

# MANUFACTURING ENGINEERING UNDERGRADUATE MAJOR (BS, HBS)

ABET Accredited. For more information, please contact program advisor Tyler DeAdder, 541-737-4718, tyler.deadder@oregonstate.edu.

The curriculum in Manufacturing Engineering supports a range of career paths in the areas of manufacturing process development, manufacturing systems analysis, and new product development, among others. The Manufacturing Engineering undergraduate degree program includes a common set of core courses that provides a solid foundation, plus 39-credits of electives organized into approved options.

Students must select and complete an approved option to receive the BS in Manufacturing Engineering degree. The degree prepares students for industry, graduate study, or other career paths, specializing or broadening further their knowledge and skills.

Course	Title	Hours
<b>First Year</b>		
Pre-Manufacturing Engineering		
CH 201	CHEMISTRY FOR ENGINEERING MAJORS <sup>2</sup>	3
CH 202	CHEMISTRY FOR ENGINEERING MAJORS <sup>1</sup>	3
CH 205	LABORATORY FOR CH 202 <sup>2</sup>	1
COMM 111 or COMM 114	*PUBLIC SPEAKING <sup>2</sup> or *ARGUMENT AND CRITICAL DISCOURSE	3
ENGR 112	INTRODUCTION TO ENGINEERING COMPUTING <sup>2</sup>	3
ENGR 248	ENGINEERING GRAPHICS AND 3-D MODELING <sup>1</sup>	3
HHS 231	*LIFETIME FITNESS FOR HEALTH	2
HHS 241	*LIFETIME FITNESS	1
MIME 101	INTRODUCTION TO MIME	3
MTH 251	*DIFFERENTIAL CALCULUS <sup>2</sup>	4

MTH 252	INTEGRAL CALCULUS <sup>2</sup>	4
MTH 254	VECTOR CALCULUS I <sup>2</sup>	4
PH 211	*GENERAL PHYSICS WITH CALCULUS <sup>2</sup>	4
WR 121	*ENGLISH COMPOSITION <sup>2</sup>	3
*Perspectives <sup>4</sup>		6
		Hours 47

<b>Second Year</b>		
ENGR 211	STATICS <sup>2</sup>	3
ENGR 212	DYNAMICS	3
ENGR 213	STRENGTH OF MATERIALS <sup>2</sup>	3
ME 250	INTRODUCTION TO MANUFACTURING PROCESSES	1
MTH 256	APPLIED DIFFERENTIAL EQUATIONS <sup>2</sup>	4
MTH 306	MATRIX AND POWER SERIES METHODS <sup>2</sup>	4
PH 212	*GENERAL PHYSICS WITH CALCULUS <sup>2</sup>	4
PH 213	*GENERAL PHYSICS WITH CALCULUS <sup>2</sup>	4
ST 314	INTRODUCTION TO STATISTICS FOR ENGINEERS <sup>1</sup>	3
WR 327	*TECHNICAL WRITING	3
*Difference, Power, and Discrimination <sup>4</sup>		3
Restricted Electives <sup>1,3</sup>		9
		Hours 44

<b>Third Year</b>		
Professional Manufacturing Engineering		
ENGR 201	ELECTRICAL FUNDAMENTALS I	3
ENGR 321/MATS 321	INTRODUCTION TO MATERIALS SCIENCE	4

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ME 311/NSE 311	INTRODUCTI TO THERMAL- FLUID SCIENCES	4
MFGE 336	PRODUCTION ENGINEERING	4
Restricted Electives <sup>1,3</sup>		22
*Perspectives <sup>4</sup>		6
Hours		43
<b>Fourth Year</b>		
IE 497 & IE 498	*MIME CAPSTONE DESIGN and *MIME CAPSTONE DESIGN	8
ME 382	INTRODUCTI TO DESIGN	4
ME 413	COMPUTER- AIDED DESIGN AND MANUFACTURING	4
MFGE 337	MATERIALS AND MANUFACTI PROCESSES	4
MFGE 436	LEAN MANUFACTURING SYSTEMS ENGINEERING	4
MFGE 437	COMPUTER CONTROL OF MANUFACTI PROCESSES	4
Biological Science Elective <sup>4</sup>		4
Restricted Electives <sup>1,3</sup>		8
*Synthesis Courses <sup>4</sup>		6
<b>Total credits required for graduation is 180</b>		
Hours		46
Total Hours		180

