

**Math 331—Continuous Models  
Syllabus**

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| <p><b>Instructor</b></p> <p>Mike Lundin<br/>Office: Bouillon 108D<br/>E-mail: Lundin@cwu.edu<br/>Web: <a href="http://www.cwu.edu/~lundin/">http://www.cwu.edu/~lundin/</a><br/>Phone: 963-1398<br/>Office Hours: MTWTh 12:10-1:30<br/>or by appointment. If you have special needs, please let me know.</p>  | <p><b>Course Description</b></p> <p>3 credits</p> <p>This course is an introduction to modeling with continuous functions. Models arising from elementary differential equations and integral equations are the focus of this course.</p>   | <p><b>Text</b></p> <p><i>Calculus—Early Transcendentals</i>, by Thomas</p> <p>Note: Some material will come by way of lecture, so it is important that you are particularly diligent in class.</p> |
| <p><b>Objectives</b></p> <p>1) Students will demonstrate logical reasoning and problem solving ability as in applications of logic to mathematical systems. That reasoning shall include conjecturing, generalizing, and verifying or disproving conjectures or generalizations.</p> <p>2) Students will demonstrate excellent written and oral communication in their demonstrations of Objective 1.</p> <p>3) Students will demonstrate cooperative learning skills both inside and outside of class.</p> | <p><b>Learning in this Class</b></p> <p>The first in a two-course sequence, Math 331 is devoted to mathematical modeling of physical phenomena via continuous functions. Continuous models arise naturally from differential and integral equations, which, in turn, are the “mathematizations” of various physical phenomena. As such, this course is based on a firm foundation of calculus. However, the focus of this course is on modeling itself, which is a necessary part of a viable secondary mathematics curriculum. Consequently, providing a framework for answering the question, “Where does this equation come from?”, is a goal.</p> <p>Take time to think about and discuss your homework with others and to refine and rewrite solutions. Make working with others a priority, but also take time to internalize the ideas yourself. Rewards for your hard work will include understanding the process of mathematical modeling.</p> |  |
| <p><b>Content</b></p> <p>Week 1—Introduction to Continuous Modeling<br/>Week 2—Regression<br/>Week 3—Growth and Decay<br/>Week 4—Populations I (Class)<br/>Week 5—Populations II <b>TEST 1</b><br/>Week 6—Vector Equations<br/>Week 7—Oscillators, Sound, Music<br/>Week 8—Damped Oscillators<br/>Week 9—Predator/Prey<br/>Week 10—Chaos<br/><b>FINAL EXAM</b></p>  | <p><b>Assessments</b></p> <p>Homework Notebook—1/4 of final grade*<br/>Weekly Quizzes—1/4 of final grade<br/>One Test—1/4 of final grade<br/>Final Exam—1/4 of final grade</p> <p>*I will collect your homework notebooks on Monday of week 4 and Monday of Week 8. Assignments <b>MUST BE NEAT, and MARKED WITH THE DATE and Assignment NUMBER</b> at the <b>TOP</b> of the <b>FIRST PAGE</b> of the Assignment:<br/>2pts (neat and mostly complete)<br/>1pt (substantially lacking)<br/>0 pts (too much missing)</p>  |  |