University of Montana
ScholarWorks at University of Montana

Syllabi

Course Syllabi

1-2014

M 414.01: Deterministic Models

Jonathan M. Bardsley

University of Montana - Missoula, johnathan.bardsley@umontana.edu

Let us know how access to this document benefits you.

Follow this and additional works at: https://scholarworks.umt.edu/syllabi

Recommended Citation

Bardsley, Jonathan M., "M 414.01: Deterministic Models" (2014). *Syllabi*. 1105.
https://scholarworks.umt.edu/syllabi/1105

SYLLABUS: MATH 414
DETERMINISTIC MODELS
John Bardsley

Associate Professor of Mathematics

308, Math Building, 243-5328

`bardsleyj@mso.umt.edu`

`http://web.math.umt.edu/bardsley/courses/414/414.html`

Time and Place: MWF 1:10pm, Room 306, Math Building.
Text: de Vries, Hillen, Lewis, Müller, Schönfisch, *A Course in Mathematical Biology: Quantitative Modeling with Mathematical and Computational Methods*, SIAM, 2006.
Prerequisite: Math 311, Ordinary Differential Equations, Math 221, Linear Algebra
Office Hours: MWF 2:10pm. Feel free to stop by other times or call/email for an appointment.

OVERVIEW: Difference equations (DEs), ordinary differential equations (ODEs), modeling with DEs and ODEs, optimization and statistical methods for parameter estimation. We will follow the book closely, though we will discuss the statistical method called bootstrap.

LEARNING GOALS:

1. to learn to model biological phenomena with difference equations and ordinary and partial differential equations.

2. to learn to analyze these models: stability, phase-plane analysis, oscillatory behavior, limit cycles, and chaos.

3. to learn how to numerically solve ODEs and how to fit DE and ODE models to data.

ASSESSMENT: Your course grade will be determined by your performance on the homework and a final project, but also by a possible exam.

HOMEWORK, EXAM, PROJECT: Homework will be given roughly every 4th class period. Any exam will be meant to mimic the MS/PhD prelim exam given in our department. Projects will be given in groups during the last week or two of the semester, with final presentations given during finals week.

FOR ANY STUDENT WITH A DISABILITY: If you have a disability that has, or might have, an effect on your performance in this class, please let me know. I will do my best to accommodate you.

Important Dates:

Feb. 4	Last day to drop/add on CyberBear.
Feb. 14	Last day to change grade option.
April 7	Last day to drop without Dean's signature.
May 14	**Final Presentations**, Wednesday, 3:20 am - 5:20pm.