CS 418: Introduction to Data Science
Syllabus
Fall 2019

Logistics, Staff, and Contacts

Lectures

Days: Tuesdays and Thursdays
Time: 02:00PM - 03:15PM (**Section A** - CRN: 42738, 42739)
05:00PM - 06:15PM (**Section B** - CRN: 44033, 44034)
Location: ARC 136

Students must attend the lecture for which they are registered.

Instructor

Gonzalo A. Bello

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Office: SEO 939
Office Phone: 312-413-5360
Office Hours: Tuesdays and Thursdays, 11:00AM - 12:00PM

Meetings outside office hours are available by appointment.

Teaching Assistants

Mahshid Hosseini

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Office Hours: TBD

George Maratos

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Office Hours: TBD

Course Website

Blackboard: uic.blackboard.com
Piazza: piazza.com/uic/fall2019/cs418
Gradescope: gradescope.com/courses/58907

All grades and course materials (lecture slides, lecture videos, assignments, etc.) will be posted on *Blackboard*.

Piazza will be used for all course-related discussion. Students are strongly encouraged to participate actively in the message boards. The teaching staff will monitor the message boards and endorse correct answers from students.

When posting, students should follow these guidelines:

- *Look before posting*; someone might have already answered the question.
- *Use an appropriate tag* (e.g., hw1, project1, exam, lecture).

- *Post publicly* so other students can benefit from the question. Use private messages only for grading issues or posts of a personal nature. Anonymous public messages are also possible.
- *Don't post answers to assignment questions*; instead, offer hints or clarifications of the material.

Please do not email the teaching staff directly; all communication will be handled through Piazza.

Course Description

Provides an in-depth overview of data science in engineering. Topics include modeling, storage, manipulation, integration, classification, analysis, visualization, information extraction, and big data in the engineering domain. *Course Information*: 3 undergraduate hours. 4 graduate hours. Extensive computer use required.

The topics covered in each lecture are shown in the course schedule.

"*The ability to manipulate and understand data is increasingly critical to discovery and innovation. As a result, we see the emergence of a new field—**data science**—that focuses on the processes and systems that enable us to extract knowledge or insight from data in various forms and translate it into action.… **[D]ata science** has evolved as an interdisciplinary field that integrates approaches from such data-analysis fields as statistics, data mining, and predictive analytics and incorporates advances in scalable computing and data management.*"

Berman, F., Rutenbar, R., Hailpern, B., et al., Realizing the Potential of Data Science

Course Objectives

Upon successful completion of this course, students should be able to:

- **Collect** and **integrate** data from multiple sources.
- **Prepare** data for analysis by detecting and correcting data quality problems and transforming data into an appropriate format.
- **Visualize** data to convey information to the viewer, such as patterns or trends.
- **Explore** data through summary statistics and visualization to understand and summarize its underlying structure.
- **Design** and **build** data models for analysis tasks, such as regression, classification, and clustering.
- **Evaluate** the results of data models, **analyze** their statistical significance, and **diagnose** their limitations, such as underfitting or overfitting.
- **Communicate** data analysis results through written reports and oral presentations.
- **Recognize** the advantages and disadvantages of existing frameworks for data storage and processing.
- **Understand** the ethical guidelines for the use of data and statistics.

Prerequisites

- CS 251: Data Structures.
- STAT 381: Applied Statistical Methods I, IE 342: Probability and Statistics for Engineers, or ECE 341: Probability and Random Processes for Engineers.

Textbook

No textbook is required.

Grading

Students are required to complete all assignments in order to receive full credit. The final grade will be determined by the following components:

Component	Quantity	Weight	Details
Lecture Assignments	~1 per class	5%	In groups, in class
Lab Assignments	9*/10**	15%	Individual
Homework Assignments	5*/6**	20%	Individual
Exam	1	20%	Individual, in class, closed book
Projects	3	25%	In groups
Final Project	1	15%	In groups

* For undergraduate students.
** For graduate students.

The final letter grade will be determined using the following scale:
90 ≤ **A** ≤ 100; 80 ≤ **B** < 90; 70 ≤ **C** < 80; 60 ≤ **D** < 70; 0 ≤ **F** < 60

Opportunities for extra credit may be offered at the discretion of the instructor.

