

# Master of Science in Health Delivery Science



**STUDENT COURSE CATALOG**

2022-2024

## Accreditation

The Cedars-Sinai Graduate School in Biomedical and Translational Science is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC).

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## QUESTIONS?

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MHDS Program Coordinator  
[Mechauna.Thierry@CSHS.org](mailto:Mechauna.Thierry@CSHS.org)

# STEPS TO DEGREE



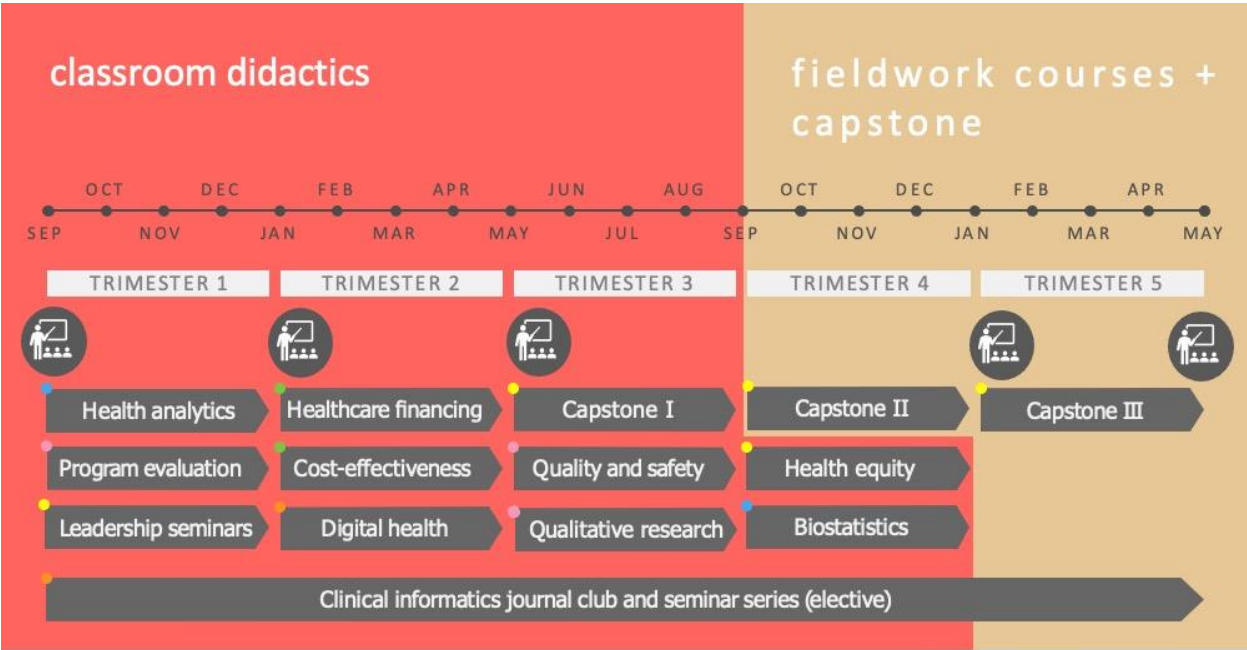


The MHDS program consists of 13 required courses and one elective course over five consecutive trimesters. Students complete didactic coursework within the first 16 months of the program while also pursuing an independent capstone project under the guidance of an assigned faculty mentor. All required courses are taught in the evenings to accommodate students with daytime commitments. The MHDS program features a diverse combination of pedagogical approaches, including traditional classroom didactics, interactive didactics, hands-on laboratory sessions, journal clubs, project sessions work and immersed experiential learning within embedded research and operational teams. In this hybrid program, courses will primarily be taught online through a remote-learning platform and interactive videoconferences in the evenings. Online learning will be supplemented by one 2-day (Thursday-Friday) in-person session during each term. In this session, students will be introduced to the program and coursework, will meet with faculty mentors, will attend networking events and will learn how to use various software programs. In addition, students will give a final, in-person presentation to Cedars-Sinai leadership about the results of their capstone project. The MHDS faculty believes it is vital to expose students to a wide range of learning experiences. Success in health delivery science requires a strong theoretical basis and pragmatic experiential learning to solidify classroom theory. In addition, students learn specific software programs, including statistical, data visualization, decision analysis and spreadsheet software that is taught in laboratory sessions. We accept a limited number of students per year into this highly competitive program.

