### University Core and Graduation Requirements

#### FRESHMAN YEAR

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
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<tbody>
<tr>
<td>MFGEN 130</td>
<td>First-year Writing or A HTG 100</td>
</tr>
<tr>
<td>MATH 112</td>
<td>Religion Cornerstone course</td>
</tr>
<tr>
<td>PHSCS 121</td>
<td>Total Hours 16.0</td>
</tr>
<tr>
<td>First-year Writing or A HTG 100</td>
<td></td>
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<tr>
<td>Religion Cornerstone course</td>
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<tr>
<td>Total Hours 16.0</td>
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#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>3rd Semester</th>
<th>4th Semester</th>
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<tbody>
<tr>
<td>CE EN 203</td>
<td>MATH/Science Elective*</td>
</tr>
<tr>
<td>CHEM 105</td>
<td>ME EN 250</td>
</tr>
<tr>
<td>STAT 201</td>
<td>MFGEN 230</td>
</tr>
<tr>
<td>REL 100</td>
<td>TECH 231</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>Religion Elective</td>
</tr>
<tr>
<td>Total Hours 15.0</td>
<td>Total Hours 16.0</td>
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#### JUNIOR YEAR

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<tr>
<th>5th Semester</th>
<th>6th Semester</th>
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<tbody>
<tr>
<td>WRTG 316</td>
<td>MFGEN 391</td>
</tr>
<tr>
<td>MFGEN 331</td>
<td>MFGEN 395</td>
</tr>
<tr>
<td>MATH/Science Elective*</td>
<td>MATH/Science Elective*</td>
</tr>
<tr>
<td>Total Hours 15.0</td>
<td>Total Hours 16.0</td>
</tr>
</tbody>
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### Graduation Requirements:

- Minimum residence hours required: 30.0
- Minimum hours needed to graduate: 120.0

*Suggested Sequence of Courses*

*Please see advisement office for approved math/science electives.

**Note:** Students are encouraged to complete an average of 15–16 credit hours each semester or 30–31 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.

Note: 123 credit hours are required to graduate with this degree.
BS in Manufacturing Engineering (396541)
2021-2022 Program Requirements (94 Credit Hours)

**REQUIREMENT 1** Complete 12 courses
- MFGEN 130 - Modern Manufacturing 3.0
- MFGEN 220 - Material Removal 3.0
- MFGEN 230 - Computer-Aided Manufacturing 3.0
- MFGEN 291 - Manufacturing Leadership 1.0
- MFGEN 331 - Metal Processes 4.0
- MFGEN 333 - Industrial Automation 3.0
- MFGEN 340 - Quality Systems in Manufacturing 3.0
- MFGEN 355 - Plastics Materials and Processing 3.0
- MFGEN 381 - Lean Manufacturing & System Design 3.0
- MFGEN 391 - Junior Seminar 0.5
- MFGEN 401 - Data Analysis 3.0
- MFGEN 491 - Senior Seminar 0.5

**REQUIREMENT 2** Complete 1 hour from the following course(s)
- MFGEN 395 - Academic Internship 3.0

**REQUIREMENT 3** Complete 12 courses
**SUPPORTING COURSES:**
- "BIO 100 - Principles of Biology 3.0
- C S 142 - Introduction to Computer Programming 3.0
- CCE 103 - Engineering Mechanics - Statics 3.0
- CHEM 105 - General College Chemistry 1 with Lab (Integrated) 4.0
- "MATH 112 - Calculus 1 4.0
- ME EN 250 - Science of Engineering Materials 3.0
- ME EN 272 - Engineering Graphics - Principles and Applications 1.0
- PHSCS 121 - Introduction to Newtonian Mechanics 3.0
- STAT 201 - Statistics for Engineers and Scientists 3.0
- TECH 112 - Exploration in Innovation Design Techniques 1.0
- "WRT 216 - Technical Communication 3.0

**REQUIREMENT 4** Complete 1 course
- ENG T 231 - (Not currently offered) 3.0
- "TECH 231 - Foundations of Global Leadership 3.0

