Math 121 – Introduction to Data Science
Wheaton College, Spring 2021

Instructor: Dr. Peter Jantsch (Office: Meyer 179)
Meeting Time: MWF 9:20-10:30AM, MEY 355
Virtual meeting links (Zoom) will be posted on the course website
Office Hours: See website
Email: `peter.jantsch@wheaton.edu`
Course Website: `https://math-121-spring-21.github.io`
TA: Chris Plimpton (`chris.plimpton@my.wheaton.edu`)

Required Materials: *The Foundations of Data Science*, Adhikari and DeNero
Available for free at `https://www.inferentialthinking.com/chapters/intro`
Note: All course resources, including a schedule, homework assignments, and grades will be posted on the course website and/or on Schoology. Students will need access to a laptop they can bring to class that can run statistical analyses with Python.

Recommended Reference: *Data Science from Scratch: First Principles with Python*, Grus (2nd edition)

Catalog Description: An introduction to statistics, sampling theory, and statistical decision making from a solid mathematical basis for non-mathematics majors. Topics treated include discrete and continuous distributions, moments, hypothesis testing, correlation and multiple correlation, regression (linear, non-linear, multivariate), ANOVA, contingency tables with tests for independence, sampling theory, and rudimentary non-parametric statistics. Students will use selected software packages for data processing and analysis.

Christ at the Core Outcomes: Student's will...

- describe phenomena using mathematical, computational, or symbolic tools (such as graphs, formulas, tables, diagrams, and algorithms).
- solve problems or draw evidence-based inferences about phenomena using a variety of mathematical techniques.
- communicate logical arguments using structured reasoning and quantitative information.

Learning Objectives: Student's will...

- Write correct small programs that manipulate and combine data sets and carry out iterative procedures.
- Extend a program with multiple functions so that it runs correctly with additional functionality.
- Calculate specified statistics of a given dataset.
- Identify the sources of randomness in an experiment.
- Formulate a null hypothesis that relates to a given question, which can be assessed using a statistical test.
- Carry out statistical analyses including computing confidence intervals and performing hypothesis tests in a variety of data settings.

- Given the result of a statistical analysis from the course, form correct conclusions about a question.
- Given a question and an analysis, explain whether the analysis addresses the question and how the analysis could change and still address the question.
- Articulate the benefits and limits of computing technology for analyzing data and answering questions.
- Correctly generate and interpret histograms, bar charts, and box plots.
- Correctly make predictions using regression and classification techniques.
- Assess the accuracy and variability of a prediction.

Communication Policy: Course content, an updated schedule, and links to the virtual class sessions will be available on the course website, while grades will be done through Schoology. **The best way to reach me is by email.** If I say something to you in person, feel free to remind me by email so I don't forget!

Content Delivery: All course lectures held in person will be simultaneously broadcast on Zoom, and recorded for those who are unable to attend synchronously. These recordings will be stored in a Box folder and made available through a link on the course website. In addition, I will post the course notes on the website following the class. Not everyone may attend class in person simultaneously, so you should anticipate attending class remotely periodcally. A rotating schedule of seating assignments for in person attendance will be available online; please check it before coming to class. Either myself or the TA will have extra office hours each week that give priority to the remote students.

COVID-19 Transition Plan: If necessary, we will hold all course lectures remotely over Zoom. These lectures will be recorded for those who cannot attend synchronously. Homework will be turned in electronically for the entire semester, and assessments such as quizzes, projects, labs, and any exams will be administered remotely.

Grading Policies: Tentative due dates and the recipe for your final grade are below. You can check your grades throughout the semester on the Schoology webpage. Due to FERPA privacy issues, I will only discuss grades in person, in virtual office hours, or through your official Wheaton email address.

Professionalism and Participation: 5%
Homework: 15%
Reading Quizzes: 5%
Labs: 20%
Project 1: 20% (Tentative due date: Mar 5)
Project 2: 20% (Tentative due date: Apr 6)
Final Project: 20% (Thursday, May 6, 10:30am)

Grades will be assigned on the following scale.

