

Towson University
Jess and Mildred Fisher College of Science and Mathematics
Department of Mathematics

MATH 211.001: Calculus for Applications
Spring 2012

Tuesday and Thursday (3:30 - 4:45)

INSTRUCTOR:

Stanley Max
Adjunct faculty in Mathematics

OFFICE:

Department of Mathematics
3rd floor, Room 348
7800 York Road

E-MAIL:

smax@towson.edu

WEB SITE AND E-MAIL POLICY:

My personal website is at the following URL:

<http://www.stanleymax.net>

I will occasionally post information on this site. From the homepage, click on “Course material.”

Also, you should check your e-mail for announcements that I will give to the entire class from time to time.

OFFICE HOURS:

Monday (5:00 – 6:00); Tuesday and Thursday (2:15 – 3:15)

COURSE DESCRIPTION:

This course is “intended primarily for students in biology, business, economics, psychology and the social sciences. Elements of differential and integral calculus from an intuitive standpoint with emphasis on the use of calculus in the above fields. Exponential and logarithmic functions, partial derivatives included. Not open to mathematics majors or minors. Prerequisite: MATH 109 or 111, 115 or 119. GenEd I.C. or Core: Mathematics,” citing the Towson University *Undergraduate Catalog*.

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COURSE OBJECTIVES:

This University core course is designed to meet the following four learning goals:

- Construct and evaluate logical arguments
- Apply and adapt a variety of appropriate strategies to solve mathematical problems
- Recognize and apply mathematics in contexts outside of mathematics
- Organize and consolidate mathematical thinking through written and oral communication

REQUIRED TEXTBOOK:

Larry J. Goldstein, David C. Lay, David I. Schneider, Nakhlé H. Asmar, *Calculus and Its Applications*, 12th ed. (Upper Saddle River NJ: Prentice Hall, 2010).

REQUIRED CALCULATOR:

A graphing calculator is required for this course. I will give separate instructions as to the make and model of graphing calculator that I recommend. I understand that a number of keys on your graphing calculator may be unfamiliar to you. That is fine. As the course progresses, I will teach you how to use your calculator for optimal performance in this course and for mathematical applications in general.

IN-CLASS EXAMINATIONS:

I will give you four in-class examinations. The fourth exam, which is cumulative, will take place during final-exam week.

ONLINE HOMEWORK:

Twelve online homework assignments, conducted through a program called MyMathLab, will be due. I will explain in class how you sign up for this program. The due dates are indicated in the schedule of topics further on in this syllabus. All the online homework assignments averaged together will carry the same weight as one of the regular exams. I will drop the lowest grade of the online homework assignments in calculating your average.

These assignments are meant to be individual work, not group work. However, I do not mind if you confer to a limited extent with your classmates on how to answer this or that question. **What you may not do is have someone else do the assignment for you, nor may you do the assignment for someone else.**

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ATTENDANCE:

It is important that you hear the class lectures, because poor attendance will make it difficult for you to understand the material. Therefore, I will take attendance at the beginning of every class.

If you have more than three unexcused absences, then the highest grade that I will assign you is a 'B'. If you have more than six unexcused absences, then the highest grade that I will assign you is a 'C'. If you have more than nine unexcused absences, then the highest grade that I will assign you is a 'D'.

Equally noteworthy is the fact that poor attendance will make it difficult for you to understand the material. **Students remain responsible for all instructional activity conducted in each class.**

The university catalog states the following:

“It is policy of the university to excuse the absences of students for the following reasons:

- illness or injury when the student is unable to attend class
- religious observance where the nature of the observance prevents the student from attending class
- participation in university activities at the request of university authorities (e.g., Intercollegiate Athletics, Forensics Team, Dance Company, etc.)
- compelling verifiable circumstances beyond the control of the student

Students requesting an excused absence must provide documentation to the instructor two weeks prior to the scheduled absence when known in advance or as soon as possible when not known in advance.

PREPARING FOR EXAMS AND LEARNING THE MATERIAL:

To learn the material and prepare for the exams in this course, above all you should attend class regularly. Furthermore, the online homework assignments provide an excellent learning source. If you would like to practice the material further, which I recommend that you do, you should work on the exercises at the end of every section. Answers to the odd-numbered exercises and answers to all the chapter tests are provided at the back of your textbook.

TUTORING:

The Academic Achievement Center (ACC) makes tutoring services for this course available on a drop-in basis and by appointment. You can receive tutoring at the Mathematics Lab at 7800 York Road, Room 105. For detailed information, look at the ACC's website, which is at the following URL:

<http://www.towson.edu/aac/LocationsAndSchedules.asp>

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DISABILITY SUPPORT SERVICES:

Towson University is committed to providing equal access to its programs and services for students with disabilities, in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with disabilities Act of 1990. To learn how to arrange for any appropriate accommodations, students with disabilities should visit the Disabilities Support Services (DSS) webpage at the following URL:

<http://www.towson.edu/dss>

If you are a student with disabilities, then you have the responsibility to let me know that you have needs in this area. You will need a memo from DSS authorizing accommodations.

