

IT223: Data Analysis

Syllabus

Session: Fall

Monday-Wednesday, 1:30-3:00

Class: Lewis 01510

Office: CDM 429

Instructor: Fatemeh Vahedian

Email: fvahedia@cs.depaul.edu

Office Hours: Wed 3:15-4:45

(please schedule by email)

Course Description: Course teaches introductory statistical methods for the analysis and visualization of data and basic concepts of probability theory. Course topics include descriptive statistics, data visualization techniques, an introduction to statistical inference (confidence intervals and hypothesis testing) for decision making, linear regression models, and data sampling techniques. The students will learn the statistical package SPSS to analyze data sets from real-world applications. The objectives of this course are:

- Develop an understanding of the basic concepts of probability and statistics
- Help students to be informed and critical readers of quantitative arguments
- Provide sufficient skills to apply simple statistical techniques with the aid of a computer
- Appreciate the role of statistics in empirical research and scientific study
- Gain flexible problem-solving skills applicable to unfamiliar statistical settings

Prerequisites: Students are expected to understand basic mathematical notation and be familiar with college algebra concepts.

Course Management System: DePaul University's Desire2Learn system (d2l.depaul.edu).

Calendar: The calendar on the D2L contains all the quizzes, labs, exams and lecture schedules. Make sure to review this schedule.

News Widget: The primary form of communication for this class will be the news widget on the D2L. Please make sure you subscribe to the widget and that DePaul has your correct email.

Forums: The class forum is the preferred place to ask questions about the class. If you have questions about a quiz question, the exams or lecture notes, please post them there. I read these frequently. All students should subscribe to the forums so that you receive email updates.

Text book: Introduction to the Practice of Statistics, 9th Edition, by D.S. Moore, G.P. McCabe and B. Craig (2017). (NOTE: Previous editions of the book are fine)

Notes and video tutorials about Excel/SPSS will be posted at the course website. It is the student's responsibility to download and be familiar with all the course documents and notes posted at the course website.

Software: The statistical package used in this course is SPSS. It is available in all DePaul labs. You can also access SPSS remotely by using our CDM terminals (suitable for fast connections). More information about the software is posted on the course website.

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| Grades: | Class contract: | 2.5% |
| | Quizzes (7 of 9): | 7x2.5% |
| | Homework: | 4x5% |
| | Midterm: | 20% |
| | Final Exam: | 40% |

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| Final Grades: | A: | 90% - 100% |
| | B: | 80% - 90% |
| | C: | 70% - 80% |
| | D: | 60% - 70% |
| | F: | less than 60% |

- Plusses and minuses are given for the upper and lower 3% in a letter's range. There is no A+.
- You may not pass the class if you do not receive a passing grade on the final exam.

Class Contract: All students must complete the class contract. It is meant to ensure that you have read the syllabus and understand the requirements for the course.

Quizzes: There are 9 quizzes. The lowest two are dropped. A quiz may be taken as many as 10 times and only the highest grade is recorded. Quizzes are taken online through the D2L. Quizzes are due at 1:15 on the day of the class in which they will be reviewed. **There will never be an extension for the quizzes.**

The purpose of the online quizzes **is not to test** your knowledge. You may (and are encouraged) to work through the problems with your fellow classmates, seek out the help of tutors, ask questions on the forums or even offer potential solutions on the forums.

The purpose of the online quizzes **is to prepare** you for the exams (which will test your knowledge). The questions are very indicative to what will be on the exam. Thus when taking a quiz, you should endeavor to learn the underlying material and not simply get the right answers.

Homework: Assignments including small lab projects using SPSS. Late submissions will be accepted no later than three days after the due date. Notice that a 20% point penalty will be applied for late submissions. Extensions may be granted only for exceptional reasons. Requests for extensions must be received BY EMAIL before the due date. **You are expected to work alone.**

Exams: There are two exams, a midterm and a final. The final exam is cumulative. Exams may not be rescheduled except under extreme extenuating circumstances. Exams are closed-book and closed-notes. Stand alone calculators are OK, but not cell phones.

