CS6440 Introduction to Health Informatics

Course Information

Course Prefix and Number: CS6440
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Section: O01
CRN: 83933
Semester: Fall
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Description

CS 6440: Introduction to Health Informatics is designed so that students with a variety of backgrounds can gain basic proficiency in health informatics. Health informatics encompasses the application of computing to: healthcare delivery; population and public health; community-based clinical research; and the potential for big data and analytics to transform the field. This is distinct from the related field of bioinformatics, which explores the role of computing in understanding the genomic and proteomic processes within cells.

During CS 6440, students will explore health information technology through working with lab assignments and a practicum project designed to provide hands-on experience with modern health informatics tools and systems. Students will get a chance to work closely with a TA mentor that will help guide them throughout the project and provide insights into the healthcare domain. Topics include health terminologies, the FHIR standard (Fast Healthcare Interoperability Resources), SMARTonFHIR, the OMOP Common Data Model and other OHDSI tooling, Artificial Intelligence/Machine Learning including LLM applications, and more.

For programming languages, all labs only require basic coding though touch upon a number of languages. Four out of six labs are in Python, with one lab each for JavaScript/Typescript and Java. All code should be accessible to any level of experience in specific languages as long as general coding principles are known.

Course Learning Outcomes

1. Students should have a general understanding of the technical side of the healthcare domain, such as terminology systems and major data standards.
2. Students should understand and be able to leverage the FHIR Interoperability Standard for healthcare data exchange.
3. Students should understand and be able to leverage the OMOP Common Data Model for research.
4. Students should be able to build secure healthcare applications and tools for clinical and/or research purposes using modern healthcare standards.

5. Students should understand how to leverage healthcare data standards, such as FHIR or the OMOP CDM, for AI/ML tasks.

Course Materials

No purchased materials are required for this course. (Note: For projects, students will be required to deploy their application on an accessible server, such as through a cloud service. Free providers or tiers are available and acceptable. Paid credits cannot be provided by the course.)

Grading Policy

Grading is on a points, not percentage, based scale.

- A final grade equal to or greater than 90 points (90 ≤ grade) will receive an A
- A final grade equal to or greater than 80 points to less than 90 points (80 ≤ grade < 90) will receive a B
- A final grade equal to or greater than 70 points to less than 80 points (70 ≤ grade < 80) will receive a C
- A final grade equal to or greater than 60 points to less than 70 points (60 ≤ grade < 70) will receive a D
- A final grade less than 60 points (grade < 60) will receive an F

No rounding is applied to grades. Grades are not curved. Extra credit may be available, allowing grades to exceed 100.

Attendance Policy

For on campus students, students are expected to attend class in order to earn full participation points.

For online students, there are no requirements to attend any scheduled sessions (e.g. Office Hours).

Academic Integrity Policy

All Georgia Tech students are expected to uphold the Georgia Tech Academic Honor Code. The majority of work for this class is to be performed individually. For the practicum project, all project related deliverables should be performed as a team.

Violations include:

- Copying, with or without modification, someone else's work when this work is not meant to be publicly accessible. (Example: a classmate's program or solution.)
- Submission of material that is wholly or substantially identical to that created or published by another person or persons, without adequate credit notations indicating authorship (plagiarism). (Example: copying code from a public source that is not included in the course materials or is otherwise official documentation without citing the source.)
- Asking for help with your code in a public forum (StackOverflow, Reddit, etc.) is disallowed.
- Posting any code publicly, either in course communication tools or outside of the course (e.g. public GitHub repositories), is also grounds for academic action unless explicitly stated as permissible, or if students are instructed to do so by instructional staff in limited circumstances where it may be required at a technical level. (Note: Unless it directly reveals solutions related to individual work, original project work may be allowed in public repositories as long as no other violations exist.)
- Use of Generative AI/LLMs/etc. tools such as GitHub co-pilot or GPT applications (e.g., ChatGPT) may produce answers or code that qualifies as plagiarism and is considered for limited use only. Use of answers or code produced wholly or substantially by any such tool is explicitly disallowed and considered an academic integrity violation. While the topic is covered in course material, students are enrolled in a specific capacity and the act of learning concepts is different from the act of using a tool professionally. This is, essentially, when students should learn how to responsibly use such tooling, including its limitations.
    - Note: Use of generative AI tools in the context of the practicum project may be more permissible. Students should consult with their mentors during project execution for situation clarification.
    - Gen AI tools may also be used for general pointers in the right direction, as long as students are not copying complete code as-is. (Example: tips on how to approach a particular generic task in Python.)

Note that students are encouraged to discuss problems and papers with others as long as this does not involve copying of code or solutions.