DETERMINATION OF YOUR GRADE:

GRADED COMPONENTS	
Online homework	19%
Exam	19%
Exam	19%
Exam	19%
Final Exam	24%

FINAL GRADE CUT-OFFS (where x is your overall score)	
A	$x \geq 93\%$
A-	$90\% \leq x < 93\%$
B+	$87\% \leq x < 89\%$
B	$83\% \leq x < 87\%$
B-	$80\% \leq x < 83\%$
C+	$77\% \leq x < 80\%$
C	$73\% \leq x < 77\%$
D+	$67\% \leq x < 73\%$
D	$60\% \leq x < 67\%$
F	$x < 60\%$

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SCHEDULE OF TOPICS:

The rest of the syllabus contains a detailed list of the textbook sections that we will go over in class, as well as exam dates and the sections with which the exams will deal. As the semester progresses, I will possibly slightly modify the order in which we discuss topics as well as the precise sections that exams will cover. However, if I do change the sections for which you need to be responsible on an exam, then I will give you sufficient advance information of this.

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JANUARY 31 (Class 1)	
<p style="text-align: center;"><u>Class Topic</u></p> <p>Syllabus and course outline.</p> <p><i>Section 0.1:</i> “Functions and Their Graphs”</p> <p><i>Section 0.2:</i> “Some Important Functions”</p> <p><i>Section 0.3:</i> “The Algebra of Functions”</p> <p><i>Section 0.4:</i> “Zeros of Functions — The Quadratic Formula and Factoring”</p> <p><i>Section 0.5:</i> “Exponents and Power Functions”</p> <p><i>Section 0.6:</i> “Functions and Graphs in Applications”</p>	

FEBRUARY 2 (Class 2)	
<p style="text-align: center;"><u>Class Topic</u></p> <p><i>Section 0.1:</i> “Functions and Their Graphs”</p> <p><i>Section 0.2:</i> “Some Important Functions”</p> <p><i>Section 0.3:</i> “The Algebra of Functions”</p> <p><i>Section 0.4:</i> “Zeros of Functions — The Quadratic Formula and Factoring”</p> <p><i>Section 0.5:</i> “Exponents and Power Functions”</p> <p><i>Section 0.6:</i> “Functions and Graphs in Applications”</p>	

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FEBRUARY 7 (Class 3)	
<p style="text-align: center;"><u>Class Topic</u></p> <p><i>Section 1.1:</i> “The Slope of a Straight Line”</p> <p><i>Section 1.2:</i> “The Slope of a Curve at a Point”</p> <p><i>Section 1.3:</i> “The Derivative”</p> <p><i>Section 1.4:</i> “Limits and the Derivative”</p> <p><i>Section 1.5:</i> “Differentiability and Continuity”</p> <p><i>Section 1.6:</i> “Some Rules for Differentiation”</p> <p><i>Section 1.7:</i> “More about Derivatives”</p> <p><i>Section 1.8:</i> “The Derivative as a Rate of Change”</p>	

FEBRUARY 9 (Class 4)	
<p style="text-align: center;"><u>Class Topic</u></p> <p><i>Section 1.1:</i> “The Slope of a Straight Line”</p> <p><i>Section 1.2:</i> “The Slope of a Curve at a Point”</p> <p><i>Section 1.3:</i> “The Derivative”</p> <p><i>Section 1.4:</i> “Limits and the Derivative”</p> <p><i>Section 1.5:</i> “Differentiability and Continuity”</p> <p><i>Section 1.6:</i> “Some Rules for Differentiation”</p> <p><i>Section 1.7:</i> “More about Derivatives”</p> <p><i>Section 1.8:</i> “The Derivative as a Rate of Change”</p>	

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FEBRUARY 14 (Class 5)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 1.1:</i> “The Slope of a Straight Line”	#1, which covers Sections 0.1, 0.2, 0.3, 0.4, 0.5, and 0.6
<i>Section 1.2:</i> “The Slope of a Curve at a Point”	
<i>Section 1.3:</i> “The Derivative”	
<i>Section 1.4:</i> “Limits and the Derivative”	
<i>Section 1.5:</i> “Differentiability and Continuity”	
<i>Section 1.6:</i> “Some Rules for Differentiation”	
<i>Section 1.7:</i> “More about Derivatives”	
<i>Section 1.8:</i> “The Derivative as a Rate of Change”	