CONTROL, IE 368 FACILITY DESIGN AND OPERATIONS MANAGEMENT, IE 411 VISUAL PROGRAMMING FOR INDUSTRIAL APPLICATIONS, IE 412 INFORMATION SYSTEMS ENGINEERING, IE 415 SIMULATION AND DECISION SUPPORT SYSTEMS, IE 418 TELECOMMUNICATION CONCEPTS, IE 419 WIRELESS NETWORKS, IE 425 INDUSTRIAL SYSTEMS OPTIMIZATION, IE 426 STOCHASTIC MODELS OF INDUSTRIAL SYSTEMS, IE 470 MANAGEMENT SYSTEMS ENGINEERING, IE 471 PROJECT MANAGEMENT IN ENGINEERING, IE 475 ADVANCED MANUFACTURING COSTING TECHNIQUES.

**Keystone Option 2 (Product Development):** ENGR 202 ELECTRICAL FUNDAMENTALS II, ENGR 391 ENGINEERING ECONOMICS AND PROJECT MANAGEMENT, MATS 322 MECHANICAL PROPERTIES OF MATERIALS (or ENGR 322 MECHANICAL PROPERTIES OF MATERIALS), ME 312 THERMODYNAMICS (or NSE 312 THERMODYNAMICS), ME 316 MECHANICS OF MATERIALS, ME 317 INTERMEDIATE DYNAMICS, ME 331 INTRODUCTORY FLUID MECHANICS (or NSE 331 INTRODUCTORY FLUID MECHANICS), ME 332 HEAT TRANSFER (or NSE 332 HEAT TRANSFER), ME 373 MECHANICAL ENGINEERING METHODS, ME 383 MECHANICAL COMPONENT DESIGN, and 4 credits of restricted electives. Process electives include: CHE 445 POLYMER ENGINEERING AND SCIENCE, ECE 418 SEMICONDUCTOR PROCESSING, ROB 421 APPLIED ROBOTICS, MATS 322 MECHANICAL PROPERTIES OF MATERIALS (or ENGR 322 MECHANICAL PROPERTIES OF MATERIALS), ME 312 THERMODYNAMICS (or NSE 312 THERMODYNAMICS), ME 316 MECHANICS OF MATERIALS, ME 331 INTRODUCTORY FLUID MECHANICS (or NSE 331 INTRODUCTORY FLUID MECHANICS), ME 383 MECHANICAL COMPONENT DESIGN, ME 480 MATERIALS SELECTION, MFGE 499 SPECIAL TOPICS (or ME 499 SPECIAL TOPICS), MFGE 438 COMPOSITES MANUFACTURING, MFGE 531 MICROMANUFACTURING.

**Major Code: 317**

\* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

<sup>1</sup> Prerequisite for several upper-division courses. Recommended for completion prior to entry into the professional program

<sup>2</sup> Required for entry into the professional program

<sup>3</sup> Must be selected to satisfy the requirements of an approved manufacturing keystone option

<sup>4</sup> Must be selected to satisfy baccalaureate core requirements

**Keystone Option 1 (Manufacturing Systems):** ENGR 390 ENGINEERING ECONOMY, IE 212 COMPUTATIONAL METHODS FOR INDUSTRIAL ENGINEERING, MFGE 285 INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING (or IE 285 INTRODUCTION TO INDUSTRIAL AND MANUFACTURING ENGINEERING), IE 355 STATISTICAL QUALITY CONTROL, IE 356 EXPERIMENTAL DESIGN FOR INDUSTRIAL PROCESSES, IE 366 WORK SYSTEMS ENGINEERING, IE 367 PRODUCTION PLANNING AND CONTROL, IE 368 FACILITY DESIGN AND OPERATIONS MANAGEMENT, and 9 credits of restricted electives. Systems electives include: IE 355 STATISTICAL QUALITY CONTROL, IE 356 EXPERIMENTAL DESIGN FOR INDUSTRIAL PROCESSES, IE 366 WORK SYSTEMS ENGINEERING, IE 367 PRODUCTION PLANNING AND