ISE FOCUS AREA: Big Data Analytics

Department of Industrial and Systems Engineering

General Education (19 sh)	sh
ALL RHET:1030 Rhetoric	4
F/S Diversity & Inclusion	3
ALL Be Creative	3
ALL Required Gen Ed Course: PSY:1001 Elementary Psychology	3
ALL Approved Gen Ed Course	3
ALL Approved Gen Ed Course	3

Math & Basic Science Core (24 sh)	sh
F/S MATH:1550 Math I: Single Variable Calculus (P: ALEKS score ≥ 75 or MPT Level 3 score ≥ 9)	4
F/S MATH:1560 Math II: Multivariable Calculus (P: MATH:1550)	4
ALL MATH:2550 Math III: Matrix Algebra (P: MATH:1550)	2
ALL MATH:2560 Math IV: Differential Equations (P: MATH:1560 & MATH:2550)	3
ALL STAT:2020 Probability & Statistics For Engr & Phys Sci (P: MATH:1560)	3
ALL CHEM:1110 Principles of Chemistry I (P: ALEKS score ≥ 55 or MPT Level 3 score ≥ 9)	4
F/S PHYS:1611 Introductory Physics I / Lab (C: MATH:1550)	4

Engineering Core (7 sh)	sh
F ENGR:1000 Engineering Success for First-Year Students (First semester standing)	1
F ENGR:1100 Introduction to Engineering Problem Solving	3
F/S ENGR:1300 Introduction to Engineering Computing (C: MATH:1550)	3

ISE Requirements (40 sh)	sh
F/S PHYS:1612 Introductory Physics II / Lab (P: PHYS:1611; C: MATH:1560)	4
F ISE:2360 Design for Manufacturing	3
S ISE:2500 Engineering Economy (C: STAT:2020)	3
S ISE:3300 Manufacturing Systems (P: ISE:2360 & ISE:3700)	3
F ISE:3350 Process Engineering (P: ISE:3700)	3
F ISE:3400 Human Factors (P: PSY:1001)	3
S ISE:3450 Ergonomics	3
S ISE:3500 Information Systems Design (P: ENGR:1300)	3
F ISE:3600 Quality Control (P: STAT:2020 or BAIS:9100 or (STAT:3100 & STAT:3101 & STAT:3200)	3
F ISE:3610 Stochastic Modeling (P: STAT:2020; C: ISE:3700)	3
S ISE:3660 Data Analytics with R (P: STAT:2020)	3
F ISE:3700 Operations Research (P: MATH:2550; C: STAT:2020)	3
S ISE:3750 Digital Systems Simulation (P: ISE:3700 & ISE:3610)	3

ISE Capstone Design Courses (4 sh)	sh
F/S ISE:4600 Industrial Engineering Design Project (IEDP) (C: ALL ISE Required Courses - ISE:2360, ISE:2500, ISE:3300, ISE:3350, ISE:3400, ISE:3450, ISE:3500, ISE:3600, ISE:3660, & ISE:3750)	4

ISE Departmental Seminars (0 sh)	sh
F ISE:2000 Sophomore Seminar: Industrial Engineering (Status: Sophomore)	0
S ISE:3000 Professional Seminar: Industrial Engineering (Status: Junior)	0

Engineering Fundamentals Electives (11 sh)	sh
Select at least 11 sh from the list of courses below	
ALL ENGR:2110 Statics (P: MATH:1550; C: MATH:1560, PHYS:1611)	2
ALL ENGR:2120 Electrical Circuits (C: MATH:2560)	3
ALL ENGR:2130 Thermodynamics (P: CHEM:1110, PHYS:1611; C: MATH:1560)	3
ALL* ENGR:2710 Dynamics (P: ENGR:2110 & MATH:1550)	3
ALL* ENGR:2720 Materials Science (P: CHEM:1110; C: MATH:1550)	3
F/S ENGR:2730 Computers in Engineering (P: ENGR:1300)	3
ALL* ENGR:2750 Mechanics of Deformable Bodies (P: ENGR:2110; C: MATH:2560)	3
S ENGR:3110 Intro to AI & Machine Learning in Engr (P: ENGR:1300; C: MATH2550)	3
F BME:2710 Engineering Drawing, Design, and Solid Modeling	3
S CBE:2040 Environment, Energy, and Climate Change	3
F/S ECE:2400 Linear Systems I (P: ENGR:2120 & MATH:2560)	3
F/S ECE:2410 Principles of Electronic Instrumentation (P: ENGR:2120 & PHYS:1612 & MATH:2560)	4

Required: Big Data Analytics (9sh)	sh
F/S ENGR:2730 Computers in Engineering (P: ENGR:1300)	3
F STAT:4540 Statistical Learning	3
S STAT:4580 Data Visualization & Data Technologies	3

Electives: Big Data Analytics (15sh)	sh
Elective: Focus Area - Technical Electives	
select three courses from this list	
ALL CS:2210 Discrete Stuctures (Recommended: Calculus I)	3
ALL CS:2230 Computer Science II: Data Structures (P: CS:1210 w/min C- or ENGR:2730 w/min C-)	4
F CS:5110 Introduction to Informatics	3
F/S ECE:3330 Introduction to Software Design (P: ENGR:2730)	3
F STAT:4740 Large Data Analysis (P: (CS:1210 w/min C- or ENGR:2730 w/min C-) & MATH:3800 & STAT:3200)	3
F/S ISE:4172 Big Data Analytics (P: STAT:2020 or BAIS:9100)	3
S* ISE:5380 Deep Learning (Recommended: Knowledge of at least one programming language (Python, C++, MATLAB, etc.)	3
F* ISE:5740 Design and Analysis of Computer Experiments	3
F* ISE:6790 Advanced Data Analytics and Informatics	3
Elective: Focus Area - Math / Science	
select one course from this list	
ALL BIOL:1411 Foundations of Biology (P: CHEM:1110 w/min C- or CHEM:1070 w/min A-)	4
F/S CHEM:1120 Principles of Chemistry II (P: CHEM:1110 w/min C-)	4
F/S MATH:3550 Engineering Math V (P: MATH:1560 & (MATH:2550 or MATH:2700); C: MATH:2560)	3
F/S MATH:3800 Introduction to Numerical Methods (P: MATH:2550 & MATH:1560 or MATH:1860)	3
S PHYS:2704 Physics IV - no lab required (P: PHYS:1612 & MATH:1860 or MATH:1550)	3
F/S STAT:3210 Experimental Design & Analysis (P: STAT:3200)	3
Elective: Focus Area - Systems	
select one course from this list	
F/S ISE:4172 Big Data Analytics (P: STAT:2020 or BAIS:9100)	3
F ISE:4175 Safety Engineering	3
S ISE:4900 Introduction to Six Sigma (P: ISE:3600)	3
ALL Any 5000 or above Industrial Engineering (ISE) course	3

KEY:
* Check MyUI for course offerings