

HEALTH SYSTEMS ENGINEERING

D E P A R T M E N T O F

Industrial and Systems Engineering

College of Engineering

University of Wisconsin-Madison

FACULTY

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ADMISSION NOTICE

The foundation courses for this degree program are offered both fall spring semesters and are prerequisite to most other courses in the program.

PREREQUISITES

- BS degree or equivalent
- Mathematical statistics (Ex: Stat312)
- Computer programming (Ex: CS302)
- 3 courses in ISyE: 313, 315, 320, 323, 349, 415, 417

The Associate Chair of Graduate Affairs is responsible for evaluating equivalencies.

PROGRAM DESCRIPTION

The healthcare industry, one of the largest industries in the United States, accounts for 16% of the US gross domestic product.

Recent changes in the organization and financing of health services have created enormous incentives to increase the productivity of the health system while maintaining or improving quality. Industrial engineers possess tools to analyze demands and create systems to resolve these problems.

The health systems specialization seeks to train students to look at broad issues in health care, including hospitals and clinics, health promotion and prevention, long-term care, quality improvement and management, health care financing and technology, programs and systems evaluation.

While skills in designing and manipulating statistical and mathematical models are essential to an industrial engineer's success, the health systems engineer must also be able to initiate and implement resolutions to strategic problems using knowledge of how organizational decisions are made.

Potential employers for MS-prepared health systems engineers include all healthcare institutions, governmental and voluntary agencies, universities and medical centers, research and planning organizations, manufacturers of healthcare products, pharmaceutical companies, health insurance companies, management consultants, and

architectural and construction firms. PhD's are employed in academic, research, and consulting environments.

MS DEGREE REQUIREMENTS

FOUNDATION COURSES (6 cr min)

ISyE 417	Introduction to Health Systems Engineering
ISyE 610	Design of Program Evaluation Systems
ISyE 617	Health Information Systems

DESIGN & ANALYSIS (3 cr min)

ISyE 515	Engr Management
ISyE 516	Introduction to Decision Analysis
ISyE 653	Job and Organizational Design
ISyE 691	Special Topics: Long Term Care

STATISTICS (3 cr min)

EdPsych 711	Hierarchical Linear Modeling
EdPsych 862	Multivariate Analysis
Psych 610	Statistical Analysis of Psychological Experiments
Stat 333	Applied Regression Analysis
Stat 424	Statistical Experimental Design for Engineers
Stat 541	Introduction to Biostatistics
Stat 701	Applied Time Series Analysis, Forecasting and Control I

MS DEGREE REQUIREMENTS

Continued

ISyE TOOLS (6 cr min)

ISyE 513	Capital Investment Analysis
ISyE 517	Decision Making in HC
ISyE 620	Discrete Event Simulation
ISyE 624	Stochastic Modeling
ISyE 633	Queuing Theory
ISyE 691	Special Topics in Ind Engr ⁽¹⁾
ISyE 723	Dynamic Programming
ISyE 816	Special Topics in Ind Engr ⁽¹⁾
ISyE 834	Behavioral Analysis of Management Decision Making

⁽¹⁾ Topic must be approved in advance by advisor.

CONCENTRATION AREA (6 cr min in 1 area)

AREA 1: ELECTRONIC HEALTH CARE

Ag 617	Interactive Health Communication
ISyE 662	Design and Human Disability and Aging
ISyE 671	E-Business: Technologies, Strategies and Applications
ISyE 672	E-Business Transformation: Design, Analysis and Justification

AREA 2: HEALTH OUTCOMES & EVALUATION

Nurs 761	Health Program Planning, Evaluation & Quality Improvement
PHS 795	Determinants of Health ⁽²⁾
PHS 797	Introduction to Epidem.

PHS 875	Assessment of Medical Technologies ⁽³⁾
PHS 876	Measuring Health Outcomes

⁽²⁾ Students can receive credit for either ISyE 417 or PHS 795 but not both.

AREA 3: QUALITY/SAFETY

ISyE 555	Accident Causation
ISyE 556	Occupational Health and Safety
ISyE 575	Introduction to Quality Engineering
ISyE 715	Advanced Methods for Quality Improvement
ISyE 854	Safety Theory

ELECTIVES (6 cr)

Must be approved (in writing) in advance by the student's advisor

EXIT REQUIREMENT

In order to be eligible for graduation, a Master's student must:

- Have a GPA of 3.0 or higher
- Meet all MS degree requirements for their focus area
- Have all grades entered, except for the current semester. No Is or NRs can show on the student's transcript.
- Be enrolled in at least 2cr the semester in which they graduate.
- Have their MS degree warrant signed and dated by the degree deadline.

LABORATORIES & CENTERS

Center for Quality and Productivity Improvement
Center for Health Systems Research and Analysis
CHESS
Health Systems Laboratory
Macroergonomic Safety and Health Laboratory
Sociotechnical Engineering Laboratory

JOB PLACEMENT

Engineering Career Services Office
1550 Engineering Drive, Rm M1002
Madison, WI 53706
Tel: (608) 262-3471
FAX: (608) 262-7262
<http://www.engr.wisc.edu/services>

FURTHER INFORMATION

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