

67-172 CALCULUS II
FALL 2010

Section 001: 11:30-12:30 MTWF Swart 3
Section 002: 1:50-2:50 MTWF Swart 127

INSTRUCTOR: Zoubir Benzaid

OFFICE: Swart 238

PHONE: 424-7354 (O)

OFFICE HOURS: MTWF: 10:00-10:20 and MTWF: 1:00-1:50 (And by appointment)

TEXTS:

REQUIRED: *CALCULUS: Concepts and Contexts* by J. Stewart, Brooks/Cole, 4th Edition, 2010.

HIGHLY RECOMMENDED:

1. A copy of **Maple 14** which you can get at a significantly discounted price from Maplesoft.com.

The promotion code for section 001 is AP639029

The promotion code for section 002 is AP639130

I will have more info on the course D2L website.

1. *How to Prepare for the AP Calculus* by S. Hockett et al., Barrons Educational Series; 7th edition, 2002. (USEFUL FOR BOTH 171 and 172)

2. **Free-Response Questions for AP Calculus BC** found at collegeboard.com.

3. **Student Solution Manual for Stewart's book.**

CALCULATOR: TI-83+ or TI-84+ (If you already have a TI-86, that is OK) Graphics Programmable Calculator. The TI 89 or TI 92 (or similar calculator with symbolic capability) will not be allowed.

SOFTWARE:

UWO has a full site license for the Computer Algebra System **Maple 14**. This software can be accessed using any PC or Mac at any computer lab on campus. Maple is extremely user friendly and I expect you will be using it to complete some of your homework and assigned projects. I will be giving demonstrations of the software and assigning various Maple projects throughout the semester.

TOPICS:

Chapter 5: Integrals: Areas and Distances, Definite Integral, Evaluating Definite Integrals, Fundamental Theorem of Calculus, Substitution Rule, Integration by Parts, Additional Techniques of Integration, Numerical Integration, Improper Integrals.

Chapter 6: Applications of Integration: Areas, Volumes, Arc Length, Average Value of a Function, Applications in Physics, Engineering, Economics and Biology, Probability.

Chapter 7: Differential Equations: Modeling, Direction Fields and Euler's Method, Separable Equations, Exponential Growth and Decay, Logistic Equation, Predator-Prey Systems.

Chapter 8: Infinite Sequences and Series: Sequences, Series, Integral and Comparison Tests, Ratio, Root and Alternating Series Tests, Power Series, Taylor, MacLaurin and Binomial Series, Applications of Taylor Polynomials.

EXAMS: There will be a series of three (3) one-hour exams and a comprehensive final examination. MAKE-UP TESTS will be given only in extraordinary circumstances. These written exams will count as 80% of your course grade. **Tentative** dates are

Exam 1: 10/01

Exam 2: 10/29

Exam 3: 11/19

Final Exam: 12/17

QUIZZES, TAKE HOME PROBLEMS, MAPLE PROJECTS: These will compose 20% of your grade. **Make-up quizzes will not be given and late assignments will not be accepted.**

HOMEWORK: Homework will be assigned weekly but will not be collected. It is extremely important to complete the homework problems, as the quiz problems will be very similar to the assigned ones.

GRADING: $A:[90,100]$, $A^-:[88,90)$, $B^+:[86,88)$, $B:[80,86)$, $B^-:[78,80)$, $C^+:[76,78)$, $C:[68,76)$
 $C^-:[65,68)$, $D^+:[64,65)$, $D:[61,64)$, $D^-:[58,61)$, $F:[0,58)$

ATTENDANCE: You will be expected to attend classes regularly. I will be taking attendance daily and will penalize borderline students with an excessive number of absences (4 or more). Students are responsible for all material covered in class.

D2L WEBSITE: I will maintain a D2L website for this course. The site will contain the syllabus, homework assignments, solutions to tests, solutions to selected homework problems, and Maple 14 worksheets, miscellaneous lecture notes and links to other interesting Calculus sites.

TIPS FOR SUCCESS: (ADAPTED FROM SYLLABY AT OTHER UNIVERSITIES. TIPS ARE IN NO PARTICULAR ORDER)

