CALCULUS 3 MTWF 11:00-10:50AM/1:00-1:50PM FALL 2008 STUART 308

Instructor:	Jonathan White
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Web Page:	public.coe.edu/~jwhite
Office:	Stuart 316
Office Hours:	MTWF 2:00-2:50pm and by appointment
Office Phone:	399-8280
Home Phone:	841-5111 (between 7am and 10pm)
Text:	*Calculus, Early Transcendentals, 5th Edition*, James Stewart
Problem Sets & Quizzes:	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 will generally be subject to a penalty of 20% of the possible points for each day past due.

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 properly, 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.

Students must pass an online integration gateway exam by Friday of the fourth week of class or lose 5% of the total points possible for each additional week or part of a week before passing.

If at some point these challenges or frustrations 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 25th §12.1-2 $\mathbb{R}^3$ and Vectors	Tuesday, August 26th §12.3 Dot Products	Wednesday, August 27th §12.4 Cross Products	Friday, August 29st §12.5 Lines & Planes
Monday, September 1st No Class – Labor Day	Tuesday, September 2nd §12.6 Quadric Surfaces	Wednesday, September 3rd §11.10 Taylor Series	Friday, September 5th §12.7 Cyl. & Sph. Coordinates
Monday, September 8th §13.1 Vector Functions	Tuesday, September 9th §13.2 & §13.4 $\mathbf{r}'(t)$	Wednesday, September 10th §13.3 Arc Length & Curvature	Friday, September 12th §14.1 $f:\mathbb{R}^n \to \mathbb{R}$
Monday, September 15th §14.2 Limits & Continuity	Tuesday, September 16th §14.2 Limits & Continuity	Wednesday, September 17th §14.3 Partial Derivatives	Friday, September 19th §14.4 Tangent Planes
Monday, September 22nd §14.5 Chain Rule	Tuesday, September 23rd §14.6 Directional Derivatives	Wednesday, September 24th §14.7 Optimization	Friday, September 26th §14.7 Optimization
Monday, September 29th §14.8 Constrained Optimization	Tuesday, September 30th Review for Exam	Wednesday, October 1st **Exam 1**	Friday, October 3rd §15.1 Double Integrals
Monday, October 6th §15.1 Double Integrals	Tuesday, October 7th §15.2 More Double Integrals	Wednesday, October 8th §15.3 General Double Int.	Friday, October 10th §15.4 Double Int. in Polar
Monday, October 13th No Class – Fall Break	Tuesday, October 14th No Class – Fall Break	Wednesday, October 15th §15.5 Applications	Friday, October 17th §15.5 Applications
Monday, October 20th §15.6 Surface Area	Tuesday, October 21st §15.7 Triple Integrals	Wednesday, October 22nd §15.7 Triple Integrals	Friday, October 24th §15.8 Int. in Cyl. & Sph.
Monday, October 27th §15.8 Int. in Cyl. & Sph.	Tuesday, October 28th §15.9 The Jacobian	Wednesday, October 29th Review for Exam	Friday, October 31st **Exam 2**
Monday, November 3rd §16.1 Vector Fields	Tuesday, November 4th §16.2 Line Integrals	Wednesday, November 5th §16.2 Line Integrals	Friday, November 7th §16.3 Fund. Thm. of Line Int.
Monday, November 10th §16.4 Green's Theorem	Tuesday, November 11th §16.5 Curl & Divergence	Wednesday, November 12th §16.6 Parametric Surfaces	Friday, November 14th §16.7 Surface Integrals
Monday, November 17th §16.8 Stokes' Theorem	Tuesday, November 18th §16.8 Stokes' Theorem	Wednesday, November 19th §16.9 Divergence Theorem	Friday, November 21st §16.10 Summary
Monday, November 24th Review for Exam	Tuesday, November 25th **Exam 3**	Wednesday, November 26th No Class – Thanksgiving Break	Friday, November 28th No Class – Thanksgiving Break
Monday, December 1st Euler's Formula	Tuesday, December 2nd Complex Arithmetic	Wednesday, December 3rd Complex Arithmetic	Friday, December 5th Review
Final Exam – 11am on Monday, December 8th or 11am on Wednesday, December 10th			

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	10	2
Conference Attendance MathFest (July 31st-August 2nd)	15	2
Mathematics Competition Participation Iowa Mathematical Modeling Competition (October 25th-26th) Putnam Competition (December 6th)	10	2
Math Culture Reading Some weeks specific readings will be posted on the course web page Selected chapters from Berlinski's *Tour* With approval, any relevant column on MAA.org With approval, any relevant article from *Math Horizons*, *CMJ*, etc.	5	 – 5 3 3
Math Club Activities (when appropriate) Movies, Speakers, mathematical 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.