Ma 122A Calculus II (Spring 2010)

Time and Place. M,T,Th,F 12:30-1:30, E187

Instructor. Dr. Gabriela Sanchis, 384 G Esbenshade Hall, Office Phone: 361-1339

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Office Hours. M: 9-10:30, 3:30-5:00; T, Th: 9-10:30; and by appointment.

Textbook. Calculus (6th Edition) by James Stewart

Prerequisites. Ma 121 (Calculus 1)

Course Objectives.

- To deepen students' understanding of the differential and integral calculus. In particular:
  - To learn the properties of exponential, logarithmic, and inverse trig functions (Chapter 7);
  - To learn techniques for evaluating integrals of complicated functions (Chapter 8);
  - To learn how to apply calculus techniques to real-world problems including solving simple differential equations (Chapters 9 and 10);
  - To learn how to use calculus techniques to analyze curves described by parametric equations or polar coordinates (Chapter 11);
  - To learn the basic concepts of convergence of infinite sequences and series (Chapter 12).
- To learn how to use technological tools such as Mathematica and the Voyage 200 calculator as a tool in solving calculus problems.
- To gain an appreciation for the significance of the calculus in the history of scientific thought.
- To learn how to apply calculus techniques to real-world problems found in economics, physics, and the biological, social, and management sciences.

Attendance. You are expected to attend all classes. Excessive amounts of absenteeism may result in a lower grade. If you do miss a class, it is your responsibility to obtain from a classmate any notes, assignments, handouts, or anything else you may have missed.

Quizzes. There will be four quizzes (dates are indicated on the attached schedule). Each quiz will consist of questions taken directly from the assigned homework problems. The lowest quiz grade will be dropped.

Computer Lab Assignments. There will be three computer assignments that will require the use of the computer program Mathematica. You may work in pairs on these assignments (this means no more than two per group). A collaborating pair may submit one completed assignment for the pair. You must save an electronic copy of your completed assignment in the class directory. No late assignments will be accepted. The timestamp of your file will be used to determine when the assignment was turned in.

Calculator. A TI-89, TI-92, TI-92 plus, or TI Voyage 200 graphing calculator is required and should be brought to class each day and to exams. All class demonstrations will be done with the TI Voyage 200.

Homework. The homework assignments are listed at the end of this syllabus. You should do all the assigned homework immediately after the topic is discussed in class. You should come to class prepared to discuss homework, ask questions, and share solutions. Homework will be discussed at the beginning of each class. If all your questions are not addressed during this time, do not hesitate to seek additional help. The following help options are available:

- Office hours - These are listed at the beginning of the syllabus (my schedule is posted on my home page at http://users.etown.edu/s/sanchisgr/homepage.html).
- Student tutors are available Sunday through Thursday evenings in Esbenshade 368 (times will be posted at the entrance of the room as well as on the web at http://users.etown.edu/d/doytchinovb/labs/)
- Learning Services with a private tutor.

Exams. There will be four examinations prior to the final exam. These are scheduled for Tuesday February 9, Friday March 5, Thursday April 1, and Friday April 30. The comprehensive final examination is scheduled for Monday May 10, 11 a.m. to 2 p.m.

Makeup Exams. Exams and quizzes may not be made up except for absolutely unavoidable reasons. If you miss an exam or quiz for an acceptable unavoidable reason, then a make-up may be given. It is the student's responsibility to make arrangements for allowable make-ups with the instructor prior to the evening of the originally scheduled exam or quiz. If a student misses a quiz or an exam without talking to the instructor ahead of time or shortly afterwards, he/she will receive a grade of 0 for that quiz or exam. Make-ups will cover the same material but will be different from the originally given exam or quiz.

Academic Integrity. All work must be one's own and must comply with the Standards of Academic Integrity defined in the Elizabethtown College 2009-2010 Catalog, pp. 282 - 285. More specifically, computer assignments may be completed collaboratively in pairs as described above. You may work collaboratively with students other than your lab partner, but the final write-up of the assignment must be your own. Under no circumstances may you copy answers from another student's paper or cut and paste from another student's computer file. No collaboration on quizzes or exams is allowed.