FEBRUARY 16 (Class 6)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 1.1:</i> “The Slope of a Straight Line”	#2, which covers Sections 1.1, 1.2, and 1.3
<i>Section 1.2:</i> “The Slope of a Curve at a Point”	
<i>Section 1.3:</i> “The Derivative”	
<i>Section 1.4:</i> “Limits and the Derivative”	
<i>Section 1.5:</i> “Differentiability and Continuity”	
<i>Section 1.6:</i> “Some Rules for Differentiation”	
<i>Section 1.7:</i> “More about Derivatives”	
<i>Section 1.8:</i> “The Derivative as a Rate of Change”	

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FEBRUARY 21 (Class 7)	
<u>Class Topic</u>	
<i>Section 2.1:</i> “Describing Graphs of Functions”	
<i>Section 2.2:</i> “The First and Second Derivative Rules”	
<i>Section 2.3:</i> “The First and Second Derivative Tests and Curve Sketching”	
<i>Section 2.4:</i> “Curve Sketching (Conclusion)”	
<i>Section 2.5:</i> “Optimization Problems”	
<i>Section 2.6:</i> “Further Optimization Problems”	

FEBRUARY 23 (Class 8)	
<u>Class Topic</u>	<u>Online homework due</u>
Exam 1 (covers Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8)	#3, which covers Sections 1.6, 1.7, and 1.8

FEBRUARY 28 (Class 9)	
<u>Class Topic</u>	
<i>Section 2.1:</i> “Describing Graphs of Functions”	
<i>Section 2.2:</i> “The First and Second Derivative Rules”	
<i>Section 2.3:</i> “The First and Second Derivative Tests and Curve Sketching”	
<i>Section 2.4:</i> “Curve Sketching (Conclusion)”	
<i>Section 2.5:</i> “Optimization Problems”	
<i>Section 2.6:</i> “Further Optimization Problems”	

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MARCH 1 (Class 10)	
<u>Class Topic</u>	
<i>Section 2.1: “Describing Graphs of Functions”</i>	
<i>Section 2.2: “The First and Second Derivative Rules”</i>	
<i>Section 2.3: “The First and Second Derivative Tests and Curve Sketching”</i>	
<i>Section 2.4: “Curve Sketching (Conclusion)”</i>	
<i>Section 2.5: “Optimization Problems”</i>	
<i>Section 2.6: “Further Optimization Problems”</i>	

MARCH 6 (Class 11)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 2.1: “Describing Graphs of Functions”</i>	#4, which covers Sections 2.1, 2.2, and 2.3
<i>Section 2.2: “The First and Second Derivative Rules”</i>	
<i>Section 2.3: “The First and Second Derivative Tests and Curve Sketching”</i>	
<i>Section 2.4: “Curve Sketching (Conclusion)”</i>	
<i>Section 2.5: “Optimization Problems”</i>	
<i>Section 2.6: “Further Optimization Problems”</i>	

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MARCH 8 (Class 12)	
<u>Class Topic</u>	
<i>Section 2.1:</i> “Describing Graphs of Functions”	
<i>Section 2.2:</i> “The First and Second Derivative Rules”	
<i>Section 2.3:</i> “The First and Second Derivative Tests and Curve Sketching”	
<i>Section 2.4:</i> “Curve Sketching (Conclusion)”	
<i>Section 2.5:</i> “Optimization Problems”	
<i>Section 2.6:</i> “Further Optimization Problems”	

MARCH 13 (Class 13)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 3.1:</i> “The Product and Quotient Rules”	#5, which covers Sections 2.4, 2.5, and 2.6
<i>Section 3.2:</i> “The Chain Rule and the General Power Rule”	
<i>Section 3.3:</i> “Implicit Differentiation and Related Rates”	

MARCH 15 (Class 14)	
<u>Class Topic</u>	
<i>Section 3.1:</i> “The Product and Quotient Rules”	
<i>Section 3.2:</i> “The Chain Rule and the General Power Rule”	
<i>Section 3.3:</i> “Implicit Differentiation and Related Rates”	

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MARCH 20 and MARCH 22 (Spring Break: no classes)

MARCH 27 (Class 15)

<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 3.1:</i> “The Product and Quotient Rules” <i>Section 3.2:</i> “The Chain Rule and the General Power Rule” <i>Section 3.3:</i> “Implicit Differentiation and Related Rates”	#6, which covers Sections 3.1, 3.2, and 3.3

MARCH 29 (Class 16)

<u>Class Topic</u>	
Exam 2 (covers Sections 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3)	

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APRIL 3 (Class 17)	
<p style="text-align: center;"><u>Class Topic</u></p> <p><i>Section 4.1:</i> “Exponential Functions”</p> <p><i>Section 4.2:</i> “The Exponential Function e^x”</p> <p><i>Section 4.3:</i> “Differentiation of Exponential Functions”</p> <p><i>Section 4.4:</i> “The Natural Logarithm Function”</p> <p><i>Section 4.5:</i> “The Derivative of $\ln x$”</p> <p><i>Section 4.6:</i> “Properties of the Natural Logarithm Function”</p>	

