CALCULUS 3 MTWF 1-1:50PM FALL 2015 SH405

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Office Hours:	MTWF 9:30-10:30am, Th 1:00-1:50pm, and by appointment
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Home Phone:	362-3350 (between 7am and 10pm)
Text:	*Calculus, Early Transcendentals*, 1st Edition, by Briggs & Cochran, Addison-Wesley.
Problem Sets, Quizzes & WW:	There will be several problem sets and quizzes during the semester, as well as online WeBWorK assignments. Together these will be worth 200 points
Math Culture Points:	Math Culture Points will constitute 50 points. These will be earned through participation in various activities outside of class, as detailed on the third page of this syllabus.
Exams:	There will be three in-class exams administered during class time. The dates of these are indicated in the schedule on the back side of this sheet. These exams will be worth 100 points each. The final exam will be held during finals week at the date and time indicated on the back side of this sheet. The final will be worth 200 points.
Grading:	Grading will approximately follow a [92.0%, ∞) → A, [90%, 92%) → A–, [87%, 90%) → B+, [82%, 87%) → B, [80%, 82%) → B–, [77%, 80%) → C+, [72%, 77%) → C, [70%, 72%) → C–, [67%, 70%) → D+, [62%, 67%) → D, [60%, 62%) → D–, (–∞, 60%) → F scale. Current grade information will be available online through Moodle at all times.
Makeups:	For the sake of fairness to those who follow the schedule, makeups for exams will be allowed only under extenuating circumstances, with documentation and advance notice when humanly possible. Late problem sets and quizzes will generally not be accepted, and if accepted due to extenuating circumstances will generally be subject to a penalty of 20% of the possible points for each day past due. Late WeBWorK will not be accepted.

Any student entering this class should already be aware that calculus is the mathematics of changing quantities. The major development in Calculus 3 is that we widen our scope to functions of more than one variable. This simultaneously adds tremendously to the breadth of phenomena that can be addressed, and also introduces complications that have no analog in the essentially two-dimensional world of Calculus 1 and 2.

Calculus 3 is the culmination of the calculus sequence, and this presents challenges in at least three respects. First, ability to visualize and use spatial intuition is taken to a new level. Second, computations are in some cases correspondingly bigger and longer. Third, abstract theoretical considerations become a more central element, increasingly overshadowing mere computations as the most important material. In response to all three of these considerations the judicious use of technology can be a valuable aid. Sophisticated calculators such as the TI-89 and computer software packages such as *Mathematica*, when used well, can lead to easier and deeper understanding of the course material. However the use of this technology itself involves a significant learning experience, and often significant frustrations. We will attempt to use *Mathematica* in this course when the benefits are the greatest, and assist you in its use enough to keep the frustrations to a minimum.

To enter this class, each student must pass a computer-administered antiderivatives "gateway" exam. You may attempt this exam as often as desired, provided that you demonstrate understanding of previous mistakes before a retake. Success by 5pm Wednesday, September 9th will count as 10 points toward a student's WeBWorK score, but after 5pm Friday, September 18th course grades will be lowered by 5% for each week or portion of a week without passing this exam.

If at some point the challenges or frustrations of this class get too bad, I strongly encourage you to see me for extra explanation – don't wait until you're overwhelmed. I'm here to help.

