

# Math 121: Calculus II

## Winter Semester 2008

### Basic Information

Note: this syllabus is temporary, and may change up to the first day of class.

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### Official Course Catalog Entry

Calculus of functions of a single variable continued; additional applications of definite integration to moments, centroids, arc length, surface area and work. Transcendental functions, infinite series, methods of integration, review of conic sections.

### Prerequisites

At least a C in Math 120.

### Related Courses

Many students who take Math 121 also take Physics 223 (Mechanics and Sound). This semester, I will be coordinating with Prof. James Carroll as he teaches Phy 223 (MW 10-11:50, F 10-10:50)

We are also offering an exciting course that integrates Math 121 and Phy 223 to raise funds for clean water in developing countries. The course is CSIE 177-3: Playpump Hydraulics. We will be analyzing various water delivery systems, and constructing models that can be used for a "pump-a-thon" to raise money here on campus that we will donate to overseas development agencies.

Follow-up courses: Math 223 (Multivariable Calc), other math and physics courses.

### Various Info

	<b>Math 121-0</b>	<b>Math 121-1</b>	<b>CSIE 177-3</b>
Days	MTWF	MTWF	F
Times	9:00-9:50	1:00-1:50	11:00-11:50
Room	P-H 322	P-H 321	Strong 307
Final: Fri Apr 25,	9:00-10:30	1:00-2:30	11:00-12:30
CRN	23682	23722	27587-003
Credit Hrs	4	4	1

#### Mini-schedule:

Mon Jan 7: Classes Begin  
Mon Jan 21: Martin Luther King, Jr. Day--no classes  
Mon Feb 25: break week starts  
Sun Mar 2: break week ends  
Fri Mar 21: Good Friday--no classes  
Fri Mar 28: Undergraduate Symposium  
Mon Apr 21: last day of classes  
Fri Apr 25: our final exam  
Mon Apr 28: last day of finals

## Instructor information

Professor Andrew Ross

Pray-Harrold 515b

andrew.ross@emich.edu

<http://people.emich.edu/aross15>

(734) 487-1064, but I strongly prefer e-mail instead of phone contact.

Math department main office: Pray-Harrold 515, (734) 487-1444

## Office Hours and other help

Office Hours:

MTWF: 10-11, 12-1, 2-3

T/Th: 4:30-5:30 and 6:45-7:00

I am also happy to make appointments if you cannot come to the general office hours. Please send me e-mail to arrange an appointment.

The Mathematics Student Services Center (or "Math Lab") is also here to help you, in Pray-Harrold 220. Their hours for Winter 2008 are: M - Th 9a - 7p, F 10a - 2p. Please give them a call at 734-487-0983 to check if they've had to change their hours.

## Required materials

Our required text is chapters 5 through 11 of "Calculus, Early Transcendentals, 6th edition" by James Stewart published by Thomson--Brooks/Cole. There are three ways to get it:

- Single Variable Calculus: Early Transcendentals, Volume 2 (chapters 4-11) [Amazon link](#), approximate price \$76 at Amazon
- Single Variable Calculus: Early Transcendentals (chapters 1-11) [Amazon link](#), approximate price \$152 (new) at Amazon
- The entire book (Ch. 1-17), [Amazon link \(Vol 1,2,3\)](#)

The textbook should be available at all the usual bookstores on and around campus. The library has a [page about class textbooks](#) that includes bookstore addresses, and also information about the student government's Bookswap.

## Course Web Page

We will use the [WebCT](#) system. You are expected to keep an eye on your scores using the system, and get extra help if your scores indicate the need.

## Supplementary Materials

- A Companion to Calculus, 2nd Edition by Ebersole, Schattschneider, Sevilla, and Somers; ISBN-10: 049501124X
- Calculus: Single Variable, 4th edition, by Hughes-Hallett, Gleason, McCallum, et al.
- Calculus Problems for a New Century: Resources for Calculus Collection

## Course Content

Chapter	Topic
5.5	Integrals: the substitution rule
6.1	Areas between curves

- 6.2 Volumes
- 6.3 Volumes by cylindrical shells
- 6.4 Work
- 6.5 Average Value of a Function
- 7.1 Integration by Parts
- 7.2 Trigonometric integrals
- 7.3 Trigonometric substitution
- 7.4 Integration of rational functions by partial fractions
- 7.5 Strategy for integration
- 7.7 Approximate integration
- 7.8 Improper Integrals
- 8.1 Arc Length
- 8.2 Area of a surface of revolution
- 8.3 Applications to physics and engineering
- 11.1 Sequences
- 11.2 Series
- 11.3 The integral test and estimates of sums
- 11.4 The comparison test
- 11.5 Alternating Series
- 11.6 Absolute convergence and the ratio and root tests
- 11.7 Strategy for testing series
- 11.8 Power series
- 11.9 Representations of functions as power series
- 11.10 Taylor and Maclaurin series

## **Grading Policies**

### **Attendance**

Regular attendance is strongly recommended. There will be material presented in class that is not in the textbook, yet will be very useful. Similarly, there are things in the textbook that are might not be covered in class, but are still very useful. If you must miss a class, arrange to get a copy of the notes from someone, and arrange for someone to ask your questions for you.

My lectures and discussions mostly use the chalkboard, along with demonstrations in Excel and other mathematical software. I do not usually have PowerPoint-like presentations, and thus cannot hand out copies of slides.

### **Homework**

Homework will be assigned about once a week. We may be using the on-line homework system MapleTA.

### **Quizzes**

We will often have a short quiz, roughly once a week. Some of these might be announced; others might be unannounced.

### **Exams**

The dates of mid-semester exams have not yet been determined. We will probably have a gateway exam to make sure you are up to speed on the prerequisite material. The final exam will be cumulative.

## Overall Grades