HEALTH DATA SCIENCE (HDS)

Visit the Course Schedule Search website to find out when courses will be offered during the academic year.

Read more about the courses within this subject prefix in the descriptions provided below.

HDS 801 - The U.S. Healthcare System
Credits: 3
Focuses on the organization, financing, and delivery of healthcare in the U.S. Contrasts the private and public sectors and examines the effects of market competition and government regulation. Examines the ways that medical providers are paid, and explores the major issues currently facing physicians, hospitals, and the pharmaceutical industry. Discusses several potential small-scale and large-scale reforms to the healthcare system and evaluates their likely effects on healthcare spending, quality of care, and access to care.
Equivalent(s): ADMN 801
Grade Mode: Letter Grading

HDS 802 - Programming in Healthcare Environments
Credits: 3
This course covers using Python as a programming language to write, implement, and design programs that are relevant to various aspects of programming in a health setting. After completion of this course, students should be comfortable with the basic data structures in Python and R (including arrays, dictionaries, and dataframes), conditional logic and iterators, writing Python and R functions, and using Python libraries to read external data and perform data manipulations and data analysis.
Grade Mode: Letter Grading

HDS 803 - Translation of Health Data
Credits: 3
This course will give you the skills you need to leverage data to reveal valuable insights and advance your career. This course teaches you the visualization skills necessary to be effective Data Storytellers which helps engage your audience in a story about the data. This course focuses on concepts as well as hands-on experience of presenting data from initial concepts to final presentation by creating meaningful displays of quantitative and qualitative data to facilitate peer/managerial decision making.
Prerequisite(s): HDS 801 with a minimum grade of B-.
Grade Mode: Letter Grading

HDS 804 - Health Data Systems
Credits: 3
In this course, students will learn the landscape of data used in healthcare settings, engage in active case applications and case studies, and propose a decision support system improvement. It examines modern decision support systems, types of applications, both mobile and web based, enterprise versus cloud-based systems. Specifically examined will be the Electronic Health Record (EHR) and other clinical and administrative information systems. Also examined will be interoperability and regulatory requirements.
Prerequisite(s): HDS 801 with a minimum grade of B-.
Grade Mode: Letter Grading

HDS 805 - Applied Machine Learning in Healthcare
Credits: 3
This course covers the foundations of machine learning in healthcare systems including algorithms related to classification and regression prediction in supervised setting, clustering and dimension reduction in an unsupervised setting. Topics include data preprocessing and classification techniques such as logistic regression, support vector machines, KNN, Na'ive Bayes', ensemble methods such as random forests, boosted trees, XGBoost, dimension reduction techniques such as principal components analysis, t-distributed scholastic neighborhood embedding, ISOMAP, locally linear embedding, UMAP, multidimensional scaling.
Prerequisite(s): HDS 800 with a minimum grade of B- and HDS 801 with a minimum grade of B- and HDS 802 with a minimum grade of B-.
Grade Mode: Letter Grading

HDS 806 - Outcomes Research
Credits: 3
This course examines the evidence developed through the lens of outcomes research relative to clinical care and public/population health initiatives. It explores the development of study design, developing a workable research question and associated proposed study methods. The course explores frequently used study designs, techniques for evaluating/selecting health outcomes measures, and analytical approaches appropriate to conducting health outcomes research. Students will construct an independent research protocol, which will be developed in increments as course evolves.
Prerequisite(s): HDS 804 with a minimum grade of B-.
Grade Mode: Letter Grading

HDS 807 - Unstructured Health Data
Credits: 3
This course covers the essential unstructured data formats, storage platforms and methods of retrieving and analyzing such data in the healthcare system. Specifically, the course will cover electronics health records, patient health portals, telemedicine videos, ICU sensor data, genomic data, biomedical literature, social media data, biomedical image data and physician notes.
Prerequisite(s): HDS 805 with a minimum grade of B-.
Grade Mode: Letter Grading

HDS 808 - The Successful Healthcare Project
Credits: 3
This course supports the design and initiation of the Practicum Health Data Science project required for completion of the Master of Health Data Science program. Students may elect to enroll in this course before beginning the practicum or concurrently with the practicum. The course covers definition of a high value research topic, development of a project plan and project launch. Students will complete key project milestones including negotiation of a project charter, development of an approved analysis plan, and demonstrate access to required data.
Prerequisite(s): HDS 800 with a minimum grade of B- and HDS 801 with a minimum grade of B- and HDS 802 with a minimum grade of B- and HDS 803 with a minimum grade of B-.
Grade Mode: Letter Grading

HDS 890 - HDS Independent Study
Credits: 3-6
This course will be designed by the student and the instructor. Course topics and deliverables will be established together and approved by the supervising faculty. Credit hours (not to exceed 6-credit hours) will be determined by the supervising faculty based on the size and scope of the student's intended project.
Grade Mode: Letter Grading