Project in Applied Data Science

EGN 6XXX Section XXXX
Class Periods: TBD
Location: TBD
Academic Term: Spring 2026

Instructor:
Varied

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
Please contact through the Canvas website

- TBD

Course Description
Using concepts learned in prerequisite courses, including AI ethics, math foundations, applied data science, and machine learning, students will individually or as a team identify data science problems, formulate solutions, and apply data science knowledge in the context of a real-world project. Project requirements include preparing a plan, technical final report, delivering an oral presentation, and creating a software repository.

Course Pre-Requisites
The core courses listed below:

- EGS 6XXX AI Ethics for Tech Leaders
- CAP 5771 Applied Data Science
- EGN 6446 Mathematical Foundations for Applied Data Science
- EEE 6778 Applied Machine Learning II

Course Objectives
Develop problem-solving skills by building data-centric solutions that address practical, socially or scientifically relevant challenges. Emphasize real-world impact and the application of data science to benefit society. Develop an end-to-end project plan that includes clearly defined requirements and a realistic development timeline. Adapt to unforeseen difficulties through iterative refinement. Devise data pipelines or algorithms and implement them efficiently using well-documented, maintainable code. Design and execute reproducible experiments to rigorously evaluate the performance and effectiveness of deployed systems. Encourage interdisciplinary collaboration to enhance the relevance and reach of solutions across societal domains.

1. identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. communicate effectively with a range of audiences
4. recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. acquire and apply new knowledge as needed, using appropriate learning strategies

Materials and Supply Fees
None

Required Textbooks and Software

None

Recommended Materials
Course materials (notes, textbooks, programs) from the prerequisite courses.
The instructor will use material from the following website as well, which provides lectures on problem selection, data management, and picking a GPU to web deployment, monitoring, and retraining for full-stack applications.

https://fullstackdeeplearning.com/

Required Computer
UF student computing requirement: *https://news.it.ufl.edu/education/student-computing-requirements-for-uf/*.

Course Schedule
The course schedule is described below. Project teams will be guided and evaluated by their advisor in coordination with the instructor. A list of potential faculty advisors from different departments (and potentially outside the College) and identified by their area of interest will be provided to the students. The students will submit their top three advisor choices, and the instructor will decide on the final matching. Students may submit a proposed advisor if they already have the faculty approval. The instructor will be providing feedback throughout the course, will facilitate finding the advisor, and will provide short lectures related to each assignment. The advisor will advise the team on a regular basis; attend and provide feedback on the Mid-Project Review; attend and provide feedback on the Oral Presentation and AI System Demonstration; review the drafts of the Project Plan and the Final Report and approve the final versions; determine that the software has been uploaded, evaluate it, and approve a final version.

Week	Task	Detailed Description
1	Team Formation	Define Project and find an Advisor
2	Project Plan Submission	Write a Project Plan that includes both project requirements and software or software and hardware development plan. Obtain access to system if needed.
3	Project Setup	Obtain Final Approval of Project Plan. Set up repository. Work through initial steps of development plan. Clean Code. Meet with Advisor. Obtain access to data.
4	Project Development	Work through initial steps of development plan. Build tools for manipulating data. Clean Code. Meet with Advisor.
	First Quarter-project review	Discuss difficulties encountered in the development plan and/or team communications and how they were resolved or, if not, how you might resolve them.
5	Project Development	Work through (mitigated) initial steps of development plan. Conduct initial data cleaning or algorithm training and testing. Clean Code. Meet with Advisor.
6	Project Development, Clean Repository	Work through initial steps of development plan. Gather more data if applicable and continue data-driven experiments. Clean Code. Meet with Advisor. Make clean software in repository available to instructor and project advisor throughout the project.
7	Mid-project review	Discuss difficulties encountered and how they were resolved or, if not, how you might resolve them. Discuss detailed design of experiments.
8	Data-driven Experiments	Continue data-driven experiments or machine learning model training. Initiate system integration and/or simulation as needed. Clean Code. Meet with Advisor
9	Data-driven Experiments, System Integration	Conduct extensive data-driven experiments and system integration and/or simulation. Clean Code. Meet with Advisor
10	Data-driven Experiments, System Integration	Conduct extensive data-driven experiments and system integration and/or simulation. Clean Code. Meet with Advisor. Make software available to instructor and project advisor.

