

**IT223 Data Analysis
Fall 2014 Course Syllabus**

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Contact Hours: Tue 3:00PM - 4:30PM at CDM 716

Course website: <https://d2l.depaul.edu/>

Summary of Course

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, 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:

- to develop an understanding of the basic concepts of probability and statistics,
- to help students to be informed and critical readers of quantitative arguments,
- to provide sufficient skills to apply simple statistical techniques with the aid of a computer,
- to appreciate the role of statistics in empirical research and scientific study,
- and to gain flexible problem-solving skills applicable to unfamiliar statistical settings.

Prerequisites: MAT130 or instructor's consent.

Required Textbook and Printed Resources:

Introduction to the Practice of Statistics, Seventh Edition, by D.S. Moore, G.P. McCabe and B. Craig (2010). (NOTE: Previous editions of the book are fine)

Notes and video tutorials about 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.

Other good free resources:

- 1) Online statistical textbook at <http://onlinestatbook.com/2/index.html>
- 2) Open Intro Statistics at <http://www.openintro.org/stat/textbook.php>

Statistical package

The statistical package used in this course is SPSS and 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.

Grading Policy The final grade has the following components:

- *Quizzes* (20%):

- *Homework assignments (50%):* Weekly assignments including small group projects. 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.
- *Final exam (30%):* The final exam will be cumulative. The test will be proctored and students will be allowed to use a limited amount of notes during the exam. Students should bring a calculator (no phones are allowed). See section on Final exam for more details.

Students receiving more than 90% of possible points are guaranteed at least an A-, more than 80% at least a B-, more than 70% at least a C-, and more than 60% at least a D.

Remarks about homework Working through homework exercises and applying the statistical concepts to real problems is a critical step for building a complete understanding of the statistical concepts. Only by trying to apply the statistical techniques you can test if you really understand them. Homework assignments should be regarded as a genuine “learning experience.” Study groups are encouraged, but you should, however, be sure that the effort is truly collaborative. The best strategy for completing the assignment is to begin tackling the questions alone, then discussing with others, and finally writing up your answers by yourself. Feel free to consult the instructor when you are stuck.

Students are expected:

1. To read this document in full!
2. To check email messages regularly and to keep the current email account information on <http://campusconnect.depaul.edu>.
3. To visit the course website and read course announcements on a regular basis.
4. To participate actively to class discussions and activities and to work on the practice problems and exercises that are designed to improve students’ understanding of the class topics.
5. To be familiar with all the course documents and notes posted at the course website.
6. To read all the sections in the textbook relevant to the modules. The reading assignments are listed in each module. Notes are meant to complement the course textbook NOT TO REPLACE IT.
7. **To contact me regularly and ask me questions related to the course.** If you are on campus, you can stop by my office (room 716 of CDM building) during contact hours, or by appointment at other times. The best way to contact me is through **email at rsettimi@cdm.depaul.edu**. Most emails will be answered within 24 hours. You can also call my **office phone number (312 3625556)**.
8. To post on the discussion forum messages that are of interest to the entire class.
9. To work independently on course assignments and not to copy or submit someone else's work as your own. See also University academic integrity policy below.

Tutors

CDM offers free tutoring for many of its courses. The tutors’ schedule is at:

<http://www.cdm.depaul.edu/advising/Pages/TutoringProgram.aspx>.

If you have any difficulty with the course topic, you should contact me or come and see me during office hours.

COLLEGE POLICIES

Online Course Evaluations

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.

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. More information can be found at <http://academicintegrity.depaul.edu/>. Violations of the University Academic Integrity Policy include (but are not limited to): (a) using or providing unauthorized assistance or materials on course assignments; (b) possessing unauthorized materials during an examination; (c) submitting as one's own any material that is copied from published or unpublished sources such as the Internet, print, computer files without proper acknowledgement that it is someone else's; (d) submitting as one's own work a report, examination, paper, computer file, lab report or other assignment which has been prepared by someone else.

If you are unsure about what constitutes unauthorized help on an exam or assignment, or what information requires citation and/or attribution, please ask your instructor. If proven, violations may result in the failure of the assignment, failure of the course, and/or additional disciplinary actions.

Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at: <http://cdm.depaul.edu/enrollment>.

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: csd@depaul.edu. Lewis Center 1420, 25 East Jackson Blvd. Phone number: (312)362-8002, Fax: (312)362-6544, TTY: (773)325.7296

SCIENTIFIC INQUIRY LEARNING DOMAIN

IT223: Data analysis is included in the Liberal Studies program as a course with credit in the Scientific Inquiry domain. Courses in the Scientific Inquiry domain are designed to provide students with an opportunity to learn the methods of modern science and its impact on the world around us. Courses are designed to help students develop a more complete perspective about science and the scientific process, including: an understanding of the major principles guiding modern scientific thought; a comprehension of the varying approaches and aspects of science; an appreciation of the connection among the sciences; the fundamental role of mathematics in practicing science; an awareness of the roles and limitations of theories and models in interpreting, understanding, and predicting natural

phenomena; and a realization of how these theories and models change or are supplanted as our knowledge increases.

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.

Writing Expectations

Writing is integral for communicating ideas and progress in science, mathematics and technology. The form of writing in these disciplines is different from most other fields and includes, for example, mathematical equations, computer code, figures and graphs, lab reports and journals. Courses in the SI domain must include a writing component where that component takes on the form appropriate for that course (eg, lab reports, technical reports, etc.)

How Writing Expectations Will Be Met

Throughout the course of the quarter, students will be required to explain and interpret the results of their analyses and to discuss in writing the results and conclusions of their analyses. The written analysis will be supported by charts and graphs, and a discussion of the quality and generalization of their results.