Course Syllabus
INDS 4997: Capstone in Data Science
TuTh 2:00pm - 3:15pm, Cudahy Hall 131

Instructor: Daniel Rowe, Ph.D.
Email: daniel.rowe@marquette.edu
Website: www.mssc.mu.edu/~daniel
Office: CU 313
Office Hours: TuTh 11:30am - 12:30pm & 3:15pm - 3:45pm in CU 313

Bulletin Description:

Students in this course apply their knowledge of data science foundations, theory, and methods to address data-driven problems in academic and non-academic sectors. The course activities focus on a semester-length project that synthesizes statistical and computational challenges involved in solving real-world problems.

Learning outcomes: Students will learn to

- synthesize concepts from data science, including data analytics and visualization;
- learn to apply their exploratory data analysis skills to real-world projects;
- build an efficient and accurate prediction model;
- develop a project-appropriate plan and structure for data management;
- structure, manage and access one or more large, complex datasets;
- complete the analysis and interpretation of a complex, real-world data project; and
- present the analysis and interpretation of a complex, real-world data project in both written reports and oral presentations.

Prerequisite: Consent of MSSC or COSC department. Generally, MATH 3570 (or COSC 3570) and senior standing Data Science major.

Course Structure: Students apply their data science skills, statistical and computational, to real-world applications. Students work on a data project encompassing the entire semester either in an academic or non-academic setting, submit a complete report on the project, and present the results of their project to the class.

Websites: Course materials can be found on the D2L website: https://d2l.mu.edu/index.asp

Grading: Students will be graded based on the following factors:

- Homework 20%
- Team Project 25%
- Team Project Report 20%
- Group Presentation 15%
- Participation 20%

- *Homework:* A number of small homework assignments will be completed throughout the semester. These are meant to review material learned in previous courses and connect to realistic projects.
- *Team Project:* Student's will form groups of 2-3 students. Each group will design a project to analyze data sets. Students will be expected to develop a library and/or uses existing tools to their data of interest. Periodically throughout the semester students will provide updates on their project to the class. It is expected that there will be clear deliverables at the end of the project in the form of either a novel analysis or new packages. While working in groups each student will have distinct contributions to the project. Members of a team will receive the same project score if they contribute equally to all team deliverables. Failure to contribute will result in a lower score.
- *Team Project Manuscript:* The results of the team project will be written in a group manuscript that includes the parts of a field-specific journal article, including visualization of data analysis and description of any pipelines or tools developed. Students will be assigned specific sections of the manuscript and assessed on both their individual and group contributions using a rubric and peer assessment of contributions.
- *Group Presentation:* The results of the team project will be presented to the class at the end of the semester outlining the goals of the project, methodologies used, and outcomes.
- *Participation:* Participation will be assessed based on a combination of attendance, class preparation and equal participation in all group work.

Grading Scale:

A......95.00 – 100%	B- ....73.00 – 77.99	D+ .. 51.00 – 55.99
A- ....89.00 – 94.99	C+ ...67.00 – 72.99	D .....45.00 – 50.99
B+ ...84.00 – 88.99	C......62.00 – 66.99	F ......<44.99
B- ....78.00 – 83.99	C- ....56.00 – 61.99	

NO LATE HOMEWORK WILL BE ACCEPTED NOR WILL YOU BE ALLOWED TO MAKE UP MISSED WORK! Plan accordingly! It is better to submit something, even if it is incomplete.
You can scan your work and submit it as a PDF file, but make sure the PDF file is readable, before submission. Low quality scanned homework will be considered as NO submission.

Make-up Policy: There will not be any make-up exam or homework unless there is an emergency.

Expectations of Academic Honesty: This course will expect all students to follow University and College statements on academic honesty found in the Bulletin. Consequences of failure to follow these policies can range from an `F' on a assignment to removal from the University. If you have concerns or questions on this matter, talk to the instructor for clarification.

Important Note: I reserve the right to modify this syllabus at any time during the course of the term. If such a modification is substantial, I will reissue a revised syllabus.