

## MA2560: Calculus II (Spring 2010)

MWF 10:10–11:00AM, Hyde 315

T 11:00–12:15PM, Hyde 315

### Instructor Information

**Instructor:** Dr. Dana Ernst

**Office:** Hyde 312

**Office Phone:** 603.535.2857

**Email:** [dcernst@plymouth.edu](mailto:dcernst@plymouth.edu)

**Office hours:** MWF 11AM–12:00PM, T 1:30–2:30PM (or by appointment)

**Webpage:** <http://oz.plymouth.edu/~dcernst>

### Course Information and Policies

**Prerequisites:** A satisfactory grade in MA2550: Calculus I (or equivalent). Note: Students may not receive credit for both MA2520 and MA2560.

**Course Description:** A continuation of first semester calculus, including further study of integration techniques, improper integrals, infinite series, polar coordinates and conic sections. We may occasionally use software packages, like **Lurch** and **Sage**, which are capable of doing symbolic mathematics. In fact, I encourage you to obtain **Lurch** via a free download at <http://lurch.sourceforge.net/> and to sign up for a free **Sage Notebook** account at <http://www.sagenb.org/>.

**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 MA2560 provides students with skills necessary for upper division mathematics courses, such as MA3540: Multivariable Calculus. In this second semester course, we focus on the important problem of how one actually integrates functions. Among the techniques of integration we will learn are the methods of partial fractions and integration by parts. We will also generalize the notion of changing variables (substitution) to study parameterization and new coordinate systems, like polar coordinates. Along the way we will study logarithm, exponential, and hyperbolic trigonometric functions, which are useful in their own right and for integration. Another topic of the semester will be a study of infinite series, which will let us consider “nice” functions as “infinite polynomials,” called Taylor Series. Taylor Series will allow us to integrate functions when our previous techniques do not suffice, and provide useful approximations of functions for numerical techniques. Lastly, 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):** MA2560 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. 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. Some of the labs may utilize mathematics software such as **Lurch** and **Sage**. There will be roughly 5 labs during the semester, 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: February 23, March 15, and April 20**. Each exam will be worth 20% of your overall grade. There will also be a *cumulative* final exam, which will be on **Tuesday, May 18** at 11:00AM–1:30PM (note: I'm using our Tuesday at 11:00–12:15PM time slot to determine when our final exam is). 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>), **Sage**, **Lurch**, your graphing calculator, etc. when doing homework. In fact, some of the homework problems and lab questions intend for you to use some sort of technology. 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.

<b>Homework &amp; Labs:</b>	20%	(each HW worth 5 points, each lab worth 10 points)
<b>3 Midterm Exams:</b>	60%	(20% each)
<b>Final exam:</b>	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 Hall room 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!*