Course Policies

Attendance

Attendance is **strongly recommended**. Students are responsible for making up any course material covered during missed classes.

Lecture Assignments

Lecture assignments will be completed at every lecture. Students must attend the lecture and participate in the assignment to receive full credit for that lecture. Students may miss **at most 5 lectures** without any grade penalty.

Lab Assignments, Homework Assignments, and Projects

Lab assignments must be submitted on *Gradescope*. Homework assignments and projects must be submitted on *Blackboard*. Lab assignments and homework assignments are individual. For projects, students must work in **groups of 3 students** composed of **one graduate student and two undergraduate students**. Further instructions for the submission will be given in each assignment or project.

Due dates for lab assignments, homework assignments, and projects are shown in the course schedule. **The deadline for submission is Sunday at 11:59PM (Central Time) on the week due**. Any deadline extensions are up to the discretion of the instructor and will be announced to the class.

Graduate students are required to submit all **6 homework assignments** and **10 lab assignments**. Undergraduate students are required to submit only **5 homework assignments** and **9 lab assignments**. If an undergraduate student submits all homework assignments or lab assignments, the **lowest one will be dropped at the end of the semester**.

Late Submissions

Late submissions of lab assignments and projects will be accepted **within 0-12 hours after the deadline with a 5-point penalty** and **within 12-24 hours after the deadline with a 20-point penalty**. No late submissions (penalty or not) will be accepted more than 24 hours after the deadline.

No late submissions will be accepted for homework assignments or for the final project.

Regrade Requests

Regrade requests for lab assignments and exams may be submitted on *Gradescope*. Regrade requests will **not** be accepted **more than one week** after grades for that lab assignment or exam have been posted.

To request a regrade, students must follow these guidelines:

- *Review the sample solution* to understand how to solve the assignment or exam.
- *Review the grading rubric* to understand how points were assigned.
- Based on the sample solution and the grading rubric, *write a clear and complete description* explaining **why** you should receive more points in the assignment or exam.

If students do not follow these guidelines, the teaching staff will dismiss their regrade request without further review.

Academic Honesty

Lab assignments, homework assignments, and exams are individual. Students are required to submit their own solutions and acknowledge any sources used. For projects, students must work in groups of 3 students.

Offering or receiving any kind of unauthorized or unacknowledged assistance (from students, friends, family, tutors, textbooks, or the Internet) **is a violation of the University's academic integrity policies**, will result in a grade of zero for the assignment and will be subject to disciplinary action (see **Academic Integrity** section below).

Academic Integrity

As an academic community, UIC is committed to providing an environment in which research, learning, and scholarship can flourish and in which all endeavors are guided by academic and professional integrity. All members of the campus community–students, staff, faculty, and administrators–share the responsibility of

insuring that these standards are upheld so that such an environment exists. Instances of academic misconduct by students will be handled pursuant to the Student Disciplinary Policy.

Religious Holidays

Students who wish to observe their religious holidays shall notify the faculty member by the tenth day of the semester of the date when they will be absent unless the religious holiday is observed on or before the tenth day of the semester. In such cases, the student shall notify the faculty member at least five days in advance of the date when he/she will be absent. The faculty member shall make every reasonable effort to honor the request, not penalize the student for missing the class, and if an examination or project is due during the absence, give the student an exam or assignment equivalent to the one completed by those students in attendance. If the student feels aggrieved, he/she may request remedy through the campus grievance procedure.

Disability Accommodation

UIC is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities. Students with disabilities who require accommodations for access to and/or participation in this course are welcome, but must be registered with the Disability Resource Center (DRC). Students may contact DRC at 312-413-2183 (v) or 773-649-4535 (VP/Relay).

For more information on UIC's policies on working with students with disabilities, please see the University's Guide for Accommodating Students.

Grievance Procedures

UIC is committed to the most fundamental principles of academic freedom, equality of opportunity, and human dignity involving students and employees. Freedom from discrimination is a foundation for all decision making at UIC. Students are encouraged to study the University's Nondiscrimination Statement. Students are also urged to read the University's Public Formal Grievance Procedures. Information on these policies and procedures is available on the website of the University's Office of Access and Equity.

Last Modified: August 25, 2019