

# IT 403 Winter 2023

## Statistics and Data Analysis

Section 801 meets Th 17:45 – 21:00; 810 (on-line)

Dr. Steve Rubinow

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Office hours: Th immediately before class or by appointment



### Summary of the Course

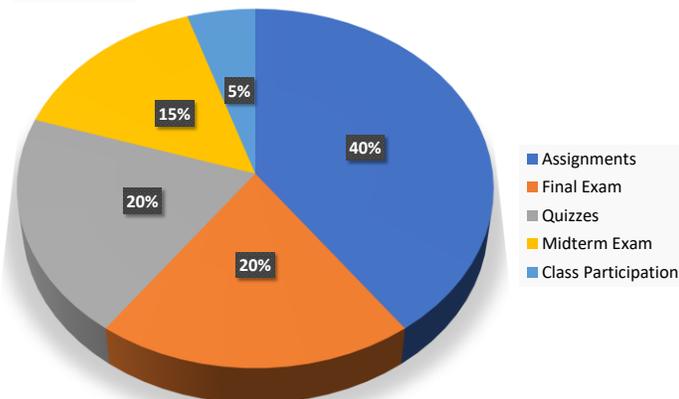
Introduction to univariate data analysis methods. Descriptive statistics and data visualization methods. Overview of sampling techniques for data collection, and introduction to statistical inference methods for decision making including simple linear regression, estimation procedures using confidence intervals and hypothesis testing.

#### Prerequisites

None



### Grading / Evaluation



A 93–100	B+ 87–89	C+ 77–79	D+ 67–69	F 0–59
A- 90–92	B 83–86	C 73–76	D 60–66	
	B- 80–82	C- 70–72		



### Contact Information

- Email is the primary mode of off-line communication with the class
- Please make certain that your email address is correctly listed on Campus Connect ([@depaul.edu](mailto:@depaul.edu))
- When emailing, please write the subject of your email as follows: IT 403 – *purpose of email*



### Organization of the Course



### Learning Outcomes

Students will be able to:

- develop an understanding of the basic concepts of probability and statistics,
- 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.



### Textbooks

- OpenStax Statistics:** <https://openstax.org/details/books/introductory-statistics> (does not have a required payment, however, the publishers request a contribution.)
- OpenIntro Statistics:** <https://www.openintro.org/book/os/>
- Humongous Book of Statistics Problems,** Kelley, W.M. and Donnelly, R.A., Alpha (2009).

Special thanks to Y. Mendelsohn for all the material he has developed in prior versions of the course



## Course Schedule: Topics

<b>WEEK 1: JAN 5</b> <ul style="list-style-type: none"> <li>INTRODUCTION</li> <li>DATA SOURCES</li> <li>GRAPHING</li> <li>DESCRIPTIVE STATISTICS</li> <li>INTRO TO R</li> </ul>	<b>WEEK 2: JAN 12</b> <ul style="list-style-type: none"> <li>HISTOGRAMS</li> <li>OUTLIERS</li> <li>DENSITY CURVES</li> <li>VARIATION</li> <li>R (CONT'D)</li> </ul>	<b>WEEK 3: JAN 19</b> <ul style="list-style-type: none"> <li>VARIATION (CONT'D)</li> <li>EMPIRICAL RULE</li> <li>SCATTERPLOTS</li> </ul>	<b>WEEK 4: JAN 26</b> <ul style="list-style-type: none"> <li>CORRELATION</li> <li>REGRESSION</li> </ul>	<b>WEEK 5: FEB 2</b> <ul style="list-style-type: none"> <li>CAUSATION</li> <li>PRINCIPLES IN STUDY DESIGN</li> </ul>
<b>WEEK 6: FEB 9</b> MIDTERM EXAM	<b>WEEK 7: FEB 16</b> <ul style="list-style-type: none"> <li>PROBABILITY</li> </ul>	<b>WEEK 8: FEB 23</b> <ul style="list-style-type: none"> <li>PROBABILITY (CONT'D)</li> <li>INFERENCE</li> <li>CONFIDENCE INTERVALS</li> </ul>	<b>WEEK 9: MAR 2</b> <ul style="list-style-type: none"> <li>HYPOTHESIS TESTING</li> </ul>	<b>WEEK 10: MAR 9</b> <ul style="list-style-type: none"> <li>MULTIPLE REGRESSION</li> </ul>