Tutoring: Free – make use of it! See link to the tutoring page under the General Course Resources link on the class web page.

Attendance: Attendance is not required. However, students are responsible for all material and announcements presented in class. DL students are expected to watch the lectures online.

Online Teaching Evaluation: Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in CampusConnect.

Learning Outcomes

- 1) Students will understand the major principles guiding modern scientific thought. Students will demonstrate a mastery of the science content knowledge of their SID courses.
- 2) Students will know that science, technology, and math serve as mechanisms for inquiry into the nature of the universe. Students will:
 - a) identify questions that can be answered through scientific investigations;
 - b) design and conduct a scientific investigation to test a scientific hypothesis;
 - c) use appropriate tools and techniques together, analyze, and interpret data to support or refute a scientific hypothesis;
 - d) develop descriptions, explanations, predictions, and models using evidence;
 - e) describe relationships between evidence and explanations using critical and logical thinking;
 - f) recognize and analyze alternative explanations and predictions;
 - g) communicate scientific procedures and explanations;
 - h) use mathematics in all aspects of scientific inquiry.
- 3) Students will understand and appreciate the interrelationships among science, technology and math. Students will:
 - a) use technology and mathematics to identify a problem or design a solution to a problem;
 - b) give examples of how science and technology inform and influence each other.
- 4) Students will understand and appreciate the role of science in society and in their lives. Students will:
 - a) Provide examples of how science and technology impact our lives, and how social needs and concerns impact our development of technology and scientific investigation;
 - b) develop positive attitudes towards science, technology, and mathematics;
 - c) establish an ongoing experiential/service-learning interest in science, technology, and mathematics.
- 5) Students will understand the nature of science, technology, and mathematics. Students will:

- a) provide examples of the abuse of science, including the representation of unfalsifiable claims as science and other forms of pseudoscience;
- b) explain the strengths and limits of scientific inquiry;
- c) explain the difference between evidence and inference, and the provisional nature of scientific explanations by providing examples of how our understanding of the workings of the world has changed in the past;
- d) explain the difference between probability and certainty, and describe what is meant by uncertainty in the context of science, technology, and mathematics.

How Learning Outcomes Will Be Met

Outcome 1: in the module on data collection, assignments will focus on principles and criteria of statistical experiments and sampling. Possible assignments include: to design experiments, observational studies or surveys, or to critique examples of data collections.

Outcome 2 and 3: Throughout the course students learn data analysis and statistical techniques to analyze sets of data using a statistical package (e.g. SPSS). Students will work with real data and use the statistical package to run the analyses. Assignments will include a writing component where students will describe the results of their analyses and discuss conclusions and validity of their analyses.

Outcome 4: students will review articles in scientific journals and in newspapers or magazines that report results of statistical analyses, to gain an appreciation of the role of statistics in empirical research and scientific study.

Outcome 5: students will become informed and critical readers of quantitative arguments. An assignment will ask students to find studies or news reports that describe associations and to discuss the validity of their conclusions.

Academic Integrity Policy: This course will be subject to the academic integrity policy passed by faculty. More information can be found at <http://academicintegrity.depaul.edu/>

Plagiarism: The university and school policy on plagiarism can be summarized as follows: Students in this course should be aware of the strong sanctions that can be imposed against someone guilty of plagiarism. If proven, a charge of plagiarism could result in an automatic F in the course and possible expulsion. The strongest of sanctions will be imposed on anyone who submits as his/her own work any assignment which has been prepared by someone else. If you have any questions or doubts about what plagiarism entails or how to properly acknowledge source materials be sure to consult the instructor.

Incomplete: An incomplete grade is given only for an exceptional reason such as a death in the family, a serious illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final, and approved by the Dean of the College of Computing and Digital Media. Any consequences resulting from a poor grade for the course will not be considered as valid reasons for such a request.

Resources for Students with Disabilities: Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential.

To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at:

Student Center, LPC, Suite #370

Phone number: (773)325.1677

Fax: (773)325.3720

TTY: (773)325.7296