- 1. COME TO CLASS:** Lectures are the most important source of course material. Regular attendance is necessary to develop the best learning environment between the teacher and student. The classroom method of learning goes all the way back to Socrates. If it were not effective, there would be no universities, only bookstores. Although one could possibly do quite well without coming to class, it will be much, much harder to do so (to do a lot of work in order to avoid a little bit of work is the epitome of laziness).
- 2. READ THE TEXT:** The textbook supplements the lecture and helps to provide a second explanation of the course material. Many students read the book “backwards.” They start with the list of assigned problems; when they get stuck on a problem, they scan backwards for a formula in a colored box that they hope will apply. If that fails, they begin to read the actual words on the page. For each topic, read the exposition from beginning to end. It was written that way for a reason! Make notes on the book or note cards. Slow down to make sure you understand each sentence, each paragraph, for the next one is usually built upon it. You cannot read mathematics the same way you read a novel.
- 3. DO THE HOMEWORK:** As hinted to above, this is absolutely essential for understanding the course material. Yes, the concepts are masterfully explained by your instructor in class and beautifully presented in the book, and all of it makes so much sense, but to truly **KNOW** the concepts, you must apply them to actual problems, and this takes a lot of practice. Doing the problems reinforces the material in your brain, so that when another problem comes along, you can compare it to those you have already solved. I can guarantee you that even the best students will be challenged by some of the concepts we will cover and once again to overcome the challenge requires problem solving. Everyday assignments and weekly quizzes are set up to discourage falling behind in homework. Many concepts are built upon previous ones, so failing to keep up will have disastrous consequences. Do the homework as soon as possible after the lecture while it is still fresh. I will put up some solutions to what I consider the most delicate homework problems. Make sure you know why each of your answers is wrong and what the correct answer is.
- 4. ASK QUESTIONS:** Only Newton and Leibniz understood Calculus the first time through; the rest of us had a teacher. Ask questions in class. Feel free to have something repeated (chances are you are not the only one confused). Come to my office to ask questions. Go the tutoring lab to ask questions and get help.
- 5. FIND A STUDY GROUP:** You can learn so much more when you have people to work with. Group work solves problems better because tactics can be discussed and solutions closely examined. Moreover it is so much more fun to share your misery, confusion, or enlightenment with friends.
- 6. RELAX:** Enjoy the course; you are learning some beautiful and powerful mathematics.

READING AND PROBLEM ASSIGNMENTS:

<i>Read Section</i>	<i>Problems</i>
5.1: Areas and Distances	2, 3, 9, 10, 12, 15, 18, 22, 24, 26, 28.
5.2: The Definite Integral	2, 3, 5, 8, 11, 16, 18, 19, 21, 24, 28, 30, 31, 35, 38, 44, 49, 51, 54, 55.
5.3: Evaluating Integrals	2, 3, 9, 10, 13, 14, 19, 20, 25, 26, 34, 36, 45, 50, 53, 56, 62, 64, 68.
5.4: The Fundamental Theorem of Calculus	3, 4, 7, 8, 9, 14, 15, 18, 20, 24, 26, 27, 28, 29
5.5: The Substitution Rule	3, 4, 7, 8, 13, 14, 19, 20, 25, 26, 33, 34, 39, 44, 47, 48, 52, 54, 58, 63, 64, 67, 71.

5.6: Integration by Parts	3, 4, 9, 13, 14, 21, 22, 25, 28, 34, 35, 36, 38, 40, 44, 45, 46.
5.7: Additional Techniques	3, 8, 10, 13, 15, 18, 19, 20, 26, 28, 30, 32, 36.
5.9: Approximate Integration	2, 7, 8, 18, 19, 21, 28, 32, 40, 42.
5.10: Improper Integrals	4, 5, 6, 13, 14, 19, 20, 23, 24, 41, 43, 46, 48, 50, 56.
6.1: More about Area	4, 5, 8, 11, 16, 22, 25, 26, 29, 33, 34, 36, 38, 41, 45.
6.2: Volumes	3, 10, 12, 13, 15, 20, 23, 25, 26, 27, 30, 32, 33, 34, 37, 39, 45, 46.
6.3: Volume by Cylindrical Shells	3, 6, 9, 14, 18, 24, 28, 32, 36.
6.4: Arc Length	4, 5, 7, 8, 12, 17, 24, 26, 27, 31.
6.5: Average Value of a Function	5, 8, 14, 15, 18, 22.
6.6: Applications to Physics and Engr.	5, 10, 13, 14, 16, 18, 21, 23, 26, 33, 36, 40, 44, 46, 50.
6.8: Probability	3, 6, 10, 14, 18.
7.1: Modeling with Differential Equations	3, 6, 8, 9, 11, 12, 14
7.2: Direction Fields and Euler's Method	2, 3-6, 9, 10, 16, 21, 24, 26, 27
7.3: Separable Equations	2, 5, 8, 10, 13, 17, 20, 23, 26, 30, 32, 35, 38, 40, 42, 45, 47, 49, 54.
7.4: Exponential Growth and Decay	4, 6, 9, 13, 16, 18, 21, 22
7.5: Logistic Equation	2, 5, 7, 11, 12, 14
7.6: Predator-Prey Systems	2, 3, 5, 8, 10
8.1: Sequences	5, 6, 11, 12, 17, 18, 23, 24, 29, 30, 38, 41, 42, 46, 51
8.2: Series	3, 4, 9, 12, 15, 19, 20, 26, 27, 30, 31, 35, 36, 44, 51
8.3: Integral and Comparison Tests	4, 7, 8, 9, 13, 16, 20, 25, 26, 30, 33
8.4: Other Convergence Tests	3, 6, 8, 13, 18, 21, 22, 28, 31, 35
8.5: Power Series	3, 6, 9, 10, 13, 18, 20, 23
8.6: Functions as Power Series	3, 6, 9, 11, 15, 16, 21, 25, 28, 32, 33, 36
8.7: Taylor and McLaurin Series	3, 5, 9, 12, 16, 20, 23, 29, 33, 36, 39, 41, 42, 45, 48, 49, 52, 56
8.8: Binomial Series	3, 4, 7, 10
8.9: Applications of Taylor Series	3, 6, 9, 10, 11, 16, 23, 27, 30