for the ride. Yet, getting the correct answer does not imply that you understand anything! You are not required to purchase a graphing calculator nor will you need them on any of the exams. However, you will be allowed to use a graphing calculator on exams as long as the calculator does *not* include a computer algebra system (CAS). If you decide to purchase a graphing calculator, I recommend the TI-83 or TI-83 Plus. If you have questions about whether a particular calculator is appropriate or allowed, please ask. I will *not* spend class time discussing how to use a graphing calculator.

Attendance: Regular attendance is expected and is vital to success in this course, but you will not be graded on attendance.

Course Evaluation

Grading: You will be graded on your written work, which will be judged on the basis of *correctness*, *completeness*, and *legibility*.

Basis for Evaluation: Your final grade will be determined by the scores of your homework, labs, exams, and final exam.

Homework/Labs:	20%	(each homework assignment worth 5 points, each lab worth 10 points)
3 Exams:	60%	(20% each)
Final exam:	20%	

Grade Determination: Grades may be “massaged” at the end of the semester, but in general this is what you should expect:

93–100%	A	73–76%	C
90–92%	A-	70–72%	C-
87–89%	B+	67–69%	D+
83–86%	B	63–66%	D
80–82%	B-	60–62%	D-
77–79%	C+	0–59%	F

Additional Information

Math Center: This student-run organization provides peer tutoring services for most 1000 and 2000 level math courses and some 3000 level courses. Tutors are typically math majors interested in teaching math and practicing their instructional skills. The Math Center is located in Hyde 351. You can drop in anytime during open hours. More information can be found at:

<http://www.plymouth.edu/math/resources/center.html>

Student Handbook: The PSU Student Handbook addresses policies pertaining to students with disabilities, religious observation, honor code, general conduct, etc. The Handbook can be found at:

<http://www.plymouth.edu/stulife/handbook/handbook.html>

ACT for Growth: All teacher education majors are subject to the Areas of Concern/Targets for Growth policy, which is located at:

<http://www.plymouth.edu/education/act.html>

Closing Remarks

When does the learning happen? It might happen in class, but most likely it happens when you sit down to do your homework. Most of you can follow what I do on the board, but the question is, can you do it on your own? To learn best, you must struggle with mathematics on your own. It is supposed to be difficult. However, if you are struggling too much, then there are resources available for you. I am always happy to help you. If my office hours don't work for you, then we can probably find another time to meet. You can also get help from each other. Get a study buddy! Help each other learn. Go to the Math Center (see above). It is your responsibility to be aware of how well you understand the material. Don't wait until it is too late if you need help. *Ask questions!*