

College of Public Health
Fall 2025

SYLLABUS

Course Information:

HI 456 - Health Data Mining and Analysis; Section DL1
Location: Online

Instructor: Sanja Avramovic, Ph.D.

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Office Hours: Tuesday, 7pm (Zoom) and by appointment

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Office Hours available on Canvas

Course Description:

This course introduces students to data mining in health care. Methods for mining health care databases and synthesizing task-oriented knowledge from computer data and prior knowledge are emphasized. Topics include fundamental concepts of data mining, data preprocessing, classification and prediction, cluster analysis, and visualization. The course will provide an overview of practical tools for discovering knowledge from medical data.

Course Outcomes:

At the conclusion of the course students will be able to:

1. Describe data mining techniques and their use in knowledge discovery.
2. Define a health related problem to be solved by means of data mining.
3. Apply data preprocessing techniques to clean and prepare data sets for analysis.
4. Built and assess predictive models.
5. Develop skills of using recent data mining software for solving practical problems in health care.

Required Textbook(s) and/or Materials:

No textbook is required. Reading materials to be assigned at the professor's discretion.

Teaching Methods:

The class format will combine lectures, presentations and laboratory work:

- Learn one: online and in person interactive lecture.
- Teach one: Students teach the topic they have learned to one another.
- Do One: Laboratory work. Complete assignments during class time.

The class will be interactive and require every student to be engaged in the classroom discussion and assignments and to teach a topic they learned to one another

Prerequisites

HAP 361 Healthcare Databases (or CDS 302) is a required course that must be **completed prior** enrolling in the HAP 456 class.

Grading:

Assignments	% of the final grade	Description
Homework assignments, quizzes, and discussions	40	Each module has a homework assignment and/ or a quiz associated with it. A quiz has from 5 to 10 questions. You may use your notes to complete the quizzes. Assignments will cover material from the class. Students are required to complete all assignments one week after lecture day. Modules have a critical thinking discussion question associated with the particular topic. Original responses to each discussion question should be at least 1 paragraph long. Follow-up responses should be at least a short paragraph in length.
Midterm	20	Midterm will cover the material from the first part of the semester. The exam is timed, open-book, with full access to Internet, Google, and to the course web page. Do not rely on the open-book access as time limitations typically prohibit learning the content during the exam time.

Teach One	10	Each student is expected to not only learn the concepts in the course, and do the assignments, but also teach a portion of the course. Students are expected to teach by preparing a brief video. Students select which topic they wish to teach.
Final Exam	30	The exam will cover material from the second part of the semester. The final exam is timed, open-book, with full access to Internet, Google, and to the course web page. Do not rely on the open-book access as time limitations typically prohibit learning the content during the exam time.
Total	100	

Grading Scale:

Grade	Percentage
A	100-93
A-	92-90
B+	89-87
B	86-83
B-	82-80
C+	79-77
C	76-73
C-	72-70
D	69-60
F	59-0

Turnaround time for grading:

All activities/assignments completed and received by the due date will have grades posted in this course's Canvas Grade Center within 14 days of the due date. Late submission penalty is 20% of the grade.

Course Logistics:

In a typical week, you will:

- Participate in in person session
- Watch mini-lectures and videos

- Participate in online learning activities such as discussion board postings, and comprehension quizzes.
- Submit all assignments and/or tests through Canvas according to the assignment schedule.

Though the delivery method is different, it should take you the same amount of time as a typical undergraduate course. You should **expect to spend an average of 9 hours** each week (this includes the time you would have spent in a classroom).

Computer Requirements:

This is a computationally intensive course, and you are expected to access databases, software tools, and other contents. You will need:

- Fast computer (multicore PC or Mac) with at least 100GB of free disk space and at least 16GB RAM, Windows 10. Mac users may require more powerful computers to enable virtualization to run Windows.
- Fast internet connection
- Microsoft office for viewing and preparing files (free for GMU students)
- Good text editor: Notepad++, EditPad Pro, Text Wrangler, etc.
- Other software will be provided in class (SQL server, Weka, R, Python)

Academic Integrity:

Academic Standards exist to promote authentic scholarship, support the institution's goal of maintaining high standards of academic excellence, and encourage continued ethical behavior of faculty and students to cultivate an educational community which values integrity and produces graduates who carry this commitment forward into professional practice.

As members of the George Mason University community, we are committed to fostering an environment of trust, respect, and scholarly excellence. Our academic standards are the foundation of this commitment, guiding our behavior and interactions within this academic community. The practices for implementing these standards adapt to modern practices, disciplinary contexts, and technological advancements. Our standards are embodied in our courses, policies, and scholarship, and are upheld in the following principles:

- **Honesty:** Providing accurate information in all academic endeavors, including communications, assignments, and examinations.
- **Acknowledgement:** Giving proper credit for all contributions to one's work. This involves the use of accurate citations and references for any ideas, words, or materials created by others in the style appropriate to the discipline. It also includes acknowledging shared authorship in group projects, co-authored pieces, and project reports.
- **Uniqueness of Work:** Ensuring that all submitted work is the result of one's own effort and is original, including free from self-plagiarism. This principle extends to written assignments, code, presentations, exams, and all other forms of academic work.

