

CALCULUS 3 MTWF 1:00-1:50PM FALL 2007 STUART 308

- Instructor: Jonathan White
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- 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: 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 (2/7 of the final grade)
- 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 (1/7 of the final grade) 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 (2/7 of the final grade).
- 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.

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.

Tentative Schedule

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

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.