Math 172

Calculus II – Spring 2014

67-172-001 11:30–12:30 MTWF Swart 203 67-172-002 12:40–1:40 MTWF Swart 203

Calculus is the greatest triumph of Renaissance mathematics. It is among the deepest, richest, farthest reaching and most beautiful intellectual achievements of the human species. With calculus, we can solve complicated problems in engineering, physics, chemistry, biology, and economics, often reducing complex situations to accessible rules and procedures.

Math 172 is the second class in a three-course calculus sequence that is designed to introduce you to the fundamental ideas of calculus: functions, derivatives, limits, and the definite integral. We'll approach these concepts from three different perspectives: the analytical/algebraic, the graphical, and the numerical. We'll also see the power of calculus by looking at lots of interesting applications.

You can learn mathematics *only* by doing it. As a result, you will be active participants in the learning process in Math 172. Although I will lecture on most of the material in the course, a good part of the class will be student-generated, involving group-work and class discussion.

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Office Hours: My current schedule of office hours can be found at

http://www.uwosh.edu/faculty_staff/szydliks/schedule.shtml.

I am available at other times as well. Just ask!

- **Text:** Calculus, Concepts and Contexts, 4th Edition, by Stewart. If you choose to purchase a book other than through the UW-Oshkosh bookstore (the UWO "Backpack Edition"), please make sure that you purchase the correct edition. Feel free to check with me.
- **Calculator:** The TI-84 graphing calculator is required and used for homework, quizzes and tests. Bring your calculator to class each day. Some other calculators may be acceptable (e.g. TI-83 or TI-85, HP calculators), but I may not be able to provide support for those calculators, and in no case will you be allowed to use any symbolic algebraic calculators (e.g. TI Nspire) on quizzes or exams.
- **Course Topics:** There are two key concepts in calculus: the derivative and the integral. You studied the derivative in great detail in Math 171. Although we will cover a variety of topics in Math 172, one of our main goals is to develop an understanding of the integral and its amazing relationship to the derivative.

During this class, we'll cover most of the chapters 5-8 of the textbook. We'll start the course by looking at the "area problem," the definite integral, and the Fundamental Theorem of Calculus in Chapter 5. We'll spend a significant amount of time developing tools that help us calculate integrals. In Chapter 6, we'll explore applications of integration. Then we'll investigate differential equations, a related concept, in Chapter 7. We'll see lots more applications here. We'll finish the course with the study of infinite sequences and series in Chapter 8.

Assessment

- Exams: There will be 3 exams, given from 6:00–9:00 pm in Nursing/Education 152 on the following dates: Thursday, March 6, Tuesday, April 15, and Thursday, May 15. Each exam will be worth 22% of your total course grade. Arrangements for conflicts due to University sponsored activities must be made at least one week in advance.
- Homework/Quizzes: Extensive homework will be assigned, and the majority will be graded. The homework will come in two formats:
 - Many of the assignments will utilize the online homework system *WeBWorK*. This tool offers extensive opportunities to practice different types of problems that arise from the course material. I'll tell you much more about this in class.
 - There will be non-WeBWorK assignments as well. These will include problems that require you to communicate in ways (e.g. written, graphical) that cannot be readily assessed by computer.

You will be required to do a lot of work in this course!

There will also be frequent quizzes on the course material. Quizzes, homework and other assignments will compose 29% of your course grade. If missed, this work cannot be made up, though at least the lowest standard grade from this coursework will be dropped at the end of the semester.

Attendance: Attendance in this course is required, and will compose 5% of your grade. You will be allowed 2 absences without penalty. For each subsequent absence, you will lose one-half of a percentage point from your attendance grade. Note: arriving late to class or leaving early counts as one-half of a miss. In summary, your grade will be determined by the following:

4 exams (17% each)	68%
Quizzes, Homework and other assignments	27%
Attendance	5%
Total	100%

Grading Scale: Grades in the course will be assigned according to the following approximate cutoffs:

	Grade -	Grade	Grade +
\mathbf{A}	90%	93%	
в	80%	83%	88%
\mathbf{C}	70%	73%	78%
D	60%	63%	68%
\mathbf{F}	0%		

So,	for	example, a student earning 92% of the course points will receive
an	A-,	while a student earning 69% of the course points will receive a
D+	. Т	'he instructor reserves the right to ease these scales if necessary

Prerequisites: To be enrolled in Math 172, you must have earned a grade of C or better in Math 171. Success in this course requires a thorough understanding of the foundational concepts in from differential calculus, including limits, continuity, the definition of the derivative and its interpretation as a rate of change, differentiation shortcuts, antiderivatives, optimization (finding maxima and minima), and linear approximation. Early in the course, you will be expected to demonstrate your competence in many of these areas through an online gateway test. In addition, it is essential for you to have a strong foundation in algebra and trigonometry, including equations, inequalities, graphs, functions, inverses, models, and polynomials, as well as rational, exponential, logarithmic, and trigonometric functions.

Note: If You're Thinking of Majoring in Math...

... but aren't sure what career options would be available with a Math degree, then here are some resources that you can look at:

- 101 Careers in Mathematics by Andrew Sterrett.
- She Does Math! by Marla Parker.

(Steve has copies of both of the above books.)

- http://www.ams.org/careers/
- http://www.maa.org/careers/index.html