Grading. 94-100 A; 90-93 A-; 87-89 B+; 83-86 B; 80-82 B-; 77-79 C+; 73-76 C; 70-72 C-; 67-69 D+; 63-66 D; 60-62 D-; below 60 F

Course grades will be calculated according to the following weighting:

Quizzes:	15%	In-Class Exams:	50%
Labs:	10%	Final Exam:	25%

Disability. If you have a documented disability and need reasonable accommodations to fully participate in course activities or to meet course requirements, you must:

(1) Contact the Director of Disability Services, Dr. Kristin Sagun, in the Center for Student Success, BSC room 228 by calling 361-1227.

(2) Meet with me (the instructor) within two weeks of receiving a copy of the accommodation letter from Disability Services to discuss your accommodation needs and their implementation.

Tentative Schedule for Ma 122 (Spring 2010)

Monday	Tuesday	Wednesday	Thursday	Friday
18-Jan MLK Day No classes	19-Jan 7.1 Classes begin	20-Jan	21-Jan 7.1	22-Jan 7.2
25-Jan 7.3	26-Jan 7.4	27-Jan	28-Jan 7.4 Quiz 1	29-Jan 7.5
1-Feb 7.6	2-Feb 7.6	3-Feb	4-Feb 7.8	5-Feb 7.8
8-Feb Review	9-Feb Exam 1	10-Feb	11-Feb 8.1	12-Feb 8.2
15-Feb 8.2, 8.3	16-Feb 8.3	17-Feb	18-Feb 8.4 Lab 1 Due	19-Feb 8.4 Quiz 2
22-Feb 8.5	23-Feb 8.6	24-Feb	25-Feb 8.7	26-Feb 8.8
1-Mar 8.8	2-Mar 9.1, 9.2	3-Mar	4-Mar Review	5-Mar Exam 2
8-Mar	9-Mar	10-Mar Spring Break	11-Mar	12-Mar
15-Mar 10.1, 10.2	16-Mar 10.3	17-Mar	18-Mar 11.1	19-Mar 11.2
22-Mar 11.3	23-Mar 11.4 Lab 2 Due	24-Mar	25-Mar 11.4 Quiz 3	26-Mar 11.5
29-Mar 11.5	30-Mar Review	31-Mar	1-Apr Exam 3 Monday class schedule	2-Apr Good Friday
5-Apr Easter Monday	6-Apr 12.1	7-Apr	8-Apr 12.2	9-Apr 12.2, 12.3
12-Apr 12.3	13-Apr 12.4 Lab 3 Due	14-Apr	15-Apr 12.4 Quiz 4	16-Apr 12.5
19-Apr 12.6	20-Apr 12.7	21-Apr	22-Apr 12.8	23-Apr 12.9
26-Apr 12.9	27-Apr Scholarship Day	28-Apr	29-Apr Review	30-Apr Exam 4
3-May 12.10	4-May 12.10	5-May	6-May 12.11	7-May Review Classes end
10-May Ma 122A Final 11-2	11-May Ma 122B Final 11-2	12-May	13-May	14-May

Homework Assignments

Chapter 7: Inverse Functions

7.1 Inverse Functions	3,5,7,9,11,13,15,17,19,23,24,25,27,29,31,35,37,40,41
7.2 Exponential Functions and their Derivatives	1,7,9,11,13,15,17,18,19,23,27,29,31,33,35,37,39,41,45,47,49,51, 53,55,57,61,63,65,73,75,77,79,81,83,85,89
7.3 Logarithmic Functions	3,5,7,9,13,15,17,19,23,25,27,29,33,35,45,47,51,53,55,57,59,61,63
7.4 Derivatives of Logarithmic Functions	2,3,5,7,11,15,17,19,21,25,27,31,33,35,37,47,49,51,53,55,63,69,71, 73,75,79,81,83,87
7.5 Exponential Growth and Decay	5a,9,11,13,15,19a
7.6 Inverse Trigonometric Functions	1,3,5,7,13,19,21,23,25,27,29,31,37,43,45,59,61,63,65,67
7.8 Indeterminate Forms and L'Hôpital's Rule	1,3,5,7,9,11,15,17,19,21,27,29,31,33,37,39,41,43,47,48,49,55,61,63, 65,69,71,73