### Program Objectives

After completing the MHDS program, students will be able to:

- Explain key operational functions of the U.S. health system.
- Identify healthcare delivery models and digital health innovations that can improve the quality, safety and value of care.
- Use quantitative and qualitative research methods to evaluate the effectiveness and economic impact of healthcare innovations.
- Demonstrate the leadership skills to successfully manage a project that involves people from diverse disciplines.
- Communicate effectively about healthcare delivery interventions to diverse stakeholders.



- data analytics core
- health informatics core
- healthcare financing core
- performance and measurement improvement core
- capstone project and leadership seminars

**program in brief**

20-MONTH PROGRAM



**FIRST 16 MONTHS**  
WEEKNIGHT ONLINE CLASSES



**LAST 8 MONTHS**  
CAPSTONE PROJECT & FIELDWORK COURSE



**RESIDENTIALS**  
IN PERSON CLASSES & NETWORKING

# PROGRAM OVERVIEW

## FIRST YEAR OF PROGRAM

### Trimester 1 (August to December)

- HDS 200A - Health Analytics (2 Credit Hour)
- HDS 204A - Topics in Healthcare Leadership (1 Credit Hour)
- HDS 203A - Program Evaluation and Applied Epidemiology (2 Credit Hour)
- **HDS 201B - Clinical Informatics and Journal Club (Elective)** (1 Credit Hour)

### Trimester 2 (January to April)

- HDS 201A - Principles and Practice of Digital Health Science (2 Credit Hour)
- HDS 202B - Principles and Practice of Cost-Effectiveness Analysis & Budget Impact Modeling (2 Credit Hour)
- HDS 202A - Healthcare Financing and Value (1 Credit Hour)
- **HDS 201B-Clinical Informatics and Journal Club (Elective)** (1 Credit Hour)

### Trimester 3 (May to August)

- HDS 203B - Introduction to Quality, Safety and Performance Improvement (2 Credit Hour)
- HDS 204B - Applied HDS: Capstone (4 Credit Hour)
- HDS 203C - Qualitative Research (1 Credit Hour)
- **HDS 201B - Clinical Informatics and Journal Club (Elective)** (1 Credit Hour)

## SECOND YEAR OF PROGRAM

### Trimester 4 (August to December)

- HDS 200B - Introduction to Biostatistics and R (2 Credit Hour)
- HDS 204C - Applied HDS: Capstone (7 Credit Hour)
- HDS 204E - Health Equity (1 credit hour)
- **HDS 201B - Clinical Informatics and Journal Club (Elective)** (1 Credit Hour)

### Trimester 5 (January to April)

- HDS204D - Applied HDS: Capstone and Presentation to Leadership (7 Credit Hour)
- **HDS 201B - Clinical Informatics and Journal Club (Elective)** (1 Credit Hour)

*\*Course that are Bold are Optional.*

## COURSE DESCRIPTIONS

### Data Analytics Core

The Data Analytics Core is one of the 4 required core elements of the MHDS curriculum. This core comprises 2 courses: Health Analytics: Collecting, Analyzing and Visualizing Big Data in Healthcare; and Introduction to Biostatistics.

#### HDS 200A • Health Analytics: Collecting, Analyzing and Visualizing Big Data in Healthcare

Introduces students to the evolving concepts of big data and reviews how networks of data inform healthcare analytics. The overarching goal of HDS 200A is for students to gain familiarity with modern health analytic techniques.

For some of these techniques, the objective will be to develop mere familiarity and knowledge about how the technique is used, what questions it can answer and who to talk to if students ever want to employ the technique—for example, ATLAS.ti coding of text data and performance of computerized conjoint analysis.

For other techniques, the objective is to acquire hands-on skills—for example, data importing, analysis, visualization and reporting using Microsoft Excel and Tableau. In all cases, students will think critically about how to use these techniques to build a more efficient, more effective and less expensive healthcare system.

#### HDS 200B • Introduction to Biostatistics

Builds off HDS 200A by introducing students to key principles of biostatistics, including confounding, bias, descriptive statistics, hypothesis testing, confidence intervals, power calculations, t-test and chi-squared tests, analysis of variance and multiple linear, and logistic regression analysis.