## Course Schedule: Deliverables

<b>WEEK 1: DUE JAN 8</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>SYLLABUS</li> <li>DESCRIPTIVE STATISTICS</li> </ul> <b>ASSIGNMENT: #1</b>	<b>WEEK 2: DUE JAN 15</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>HISTOGRAMS</li> <li>OUTLIERS</li> <li>DENSITY CURVES</li> <li>VARIATION &amp; Z-SCORES</li> </ul> <b>ASSIGNMENT: #2</b>	<b>WEEK 3: DUE JAN 22</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>NORMAL DISTRIBUTION</li> <li>DESCRIPTION OF VARIATION</li> <li>THE EMPIRICAL RULE</li> <li>SCATTERPLOTS</li> </ul> <b>ASSIGNMENT: #3</b>	<b>WEEK 4: DUE JAN 29</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>CORRELATION</li> <li>REGRESSION</li> <li><math>R^2</math>, INFLUENTIAL POINTS, OUTLIERS</li> </ul> <b>ASSIGNMENT: #4</b>	<b>WEEK 5: DUE FEB 5</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>CAUSATION, CONFOUNDING VARIABLES</li> <li>STUDY DESIGN., ANECDOTAL EVIDENCE, BIAS</li> </ul>
<b>WEEK 6: DUE FEB 12</b>	<b>WEEK 7: DUE FEB 19</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>PROBABILITY</li> <li>ADDITION RULE</li> <li>INDEPENDENT EVENTS, MULTIPLICATION RULE</li> <li>GENERAL PROB. RULES</li> </ul> <b>ASSIGNMENT: #5</b>	<b>WEEK 8: DUE FEB 26</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>DISCRETE, CONTINUOUS PROBABILITIES</li> <li>INFERENCE</li> <li>CONFIDENCE INTERVALS</li> </ul> <b>ASSIGNMENT: #6</b>	<b>WEEK 9: DUE MAR 5</b> <b>QUIZ:</b> <ul style="list-style-type: none"> <li>HYPOTHESIS TESTING, PART 1</li> <li>HYPOTHESIS TESTING, PART 2</li> </ul> <b>ASSIGNMENT: #7</b>	<b>WEEK 10: DUE MAR 12</b>
<b>WEEK 11: DUE MAR 16</b> FINAL EXAM				



## Late Work Policy

- In order to maintain good performance in this course, it is crucial to submit the deliverables on time. Deliverables are due on a specified date and time, as stated in the course schedule, unless an extension/exception is announced.
- Late assignments will be subject to a 10% penalty for each day of late submission (i.e., from one second to 24 hours late). Assignments that are more than three (3) days late will not receive any credit; no work will be accepted after the last day our class meets.
  - This policy is strictly enforced, unless informed of a documented emergency at least 24 hours before the deadline (i.e., all health problems should be supported by a proper doctor's note).
  - The only exception are Group Assignments, where NO late submission will be accepted.
  - It is students' responsibility to know when the assignments are due (see the course schedule)
  - The assignment submission folder on D2L will automatically close three (3) days after the submission deadline. Once a folder is closed, no submission will be accepted.

Work must be submitted in the specified format (handwritten work will not be accepted). All work must be submitted either in class, or on D2L, as specified. *Only exception to the rule: If you are having trouble submitting on D2L, you may email your work. This will indicate that you completed the work on time.*

## EXAMS FOR ONLINE STUDENTS

Exams MUST be taken either:

- Through DePaul's online learning proctoring service, or
- If you live more than 30 miles away from DePaul University, at a certified proctoring center.

There are NO options for taking the exam online.

If you are unable or unwilling to take the exam in person using one of the two options above (proctored at DePaul, proctored at a certified testing center), you should not register for this course.

You register for exams through D2L. It is always a good idea to register right away for proctored exams since preferred times and locations do fill up.

Exams must be completed within the specified time window. A score of 0 will be recorded for the exam if it is not taken within the timeframe. It is not possible to pass the course without taking the exam.

Important: All questions relating to online exams should be directed to the online learning staff. The online learning staff can be reached at [olstaff@cdm.depaul.edu](mailto:olstaff@cdm.depaul.edu).

## CHANGES TO SYLLABUS

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

## ELECTRONICS/BEHAVIOR POLICY IN THE CLASSROOM

- Out of respect for others in the class, please remember to turn off all electronic devices (except computer for class) during class. Failing to follow this policy results in penalties toward class participation credit.
- The class is discussion based. Thus, students are expected to prepare for class, arrive on time and remain in the classroom until the class is over, attend every class to progress satisfactorily towards course objectives, and behave in a respectful manner. Students are accountable for material covered and assignments/ announcements made in any class sessions that they miss. Students are expected to be active learners, coming to class prepared to participate in discussion of the topics under consideration, asking good questions and making valuable observations.
- Failure to comply will affect your class participation grade.

