MASTER OF DIGITAL HEALTH (MDH) DEGREE

Program Learning Outcomes for the MDH Degree

Upon completing the MDH degree, students will be able to:

1. Develop and apply practical solutions to healthcare challenges using tools and techniques such as embedded systems, signal processing, modeling, simulation, and/or data visualization.
2. Select and apply appropriate statistical, machine learning, and AI methods for healthcare data analysis.
3. Collaborate effectively in interdisciplinary teams by communicating technical concepts clearly to both clinical and engineering audiences, while demonstrating a strong understanding of the healthcare context.

Requirements for the MDH Degree

The MDH degree is a non-thesis master's degree. For general university requirements, please see Non-Thesis Master's Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/). Students pursuing the MDH degree must complete:

- A minimum of 10 courses (30 credit hours) to satisfy degree requirements.
- A minimum of 30 credit hours of graduate-level study (graduate semester credit hours, coursework at the 500-level or above).
- A minimum of 27 graduate semester credit hours must be taken at Rice University.
- A minimum of 24 graduate semester credit hours must be taken in standard or traditional courses (with a course type of lecture, seminar, laboratory, lecture/laboratory).
- A minimum residency enrollment of one fall or spring semester of part-time graduate study at Rice University.
- A minimum of 6 courses (18 credit hours) from the Digital Health Foundations Core and the Technical Foundations Core Requirements.
  - A minimum of 2 courses (6 credit hours) from the Digital Health Foundations Core.
  - A minimum of 2 courses (6 credit hours) from the Technical Foundations Core.
  - An additional 2 courses (6 credit hours) from either the Digital Health Foundations Core or the Technical Foundations Core.
- A minimum of 1 course (3 credit hours) from the Engineering Communications Requirement.
- A minimum of 1 course (3 credit hours) from the Elective Requirement.
- A minimum of 2 courses (6 credit hours) to fulfill the Capstone Requirement.
- Required enrollment in ELEC 698 each semester in residence at Rice University.
- A maximum of 1 course (3 graduate semester credit hours) from transfer credit. For additional departmental guidelines regarding transfer credit, see the Policies (p. 2) tab.
- A minimum overall GPA of 2.67 or higher in all Rice coursework.
- A minimum program GPA of 3.00 or higher in all Rice coursework that satisfies requirements for the non-thesis master's degree with a minimum grade of C (2.00 grade points) in each course.

The courses listed below satisfy the requirements for this degree program. In certain instances, courses not on this official list may be substituted upon approval of the program's academic advisor or, where applicable, the department or program's Director of Graduate Studies. Course substitutions must be formally applied and entered into Degree Works by the department or program's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/). Additionally, these course substitutions must be approved by the Office of Graduate and Postdoctoral Studies. Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the MDH Degree		30

Degree Requirements

Code	Title	Credit Hours
Core Requirements		
Select 6 courses from the following categories:		*18*
Select a minimum of 2 courses from Digital Health Foundations (see course list below)		
Select a minimum of 2 courses from Technical Foundations (see course list below)		
Engineering Communications		
Select 1 course from the following:		*3*
ENGI 501	WORKPLACE COMMUNICATION FOR PROFESSIONAL MASTER'S STUDENTS IN ENGINEERING	
ENGI 510	TECHNICAL AND MANAGERIAL COMMUNICATIONS	
RCEL 501	ENGINEERING MANAGEMENT & LEADERSHIP THEORY AND APPLICATION	
RCEL 542	PROFESSIONAL COMMUNICATION FOR ENGINEERING LEADERS	
Elective Requirement		
Free Elective Requirement: select 1 additional course as a free elective [1]		*3*
Capstone		
ELEC 5XX	(2 semesters required, 1st semester)	3
ELEC 5XX	(2 semesters required, 2nd semester)	3
Seminar		
ELEC 698	ECE PROFESSIONAL MASTERS SEMINAR SERIES [2]	0
Total Credit Hours		**30**

Footnotes and Additional Information

[1] The Free Elective Requirement may be fulfilled by any 1 course (3 credit hours) selected from the following:

- Departmental (ELEC) course offerings at the 500-level or above, taught by ECE faculty.
- Research coursework, such as ELEC 590 or ELEC 591, when either are taken for at least 3 credit hours.
- Any of the following courses: COMP 532, ENGI 510, ENGI 529/CEVE 529, NSCI 511, RCEL 501, or RCEL 615.
- Any other course approved by the student's MECE academic advisor.

[2] ELEC 698 is taken for a Satisfactory/Unsatisfactory grade and must be completed with a Satisfactory grade. As a S/U course, it does not apply to the requirement of a minimum grade of C (2.00 grade points) in each required course.

Course Lists to Satisfy Requirements

Core Requirements

To fulfill the Master of Digital Health (MDH) degree Core Requirements, students must complete a total of 6 courses (18 credit hours) from the following two categories as listed below. At least 2 courses (6 credit hours) must be selected from Digital Health Foundations, and at least 2 courses (6 credit hours) must be selected from Technical Foundations. The remaining 2 courses (6 credit hours) can be selected from either category (Digital Health Foundations or Technical Foundations).

