

MATH-4880-MO1, Probability and Statistics for Engineers, Spring 2016

Course Information.

Course name: Probability and Statistics for Engineers
Course Number: MATH-4880
Course section: M01
Meeting times: TR 2:30-3:45 pm
Semester: Spring
Credit hours: 3
Prerequisite: Calculus III

Instructor Information

Name: María Félix Soler
Contact: mfelix2@slu.edu
Office Hours: MWF 12:00-12:50; MW 2:00 pm; and by appointment.
Office: Math Office, Padre Arrupe Hall, 1st floor.
Phone Number: 915545858 Ext: 299

Course description

This course will focus on analysing data; probability; random variables; probability distributions; expectation; sampling distributions; confidence intervals; hypothesis testing; experimental design; regression and correlation analysis.

Text book

Probability & Statistics for Engineers & Scientists, 9th Edition, by Ronald Walpole, Raymond Myers, Sharon Myers, Keying Ye

Required work

Homework, three in-class exams, and one comprehensive final exam will be given.

Late work:

Make up exams are not given. If an exam is missed due to an excused absence (see paragraph below), a make up exam will be given the *same day* of the final exam. Exams that are missed illegitimately result in a score of 0 in the final grade. Missing more than one exam will result in an F grade for the entire course.

Excused Absences:

Legitimate conflicts and excuses require written documentation and are limited to death or near death instances in the immediate family, a student's illness that requires immediate doctor's care (with the corresponding doctor's note), a University sponsored event (not club sports) and regularly scheduled religious obligations. The documentation must be presented on the day the student returns to the university. Excuses that will NOT be considered include personal travel arrangements, non-University sponsored events, a conflicting appointment, or an illness that does not prevent you from coming to the exam.

Attendance and punctuality:

Although not mandatory, I strongly urge you to attend all classes. On the other hand, you will be responsible for any announcements, information, problems or course changes that are made in all lectures. Students are expected to arrive on time to the lectures. Repeated lateness will not be tolerated. So, please come to class on time and do not leave early. Anything else is rude and disruptive.

MATH-4880-MO1, Probability and Statistics for Engineers, Spring 2016

Grading system

The final grade will be obtained as follows:

- 10% Homework.
- 5% class participation and attendance.
- 20% each in-class exam.
- 25% final exam.

Evaluation:

- Compulsory homework: a list of problems will be available every Friday to be turned in on the following week. A good presentation will be required. Homework Collaboration You are encouraged to work in group.
- In-class exams: 75 minute exam consisting of some problems related to the material covered in class.
- Final exam: The final exam is cumulative. It will cover the **entire semester's material**, will be a two or three hour exam, and will be similar in form to the midterm exams.

Course calendar: <http://www.slu.edu/madrid/academics/registrar/academic-calendar/spring-2016>

- **January:**
 - 13th Wed.: First day of classes.
 - 26th Tue.: Last day to DROP without a grade of "W" or to add a class.
 - 29th Fri.: No classes.
- **February:**
 - 11th Th.: First Exam – 20%
 - 17th Wed.: Registration Summer begins
 - 25th-26th Th.-Fri.: Winter break.
- **March:**
 - 11th Fri.: Last day to drop and receive a Grade of W.
- **April**
 - 10th Th.: Second Exam – 20%
 - 21st – 27th: Semana Santa
 - 6th Wed.: Registration for Fall Semester begins.
 - 14th Th.: Third Exam – 20%
- **May:**
 - 2nd Mon.: Holiday
 - 3rd Tue.: Last Day of Classes
 - 4th Wed.: Final Exam – 25% (12:00 to 3:00 pm).

Course outline (subject to truncation)

We will cover most of chapters 1 through 6, chapter 8 and some of chapters 9 through 10 of the book:

- Basic Probability: Sample space; Conditional Probability, Independence, Law of total probability, Bayes' Rule
- Random Variables: Discrete and continuous random variables, PMFs, PDFs and CDFs.
- Probability Models: Bernoulli, Binomial, Geometric, Uniform, Normal, Exponential distributed random variables; expectation, variance.
- Joint and conditional distributions, independence, covariance.
- Sampling Distribution and Central Limit Theorem...
- Inference: Estimation, Hypothesis Testing...
- Regression...

