IT223 Data Analysis, Summer I 2020

Instructor Dr. Alvin Chin
Class hours: Monday and Thursday 5:45 PM to 9:00 PM, online Zoom (check link in D2L)
Office: Online Zoom (check link in D2L)
Email: alvin.chin@depaul.edu
Office Hours: Tues. 6:00PM -7:00PM
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: MAT 130 or above or equivalent or Mathematics Diagnostic test placement into MAT 140 is the prerequisite for this class.

Required Textbook and Printed Resources

David Diez, Mine Cetinkaya-Rundel, Christopher D Barr. Open Intro Statistics, 4th Edition, 2019 (Free download available at https://www.openintro.org/stat/textbook.php)

Notes 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:

- Online statistical textbook at http://onlinestatbook.com/2/index.html

Statistical package

The statistical package used in this course is SPSS and is available by accessing SPSS remotely by using our CDM terminals. More information about the software is posted on the course website.

Grading Policy

The final grade has the following components:
- Quizzes (5%) – There will be 4 weekly quizzes online
- Midterm Exam (20%) to be held in Week 3 – Students will use Lockdown Browser to write the exam online and are only allowed a calculator and 1 page (double-sided) cheat sheet (no phones are allowed)
- Homework assignments (50%): There will be 4 weekly assignments to be done individually. 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.
- Project (25%): Students will form a group of up to 5 and will select a dataset and problem for their project. There will be a project proposal (5%), project presentation (10%) and project report (10%). The project presentation will be held on the last day of the last week of class.

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 your understanding of data analysis. 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 if you have any questions.

Students are expected:
- To read this document in full!
- To check email messages regularly and to keep the current email account information on http://campusconnect.depaul.edu.
- To visit the course website and read course announcements on a regular basis.
- 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.
- To be familiar with all the course documents and notes posted at the course website.
- 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.
- **To contact me regularly and ask me questions related to the course**. You can reach me during my office hours or by appointment at other times. The best way to contact me is through **email at alvin.chin@depaul.edu**. Most emails will be answered within 24 hours.
- To post on the discussion forum messages that are of interest to the entire class.
- To work independently on course assignments and quizzes and not to copy or submit someone else's work as your own. See also University academic integrity policy below.

Tentative Schedule

The following schedule is tentative. The reading assignments are from the course textbook.

Lecture (Class date)	Topic	Reading assignment
Week 1, Lecture 1 (June 15)	Introduction. Exploratory data analysis. Analyzing univariate distribution using graphs (histograms, bar charts, pie charts, and boxplots) and summary statistics for center and spread. Quiz 1 handed out, Assignment 1 handed out, project proposal.	Chapter 1, Section 1.1, 1.2 Chapter 2, Section 2.1
Week 1, Lecture 2 (June 18)	Density functions and normal distribution. Using the normal distribution to approximate symmetric distributions, normal quantile plots to test normality assumptions.	Chapter 4, Section 4.1
Week 2, Lecture 3 (June 22)	Data Relationships: Scatter plots and correlation. Introduction to regression analysis. Model fitting and diagnostic, residual analysis. Quiz 2 handed out, Assignment 2 handed out.	Chapter 8
Week 2, Lecture 4 (June 25)	Design of experiments, observational studies. Sample surveys.	Chapter 1
Week 3, Lecture 5 (June 29)	Randomness and the language of probability. Probability rules. Random variables, expected value and variability. Quiz 3 handed out, Assignment 3 handed out.	Chapter 3, Section 3.1, 3.3, 3.4
Week 3, Lecture 6 (July 2)	Midterm online in class (1st half). Toward statistical inference. Sampling distribution for sample averages. Estimating averages using Confidence Intervals	Chapter 5, Section 5.1
Week 4, Lecture 7 (July 6)	Sampling distributions for proportions. Estimating proportions using confidence intervals. Quiz 4 handed out, Assignment 4 handed out.	Chapter 5, Section 5.2 Chapter 6, Section 6.1.1, 6.1.2, Section 6.2
Week 4, Lecture 8 (July 9)	Hypothesis Testing. Significance tests on averages and proportions	Chapter 5, Section 5.3 Chapter 7, Section 7.1
Week 5, Lecture 9 (July 13)	Hypothesis Testing. Significance tests on averages and proportions	Chapter 5, Section 5.3 Chapter 7, Section 7.1
Week 5, Lecture 10 (July 16)	Final project presentations	