Code	Title	Credit Hours
Digital Health Foundations		
Select a minimum of 2 courses from the following:		*6*
COMP 519	GENOME-SCALE ALGORITHMS AND DATA STRUCTURES	
COMP 572 / BIOE 564	BIOINFORMATICS: NETWORK ANALYSIS	
ELEC 509	ARTIFICIAL INTELLIGENCE FOR HEALTH	
ELEC 518	PRINCIPLES OF BIOMEDICAL OPTICS AND ULTRASOUND	
ELEC 530	BIOMEDICAL OPTICAL IMAGING AND APPLICATIONS	
ELEC 540	FUNDAMENTALS OF BIOSENSORS IN MEDICINE	
ELEC 547	INTRODUCTION TO HUMAN-MACHINE INTERFACES	
ELEC 582	IMAGING OPTICS	
ELEC 583	ELECTROMAGNETISM AND THE BRAIN	
ELEC 587	INTRODUCTION TO NEUROENGINEERING: MEASURING AND MANIPULATING NEURAL ACTIVITY	
ELEC 589	NEURAL COMPUTATION	
ELEC 677	SPECIAL TOPICS [1]	
ELEC 682	SPOTLIGHT ON LATEST NEUROTECHNOLOGY	
Technical Foundations		
Select a minimum of 2 courses from the following:		*3*
COMP 631	INTRODUCTION TO INFORMATION RETRIEVAL	
ELEC 502 / COMP 502 / STAT 502	NEURAL MACHINE LEARNING I	
ELEC 519	DATA SCIENCE AND DYNAMICAL SYSTEMS	
ELEC 533 / CMOR 553 / STAT 583	INTRODUCTION TO RANDOM PROCESSES AND APPLICATIONS	
ELEC 542	GENERATIVE AI FOR IMAGE DATA	
ELEC 546 / COMP 546	INTRODUCTION TO COMPUTER VISION	
ELEC 555	IMAGING AND VISION FOR ROBOTICS	
ELEC 557 / COMP 557	ARTIFICIAL INTELLIGENCE	
ELEC 558	DIGITAL SIGNAL PROCESSING	
ELEC 570	DISTRIBUTED METHODS FOR OPTIMIZATION AND MACHINE LEARNING	
ELEC 571	IMAGING AT THE NANOSCALE	
ELEC 575	LEARNING FROM SENSOR DATA	
ELEC 576 / COMP 576	A PRACTICAL INTRODUCTION TO DEEP MACHINE LEARNING	
ELEC 578	INTRODUCTION TO MACHINE LEARNING	
ELEC 588 / CMOR 615 / NEUR 615	THEORETICAL NEUROSCIENCE I: BIOPHYSICAL MODELING OF CELLS AND CIRCUITS	
ELEC 602 / COMP 602 / ELEC 602	NEURAL MACHINE LEARNING AND DATA MINING II	
ELEC 631	ADVANCED MACHINE LEARNING	
ELEC 677	SPECIAL TOPICS [1]	

Footnotes and Additional Information

[1] ELEC 677 is a Special Topics course. Therefore, this course only counts toward the Master of Digital Health (MDH) degree when the course topic is related to Digital Health. Example topics include *SYSTEMS NEUROSCIENCE* or *DIGITAL IMAGE FORENSICS*. Additionally, as a variable credit hour course, ELEC 677 must be taken for at least 3 credit hours. For questions regarding a specific instance of ELEC 677 consult the MDH program advisor.

Policies for the MDH Degree

Department of Electrical and Computer Engineering Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the department of Electrical and Computer Engineering publishes a graduate program handbook, which can be found here: https://gradhandbooks.rice.edu/2025_26/Electrical_Computer_Engineering_Graduate_Handbook.pdf.

Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the appropriate academic department offering the Rice equivalent course (corresponding

to the subject code of the course content) and by the Office of Graduate and Postdoctoral Studies (GPS). Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the MDH degree should be aware of the following departmental transfer credit guideline:

- No more than 1 course (3 credit hours) of transfer credit from U.S. or international universities of similar standing as Rice may apply towards the degree.

Additional Information

For additional information, please see the Department of Electrical and Computer Engineering, and the Master of Digital Health program website: https://eceweb.rice.edu/academics/graduate-programs/mdh-program (https://eceweb.rice.edu/academics/graduate-programs/mdh-program/)/.

Opportunities for the MDH Degree

Fifth-Year Master's Degree Option for Rice Undergraduate Students

In certain situations and with some terminal master's degree programs, Rice students have an option to pursue a master's degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master's degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master's degree program. A plan of study will need to be approved by the student's undergraduate major advisor and the master's degree program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor's degree and the master's degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
- more information on this *Undergraduate - Graduate Concurrent Enrollment* opportunity, including specific information on the registration process can be found here (https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/).

Rice undergraduate students completing studies in science and engineering may have the option to pursue the Master of Digital Health (MDH) degree. For additional information, students should contact their undergraduate major advisor and the MDH program director.

Additional Information

For additional information, please see the Department of Electrical and Computer Engineering, and the Master of Digital Health program website: https://eceweb.rice.edu/academics/graduate-programs/mdh-program (https://eceweb.rice.edu/academics/graduate-programs/mdh-program/)/.