A (≥ 93); A- (90-92); B+ (87-89); B (83-86); B- (80-82); C+ (77-79); C (73-76); C- (70-72); D+ (67-69); D (63-66); D- (60-62); F (< 60).

Professionalism and Participation: This includes things like participating in class sessions, attending class according to the in-person attendance schedule and following the covid-safe protocols, and actively collaborating with your group on labs.

Quizzes and Homework: Homework assignments will be posted on the course website throughout the

semester. Assignments will consist of problems from the required textbook, and will be collected through upload to Schoology. If you handwrite your assignments, consider using the **Adobe Scan** app on your phone to create a .pdf file for submission.

I will also give in-class quizzes with problems similar to the assigned homework. You will not have to turn in any homework solutions for the material covered by the quiz. I will announce in advance whether a quiz or homework solutions are expected on the due date. Homework and quiz scores will be weighted equally, and the lowest two grades will be dropped.

Make-up quizzes and exams are only permitted under extenuating circumstances if proper documentation provided within one week of the missed assessment. Extenuating circumstances include illness, family emergencies, and College-sanctioned athletic or academic events.

Academic Integrity/Inclusive Language: Acts of plagiarism and cheating steal from others while compromising your own integrity. Plagiarism represents the work of others as your own without citing a reference to the real source. Cheating violates the conditions under which an intended task was to be completed. The College expects all members of our Christian community to maintain the highest levels of academic honesty. Instances of academic dishonesty will result in disciplinary action and will be reported to Student Development. For academic discourse, spoken and written, the faculty expects students to use gender inclusive language for human being.

Extra Help: Please do not hesitate to drop in during office hours (or other times—just email me!) to discuss a homework problem, coding issue, or any aspect of the course. In addition, the TA for this course will be providing weekly help sessions. A schedule for help sessions can be found on the course webpage.

Provisions for Students with Disabilities: Wheaton College is committed to providing reasonable accommodations for students with disabilities. Any student with a documented disability needing academic adjustments is requested to contact the Academic and Disability Services Office as early in the semester as possible. Please call `630.752.5615` or e-mail `las@wheaton.edu` for further information. If you have any needs in this area, you are responsible for communicating these to me at the beginning of the semester and you must give me 48 hours notice before each exam/quiz if special accommodations need to be made.

Confidentiality and Mandatory Reporting: As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a faculty member. I am required to share information regarding sexual misconduct about a crime that may have occurred on Wheaton College's campus with the College. Confidential resources available to students include Confidential Advisors, the Counseling Center, Student Health Services, and the Chaplain's Office. More information on these resources and College Policies is available at `www.wheaton.edu/sexualassaultresponse`.

Classroom Conduct

Attendance: Please check the course website for a schedule of which students may attend class in person on a given day. By attending in person you agree to follow all the rules regarding face coverings, entering and exiting the classroom, and cleaning your spaces and equipment. If you do not want to follow these requirements, you may attend class virtually. Do not come to class if you are exhibiting *any* symptoms of COVID-19.

Zoom Etiquette: It is important to me that the students joining remotely are involved in the class discussion. When joining class remotely via ZOOM, please join with your audio off. When you have a question during class you may (1) use the "CHAT to everyone" feature to type your question, (2) use the "raise your hand" feature and wait for me to call on you, or (3) unmute yourself, politely interrupt me, and I will pause and give you time to ask your question.

Entering/Leaving the classroom: Please enter and leave the classroom in the manner instructed to minimize close contact with others. Please clean your desk and work area before leaving

Technology: Laptops are only to be used for classrooms activities.

Face Coverings: In accordance with the Wheaton College Face Covering Policy and COVID-Safe, Thunder-Strong Commitment, signed by each student and faculty member, CDC-approved face coverings and social distancing are required while attending class. Failure to comply with wearing a face covering or social distancing will result in dismissal from the class session and an unexcused absence. Multiple violations can lead to dismissal from the class.