Math 338 – Statistics Applied to Natural Sciences

Spring 2011 - Section 1, MH 442, MWF 9:00-9:50 a.m.; Section 2 (lab), MH 452, MW 10:00-10:50 a.m.

Section 5, MH 442, MWF 12:00-12:50 p.m.; Section 6 (lab), MH 452, MW 1:00-1:50 p.m.

Instructor: Mortaza (Mori) Jamshidian, Professor  
Office: MH 180,  Phone: 657-278-2398  
Office Hours: MW 2:00-3:00 p.m., F 1:00-2:00, or by appointment  
Homepage: [http://math.fullerton.edu/mori](http://math.fullerton.edu/mori)  
E-mail: mori@fullerton.edu


Calculator and software: A calculator with statistical functions is required. We will use the statistical package R.

Your e-mail address wanted: You are required to send e-mail containing the following information to me (mori@fullerton.edu) by no later than tomorrow, 5:00 p.m.

The e-mail should consist of the following information:

1. Your complete name (First and last name)
2. Your class and section number (e.g., Math 3xx, Section x)
3. An e-mail address that you check very regularly (not necessarily your school e-mail).
4. Your major/concentration/minor
5. A list of courses that you have taken and are relevant to this course
6. Any comments or suggestions

I will send take home quizzes, class notes, and various communiqué through e-mail. I will send a “test e-mail” to everyone tomorrow. If you do not receive this test e-mail, please see me ASAP to resolve any problems there may be.

Note: Any credits that you lose due to not establishing your e-mail connection with me on time will be your responsibility.

Course topics: Students will learn how to produce data using sampling survey methods as well as design of experiments. Tabular, graphical and numerical techniques that can be used to explore and summarize data will be introduced. Students will understand basic probability theory concepts of random variables, probability mass and probability density functions, expected value and variance. A few commonly used discrete and continuous probability models will be introduced. The probability theory learnt will be utilized in introducing concepts of sampling distributions, point estimation, confidence intervals, and hypothesis testing. The course will also include a preliminary introduction to discrete data analysis (two way contingency tables), analysis of variance, and regression analysis.

Math 338 fulfills a General Education requirement. Further details on learning goals are given below. The writing requirement for the course will be fulfilled through the reports that will be prepared for the lab activities.

Course requirements and grading policy: Homework and lab projects (15%) will be assigned and graded. There will be in-lab tests (15%). Finally, there will be three midterm exams (40%) and a final exam, theory (25%) and lab (5%). The laboratory tests are open books, open notes. The in-class exams will be closed book
and closed notes. However, you will be allowed to bring a page of crib-sheet for each exam, and five pages for the final exam.

The following is a tentative exam schedule (in-lab exam dates will be announced a week prior to each exam):

<table>
<thead>
<tr>
<th>Exam I</th>
<th>Exam II</th>
<th>Exam III</th>
<th>Final</th>
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<tbody>
<tr>
<td>Mon. Feb. 14</td>
<td>Mon. March 14</td>
<td>Mon. April 18</td>
<td>Section 1: Wed. May 18 @ 9:30-11:20;</td>
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<td>Lab: Monday, May 16 @ 12:00-1:50</td>
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<td>Section 5: Fri. May 20 @ 12:00-1:50;</td>
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<td>Lab: Monday, May 16 @ 2:30-4:20</td>
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Letter grades will be assigned as follows:

<table>
<thead>
<tr>
<th>Percent</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>97-100</td>
<td>A+</td>
</tr>
<tr>
<td>90-96</td>
<td>A</td>
</tr>
<tr>
<td>88-89</td>
<td>A-</td>
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<tr>
<td>85-87</td>
<td>B+</td>
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<tr>
<td>80-84</td>
<td>B</td>
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<tr>
<td>78-79</td>
<td>B-</td>
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<tr>
<td>75-77</td>
<td>C+</td>
</tr>
<tr>
<td>65-74</td>
<td>C</td>
</tr>
<tr>
<td>60-66</td>
<td>D+</td>
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<tr>
<td>60-59</td>
<td>D</td>
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<tr>
<td>50-59</td>
<td>F</td>
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</tbody>
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**CNSM Study 25-35**: I am an advocate of the CNSM Study 25-35 campaign. CNSM Study 25-35 represents the need for a full-time student (12 to 15 units) to spend 25 to 35 hours per week studying to succeed in her/his classes.

