Math 420/620: Mathematical Modeling
Spring Semester 2019

Time: MW 4:00-5:15pm, AB 635.
by Mark M. Meerschaert.
Instructor: Aleksey (Alex) Telyakovskiy
e-mail: alekseyt@unr.edu
Web page: [http://wolfweb.unr.edu/homepage/alekseyt](http://wolfweb.unr.edu/homepage/alekseyt)
WebCampus: [https://webcampus.unr.edu](https://webcampus.unr.edu)
Phone: 784-1364
Office: DMS 322
Office Hours: MW 1:45-2:15pm, Thur 9:00-10:00am or by appointment (Note—since you’ll
be working in groups, if you have a conflict with an office hour, you should be
able to send a representative of your group.)

**Prerequisites:** ENG 102; CH 201 or CH 202 or CH 203 or CH 212; MATH 283 with a ”C-” or better;
STAT 352 or STAT 461; and Junior or Senior standing.

**Topics:** Topics will be taken from Meerschaert’s book.

This course may satisfy:
Core Curriculum Capstone requirements;
Integration & Synthesis requirement;
Application requirement.

**Student Learning Outcomes:**
Upon completion of this course:

- Students will be able to choose and apply key mathematical and statistical techniques for solving
  problems in a diverse collection of scientific disciplines.

- Students will be able to organize and clean data; critically assess the origin of the data and method
  of data analysis.

- Students will be able to interpret the results of the modeling process to reach sound scientific
  conclusions within the problem’s economic, scientific, and social context.

- Students will be able to propose a project (individually or in a group) and devise strategies and
  practices to do the research work that will lead, with the support of computational software (e.g.
  Maple, Mathematica, R, Matlab), to the writing of a technical report using professional typesetting
  software (e.g., LaTeX)

**Grading policy:**

**Midterm Exam:** 20%
There will be one mid-term exams. Topics and the date will be announced in
class a week advance. Midterm is tentatively on Wednesday April 3 at DMS 106, computer lab.

Any student requiring accommodations through the DRC must schedule their exams on the same day as
in the class exams.

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HW: 80% Homework will be assigned each week, and will be due by the end of business hours on Friday turned into my mailbox in Math & Stat Department (DMS 314) unless otherwise indicated. Late homework will not be accepted. Students may work in groups of up to four students on all homework assignments. Each group will submit one paper with names of all group members.

Final Project for Math 620: Students in Math 620 are required to work on a project. Project can be selected from the suggested list of projects (I’ll give you this later) or selected by the student with my approval. Please decide what your project is going to be on before the Spring Break, and let me know. The final version of the project should be submitted in hard copy in LaTeX or Word using Microsoft Equation Editor. I would ask you to submit projects before the May 6, so that I can read them and provides comments to you before you submit the final version at the end of the semester on May 13 at the time of the final meeting.

Test Make-Up Policy: Make-ups or early exams are not permitted. If you must miss an exam because of a valid documented emergency or an official university function that conflicts with an exam date, then the absences are managed according to University Administrative Manual (UAM) 3,020.

Homework guidelines: Here are a few comments concerning the grading policies on the homework.

- You are responsible for editing and proof-reading your homework solutions. Answers that do not make sense (whether due to serious conceptual problems or sloppy writing) may receive no credit.

- Your solutions must include answers, in clear English, to the questions asked in assigned problems. If some mathematical computation is necessary to determine the answer, then evidence that you did the computation should be included. BUT the computation is not worth anything without a clear (and correct) explanation of the conclusion you draw from your calculation.

- If a problem involves numerous repetitive calculations (say, with slightly modified parameters), then you should provide sample calculations or data, as well as explanation or summaries of what variations were made and how the conclusion varied. When the amount of data exceeds that which can be explained clearly in English, a table or graph may be the best way to present the data. If I am unable to find your conclusions without wading through many pages of repetitive Maple code and/or graphics, you may not receive credit for the conclusions you have reached, even if they are correct.

CAUTION: Other than discussions with me and joint work within your group, no outside help may be given/received on any homework assignments.

Note: Please be polite and turn off all the cell phones, music players and pagers before class. They are very distracting for everybody.

Grading scale: Grade “C” corresponds to 70%, there will be no “C−” grade. All other pluses/minuses will be used in grade assignment.

Drop deadline: The final day to drop classes and receive “W” is Tuesday April 2.

Technology: We shall use MAPLE to work various examples and conduct multiple simulations, MAPLE is available on computers in the Math Center, and in many UNR computer labs.

Email communication: Emails will be answered within 24 hours.

Support: If you have any difficulties that are interfering with your work in this class, please see me to discuss them. Also, personal counseling and disability resources are available through the Student Services (Counseling: 784-4648, Disability: 784-6000). 

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Disability Statement: Any student with a disability needing academic adjustments or accommodations is requested to speak with the Disability Resource Center (Pennington Student Achievement Center, Suite 230) as soon as possible to arrange for appropriate accommodations.

Academic Dishonesty: The University Academic Standards Policy defines academic dishonesty, and mandates specific sanctions for violations. See the University Academic Standards policy: UAM 6,502.

Diversity Statement: The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, please contact the University's Equal Opportunity & Title IX Office at 775-784-1547. Resources and interim measures are available to assist you. For more information, please visit: http://www.unr.edu/equal-opportunity-title-ix.

Surveillance of lectures: Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

P.S. The information listed here is subject to change. If any change takes place it will be announced in class.

A tentative course plan:

| Mon Jan 21 | MLK Day no class |
| Mon Jan 28 | Sec. 1.3, 2.1 |
| Mon Feb 4 | Sec. 2.3, 3.1 |
| Mon Feb 11 | Sec. 3.2, 3.3 |
| Mon Feb 18 | President's Day no class |
| Mon Feb 25 | Sec. 4.2, 4.3 |
| Mon Mar 4 | Sec. 5.1, 5.2 |
| Mon Mar 11 | Sec. 5.3 |
| Mon Mar 18 | Spring Break no class |
| Mon Mar 25 | Sec. 5.3, 6.1 |
| Mon Apr 1 | Sec. 6.2 |
| Mon Apr 8 | Sec. 6.3 |
| Mon Apr 15 | Sec. 6.4, 7.1 |
| Mon Apr 22 | Sec. 7.3, 7.4 |
| Mon Apr 29 | Sec. 8.1 |
| Mon May 6 | Sec. 8.2, 8.3 |
| Mon May 13 | Final Meeting 2:30-4:30pm |