The course includes lab sessions to familiarize students with using statistical software programs.



## Healthcare Financing Core

The Healthcare Financing Core is 1 of the 4 required core elements of the MHDS curriculum. This core comprises 2 courses: Healthcare Financing and Value; and Principles and Practice of Cost-Effectiveness Analysis.

### HDS 202A • Healthcare Financing and Value

Provides an overview of how healthcare is financed in post-ACA America. The class reviews the major payer sources (Medicare, Medicaid, sponsored insurance, ACA plans), presents traditional and alternative payment models, compares volume-based versus value-based payment systems, and discusses how ACOs deliver and finance population health.

Students learn how to analyze healthcare costs and quality from the perspective of different health system stakeholders, including public and private payers; primary care and specialty physicians; hospitals and post-acute care providers; pharmaceutical manufacturers and distributors; and patients. Students also learn about the organizational changes occurring in the health system associated with changes in healthcare financing.

### HDS 202B • Principles and Practice of Cost-Effectiveness Analysis and Budget Impact Modeling

The class provides students with an introduction to the theory, techniques and practical issues surrounding model development for health economic analysis, with a focus on development and testing of decision trees. Other topics include systematic review and meta-analysis, health status measurement with utilities, budget-impact modeling, and quality assessment of health economic models.

The class consists of interactive lectures supported by hands-on laboratories and reading assignments to



become familiar with TreeAge decision-analysis software. Students will learn about tools to determine how best to balance limited resources with demands to deliver high-quality care. The course surveys the fields of statistics, psychometrics, decision analysis, information technology, epidemiology and medicine to illustrate how employing decision science can allow us to make the best possible healthcare decisions when the stakes are high.

Students will develop a strong understanding of the theory and practice of basic decision analysis and the ability to read articles in the field critically. Finally, students receive training to produce their own health-economics models to help healthcare organizations decide whether to fund (or defund) new programs or interventions using varying payer perspectives.



## Health Informatics Core

The Health Informatics Core is 1 of the 4 required core elements of the MHDS curriculum. This core comprises 2 courses: Principles and Practice of Digital Health Science; and Clinical Informatics Journal Club and Seminar Series.

### HDS 201A • Principles and Practice of Digital Health Science

Explore how digital interventions are being employed to drive clinical decisions and offer value to healthcare organizations, their patients and their staffs. Digital health is a broad term that encompasses use of digital devices and platforms, including electronic health records (EHRs), patient-provider portals, mobile health (mHealth) applications and wearable biosensors to improve process and outcomes. The course begins by focusing on the revolution in remote patient monitoring made possible by ubiquitous broadband networks and wide penetration of smartphones. (Over 80% of the U.S. population now owns a smartphone.)

In addition, it is now possible to supplement patient reported outcomes (PROs) with additional data from remote monitoring, such as from wearable biosensors. Specialized, medical-grade sensors are increasingly approved by the Food and Drug Administration and are useful to monitor physiologic data, from glucose levels to brain function to medication adherence.

The class will also cover the burgeoning ecosystem of mobile health apps, including patient-facing, provider-facing and patient-provider smartphone apps. We will review best practices for mHealth app development and review example of apps that worked—and didn't.

Students will learn how to develop, test and scale apps for patients and providers. We will also review issues surround data security, data storage and data sharing using mHealth applications, and discuss their role within the domain of consumer health informatics.

The class will next explore electronic health records (EHRs), including patient-provider portals. The class will review the different EHR architectures, benefits of cloud-based vs. fixed EHR systems, and ways to leverage the EHR to improve the value of care.

We will then examine technologies gaining traction in digital health, including telemedicine, virtual-reality interventions, and social media, among others. We consider these examples within a framework for making smarter decisions in the age of digital health—a model that brings together what the clinician knows, what the patient wants and what the technologies predict.

In all cases we will explore real-life case studies at Cedars-Sinai and beyond, learning from practitioners in the field using digital health in the clinical trenches.

### HDS 201B • Clinical Informatics Journal Club and Seminar Series

Complements HDS 201A. Students meet once a month for interactive sessions to discuss topics in health informatics and health-delivery science by reviewing new literature using a journal club format.

