CALCULUS 3 MTWF 1:00-1:50PM FALL 2012 STUART 405

Instructor:	Jonathan White
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Office:	Stuart 316
Office Hours:	MTWF 9:30-9:50am, MWF 11:00-11:30, 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 90% A, 80% B, 70% C, 60% D 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 Friday, August 31st will count as 5 points toward a student's WeBWorK score, but after 5pm Friday, September 7th 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, August 27th §11.1-2 Vectors	Tuesday, August 28th §11.3 Dot Products	Wednesday, August 29th §11.4 Cross Products	Friday, August 31st §11.5 $\mathbf{f}:\mathbb{R}\to\mathbb{R}^3$
Monday, September 3rd No Class – Labor Day	Tuesday, September 4th §11.5 $\mathbf{f}:\mathbb{R}\to\mathbb{R}^3$	Wednesday, September 5th §12.1 Planes & $f:\mathbb{R}^2\to\mathbb{R}$	Friday, September 7th §12.2 Surfaces Graphically
Monday, September 10th §12.1-2 Planes & $f:\mathbb{R}^2\to\mathbb{R}$	Tuesday, September 11th §12.3 Limits & Continuity	Wednesday, September 12th §12.4 Partial Derivatives	Friday, September 14th §12.5 Chain Rule
Monday, September 17th §12.6 Dir. Der. & Gradients	Tuesday, September 18th §12.7 Tangent Planes	Wednesday, September 19th §12.8 Optimization	Friday, September 21st §12.8 Optimization
Monday, September 24th §12.9 Constrained Opt.	Tuesday, September 25th §12.9 Constrained Opt.	Wednesday, September 26th Review for Exam	Friday, September 28th **Exam 1**
Monday, October 1st §13.1 Double Integrals	Tuesday, October 2nd §13.1 Double Integrals	Wednesday, October 3rd §13.2 Double Integrals	Friday, October 5th §13.2 Double Integrals
Monday, October 8th §13.3 Double Int. in Polar	Tuesday, October 9th §13.4 Triple Integrals	Wednesday, October 10th §13.4 Triple Integrals	Friday, October 12th §13.5 Triple Int. in Cylindrical
Monday, October 15th No Class – Fall Break	Tuesday, October 16th No Class – Fall Break	Wednesday, October 17th §13.5 Triple Int. in Spherical	Friday, October 19th 13.6 Applications
Monday, October 22nd 13.6 Applications	Tuesday, October 23rd §13.7 The Jacobian	Wednesday, October 24th Review for Exam	Friday, October 26th **Exam 2**
Monday, October 29th §11.6-7 $\mathbf{f}':\mathbb{R}\to\mathbb{R}$	Tuesday, October 30th §11.6-7 $\mathbf{f}':\mathbb{R}\to\mathbb{R}$	Wednesday, October 31st §11.8-9 Length & Curvature	Friday, November 2nd §14.1 Vector Fields
Monday, November 5th §14.1 Vector Fields	Tuesday, November 6th §14.2 Line Integrals	Wednesday, November 7th §14.2 Line Integrals	Friday, November 9th §14.3 The Fun. Theorem
Monday, November 12th §14.4 Green's Theorem	Tuesday, November 13th §14.5 Divergence and Curl	Wednesday, November 14th §14.5 Divergence and Curl	Friday, November 16th §14.6 Surface Integrals
Monday, November 19th §14.6 Surface Integrals	Tuesday, November 20th §14.7 Stokes Theorem	Wednesday, November 21st No Class – Thanksgiving Break	Friday, November 23rd No Class – Thanksgiving Break
Monday, November 26th §14.8 Divergence Theorem	Tuesday, November 27th §14.9 The Fun. Theorem	Wednesday, November 28th Review for Exam	Friday, November 30th **Exam 4**
Monday, December 3rd Quadratic Approximations	Tuesday, December 4th Complex Arithmetic	Wednesday, December 5th The Complex Plane	Friday, December 7th Review for Final
Monday, December 10th Review for Final			
Final Exam – 11am Friday, December 14th			

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.

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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 MIdwestern GrapH TheorY (MIGHTY) (October 21st-22nd) Iowa Section of the MAA (October 5th-6th)	5-15	2
Mathematics Competition Participation Iowa Mathematical Modeling Competition (October 25th-27th) Putnam Competition (December 1st)	10	2
Math Culture Reading Some weeks specific readings will be posted on the course web page With approval, any relevant column on MAA.org With approval, any relevant article from *Math Horizons*, *CMJ*, etc.	5	 – 3 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/response 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.