

Design and Manufacturing EFA

Many graduates of Industrial Engineering are recruited to jobs in manufacturing industries functions that include the use of Computer aided Design and Manufacturing, 3D design, virtual and physical prototyping, design and simulation of manufacturing processes and manufacturing systems. The recent growth in manufacturing industry in the US and efforts to bring manufacturing facilities back to the country leading to a substantial increase in career opportunities in design and manufacturing. Graduates with this focus find employment in diverse industries that include supplier manufacturing industry (John Deere, Caterpillar, Rockwell Collins, Raytheon, and Boeing), healthcare (Johnson&Johnson, Zimmer), and software and information industry (Pro/Engineer, Catia, SolidWorks, AutoCAD). The Design and Manufacturing EFA builds on the required courses for the undergraduate program in IE and provides an advanced education in design and manufacturing. A total of 21s.h. of coursework is required.

The following courses are required:

Semester	Course #	Course	Session	SH	Pre-/Co-Requisites
4 (Spring)	ARTS:1020	Elements of 3D Design	F,S	3	
5 (Fall)	TDSN:2240	Digital Drafting with AutoCAD	F,S	3	TDSN:2210 *
6 (Spring)		Science or Math Elective		3	
7 (Fall)		General Elective		3	
8 (Spring)		General Elective		3	
8 (Spring)		General Elective		3	
8 (Spring)		Above-3000 Engineering Course		3	

*The prerequisite is waived for IE students.

General Elective Courses:

Course #	Course	Session	SH	Pre-/Co-Requisites
ISE:5650	Mechatronics Engineering for Smart Device Design	S ²	3	ENGR:2120 and ENGR:2760
ISE:5620	Design of Experiments	S ²	3	STAT: 2020
ISE:6232	Advanced Computer-Aided Design and Manufacturing	S ¹	3	One Programing Language
ISE:4116	Manufacturing Processes, Simulations and Automation	F	3	ME: 2300 or ENGR:2760
ISE:4900	Introduction to Six Sigma	S	3	ISE: 3600
BME:2710	Engineering Drawing, Design, & Solid Modeling	F	3	
TDSN:2250	Computer Modeling with 3ds Max	F,S	3	TDSN:2210
MTLS:4910	Mixed Media Workshop	S	3	MTLS:2910
ME:4112	Engineering Design Optimization	S	3	ENGR:2110 and MATH:2550
TDSN:3200	Product Design	F	4	TDSN:2210
TDSN:4250	Fabrication & Design: Hand Built Bicycle	F,S	4	TDSN:2240
ME:5167	Composite Materials	S ²	3	ENGR:2750
BME:2500	Bio-Materials/Biomechanics	F,S	4	ENGR:2110 and HHP:3500 and (BIOS:4120 or STAT:3510)
BME:5401	Biomaterials and Implant Design	F	3	ENGR:2750 and BME:2500

** The sessions listed are typical but are not guaranteed to be taught

Science and Math Elective:

Course #	Course	Session	SH	Pre-/Co-Requisites
BIOL:1411	Foundations of Biology	All	4	CHEM:1110
CHEM:1120	Principles of Chemistry II	All	4	CHEM:1110
MATH:3550	Engineering Mathematics V	F,S	3	MATH:1560 and MATH:2550
MATH:3800	Elementary Numerical Analysis	F,S	3	MATH:1560 or MATH:2550

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¹ offered in odd years.

² offered in even years.