## Performance Measurement & Improvement Core

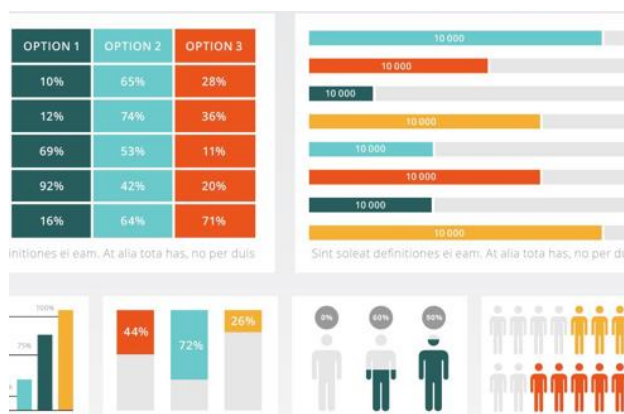
The Performance Measurement and Improvement Core is 1 of the 4 required core elements of the MHDS curriculum. This core comprises 4 courses: Program Evaluation and Applied Epidemiology, Quality, Safety and Performance Improvement, Qualitative Research and Health Equity

### HDS 203A • Program Evaluation and Applied Epidemiology

Class topics include using epidemiological methods to evaluate the impact of health interventions on healthcare utilization and quality of care, among others.

The class begins by defining the field of outcomes research and then addresses how healthcare systems measure outcomes and why it matters. Students then explore the difference between randomized controlled trials and pragmatic controlled trials.

HDS 203A explores quasi-experimental designs frequently required for program evaluation, such as interrupted time series and difference-in-difference designs. The course also explores the influence of bias on data interpretation (e.g., selection bias, confounding, attrition and participant bias).



### HDS 203B • Introduction to Quality, Safety and Performance Improvement

Explore issues related to quality and safety in healthcare. The overarching goal of HDS 203B is to introduce the theory and practice of quality measurement. Three scientific disciplines are presented: quality measurement, quality improvement and program evaluation. The class also explores contextual factors that influence quality of care, including health policy and payment incentives, health information technology and controversies such as physician autonomy in an increasingly systematized healthcare environment.

Course material is closely linked to real-world applications, with examples drawn from ongoing hospital, health system and policy initiatives from around the country. Students learn via interactive lectures, journal club sessions analyzing relevant articles, homework assignments, and an in-depth course project. Topics include the different types of measures (e.g., structure, process, outcome), data sources that can be used for measurement (e.g., claims data, electronic health record data, medical record data and patient outcome data), attributes of measures and data sources required to be valid reflections of quality, approaches to quality measure development and quality measures of importance nationally (e.g., HEDIS measures, Medicare quality measures for hospitals, etc.).

Additionally, the course covers strategies for changing clinical practice and improving quality, a field increasingly referred to as implementation science. Diverse schools of thought are drawn upon, including management science, behavioral economics, organizational psychology and performance improvement techniques (e.g., Lean Six Sigma). Evidence from applications to healthcare systems is reviewed, particularly systematic reviews from the Cochrane Collaboration.

## HDS 203C • Qualitative Research

Introduces students to the field of qualitative research. The course aims to build understanding of the traditions of qualitative research, and provide hands-on training in designing rigorous qualitative research, conducting data collection, and interpreting qualitative findings. To achieve these aims, students will develop “mock” qualitative research projects focusing on different qualitative methods.



## HDS 203D • Health Equity

This course will provide learners the opportunity to examine overarching principles and considerations on how the US health care system and other systems impact health, either enhancing or undermining it. A careful analysis of the role of structural racism and discrimination will lay the foundation for the course. In addition, in-depth discussions on how to capture and interpret racial/ethnic/sexual and gender minority data will be included. Further, strategies for engaging community stakeholders in health equity research will be discussed, including a review of evidence-based interventions that aim to help address, understand, and possibly reduce health inequities. Lastly, the roles and responsibilities of all health care providers and researchers in closing the equity gap will be widely discussed throughout the course. By the end of the course, learners should have a broad understanding of how social determinants impact health equity, as well as potential mitigation strategies to reduce inequities.

## Capstone Project

To complete the MHDS program, students spend 12 months applying classroom theory to the subject of their choosing and produce a presentation about the experience.

