

Applied Analysis (Math 475) — Fall, 2008

Location and Time: 215 Bouillon, MWF, 1:00-1:50 pm

Instructor: Dr. Dan Curtis

Office: 107a Bouillon

Office Hours: MTWThF 10:00-10:50 and by appointment. You can drop by my office at any time and usually I'll be able to talk with you.

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Final Exam: Thursday, December 11: 12:00-2:00 pm

Textbook: No text. I have prepared a considerable amount of material in the form of *Mathematica* notebooks and pdf files; these will form the basis of the course. I will provide a list of books that cover many topics we will cover; if you feel the need for a book you can get one or more of these.

Course Content: This course and its successors, Math 476 and 477, will comprise an introduction to applied mathematics. We will study mathematical methods for investigating a variety of natural phenomena.

Learner Outcomes: After completing this course, the student will understand:

- what the divergence and curl of a vector field are
- how to apply the Divergence Theorem and Stokes Theorem to problems in such fields as fluid mechanics, heat transfer and electromagnetic theory
- how to formulate mathematical models to describe a wide range of natural phenomena
- how Newton derived Kepler's laws of planetary motion from his theory of universal gravitation.
- what dimensional analysis is and how to use the Buckingham Pi Theorem
- the role of nondimensionalization in the formulation of physical models
- what a tensor is, and how they arise in scientific and mathematical contexts

Grading: Your course grade will be determined by the following:

1. A project on The Kepler Problem worth 100 points.
2. Five homework assignments, worth 20 points each for a total of 100 points.
3. A take-home midterm problem set worth 100 points.
4. A final exam worth 100 points.
5. Extra credit assignments may be made during the quarter, allowing you to earn extra points.

A perfect score on the first four of the above categories would result in a total of 400 points. Your course grade will be determined by the percentage p of these points you earn, according to the following scale.

$90 \leq p$	A	$65 \leq p < 77.5$	C
$89 \leq p < 90$	A-	$64 \leq p < 65$	C-
$87.5 \leq p < 89$	B+	$62.5 \leq p < 64$	D+
$80 \leq p < 87.5$	B	$50 \leq p < 62.5$	D
$79 \leq p < 80$	B-	$p < 50$	F
$77.5 \leq p < 79$	C+		

Students with disabilities: If you require accommodation based on a documented disability, have emergency medical information to share, or need special arrangements in case of emergency evacuation, please discuss the situation with me as soon as possible

Class Schedule (31 class days)

Date	Class Activity	Date	Class Activity
09/22		11/03	Class
09/23		11/04	
09/24	Class (first day of classes)	11/05	Class
09/25		11/06	
09/26	Class	11/07	Class
09/29	Class	11/10	Class
09/30		11/11	HOLIDAY: Veterans Day
10/01	Class	11/12	Class
10/02		11/13	
10/03	Class	11/14	Class
10/06	Class	11/17	Class
10/07		11/18	
10/08	Class	11/19	Class
10/09		11/20	
10/10	Class	11/21	Class
10/13	Class	11/24	Class
10/14		11/25	
10/15	Class	11/26	Thanksgiving Break
10/16		11/27	Thanksgiving Break
10/17	Class	11/28	Thanksgiving Break
10/20	Class	12/01	Class
10/21		12/02	
10/22	Class	12/03	Class
10/23		12/04	
10/24	Class	12/05	Class (last class day)
10/27	Class	12/08	Student study day
10/28		12/09	
10/29	Class	12/10	
10/30		12/11	Final Exam (12:00-2:00 pm)
10/31	Class	12/12	