

Requirements for Concentration in Healthcare Engineering

Requirements for Concentration in HEPS

- Fulfill all requirements for IOE masters program
- 3 semesters (Fall, Winter, Fall)
- Complete year-long program-designed hands-on project (3 credits 2nd semester, full-time summer, 3 credits 3rd semester)
- Satisfy the following course requirements:
 - * IOE 813: Providing Better Healthcare Through Systems Engineering: Seminars and Discussions—*must be taken first semester (Fall)*:
 - * Statistics/Data Analysis: 1 course
 - * Intro to Healthcare: 2 courses
 - * Technical Core: 2 courses
 - * Methodology: 2 courses
 - * Program Focus: 2 courses
- Students may petition for special permission to count additional courses towards the HEPS requirements

At least one course (Statistics/Data Analysis):

IOE 460: Decision Analysis and Bounded Rationality
 IOE 465: Design of Experiments
 IOE 466: Statistical Quality Control
 STATS 500: Applied Statistics I
 STATS 503: Multivariate Statistics
 IOE 560 / STAT 550: Bayesian Decision Analysis
 IOE 562 / STAT 535: Reliability
 IOE 565 / MFG 561: Time Series Modeling, Analysis, Forecasting
 IOE 570 / STAT 570: Experimental Design
 BIOSTAT 502: Application of Regression Analysis to Public Health Studies
 BIOSTAT 521: Applied Biostatistics
 BIOSTAT 522: Biostatistical Analysis for Health-Related Studies
 BIOSTAT 605: Intro to SAS Statistical Programming
 BIOSTAT 675: Survival Time Analysis
 BIOSTAT 682: Applied Bayesian Inference
 LHS 610: Exploratory Data Analysis for Health

At least two of the following courses (Program Focus):

IOE 413: Optimization Modeling in Health Care
 IOE 438: Occupational Safety Management
 IOE 513: Healthcare Operations Research: Theory and Applications
 IOE 533 / MFG 535: Human Motor Behavior and Engineering Systems
 IOE 534: Occupational Biomechanics
 IOE 539: Safety Engineering Methods
 HMP 553: Data Management in Health Care
 HMP 610: Cost-Effectiveness Analysis in Health
 HMP 625: Comparative Health Policy and Management in High Income Countries
 HMP 654: Operations Research and Control Systems
 HMP 655: Decision Making Models in Health Care
 HMP 668: Introduction to Health Informatics
 HMP 669: Database Systems and Internet Applications in Health Care
 HMP 826: Applied Econometrics in Health Services Research
 BME 510: Medical Imaging Laboratory
 BME 516 / EECS 516: Medical Imaging Systems
 EECS 556: Image Processing
 NERS 583: Applied Radiation Dose Assessment

At least two of the following courses (Technical Core):

IOE 425 / MFG 426: Lean Manufacturing and Services
 IOE 432: Industrial Engineering Instrumentation Methods
 IOE 434: Human Error and Complex System Failures
 IOE 463: Measurement and Design of Work
 IOE 474: Simulation
 IOE 536: Cognitive Ergonomics
 IOE 574: Simulation Analysis

IOE Masters Program: Requirements for Concentration in Healthcare Engineering

At least two of the following courses (Intro to Healthcare):

HMP 601: Healthcare Quality, Performance Measurement and Improvement
HMP 602: Survey of the U.S. Health Care System
HMP 685: The Politics of Public Health Policy
EPID 503: Strategies and Uses of Epidemiology
ANAT 403: Human Anatomy: Structure and Function
PHYSIOL 502: Human Physiology
BIOMEDE 499.002: Clinical Observation and Needs Finding
PUBHLTH 626: Understanding and Improving the US Healthcare System
PUBHLTH 512 : Principles Of Epidemiology For Public Health

At least two of the following courses (Methodology):

IOE 416: Queueing Systems
IOE 419: Service Operations Management
IOE 421: Work Organizations
IOE 440: Operations Analysis and Management
IOE 449: Material Handling Systems
IOE 510: Linear Programming I
IOE 511 / MATH 562: Continuous Optimization Methods
IOE 512: Dynamic Programming
IOE 515: Stochastic Processes I
IOE 516: Stochastic Processes II
IOE 518: Introduction to Integer Programming
IOE 522: Theories of Administration
IOE 534 / BIOMEDE 534: Occupational Biomechanics
IOE 536: Cognitive Ergonomics
IOE 541: Inventory Analysis and Control
IOE 543: Scheduling
IOE 545: Queueing Networks
IOE 551: Benchmarking, Productivity Analysis and Performance Measurement
IOE 615: Advanced Stochastic Processes
IOE 616: Queueing Theory
IOE 640: Mathematical Modeling of Operational Systems
EECS 558: Stochastic Control

Sample Course Schedule for Concentration in HEPS

First semester (Fall)

- IOE 813: Providing Better Healthcare through Systems Engineering: Seminars & Discussions (2 cred.)
- IOE 413: Optimization Modeling in Health Care (3 cred.)
- STATS 500: Applied Statistics I (3 cred.)
- HMP 600: The Health Services System I (3 cred.)
- HMP 610: Cost-Effectiveness Analysis in Health (3 cred.)

Second semester (Winter)

- Project (3 cred.)
- HMP 601: Control of Quality & Costs of Health Care (3 cred.)
- IOE 463: Measurement & Design of Work (3 cred.)
- IOE 434: Human Error & Complex System Failures (3 cred.) or IOE 474: Simulation (4 cred.)
- IOE 510: Linear Programming (3 cred.)

Third semester (Fall)

- Project (3 cred.)
- IOE 513: Providing Better Health Care through Systems Engineering: Operations Research Applications & Techniques (3 cred.)
- IOE 515: Stochastic processes (3 cred.)
- IOE 425: Manufacturing Strategies (2 cred.)



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