Chapter 8: Techniques of Integration

8.1 Integration by Parts	1,3,7,11,13,15,17,19,23,27,29,38,39,43,47,51,53,57,61, $\int x^6 \sin 2x \, dx$
8.2 Trigonometric Integrals	1,5,7,11,15,17,19,21,23,25,27,29,33,35,39,41,47,55,57,61
8.3 Trigonometric Substitution	1,3,5,7,9,13,17,21,25,27
8.4 Integration of Rational Functions by Partial Fractions	1,3,5,7,9,11,15,17,21,23,25,29,67
8.5 Strategy for Integration	1,3,7,9,11,13,15,19,29,41,43,51,73
8.6 Integration Using Tables and CAS	1,3,5,9,13,19,21,23,25,27,29,35
8.7 Approximate Integration	1,3,7,15,17,29,35
8.8 Improper Integrals	1,5,7,11,13,15,21,25,27,31,33,41,43,57,63

Chapter 9: Further Applications of Integration

9.1 Arc Length	1,3,5,7,9,11,13,19,21,29
9.2 Area of a Surface of Revolution	1,3,5,7,9,11,13,15,25,28,30

Chapter 10: Differential Equations

10.1 Modeling with Differential Equations	1,3,5,9,11
10.2 Direction Fields and Euler's Method	1,3,5,6,7,9,11,13,15
10.3 Separable Equations	1,3,5,7,9,11,13,15,19,27

Chapter 11: Parametric Equations and Polar Coordinates

11.1 Curves Defined by Parametric Equations	1,3,5,7,9,11,15,24,25,27,29,31b,33,45ab
11.2 Calculus with Parametric Curves	1,3,5,7,11,13,15,17(graph without calc),21,23,29, 37,39,41,48(graph without calc)
11.3 Polar Coordinates	1,3,5,7,11,13,15,17,19,21,23,25,29,31,33,35,37,41,49,57,59,61, 63,65,71,75
11.4 Areas and Lengths in Polar Coordinates	3,5,7,9,17,21,23,27,29,35,37,41,45,49,51
11.5 Conic Sections	1,3,5,7,11,13,15,17,19,21,23,25,27,29

Chapter 12: Infinite Sequences and Series

12.1 Sequences	3,5,7,9,11,13,17,19,21,23,25,27,29,33,39,41,43,47,51,61,63,65,67,69
12.2 Series	3,5,7,11,13,15,17,23,25,27,29,31,35,37,39,41,43,45,47,49,53, and worksheet
12.3 The Integral Test and Estimates of Sums	3,5,7,9,11,12,13,15,17,21,23,34,35
12.4 The Comparison Tests	1,3,5,7,9,11,13,15,17,19,21,23
12.5 Alternating Series	3,5,7,9,11,13,15,27,29
12.6 Absolute Convergence and the Ratio and Root Tests	1,3,5,7,9,13,15,17,21,23,25,29,31
12.7 Strategy for Testing Series	3,7,9,11,13,15,16,34,35,37
12.8 Power Series	3,5,7,9,11,15,17,19,23,25
12.9 Representations of Functions as Power Series	3,5,7,9,13,15,23,25
12.10 Taylor and Maclaurin Series	1,5,9,13,15,17,19,29,33,37,39,41,47,49,55,57,59,63,67,68
12.11 Applications of Taylor Polynomials	3,5,7,9,13,15,17,19,21