**Make-up exams** will be given only in extreme instances and only with advance permission of the instructor. Any student who does not take an exam at the scheduled time without prior consent of the instructor will receive a grade of zero on that exam. If any student feels that a sudden illness is sufficiently extreme to warrant a make-up exam, the instructor must be provided with documentation prepared by an appropriate authority.

**Learning Goals**: This course achieves all of the general education learning goals of category III A.1 of the Mathematics Department. This course achieves all of the general education learning goals in this category which are:

- To understand and appreciate the varied ways in which mathematics is used in problem-solving.
- To understand and appreciate the varied applications of mathematics to real-world problems.
- To perform appropriate numerical calculations, with knowledge of the underlying mathematics, and draw conclusions from the results.
- To demonstrate knowledge of fundamental mathematical concepts, symbols, and principles.
- To solve problems that requires mathematical analysis and quantitative reasoning.
- To summarize and present mathematical information with graphs and other forms that enhance comprehension.
- To utilize inductive and deductive mathematical reasoning skills in finding solutions, and be able to explain how these skills were used.
- To explain the overall process and the particular steps by which a mathematical problem is solved.
To demonstrate a sense of mastery and confidence in the ability to solve problems that requires mathematical concepts and quantitative reasoning.

These goals are assessed through the course work, including homework, classroom and lab activities, quizzes, exams, and projects reports.

Two broad goals of the course are to provide students an appreciation of the very important role of the field of statistics in empirical research, and to teach students to use some useful statistical methods in empirical research. Particular goals of the course are

- To learn basic techniques for exploring and describing data sets.
- To understand and appreciate the importance of how data are produced and the difference between experimental and non-experimental studies.
- To learn basic inferential methods, understand why they work, and appreciate their basic theoretical properties.
- To learn use of a statistical software.

**Academic Integrity:** Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. Since dishonesty in any form harms the individual, other students and the university, policies on academic integrity are strictly enforced. I expect that you will familiarize yourself with the academic integrity guidelines found in the current student handbook (see [http://www.fullerton.edu/deanofstudents/judicial/policies.htm](http://www.fullerton.edu/deanofstudents/judicial/policies.htm)).

Examples of actions that constitute academic dishonesty include, but are not limited to:

1. Unacceptable examination behavior – communicating with fellow students, copying material from another student’s exam or allowing another student to copy from an exam, possessing or using unauthorized materials, or any behavior that defeats the intent of an exam.
2. Plagiarism – taking the work of another and offering it as one’s own without giving credit to that source, whether that material is paraphrased or copied in verbatim or near-verbatim form.
3. Unauthorized collaboration on a project, homework or other assignment.
4. Documentary falsification including forgery, altering of campus documents or records, tampering with grading procedures, fabricating lab assignments, or altering medical excuses.

**Emergency Evacuation:** In the event of an emergency such as earthquake or fire:

- Take all your personal belongings and leave the classroom. Use the stairways located at the east, west, or center of the building.
- Do not use the elevator. They may not be working once the alarm sounds.
- Go to the lawn area towards Nutwood Avenue. Stay with class members for further instruction.
- For additional information on exits, fire alarms and telephones, **Building Evacuation Maps** are located near each elevator.
- Anyone who may have difficulty evacuating the building, please see the instructor.

**Some important dates**

**February 7 (Monday):** Last day for students to ADD with a permit. All permits expire at midnight on February 7.

**February 7 (Monday):** Last day for students to DROP without a grade of “W”. Students drop using Titan Online.
March 4 (Friday): Last day the Math Department will be flexible on the approval of late withdrawal requests. Beginning Monday, March 7, students must have a serious and compelling reason for withdrawing (e.g. medical reason) and must provide supporting documentation for their reason.

April 22 (Friday): Last day to withdraw with a truly serious and compelling reason that is clearly beyond the student’s control. Students must document their reason.