MATH 331 | CONTINUOUS MODELS | Spring 2009
MW 10:20 - 11:35

Professor:	Dr. Chris Black
Office:	Snoqualmie Hall #302B
Office Hours:	W 12:00 - 1:30 and by arrangement
Office Phone:	425-640-1574 ×3871
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Texts: *Nonlinear Dynamics and Chaos*, Steven Strogatz, Westview Publishing, 1994
Ordinary Differential Equations, Tenenbaum and Pollard, Dover Publishing, 1963

COURSE PHILOSOPHY:

Mathematical modeling is the process of taking a problem of practical interest, casting it in a mathematical form, and arriving at a meaningful or useful solution. There are many ways to mathematically model: statistically, discretely, continuously, etc. Since the title of this course is "Continuous Models", we'll investigate situations that require the use of continuous methods. We will limit ourselves to studying problems whose mathematical formulation consists of ordinary differential equations. While technology is a useful tool for visualization, the emphasis in this course will be on analytical (pencil and paper) methods for solving and analyzing problems. We will use methods of differential equations to investigate dynamical systems and chaos, and model processes in engineering, biology, ecology, and physics.

PROBABLE COURSE TOPICS:

- ▷ Direction fields & phase portraits
- ▷ Elementary differential equations
- ▷ Oscillations
- ▷ Bifurcations
- ▷ Damped motion
- ▷ Pendula
- ▷ Population models
- ▷ Conservative & reversible systems

GRADING:

Homework:	300-350 points, as needed
In-Class Exams:	200 points (2 @ 100 points each)
Final Exam:	100 points
Participation:	15 points
Attendance/Citizenship:	15 points

HOMEWORK:

Homework is an integral part of this course. Homework will be assigned from each of the two course texts. All assigned problems will be collected, but not all will be assessed. Homework problems should be done with pencil and paper, and will be graded for correctness and presentation. Your work should be presented clearly, with all steps shown in logical order. The right answer without clearly presented supporting work will not receive full credit.

If time permits, we will spend some class time working in groups to discuss the homework problems, however the final version should be written individually. You are invited to come see me for hints on homework problems if you get stuck. You will find that reading the textbooks will be critical to your success in this course.

In-class Exams:

There will be two in-class exams, scheduled for Monday 5/4 and Monday 6/1. These are timed exams, covering the concepts and methods presented in class. No make-up exams will be given unless you receive permission from the professor **before** the date of the exam.

Final Exam:

The final exam is scheduled for Tuesday 6/9/2009 from 9:00 - 11:00 pm. This will be a comprehensive exam covering the basic concepts of the course.

Participation:

We will spend a portion of some class sessions working in small groups, and I will often ask students to present their work at the board. Your participation will be graded based on your interactions with your peers, your activity level and focus during class, and how often you volunteer to present your solutions.

Attendance/Citizenship:

Discussion, interaction, and group problem solving will all be important aspects of this course, which necessitate your attendance. Citizenship addresses your behavior and comportment with class members and the professor. We each need to be respectful of other students, other cultures, and differing ideas within our learning community.

Honor and Respect:

Each of us should consider our placement at this institution to be a privilege. We need to have respect for one another, and for ourselves. In light of these facts, cheating in any form will not be tolerated. You are encouraged to work together on homework problems, however anything you turn in with your name on it should have been written by you alone. In a course where much of your grade is determined by your proof writing, plagiarism is a concern. The word "plagiarize" is defined by Merriam-Webster as "to steal and pass off (the ideas or words of another) as one's own: use (another's production) without crediting the source." This is a very serious offense.

Disability Services:

Students with disabilities may arrange for academic adjustments by providing the professor with a copy of the "Confirmation of Eligibility for Academic Adjustments" from the Disability Support Services Office as soon as possible. To obtain this form, contact the Disability Support Services Office at the main campus at dssrecept@cwu.edu or (509) 963-2171.