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)

Select at least 11 sh from the list of courses below

		sh
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 (12sh)

			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
F		**ECE:5450 Machine Learning** *(P: ECE:2400 or BME:2200)*	3
F/S	**OR**	**BAIS:3500 Data Mining** *(P: (BAIS:2800 or STAT:2020 w/min B or STAT:4101 or ECON:4800) & BAIS:3020 & BAIS:3200)*	3

Electives: Big Data Analytics (12sh)

Elective: Focus Area - Technical Electives

select two courses from this list

		sh
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:6380 Deep Learning** *(Recommended: Knowledge of at least one programming language (Python, C++, MATLAB, etc.)*	3

Elective: Focus Area - Math / Science

select one course from this list

		sh
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

		sh
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