## RELIGIOUS OBSERVATIONS

Accommodations will be made to allow students to fully express their faith. Please provide notice in advance by email if you will be absent, or need extensions on assignments, due to religious observations.

## SCHOOL ACTIVITIES

Every effort to accommodate student participation in school activities, such as athletic competitions, will be made. Please provide notice in advance by email if you will be absent, or need extensions on assignments, due to school activities.

## 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 collaborate with the Dean of Students Office to assist in managing such issues.

## 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: <https://www.cdm.depaul.edu/Current%20Students/Pages/Enrollment-Policies.aspx>

In the case of illness, or other excused absences, a student may contact the Dean of Students to request a formally approved absence. Upon receipt of documentation, the dean's office will notify all instructors of the student that an approved absence has occurred. The notification will maintain student privacy by not including the reasons for the absence. Contact information may be found at: <http://studentaffairs.depaul.edu/dos/contactus.html>

## UNIVERSITY POLICIES

### Incomplete Grades

An incomplete grade is a special, temporary grade that may be assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of the term and when otherwise the student had a record of satisfactory progress in the course. All incomplete requests must be approved by the instructor of the course and a CDM Associate Dean. Only exceptions cases 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>

### Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. All students are expected to abide by the University's Academic Integrity Policy which prohibits cheating and other misconduct in student coursework. Publicly sharing or posting online any prior or current materials from this course (including exam questions or answers), is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity. More information can be found at <https://resources.depaul.edu/teachingcommons/teaching/academic-integrity/Pages/default.aspx>.

#### Posting work on online sites, such as Hero

All students are expected to abide by the University's Academic Integrity Policy which prohibits cheating and other misconduct in student coursework. Publicly sharing or posting online any prior or current materials from this course (including exam questions or answers), is considered to be providing unauthorized assistance prohibited by the policy. Both students who share/post and students who access or use such materials are considered to be cheating under the Policy and will be subject to sanctions for violations of Academic Integrity.

### 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 providing 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 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/onlineteaching-evaluations.aspx> for additional information.

### Students with Disabilities

Students seeking disability-related accommodations are required to register with DePaul's Center for Students with Disabilities (CSD) enabling them to access accommodations and support services to assist with their success. There are two office locations:

- Loop Campus (312) 362-8002
- Lincoln Park Campus (773) 325-1677
- Email: [csd@depaul.edu](mailto:csd@depaul.edu)

Students who register with the Center for Students with Disabilities are also invited to contact Dr. Gregory Moorhead, Director of the Center, privately to discuss how he may assist in facilitating the accommodations to be used in a course. This is best done early in the term. The conversation will remain confidential to the extent possible. Please see <https://offices.depaul.edu/student-affairs/about/departments/Pages/csd.aspx> for Services and Contact Information.

## RESPECT FOR DIVERSITY AND INCLUSION AT DePAUL UNIVERSITY AS ALIGNED WITH OUR VINCENTIAN VALUES

At DePaul, our mission calls us to explore “what must be done” in order to respect the inherent dignity and identity of each human person. We value diversity because it is part of our history, our traditions and our future. We see diversity as an asset and a strength that adds to the richness of classroom learning. In my course, I strive to include diverse authors, perspectives and teaching pedagogies. I also encourage open dialogue and spaces for students to express their unique identities and perspectives. I am open to having difficult conversations and I will strive to create an inclusive classroom that values all perspectives. If at any time, the classroom experience does not live up to this expectation, please feel free to contact me via email or during office hours.

## PREFERRED NAME & GENDER PRONOUNS

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the quarter so that I may make appropriate changes to my records. Please also note that students may choose to identify within the University community with a preferred first name that differs from their legal name and may also update their gender. The preferred first name will appear in University related systems and documents except where the use of the legal name is necessitated or required by University business or legal need. For more information and instructions on how to do so, please see the Student Preferred Name and Gender Policy at <http://policies.depaul.edu/policy/policy.aspx?pid=332>

## COVID-19 HEALTH AND SAFETY PRECAUTIONS

The health and safety of everyone at DePaul depend on the cooperation of all who come to campus. By taking care of yourself, you protect the entire community. DePaul’s COVID-19 response plans are based on the latest guidance from the Centers for Disease Control and Prevention, the Chicago Department of Public Health and the university’s medical advisor from AMITA Health.

Mandatory protocols must be followed by DePaul students, faculty and staff at all times on both campuses <https://resources.depaul.edu/coronavirus/guidance/health-safetypractices/Pages/default.aspx>.