	Third Quarter-project review	Discuss difficulties encountered and how they might affect the project's objectives and/or evaluation metrics. Design a mitigation plan to address them, as needed.
11	Data-driven Experiments, System Integration	Conduct extensive data-driven experiments and system integration and/or simulation. Plan demonstration system. Clean Code. Meet with Advisor
12	Finalize Data-driven system	Build demonstration. Begin Final Report and presentation. Clean Code. Meet with Advisor.
13	Final Presentation	Demonstrate system and give oral presentation. Submit draft final report and oral presentation.
14	Final Report	Submit final report and finalize software in repository. Make final software available to instructor and project advisor.
15	Final Code & Report Revisions	Make changes to final report and software as required.

Attendance Policy, Class Expectations, and Make-Up Policy

Excused absences must be consistent with university policies in the Graduate Catalog (https://catalog.ufl.edu/graduate/regulations) and require appropriate documentation. Additional information can be found here: https://catalog.ufl.edu/graduate/regulations/

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Project Plan	100	20%
Mid-project review	100	10%
Oral Presentation, including demonstration	100	25%
Software in Repository	100	20%
Final Report	100	25%
Total		100%

Description of Assignments

Creating a data-centric solution is primarily a software engineering problem. The assignments are designed to promote the use of software engineering design principles. Some projects may involve software that enables control of hardware devices, such as robots or networks of communicating sensors for smart homes and cities. In what follows, we will use the phrase Software Engineering with the understanding that there may be Hardware components to the project. There are five components of software engineering comprise the graded activities in this course.

Project Plan.

The Project Plan is a document with two major sections: Requirements and Software Development Plan (SDP). The Problem Requirements section focuses on clearly identifying the inputs and outputs of the data-driven system. Inputs may include various sources of data such as publicly available datasets, real-time sensor feeds, web-scraped content, or streaming data from platforms like social media or autonomous vehicles. Outputs describe the system's expected behaviors or results, which can range from predictive or classification outcomes to more complex responses like decision-making sequences or user interactions through dashboards or conversational AI interfaces. The SDP provides a detailed technical roadmap for building the solution. It outlines the software architecture, data structures, and machine learning models that will be used to fulfill the requirements. This section also defines the data processing workflows, libraries, and tools selected for the project, along with storage formats and evaluation metrics. Additionally, it includes a structured timeline with clearly defined milestones to guide the development process and ensure that key objectives are met throughout the project lifecycle.

Mid-Project Review.

The Mid-Project Review consists of a document and presentation that includes a detailed discussion of the status of the milestones. If milestones that should have been achieved have not been achieved, then the Project Plan needs to be updated. The SDP and possibly the Requirements will need to be revised. Proposed revisions should be included in the document and presentation.

Oral Presentation and AI System Demonstration.
The Oral Presentation document (PowerPoint or keynote etc.) will describe steps leading to and the capabilities of the completed project as compared to requirements. The Demonstration involves running a version of the data-centric solution to show how the system meets the requirements. This version should demonstrate software/hardware interfaces if applicable.

Upload Software to Repository.
The final version of the software will be uploaded to a software repository, such as GitHub, in a form that can be downloaded and run without any other software. If hardware components are involved, they must be described in detail in the Final Report.

Final Report.
The Final Report is a document that describes the completed project more precisely than the oral presentation. It will include descriptions of which milestones were met, and which were revised. The revisions will be explained. The completed data-driven system can be described using information flow diagrams, pseudo-code, and discussion, with examples, of how to use it. An appendix will include a description of the software uploaded to the repository.

Cumulative assignment score will be computed as a weighted average of the individual assignment scores (each on the 100-point scale) using the above weights. Letter grades will be obtained by thresholding as follows:

Grading Policy
The following is given as an example only.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
UF Graduate Catalog
Grades and Grading Policies

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
- Your academic advisor or Graduate Coordinator
- HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu

• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:
Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://elearning.ufl.edu/.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*: https://distance.ufl.edu/getting-help/; https://distance.ufl.edu/state-authorization-status/#student-complaint.*