

Instructor: Paul J. Hurtado (email: phurtado)

Fall 2015

Office: 220 DMSC. **Phone:** 775-784-4655 or Math Office: 775-784-6773

Text: Meerschaert, M. M. *Mathematical Modeling* (4th)

Lectures: MW 4:00pm-5:15pm in **Room DMSC 106**.

Office Hours: TBD or by appointment in 220 DMSC.

Description: Formulation, analysis & critique of methods of mathematical modeling; selected applications in physics, biology, economics, political science & other fields. (Major Capstone course.)

Course Pre-requisites: MATH 283 R (Calc III; C- or better); MATH/STAT 352 (Prob & Stat) or MATH 461 (Prob Theory); junior or senior standing. (Also, CH 201 & ENG 102)

Course Website: Registered students are responsible for frequently checking Web Campus, the course website at <http://www.pauljhurtado.com/teaching/FA15/> and their university email accounts. Students are assumed to be aware of all information posted prior to each lecture.

Course content: Book chapters 1-9 (selected sections), and supplements provided by the instructor.

Course Objectives: (View UNR's new Silver Core Objectives at <http://goo.gl/bnDbqo>)

- **Integration & Synthesis (CO 13):** Students will be able to integrate and synthesize Core knowledge, enabling them to analyze open-ended problems or complex issues.
- **Application (CO 14):** Students will be able to demonstrate their knowledge and skills developed in previous Core and major classes by completing a project or structured experience of practical significance.

Student Learning Outcomes: Upon successful course completion, a student will be able to:

- Apply modeling techniques to solving problems in various scientific disciplines (CO2, CO13)
- Critically assess data collection, use, and analysis; organize and clean data (CO3, CO13).
- Interpret the results of the modeling process to provide sound scientific conclusions within the problem's original scientific and social context (CO9).
- Propose a project, devise strategies and practices to do the research, and write a technical report using professional typesetting software (e.g., LaTeX) (CO1, CO14; possibly CO4).

General Rules: I (the instructor) come to class to help you learn, and I expect you will come to class to learn and help others learn. Everyone in class, myself included, is expected to be respectful to one another. All of your electronic devices (phones, laptops, music players, etc.) are to be turned off while in the classroom, unless approved by the instructor. Disruptions during class will not be well tolerated, and are to be kept to a minimum.

Homework: Homework will be due approximately weekly. A subset of the assigned problems will be graded. Please write or type solutions legibly. I will give zero credit for problems I cannot easily read. Your solutions must show all relevant work, and be a clear explanation of your reasoning. The same applies to exams.

Exams: There will be two midterm exam (one in-class, one take-home) and no final exam.

Term Paper: Each student will complete a project and submit a term paper at the end of the course. The instructor will help you identify a good topic, and will consult closely with you during the semester. In addition to the term paper, students will also present their results on the final day of class. There is no final exam, so class will meet for project presentations during the time scheduled for our final exam: **Monday, 14 Dec 2015, from 2:45-4:45pm.**

Graduate/Undergraduate: Homeworks and exams may differ (or overlap substantially) for graduate (620) and undergraduate (420) students. Math 620 students must identify an appropriate peer-reviewed journal, and their term paper must be formatted for submission to that journal (actual submission is **not** required).

Computing Resources: Some coursework requires use of mathematical software. Students are assumed to have access to a computer with the free software [R](http://www.r-project.org) (www.r-project.org) or similar software (e.g., Python or Matlab) installed. Students using R are further encouraged to use the front-end [RStudio](http://www.rstudio.com) (www.rstudio.com). Additional software (e.g., [Maxima](#)) will be discussed during the first class meeting.

Final Grades: Your grade for the course will be determined as follows:

30% Homework 40% Exams 20% Project

The remaining 10% comes from the better of your *exams* grade and your *project* grade.

The grading scale that will be used is:

A	A-	B+	B	B-	C+	C	D	F
≥93%	≥90%	≥87%	≥83%	≥80%	≥77%	≥70%	≥60%	<60%

Makeup, Late Policy: Late homework will not be graded. There will be no early or make-up exams. However, if you need to miss an exam due to participation in official university activities, you must make arrangements with the instructor at least two weeks prior to the exam in question.

Academic Dishonesty: Cheating, plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the [Student Code of Conduct](#). Students are assumed to know what plagiarism is (for a definition, see wpacouncil.org/positions/WPAplagiarism.pdf) and how to avoid it. Academic dishonesty will not be tolerated and penalties can include canceling a student’s enrollment without a grade or receiving an F for the course or assignment. For more details, see the [UNR General Catalog](#).

Disability Services: Any student with a disability needing academic adjustments or accommodations is requested to speak with the Disability Resource Center (Thompson Building, Suite 101) and then me, as soon as possible, to arrange for appropriate accommodations.

Academic Success Services: A common habit among successful students is to seek help outside of the classroom. Your student fees cover use of the Math Center (784-4433 or www.unr.edu/mathcenter), Tutoring Center (784-6801 or www.unr.edu/tutoring-center), and University Writing Center (784-6030 or www.unr.edu/writing-center). These centers support your classroom learning; it is your responsibility to take advantage of their services.

Statement on Audio and Video Recording: Written permission of the instructor is required to video or audio recorded class lectures. In order to accommodate students with disabilities, some students may have been allowed to record class lectures and discussions. Therefore, your comments and actions during class may be recorded. Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy.