CALCULUS 3 MTWF 1:00-1:50PM FALL 2010 STUART 405

Instructor:	Jonathan White
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Office:	Stuart 316
Office Hours:	MTW 3:00-3:50pm and by appointment
Office Phone:	399-8280
Home Phone:	362-3350 (between 7am and 10pm)
Text:	*Calculus, Early Transcendentals, 6th Edition*, James Stewart
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 elsewhere.
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, sometimes 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, September 3rd will count as 5 points toward a student's WeBWorK score, but after 5pm Friday, September 10th course grades will be lowered by 5% for each week or portion of a week without passing this exam.

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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 30th §12.1-2 $\mathbb{R}^3$ and Vectors	Tuesday, August 31st §12.3 Dot Products	Wednesday, September 1st §12.4 Cross Products	Friday, September 3rd §12.5 Lines & Planes
Monday, September 6th No Class – Labor Day	Tuesday, September 7th §12.6 Quadric Surfaces	Wednesday, September 8th §12.6 Quadric Surfaces	Friday, September 10th §14.1 $f:\mathbb{R}^n \to \mathbb{R}$
Monday, September 13th §14.2 Limits & Continuity	Tuesday, September 14th §14.2 Limits & Continuity	Wednesday, September 15th §14.3 Partial Derivatives	Friday, September 17th §14.4 Tangent Planes
Monday, September 20th §14.5 Chain Rule	Tuesday, September 21st §14.6 Directional Derivatives	Wednesday, September 22nd §14.7 Optimization	Friday, September 24th §14.7 Optimization
Monday, September 27th §14.8 Constrained Opt.	Tuesday, September 28th §14.8 Constrained Opt.	Wednesday, September 29th Review for Exam	Friday, October 1st **Exam 1**
Monday, October 4th §15.1 Double Integrals	Tuesday, October 5th §15.1 Double Integrals	Wednesday, October 6th §15.2 Iterated Integrals	Friday, October 8th §15.3 General Double Integrals
Monday, October 11th §15.4 Double Int. in Polar	Tuesday, October 12th §15.5 Applications	Wednesday, October 13th §15.5 Applications	Friday, October 15th §15.6 Triple Integrals
Monday, October 18th §15.6 Triple Integrals	Tuesday, October 19th Cylindrical & Spherical	Wednesday, October 20th §15.7 Int. in Cylindrical	Friday, October 22nd No Class – Fall Break
Monday, October 25th §15.8 Int. in Spherical	Tuesday, October 26th §15.9 The Jacobian	Wednesday, October 27th Review for Exam	Friday, October 29th **Exam 2**
Monday, November 1st §13.1 Vector Functions	Tuesday, November 2nd §13.2 & §13.4 $\mathbf{r}'(t)$	Wednesday, November 3rd §13.2 & §13.4 $\mathbf{r}'(t)$	Friday, November 5th §13.3 Arc Length & Curvature
Monday, November 8th §16.1 Vector Fields	Tuesday, November 9th §16.2 Line Integrals	Wednesday, November 10th §16.2 Line Integrals	Friday, November 12th §16.3 Fun. Theorem of Line Int.
Monday, November 15th §16.4 Green's Theorem	Tuesday, November 16th §16.5 Curl & Divergence	Wednesday, November 17th §16.6 Parametric Surfaces	Friday, November 19th §16.7 Surface Integrals
Monday, November 22nd §16.8 Stokes' Theorem	Tuesday, November 23rd §16.8 Stokes' Theorem	Wednesday, November 24th No Class – Thanksgiving Break	Friday, November 26th No Class – Thanksgiving Break
Monday, November 29th §16.9 Divergence Theorem	Tuesday, November 30th §16.10 Summary	Wednesday, December 1st Review for Exam	Friday, December 2nd **Exam 3**
Monday, December 6th Quadratic Approximation	Tuesday, December 7th Euler's Formula	Wednesday, December 8th Complex Arithmetic	Friday, December 9th Complex Arithmetic
Monday, December 13th Review			
Final Exam – 11am on Friday, December 17th			

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 Iowa Section of the MAA (October 22nd-23rd)	5-15	2
Mathematics Competition Participation Iowa Mathematical Modeling Competition (October 9th-10th) Putnam Competition (December 4th)	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	3
Volunteer Math Outreach Working with students at Polk Elementary, 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 email. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event.