APRIL 5 (Class 18)	
<p style="text-align: center;"><u>Class Topic</u></p> <p><i>Section 4.1:</i> “Exponential Functions”</p> <p><i>Section 4.2:</i> “The Exponential Function e^x”</p> <p><i>Section 4.3:</i> “Differentiation of Exponential Functions”</p> <p><i>Section 4.4:</i> “The Natural Logarithm Function”</p> <p><i>Section 4.5:</i> “The Derivative of $\ln x$”</p> <p><i>Section 4.6:</i> “Properties of the Natural Logarithm Function”</p>	

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APRIL 10 (Class 19)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 4.1:</i> “Exponential Functions”	#7, which covers Sections 4.1, 4.2, and 4.3
<i>Section 4.2:</i> “The Exponential Function e^x ”	
<i>Section 4.3:</i> “Differentiation of Exponential Functions”	
<i>Section 4.4:</i> “The Natural Logarithm Function”	
<i>Section 4.5:</i> “The Derivative of $\ln x$ ”	
<i>Section 4.6:</i> “Properties of the Natural Logarithm Function”	

APRIL 12 (Class 20)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 5.1:</i> “Exponential Growth and Decay”	#8, which covers Sections 4.4, 4.5, and 4.6
<i>Section 5.2:</i> “Compound Interest”	

APRIL 13 (Last day to drop courses with an automatic grade of ‘W’)

APRIL 17 (Class 21)	
<u>Class Topic</u>	
<i>Section 5.1:</i> “Exponential Growth and Decay”	
<i>Section 5.2:</i> “Compound Interest”	

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APRIL 19 (Class 22)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 6.1:</i> “Antidifferentiation”	#9, which covers Sections 5.1 and 5.2
<i>Section 6.2:</i> “Areas and Riemann Sums”	
<i>Section 6.3:</i> “Definite Integrals and the Fundamental theorem”	
<i>Section 6.4:</i> “Areas in the xy -Plane”	
<i>Section 6.5:</i> “Applications of the Definite Integral”	

APRIL 24 (Class 23)	
<u>Class Topic</u>	
<i>Section 6.1:</i> “Antidifferentiation”	
<i>Section 6.2:</i> “Areas and Riemann Sums”	
<i>Section 6.3:</i> “Definite Integrals and the Fundamental theorem”	
<i>Section 6.4:</i> “Areas in the xy -Plane”	
<i>Section 6.5:</i> “Applications of the Definite Integral”	

APRIL 26 (Class 24)	
<u>Class Topic</u>	
Exam 3 (covers Sections 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.2, 6.2)	

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MAY 1 (Class 25)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 6.1:</i> “Antidifferentiation”	#10, which covers Sections 6.1, 6.2, and 6.3
<i>Section 6.2:</i> “Areas and Riemann Sums”	
<i>Section 6.3:</i> “Definite Integrals and the Fundamental theorem”	
<i>Section 6.4:</i> “Areas in the xy -Plane”	
<i>Section 6.5:</i> “Applications of the Definite Integral”	

MAY 3 (Class 26)	
<u>Class Topic</u>	
<i>Section 6.1:</i> “Antidifferentiation”	
<i>Section 6.2:</i> “Areas and Riemann Sums”	
<i>Section 6.3:</i> “Definite Integrals and the Fundamental theorem”	
<i>Section 6.4:</i> “Areas in the xy -Plane”	
<i>Section 6.5:</i> “Applications of the Definite Integral”	

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MAY 8 (Class 27)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 6.1:</i> “Antidifferentiation”	#11, which covers Sections 6.4 and 6.5
<i>Section 6.2:</i> “Areas and Riemann Sums”	
<i>Section 6.3:</i> “Definite Integrals and the Fundamental theorem”	
<i>Section 6.4:</i> “Areas in the xy -Plane”	
<i>Section 6.5:</i> “Applications of the Definite Integral”	

MAY 10 (Class 28)	
<u>Class Topic</u>	
<i>Section 7.1:</i> “Examples of Functions of Several Variables”	
<i>Section 7.2:</i> “Partial Derivatives”	
<i>Section 7.3:</i> “Maxima and Minima of Functions of Several Variables”	

MAY 15 (Class 29)	
<u>Class Topic</u>	<u>Online homework due</u>
<i>Section 7.1:</i> “Examples of Functions of Several Variables”	#12, which covers Sections 7.1, 7.2, and 7.3
<i>Section 7.2:</i> “Partial Derivatives”	
<i>Section 7.3:</i> “Maxima and Minima of Functions of Several Variables”	

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MAY 17 (5:00 p.m. – 7 p.m.)

Class Topic

Final Exam (covers all course material)