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Tentative Schedule

Monday, 8/31 §11.1-2 Vectors	Tuesday, 9/1 §11.3 Dot Products	Wednesday, 9/2 §11.4 Cross Products	Friday, 9/4 §11.5 $\mathbf{f}:\mathbb{R}\to\mathbb{R}^3$
Monday, 9/7 No Class – Labor Day	Tuesday, 9/8 §12.1 Planes	Wednesday, 9/9 §12.1 Quadric Surfaces	Friday, 9/11 §12.1 $f:\mathbb{R}^2\to\mathbb{R}$
Monday, 9/14 §12.3 Limits & Continuity	Tuesday, 9/15 §12.4 Partial Derivatives	Wednesday, 9/16 §12.5 Chain Rule	Friday, 9/18 §12.6 Dir. Der. & Gradients
Monday, 9/21 §12.7 Tangent Planes	Tuesday, 9/22 §12.8 Optimization	Wednesday, 9/23 §12.8 Optimization	Friday, 9/25 §12.8 Optimization
Monday, 9/28 §12.9 Constrained Opt.	Tuesday, 9/29 §12.9 Constrained Opt.	Wednesday, 9/30 Review for Exam	Friday, 10/2 **Exam 1**
Monday, 10/5 No Class – Fall Break	Tuesday, 10/6 No Class – Fall Break	Wednesday, 10/7 §13.1 Double Integrals	Friday, 10/9 §13.1 Double Integrals
Monday, 10/12 §13.2 Double Integrals	Tuesday, 10/13 §13.2 Double Integrals	Wednesday, 10/14 §13.3 Double Int. in Polar	Friday, 10/16 §13.4 Triple Integrals
Monday, 10/19 §13.4 Triple Integrals	Tuesday, 10/20 §13.5 Triple Int. in Cylindrical	Wednesday, 10/21 §13.5 Triple Int. in Spherical	Friday, 10/23 13.6 Applications
Monday, 10/26 13.6 Applications	Tuesday, 10/27 §13.7 The Jacobian	Wednesday, 10/28 Review for Exam	Friday, 10/30 **Exam 2**
Monday, 11/2 §11.6-7 $\mathbf{f}':\mathbb{R}\to\mathbb{R}$	Tuesday, 11/3 §11.6-7 $\mathbf{f}':\mathbb{R}\to\mathbb{R}$	Wednesday, 11/4 §11.8-9 Length & Curvature	Friday, 11/6 §14.1 Vector Fields
Monday, 11/9 §14.1 Vector Fields	Tuesday, 11/10 §14.2 Line Integrals	Wednesday, 11/11 §14.2 Line Integrals	Friday, 11/13 §14.3 The Fun. Theorem
Monday, 11/16 §14.4 Green's Theorem	Tuesday, 11/17 §14.5 Divergence and Curl	Wednesday, 11/18 §14.5 Divergence and Curl	Friday, 11/20 §14.6 Surface Integrals
Monday, 11/23 §14.6 Surface Integrals	Tuesday, 11/24 §14.7 Stokes Theorem	Wednesday, 11/25 No Class – Thanksgiving Break	Friday, 11/27 No Class – Thanksgiving Break
Monday, 11/30 §14.8 Divergence Theorem	Tuesday, 12/1 §14.9 The Fun. Theorem	Wednesday, 12/2 Review for Exam	Friday, 12/4 **Exam 3**
Monday, 12/7 The Complex Plane	Tuesday, 12/8 Complex Arithmetic	Wednesday, 12/9 Quadratic Approximations	Friday, 12/11 Review for Final
Monday, 12/14 Review for Final			
11am Friday, 12/18			

Any students with disabilities which might affect their performance in this class should contact me as soon as possible to arrange accommodations.

The faculty has adopted a policy on academic integrity. It is your responsibility to understand and follow it.

Diversity, in all its forms, is valuable.

Math Culture Points

A portion of the grade for this course will take the form of Math Culture Points. These will be earned through activities outside of class including, but not necessarily limited to, those listed below:

Activity	Points	Maximum
Colloquium Attendance	5	–
Colloquium Presentation	5-15	2
Conference Attendance Iowa Section of the MAA	5-15	2

Mathematics Competition Participation
   Iowa Mathematical Modeling Competition
   Putnam Competition
	15	2

Math Culture Reading
   Some weeks specific readings will be posted on the course web page
   With approval, any relevant article from *Math Horizons*, *CMJ*, etc.
	5	–
		3

Math Club Activities (when appropriate) Movies, Speakers, Game Nights, math portion of Playground of Science, etc.	5	--
Volunteer Math Outreach Working with students at McKinnley Middle School, etc.	5	2

Generally Math Culture Points can be earned for at most two activities in any given week, so you should plan to spread your participation throughout the semester. In each case above, credit assumes both full participation and submitting a brief summary/reflection via Moodle. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event or reading.