CALCULUS 3 MTWF 1:00-1:50PM FALL 2011 STUART 405/308

Instructor:	Jonathan White
E-Mail:	jwhite@coe.edu
Web Page:	public.coe.edu/~jwhite
Office:	Stuart 316
Office Hours:	MTWF 9:00-9:50am 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.

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.

CALCULUS 3 MTWF 1:00-1:50PM FALL 2011 STUART 405/308

Tentative Schedule

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

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.

CALCULUS 3 MTWF 1:00-1:50PM FALL 2011 STUART 405/308

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 21st-22nd)	5-15	2
Mathematics Competition Participation Iowa Mathematical Modeling Competition (?) Putnam Competition (December 3rd)	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, articles from *Math Horizons*, *CMJ*, etc. With approval, articles from *College Mathematics Journal*, *Mathematics Magazine*, etc.	5	 – 3 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 Moodle. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event.