Important Dates

Monday, June 15, 2020 – First day of class
Tuesday, June 16, 2020 - Deadline to add classes to SUI 2020 schedule at 11:59 PM
Wednesday, June 17, 2020 - Deadline to finish Quiz #1 at 11:59 PM
Friday, June 19, 2020 - Last day to drop SUI 2020 classes with no penalty, Last day to select auditor status for SUI 2020 classes
Saturday, June 20, 2020 - Grades of "W" assigned for SUI 2020 classes dropped on or after this day

Sunday, June 21, 2020 – Assignment 1 due at 11:59 PM, Project proposal due at 11:59 PM
Wednesday, June 24, 2020 – Deadline to finish Quiz #2 at 11:59 PM
Sunday, June 28, 2020 – Assignment 2 due at 11:59 PM
Wednesday, July 1, 2020 – Deadline to finish Quiz #3 at 11:59 PM
Thursday, July 2, 2020 – Midterm online during first half of class (5:45 PM to 7:15 PM, 1.5 hours)
Sunday, July 5, 2020 – Assignment 3 due at 11:59 PM
Tuesday, July 7, 2020 - Last day to withdraw from SUI 2020 classes
Wednesday, July 8, 2020 – Deadline to finish Quiz #4 at 11:59 PM
Sunday, July 12, 2020 – Assignment 4 due at 11:59 PM
Thursday, July 16, 2020 – Project presentation in class
Friday, July 17, 2020 – Project report due at 11:59 PM

Tutors

CDM offers free tutoring for many of its courses. The tutors' schedule is at:
https://www.cdm.depaul.edu/Student-Resources/Pages/Student-Tutoring.aspx.   If you have any difficulty with the course topic, you should contact me or come and talk to me during office hours.

College Policies

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

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. Please see https://resources.depaul.edu/teaching-commons/teaching/Pages/online-teaching-evaluations.aspx for additional information.

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. More information can be found at https://offices.depaul.edu/oaa/faculty-resources/teaching/academic-integrity/Pages/default.aspx.

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://www.cdm.depaul.edu/Current%20Students/Pages/PoliciesandProcedures.aspx

Incomplete Grades

An incomplete grade is a special, temporary grade assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of term and when otherwise the student had a record of satisfactory progress in the course. All incomplete requests must be approved by the instructor and a CDM Associate Dean. Only exceptions will receive such approval. Information about the Incomplete Grades policy can be found at http://www.cdm.depaul.edu/Current%20Students/Pages/Grading-Policies.aspx.

Students with Disabilities

DePaul University is committed to ensuring equal access to its educational and extracurricular opportunities for students with disabilities. The Center for Students with Disabilities (CSD) offers reasonable academic accommodations and services to support our students. We also serve as a resource to the many university departments that have a responsibility to accommodate students. Please see https://offices.depaul.edu/student-affairs/about/departments/Pages/csd.aspx for Services and Contact Information.

Attendance

Students are expected to attend each class and to remain for the duration. As the class is online and students can watch the classes on their own time after recording, attendance will be taken based on students having watched the recorded class. This will be done by asking a question from the class and the student having to answer that question correctly. The overall grade for participation drops one-third after any absence. Three absences for any reason, whether excused or not, may constitute failure for the course.

Class Discussion

Student participation in class discussions will be measured in two ways. First, students are highly encouraged to ask questions and offer comments relevant to the day's topic. Participation allows the instructor to "hear" the student's voice when grading papers. Secondly, students will be called upon by the instructor to offer comments related to the reading assignments. Students must keep up with the reading to participate in class discussion.

Attitude

A professional and academic attitude is expected throughout this course. Measurable examples of non-academic or unprofessional attitude include but are not limited to: talking or disrupting class when the instructor is speaking, mocking another's opinion, and cell phones ringing while watching the class in real-time. If any issues arise a student may be asked to leave the online classroom. The professor will work with the Dean of Students Office to navigate such student issues.

Civil Discourse

DePaul University is a community that thrives on open discourse that challenges students, both intellectually and personally, to be Socially Responsible Leaders. It is the expectation that all dialogue in this course is civil and respectful of the dignity of each student. Any instances of disrespect or hostility can jeopardize a student's ability to be successful in the course. The professor will partner with the Dean of Students Office to assist in managing such issues.

Cell Phones/On Call

If you bring a cell phone to the online class, it must be off or set to a silent mode. Should you need to answer a call during class, students must leave the online classroom in an undisruptive manner.