The HDS 204 series includes four lockstep courses that build upon one another and culminate in completion of the capstone, delivery of a final written report and oral presentation of the report to Cedars-Sinai leaders. The sequence is as follows:

## HDS 204A • Topics in Healthcare

Students attend a biweekly seminar in healthcare leadership, where they develop a framework to assume a leadership role in the capstone project as a model for leadership in future organizations. The seminar series consists of highly engaging, interactive didactic sessions that promote discussion and learner engagement. During each session, leaders from diverse areas of the organization share their experience and expertise. Additionally, students prepare presentations based on assigned reading materials, which are followed by interactive discussions about leadership and personal development.

## HDS 204B • Applied HDS: Capstone I

Project identification and literature review. Students will work with their mentor and an assigned peer-partner to identify an area of opportunity within a healthcare organization that they wish to analyze for their capstone project. They will also perform a literature search to familiarize themselves with the

subject. The course culminates in a formal work-in-progress presentation to the course directors and other students.

### **HDS 204C • Applied HDS: Capstone II**

Stakeholder analysis and development of quantitative analysis plan. Students will identify relevant stakeholders for their project and will perform stakeholder interviews. Students will also develop a plan for the quantitative analysis they will perform during the final step of their capstone project. The course culminates in a formal work-in-progress presentation to the course directors and other students.

### **HDS 204D • Applied HDS: Capstone III and Presentation to Leadership**

Quantitative analysis and final report. Students will perform a quantitative analysis of their choosing, such as a cost-effectiveness analysis, an analysis of existing data, or a meta-analysis. The course culminates in a



# KEY FACULTY

## PROGRAM LEADERSHIP DIRECTORS



**Brennan Spiegel, MD, MPH**  
MHDS Program Director



**Christopher V. Almario MD, MSHPM**  
MHDS Program Associate Director

## COURSE DIRECTORS

**Brennan Spiegel, MD, MPH**  
Course Director for HDS 200A, HDS 201A  
Course Co-Director for HDS 202B

**Celina Shirazipour, PhD**  
Course Director for HDS 203C and 204A  
Course Co-Director for Capstone series

**Christopher V. Almario, MD, MSHPM**  
Course Co-Director for HDS 202B  
Course Co-Director for Capstone series

**Carl Berdahl, MD, MS**  
Course Co-Director for HDS 203B

**Laura Finster, MPH**  
Course Director for HDS 203D

**Lisa Masson, MD, MBA**  
Course Director for HDS 201B

**Jim Mirocha, MS**  
Course Co-Director for HDS 200B

**Gillian Gresham, PhD**  
Course Director for HDS 203A  
Course Co-Director for Capstone series

**Marie Lauzon, MS**  
Course Co-Director for HDS200B

**Thomas M. Priselac**  
Co-Instructor for HDS 200A, 201A, 202A

**Loretta So, PhD, MSN**  
Course Co-Director for HDS 203B

**Doug Sturnick, MBA**  
Course Co-Director for HDS 202A

**Alen Voskanian, MD, MBA**  
Course Co-Director for HDS 204A

**Alex Slight Warner, PhD**  
Course Co-Director for HDS 203A

**David Wrigley,**  
Course Co-Director for HDS 202A

# TUITION & FEES CALENDAR

Program tuition	Standard amount	Due date
Trimester 1 (6-7) credit hours)	\$3,600	Sept. 2, 2022
Trimester 2 (5-6) credit hours)	\$3,000	Jan. 6, 2023
Trimester 3 (9-10) credit hours)	\$5,400	May 5, 2023
Trimester 4 (7-8) credit hours)	\$4,200	Sept. 1, 2023
Trimester 5 (7-8) credit hours)	\$4,200	Jan. 5, 2023
<b>Total program tuition</b>	<b>\$20,400</b>	

Student fees	Standard amount	Due date
Document Fee	\$30	Per Term
Grad Student Association Fee	\$10	Per Term
Student Program/ Resource Fee	\$40	Per Term
Student Services Fee	\$160	Per Term
Technology & Software Fee	\$120	Per Term
Library Fee	\$40	Per Term
<b>Total student fees (per term)</b>	<b>\$2,000</b>	

<b>Total tuition + student fees (all terms)</b>	<b>\$22,400</b>	
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- Per Term credit hours are contingent upon enrollment in the Clinical Informatics and Journal Club Elective (refer to course list)
  - **Questions?** Contact Victor Jackson, Student Financial Administrator, 310-423-7871