CSE 160: Introduction to Data Science

Fall 2019 – 1:35pm-2:25pm MWF – Neville 2

Catalog Description

Data Science is an interdisciplinary field focusing on the computational analysis of data to extract knowledge and insight. This course introduces the student to the collection, preparation, analysis, modeling and visualization of data, covering both conceptual and practical issues. Examples from diverse fields will be presented, and hands-on use of statistical and data manipulation software will be included.

Student Learning Outcomes

After taking Introduction to Data Science, you will:

i. Recognize the various disciplines that contribute to a successful data science effort.
ii. Understand the processes of data science: identifying the problem to be solved, data collection, preparation, modeling, evaluation and visualization.
iii. Be aware of validity challenges as well as ethical issues that arise in data science tasks.
iv. Develop an appreciation of the many techniques for data modeling and mining.
v. Be comfortable using computational tools such as the R language and its associated libraries for data analytics and visualization.

Prerequisites

CSE 2, 12 or BIS 335 or other programming experience (with permission of instructor)

Course Application

This course is one of many that count toward the Certificate in Business Analytics (for students in CBE) and is required for the Minor in Data Science (available to all undergraduates). It also counts as a Science and Technology course for CS majors (BS degree), and as a CS elective for the CS minor.

Contact Information

Prof. Brian D. Davison – http://www.cse.lehigh.edu/~brian/
E-mail: davison@cse.lehigh.edu or bdd3@lehigh.edu
Office Hours: see homepage above (or in Piazza)

Teaching Assistant: Dan Luo (dal417)
Graders: Zach Vinik (zjv220), Samuel Chebruch (sac320), and Jeff Gladstone (jag220)
Tutoring/Help/Office Hours: to be posted on Piazza

For fastest response, use the Piazza site to post your questions. You should get an answer quickly from the instructor, a grader, or a fellow student. Posts can be anonymous or private to the staff.

Online Resources

Homework, Projects, Grades: http://coursesite.lehigh.edu/
Announcements, Discussions, Notes: The Piazza plug-in within CourseSite.

Textbooks (required)

Data Science for Business. By F. Provost and T. Fawcett. O'Reilly, 2013. ISBN 978-1-449-36132-7.

An Introduction to Data Science. By J. Saltz and J. Stanton. Sage, 2018. ISBN 978-1-5063-7753-7.

Topics Expected to be Covered

Introduction to the field of data science; data collection; experimental design; data attributes; data cleaning; data characterization and analysis; data modeling and mining techniques; model evaluation; visualization; applications of data science; R scripting. Along the way we will also discuss aspects of privacy, security and social impacts. The course will also include a number of guest lecturers throughout the semester to introduce students to the variety of applications of data science.

Academic Honesty

Unless specifically permitted otherwise, the work you submit must be entirely your own. While we encourage you to discuss basic concepts and strategies with friends and classmates, the copying or sharing of solutions, in whole or in part, is never acceptable. Both the person receiving the copied work and the person providing the copied work are equally responsible. Such cases will be referred to the University Committee on Discipline and, if found guilty, you may be given a failing grade in the course (or worse). If you have questions about this policy at any point throughout the semester, ask. It is far better to be safe than sorry when your academic career may be on the line.

Attendance

Attendance is **required** for all class meetings and guest presentations, and will be tracked most days. Since most of the material is cumulative, a missed class will put you behind in a short time. However, life happens. To accommodate the expected conflicts and illnesses, you will receive **two personal days** to use at your discretion during the semester. **To use a personal day, simply do not show up to class. No excuse or justification need be given.** Any in-class assignments or participation grade that day will not count toward your total. If you miss additional days, those will be counted as a zero toward your participation grade. Exam days do not apply to this policy.

Grading

Grades will be a function of homework and quizzes (collectively worth 30%), class participation (10%) and exams. There may be one or two guest talks outside of class. Pop quizzes may occur at any time. You are responsible for everything that occurs in class as well as assigned readings. Late assignments will be penalized 10% per day, up to three days late; after that, no credit is possible.

There will be two in-class exams (20% each) and a final group project (20%). Exam dates are announced at the beginning of the semester. Missed exams without a legitimate excuse will result in a score of 0. Final letter grades are assigned at the discretion of the instructor (i.e., not always using a fixed metric).

Accommodations for Students with Disabilities

Lehigh University is committed to maintaining an equitable and inclusive community and welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact Disability Support Services (DSS), provide documentation, and participate in an interactive review process. If the documentation supports a request for reasonable accommodations, DSS will provide students with a Letter of Accommodations. Students who are approved for accommodations should share this letter and discuss their accommodations and learning needs with instructors as early in the semester as possible. For more information or to request services, please contact Disability Support Services in person in Williams Hall, Suite 301, via phone at 610-758-4152, via email at indss@lehigh.edu, or online at https://studentaffairs.lehigh.edu/disabilities.

Principles of Equitable Community

Lehigh University endorses *The Principles of our Equitable Community*. We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.

Last revised: 23 August 2019