

HEALTH DATA SCIENCE, M.S.

The Master of Science program in health data science is designed to prepare students for a career in today's data-driven health care industry. Successful data scientists possess an artful ability to blend, synthesize and communicate data for use in clinical decisions by patients and providers as well as advancing quality improvement efforts across health systems.

The Health Data Science curriculum and academic training compliments other existing programs and course offerings at Saint Louis University, including Health Informatics (Doisy College of Health Sciences), Biostatistics (College for Public Health & Social Justice), and Biomedical Informatics and Computational Biology (College of Arts & Sciences). Students will have the opportunity to take courses from each of these programs.

Curriculum Overview

The goal of the M.S. in Health Data Science program is to provide graduates with the expertise and necessary skills needed to manage, manipulate and analyze large-scale clinical and operational databases.

Most core courses will be offered onsite during hours convenient to working professionals. Some core and elective courses will be available through SLUCOR's established online graduate programs. The program may be completed on a full-time or part-time basis.

Students complete 30 credits of coursework across three integrated areas of study:

Applied Statistics

Build capabilities to ask critical questions and draw conclusions from large, complex data with a variety of analytic methods, including predictive modeling, machine learning and data visualization. The program incorporates new software regularly to promote sharp and current analytic skills.

Practical Computing

Learn a diverse set of open source and proprietary software required to link data from disparate sources such as electronic medical records, insurance claims, operations data, patient registries and personal health devices. This software includes R, Python, SAS, SQL and Hadoop.

Health Science Applications

Respond to the challenges of a regulated, dynamic industry by understanding unique health care contexts such as privacy protection, government financing, risk contracting, performance monitoring and population health management.

Fieldwork and Research Opportunities

The Master of Science (M.S.) in Health Data Science program offered by SLUCOR will provide traditional students and working professionals with the expertise and hands-on skills needed to meet this increasing demand in the healthcare systems. Focus will be placed on highly sought-after skills in health data manipulation, data visualization, data mining, machine learning and predictive analytics. Students will build programming skills in R, SAS, SQL and Python; as well as gain experience working with advanced computing tools such as Hadoop and MapReduce. This program capitalizes on the existing teaching

and research strengths of current SLUCOR faculty, most of whom have experience in the corporate world, in addition to academia.

Careers

After graduating with an M.S. in health data science from SLU, students will be prepared for a career as a data scientist. Data scientists blend, synthesize and communicate data for use in clinical decisions by patients and providers and are able to advance quality improvement efforts across health systems.

Admission Requirements

Application Requirements

- Application form and fee
- Transcripts from most recent degree(s)
- Professional statement
- Résumé or curriculum vitae
- Three letters of recommendation

Requirements for International Students

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency (<http://catalog.slu.edu/academic-policies/office-admission/graduate/english-language-proficiency>)
- Proof of financial support must include:
 - A letter of financial support from the person(s) or sponsoring agency funding the time at Saint Louis University
 - A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include the courses taken and/or lectures attended, practical laboratory work, the maximum and minimum grades attainable, the grades earned or the results of all end-of-term examinations, and any honors or degrees received. WES and ECE transcripts are accepted.

Application Deadline

Applications to the program are considered on a rolling basis.

Scholarships and Financial Aid

For more information, visit the student financial services office online at <http://finaid.slu.edu>.

Learning Outcomes

1. Graduates will be able to identify and define an analytic/operational question.
2. Graduates will be able to apply appropriate statistical methods.
3. Graduates will be able to apply appropriate data management strategies.
4. Graduates will be able to critically evaluate methodological designs.
5. Graduates will be able to understand organization and financing of healthcare, and resulting data sets.
6. Graduates will be able to effectively communicate results of analyses.

Requirements

Code	Title	Credits
Applied Statistics Courses		
HDS 5310	Analytics and Statistical Programming	3
HDS 5320	Inferential Modeling	3
HDS 5330	Predictive Modeling and Machine Learning	3
Practical Computing Courses		
HDS 5210	Programming for Health Data Scientists	3
ORES 5160	Data Management	3
HDS 5230	High Performance Computing	3
Health Science Applications Courses		
HDS 5130	Healthcare Organization, Management, and Policy	3
ORES 5300	Foundations of Outcomes Research I	3
ORES 5210	Foundations of Medical Diagnosis and Treatment	3
<i>Capstone Experience</i>		
HDS 5960	Capstone Experience	3
Total Credits		30

Continuation Standards

Students must maintain a cumulative grade point average (GPA) of 3.00 in all graduate/professional courses.

Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

Course	Title	Credits
Year One		
Fall		
ORES 5300	Foundations of Outcomes Research I	3
HDS 5310	Analytics and Statistical Programming	3
Credits		6
Spring		
ORES 5210	Foundations of Medical Diagnosis and Treatment	3
HDS 5210	Programming for Health Data Scientists	3
Credits		6
Summer		
HDS 5320	Inferential Modeling	3
Credits		3
Year Two		
Fall		
ORES 5160	Data Management	3
HDS 5330	Predictive Modeling and Machine Learning	3
Credits		6

Spring

HDS 5230	High Performance Computing	3
HMP 5000	Health Care Organization	3
Credits		6
Summer		
HDS 5960	Capstone Experience	3
Credits		3
Total Credits		30