Violations of these standards—including but not limited to plagiarism, fabrication, and cheating—

are taken seriously and will be addressed in accordance with university policies. The process for reporting, investigating, and adjudicating violations is outlined in the university's academic standards procedures. Consequences of violations may include academic sanctions, disciplinary actions, and other measures necessary to uphold the integrity of our academic community.

The principles outlined in these academic standards reflect our collective commitment to upholding the highest standards of honesty, acknowledgement, and uniqueness of work. By adhering to these principles, we ensure the continued excellence and integrity of George Mason University's academic community.

Student responsibility: Students are responsible for understanding how these general expectations regarding academic standards apply to each course, assignment, or exam they participate in; students should ask their instructor for clarification on any aspect that is not clear to them.

AI (Artificial Intelligence) Tools Policy:

Strict Use Policy: The use of generative AI tools (e.g., ChatGPT, Claude, Gemini) **is not permitted for any coursework** in this class unless explicitly authorized. Unauthorized use will be treated as a violation of academic standards.

Course Expectations:

Log-in Frequency: Students must actively check the course Canvas site and their GMU email for communications from the instructor, class discussions, and/or access to course materials at least 2 times per week.

Participation: Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.

Under no circumstances, may students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Technical Competence: Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.

Technical Issues: Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.

Workload: Please be aware that this course is not self-paced. Students are expected to meet specific deadlines and due dates listed in the Course Schedule section of

this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.

Instructor Support: Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.

Email Policy:

Please use the course email/messages system to communicate with the professor. This will allow me to answer your questions more quickly.

With this said, all students are required to activate and use their GMU email accounts. All correspondence related to the course, with the course faculty, GM advisors and students will utilize GMU email or email of instructor preference. It is the responsibility of the student to maintain their individual email account and check it frequently to read and respond to course and other official university correspondence.

Mason uses electronic mail to provide official information to students. Examples include notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback.

Students are responsible for the content of university communication sent to their Mason e-mail account and are required to activate that account and check it regularly. Students are also expected to maintain an active and accurate mailing address in order to receive communications sent through the United States Postal Service.

Late Assignments/Missed Quizzes:

If a graded assignment is late, it will be marked down 20 %; after one week no points will be earned. If there are unplanned extenuating circumstances (death in family, serious illness, traffic accident) and you are unable to complete the assignment on time, please e-mail the instructor as soon as possible to discuss a new deadline for the project. In some cases, the student will need to provide documentation regarding the circumstances that have prevented the assignment from being turned in on time. If unusual circumstances cause you to miss a quiz, please discuss the situation with the instructor; each case will be resolved in an individual manner.

Course Materials and Student Privacy:

Video recordings of class meetings that are shared only with the instructors and students officially enrolled in a class do not violate FERPA or any other privacy expectation.

Video recordings that only include the instructor (no student names, images, voices,

or identifiable texts) may be shared without violating FERPA (but see below, University Policies: Privacy, for some qualifications and recommendations)

All course materials posted to Canvas or other course sites are private to this class; by federal law, any materials that identify specific students (via their name, voice, or image) must not be shared with anyone not enrolled in this class.

Video recordings — whether made by instructors or students — of class meetings that include audio, visual, or textual information from other students are private and must not be shared outside the class Live video conference meetings (e.g., Teams, Zoom, etc.) that include audio, textual, or visual information from other students must be viewed privately and not shared with others in your household or recorded and shared outside the class.

Accommodation for Students with Disabilities:

Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University.

If you are seeking accommodations, please visit the Disability Services website for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu . Phone: (703) 993-2474.

Student responsibility: Students are responsible for registering with Disability Services and communicating about their approved accommodations with their instructor in advance of any relevant class meeting, assignment, or exam

Title IX Resources and Required Reporting:

As a part of George Mason University's commitment to providing a safe and non-discriminatory learning, living, and working environment for all members of the University community, the University does not discriminate on the basis of sex or gender in any of its education or employment programs and activities. Accordingly, all non-confidential employees, including your faculty member, have a legal requirement to report to the Title IX Coordinator, all relevant details obtained directly or indirectly about any incident of Prohibited Conduct (such as sexual harassment, sexual assault, gender-based stalking, dating/domestic violence). Upon notifying the Title IX Coordinator of possible Prohibited Conduct, the Title IX Coordinator will assess the report and determine if outreach is required. If outreach is required, the individual the report is about (the "Complainant") will receive a communication, likely in the form of an email, offering that person the option to meet with a representative of the Title IX office.

For more information about non-confidential employees, resources, and Prohibited Conduct, please see University Policy 1202: Sexual and Gender-Based Misconduct and Other Forms of Interpersonal Violence. Questions regarding Title IX can be directed to the Title IX Coordinator via email to TitleIX@gmu.edu , by phone at 703-993-8730, or in person on the Fairfax campus in Aquia 373.

Student opportunity:

If you prefer to speak to someone confidentially, please contact one of Mason's confidential employees in Student Support and Advocacy (SSAC), Counseling and Psychological Services

(CAPS), Student Health Services (SHS), and/or the Office of the University Ombudsperson.