Math 420/620: Mathematical Modeling
Spring Semester 2017

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 1:30-2:20pm, R 10:00-10:50am (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.)

**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. Make-ups for the exam will be given only in extreme circumstances. Students who were absent with a documented emergency or university-sponsored activity must see the instructor beforehand to make arrangements.

Any student requiring accommodations through the DRC must schedule their exams on the same day as in the class exams.
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 8, 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 15 at the time of the final meeting.

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 4.

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).

Disability Statement: The Math department supports providing equal access for students with disabilities. I encourage any student needing to request accommodations for a specific disability to please meet with me at your earliest convenience to ensure timely and appropriate accommodations.
Academic Dishonesty: “Cheating, plagiarism or otherwise obtaining grades under false pretenses” constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student’s enrollment without a grade, giving an F for the course or for the assignment.

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:

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<thead>
<tr>
<th>Mon Jan 23</th>
<th>Sec. 1.1, 1.2</th>
<th>Wed Jan 25</th>
<th>Sec. 1.3, 2.1</th>
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<td>Mon Jan 30</td>
<td>Sec. 2.2, 2.3</td>
<td>Wed Feb 1</td>
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<td>Mon Feb 6</td>
<td>Sec. 3.2</td>
<td>Wed Feb 8</td>
<td>Sec. 3.2, 3.3</td>
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<td>Mon Feb 13</td>
<td>Sec. 3.3</td>
<td>Wed Feb 15</td>
<td>Sec. 3.3, 4.1</td>
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<td>President’s Day no class</td>
<td>Wed Feb 22</td>
<td>Sec. 4.2, 4.3</td>
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<td>Mon Feb 27</td>
<td>Sec. 4.3, 5.1</td>
<td>Wed Mar 1</td>
<td>Sec. 5.1, 5.2</td>
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<td>Mon Mar 6</td>
<td>Sec. 5.2, 5.3</td>
<td>Wed Mar 8</td>
<td>Sec. 5.3</td>
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<tr>
<td>Mon Mar 13</td>
<td>Sec. 5.3</td>
<td>Wed Mar 15</td>
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<td>Mon Mar 20</td>
<td>Spring Break no class</td>
<td>Wed Mar 22</td>
<td>Spring Break no class</td>
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<td>Midterm Exam</td>
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<td>Sec. 7.4, 8.1</td>
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<td>Mon May 1</td>
<td>Sec. 8.1, 8.2</td>
<td>Wed May 3</td>
<td>Sec. 8.2</td>
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<tr>
<td>Mon May 8</td>
<td>Sec. 8.3</td>
<td>Wed May 10</td>
<td>Prep Day no class</td>
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Mon May 15 Final Meeting 2:45–4:45pm