

## BSIE CONCENTRATIONS 2025-2026

### Students may earn one or more of five optional three-course concentrations

- Each concentration must include two courses not used towards any other IEMS concentration and must include one course outside IEMS.
- Courses used to fulfill major requirements may be used towards concentrations
- Students may not earn a concentration if receiving a major, minor or certificate in an area with substantial overlap.
- Students are encouraged to review prerequisites for all listed courses. IEMS will not advocate for waiving of prerequisites or for permission to enroll in restricted courses.

### Quantitative Finance

**Required:** IEMS 373 Financial Engineering

One of

- ECON 331 Economics of Risk & Uncertainty
- ECON 360-2 Investments
- ECON 362 International Finance

One additional course from the previous list, or from

- IEMS 305 Foundations of Modern Machine Learning
- IEMS 308 Data Science & Analytics
- IEMS 351 Optimization methods for Data Science
- STAT 354 Time Series Modeling
- STAT 365 Introduction to the Analysis of Financial Data

### Operations, Transportation & Logistics

*Students receiving the Transportation & Logistics Minor may not receive this concentration.*

CIV-ENG-371 Transportation Systems Planning and Management

CIV-ENG-376 Transportation Systems Operations

CIV\_ENV 377 Choice Modelling in Engineering

DSGN 346 Manufacturing methods for product design

### *(Operations, Transportation & Logistics, cont'd)*

ECON 355 Transportation Economics and Public Policy

IEMS 381 Supply Chain Modeling and Analysis

IEMS 382 Operations Engineering and Management

IEMS 383 Service Operations Management

IEMS 385 Introduction to Health Systems Engineering

### Data Science and Engineering

*Students receiving the DSE minor may not receive this concentration.*

BMD\_ENG 311-0 Computational Genomics

CIV\_ENV 377-0 Choice Modeling in Engineering

COMP\_SCI 312 Data Privacy

COMP\_SCI 326 Introduction to the Data Science Pipeline

COMP\_SCI 348-0 Introduction to Artificial Intelligence

COMP\_SCI 396-0 Special Topics in Computer Science (Computing, Ethics, and Society)

DATA\_ENG 300 Data Engineering Studio

ELEC\_ENG 328-0 Information Theory & Learning

ELEC\_ENG 335-0 Deep Learning Foundations from Scratch

ELEC\_ENG 373-0 Deep Reinforcement Learning

ELEC\_ENG 395-0 Special Topics in Electrical Engineering (Optimization Techniques for Machine Learning and Deep Learning)

ES\_APPM 375-1 Quantitative Biology I: Experiments, Data, Models, and Analysis

ES\_APPM 375-2 Quantitative Biology II: Experiments, Data, Models, and Analysis

IEMS 308-0 Data Science and Analytics

IEMS 340-0 Qualitative Methods in Engineering Systems

IEMS 351-0 Optimization Methods in Data Science

MECH\_ENG 301-0 Introduction to Robotics Laboratory

STAT 302 Data Visualization

STAT 357-0 Introduction to Bayesian Statistics

STAT 362-0 Advanced Machine Learning for Data Science

## BSIE CONCENTRATIONS 2025-2026

### Human-centered Engineering

*Students receiving the HCI certificate may not receive this concentration.*

CIV\_ENV 308 Environmental Justice  
CIV\_ENV 377 Choice Modeling in Engineering  
COMP\_SCI 314 Technology and Human Interaction  
COMP\_SCI 315 Design, Technology, and Research  
COMP\_SCI 329 HCI Studio  
COMP\_SCI 330 Human Computer Interaction  
COMP\_SCI 347 Conversational AI  
DSGN 300 Designing Your Life  
DSGN 305 Human-Centered Service Design  
DSGN 306 Human-Centered UX Design  
DSGN 308 Human-Centered Product Design  
IEMS 340 Qualitative Methods in Engineering Systems  
IEMS 341 Social Network Analysis  
IEMS 342 Organizational Behavior  
IEMS 344 Whole-Brain Leadership  
IEMS 345 Negotiations and Conflict Resolution for Engineers  
IEMS 385 Introduction to Health Systems Engineering  
LOC 306 Studies in Organizational Change\*  
LOC 311 Tools for Organizational Analysis\*

*\*LOC courses are difficult to access, but will be accepted as GTE by petition if available.*

### Graduate Preparation

ES\_APPM 345 Applied Linear Algebra  
IEMS 401 Applied Mathematical Statistics\*  
IEMS 450-1 Mathematical Optimization I\*  
MATH 300 Foundations of Higher Mathematics  
MATH 306 Combinatorics & Discrete Mathematics  
MATH 308 Graph Theory  
MATH 320-1, 2, 3 Real Analysis

### (Graduate Preparation, cont'd)

MATH 330-1, 2,3 Abstract Algebra  
MATH 334 Linear Algebra: Second Course  
MATH 370 Mathematical Logic  
COMP\_SCI 335 Introduction to the Theory of Computation  
COMP\_SCI 336 Design & Analysis of Algorithms  
*\*Requires permission of instructor*

### Product Management:

*Courses taken for this concentration must come from at least two different departments/areas. Only one course can be double counted towards any one of the following programs:*

- *Segal Design Certificate*
- *Business Institutions Minor*
- *Entrepreneurship Minor*

BUS\_INST 301 – Accounting  
or ENTREP 330-1 Startup Accounting and Finance  
BUS\_INST 302 – Marketing Management  
BUS\_INST 303 – Leadership in Organizations  
or IEMS 344 Whole-Brain Leadership  
COMP\_SCI 394-0 Agile Software Development  
IMC 303 Integrated Marketing Communications Strategy  
ENTREP/IEMS 325-0 Engineering Entrepreneurship  
ENTREP 331-0 Entrepreneurial Sales and Marketing  
ENTREP 340-0 Innovate for Impact  
DSGN 305 Human-Centered Service Design  
DSGN 306 Human-Centered UX Design  
DSGN 308 Human-Centered Product Design