Learning Outcomes

After completing this course, the student should be able to:

- Solve basic probability and conditional probability problems.
- Differentiate between discrete and continuous random variables and their distributions.
- Calculate expectations.
- Work with the different probability models and use them in applied problems.
- Solve joint probability problems.
- Work with the Central Limit Theorem.
- Estimate unknown parameters through point estimation and interval estimation.
- Do hypothesis testing.

MATH-4880-MO1, Probability and Statistics for Engineers, Spring 2016

Academic Honesty:

The University is a community of learning, whose effectiveness requires an environment of mutual trust and integrity, such as would be expected at a Jesuit, Catholic institution. As members of this community, students, faculty, and staff members share the responsibility to maintain this environment. Academic dishonesty violates it. Although not all forms of academic dishonesty can be listed here, it can be said in general that soliciting, receiving, or providing any unauthorized assistance in the completion of any work submitted toward academic credit is dishonest. It not only violates the mutual trust necessary between faculty and students but also undermines the validity of the University's evaluation of students and takes unfair advantage of fellow students. Further, it is the responsibility of any student who observes such dishonest conduct to call it to the attention of a faculty member or administrator.

Examples of academic dishonesty would be copying from another student, copying from a book or class notes during a closed-book exam, submitting materials authored by or editorially revised by another person but presented as the student's own work, copying a passage or text directly from a published source without appropriately citing or recognizing that source, taking a test or doing an assignment or other academic work for another student, tampering with another student's work, securing or supplying in advance a copy of an examination without the knowledge or consent of the instructor, and colluding with another student or students to engage in an act of academic dishonesty.

Where there is clear indication of such dishonesty, a faculty member or administrator has the responsibility to apply appropriate sanctions. Investigation of violations will be conducted in accord with standards and procedures of the school or college through which the course or research is offered. Recommendations of sanctions to be imposed will be made to the dean of the school or college in which the student is enrolled. Possible sanctions for a violation of academic integrity include, but are not limited to, disciplinary probation, suspension, and dismissal from the University. The complete SLU Academic Honesty Policy can be found at the following link:

http://spain.slu.edu/academics/academic_advising/docs/Academic_integrity.pdf

Accommodation Statement

In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. Students who think they might benefit from these resources can find out more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.
- University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Academic Dean's Office (San Ignacio Hall) or by going to http://spain.slu.edu/academics/learning_resources.html.

Students who believe that, due to a disability, they could benefit from academic accommodations are encouraged to contact Disability Services at [+34 915 54 58 58, ext. 204](tel:+34915545858), send an e-mail to counselingcenter-madrid@slu.edu, or to visit the Counseling Office (San Ignacio Hall). Confidentiality will be observed in all inquiries. Course instructors support student accommodation requests when an approved letter from Disability Services has been received and when students discuss these accommodations with the instructor after receipt of the approved letter.

Collection of Student Work

Saint Louis University - Madrid Campus is committed to excellent and innovative educational practices. In order to maintain quality academic offerings and to conform to relevant accreditation requirements, we regularly assess our teaching, services, and programs for evidence of student learning outcomes achievement. For this purpose we keep on file "anonymous" representative examples of student work from all courses and programs such as: assignments, papers, exams, portfolios, and results from student surveys, focus groups, and reflective exercises. Thus, copies of your work for this course, including any exams, assignments may be kept on file for institutional research, assessment and accreditation purposes. **If you prefer that Saint Louis University-Madrid Campus does not keep your work on file, you will need to communicate your decision in writing to your professor.**

Title IX Syllabus Statement

- Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form

MATH-4880-MO1, Probability and Statistics for Engineers, Spring 2016

of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU's Title IX deputy coordinator, Marta Maruri, whose office is located on the ground floor of Padre Rubio Hall, Avenida del Valle, 28 (mmaruri@slu.edu; 915-54-5858 ext. 213) and share the basic fact of your experience with her. The Title IX deputy coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

- If you wish to speak with a confidential source, you may contact the counselors at the SLU-Madrid's Counseling Services on the third floor of San Ignacio Hall (counselingcenter-madrid@slu.edu; 915-54-5858 ext. 230) or Sinews Multipletherapy Institute, the off-campus provider of counseling services for SLU-Madrid (www.sinews.es; 91-700-1979) To view SLU-Madrid's sexual misconduct policy and for resources, please visit the following web address:

<http://www.slu.edu/Documents/Madrid/campus-life/SLUMadridSexualMisconductPolicy.pdf>