**REQUIREMENT 5** Complete 2 courses
**TECHNICAL ELECTIVE COURSES:**
- ITAC 328 - Electronics, Computers, and Manufacturing 3.0
- MFGEN 372 - Design for X 3.0
- MFGEN 431 - Tool Design 3.0

**REQUIREMENT 6** Complete 12.0 hours from the following course(s)
**MATH, SCIENCE, AND STATISTICS SUPPORTING COURSES:**
- CHEM 106 - General College Chemistry 2 3.0
- CHEM 351M - Organic Chemistry 1 - Majors 3.0
- CHEM 357 - Industrial Organic Chemistry 3.0
- MATH 113 - Calculus 2 4.0
- MATH 213 - Elementary Linear Algebra 2.0
- MATH 215 - Computational Linear Algebra 1.0
- MATH 334 - Ordinary Differential Equations 3.0
- PHSCS 123 - Introduction to Waves, Optics, and Thermodynamics 3.0
- STAT 462 - Quality Control and Industrial Statistics 3.0
- STAT 466 - Introduction to Reliability 3.0
- STAT 511 - Statistical Methods for Research 1 3.0
- STAT 512 - Statistical Methods for Research 2 3.0

**REQUIREMENT 7** Complete 2 courses
- ME EN 475 - Integrated Product and Process Design 3.0
- ME EN 476 - Product Development 2 - Capstone 3.0

**REQUIREMENT 8** Complete department packet and exit interview.

**THE DISCIPLINE:**
Manufacturing is an exciting and rewarding discipline that has significant impact on a society's standard of living and economic independence. At BYU the manufacturing program is specifically oriented toward creating leaders in the industry. Students in manufacturing learn creative and analytical skills that will enable them to quickly diagnose and solve manufacturing problems with insight from both engineering and management perspectives. They also develop interpersonal and communication skills that will prepare them to work as part of an engineering team and effectively interact with vendors, management, and production personnel. In addition, they receive hands-on training in modern lab facilities and learn to use computers to design, analyze, implement, and control manufacturing operations. Manufacturing professionals are knowledgeable and skilled in the managing methods, technologies, equipment, and tooling needed to produce affordable products of high quality. They are able to effectively coordinate the procurement, installation, and start-up of production equipment as well as improve the productivity of existing operations. They are also able to coordinate manufacturing and supply-chain operation in a global setting.

Graduates may further their technical and managerial skills by pursuing either a master of science in technology or a master of business administration.

**RESEARCH OPPORTUNITIES:**
Students can work on a variety of industry-sponsored and related projects, often working directly with manufacturing engineers in industry. Manufacturing classes sometimes integrate these projects into the course work, but other industrial projects can be done outside of class, usually for pay. The excellent equipment and facilities in the department provide the resources where industry projects can be effectively accomplished.

**INTERNSHIPS:**
Professional training in actual companies is required and the advisor in the department can help students who desire to complete an internship. Both domestic and international internship opportunities are available for credit (and usually some pay). Many internships lead to permanent employment with the sponsoring company. Internships also offer a great chance for students to understand how their education is actually applied and to investigate further career directions and potential focus areas in their education.

**PROFESSIONAL AND HONOR SOCIETIES:**
The department sponsors strong student chapters of national societies associated with manufacturing and materials including the Society of Manufacturing Engineers (SME) and the Society of the Advancement of Materials and Process Engineering (SAMPE). Students may also participate in the national engineering technology honor society, Tau Alpha Pi and other honor societies.

**FINANCING:**
Many students can receive financial aid from department-sponsored scholarships or part time employment. The employment can be as teaching/lab assistants, apprentice engineers working on an industry sponsored project, or research assistants under the direction of a faculty member.
CAREERS:
Career opportunities in manufacturing are plentiful and rewarding. Typical entry-level job titles include manufacturing engineer, quality manager, process engineer, tool engineer, product engineer, quality engineer, production supervisor, and account manager (technical sales). New graduates are typically hired into technical positions but have the opportunity to quickly move into management. The job outlook for manufacturing graduates is bright and should continue to be strong in the future. When one considers that everything that does not exist as part of nature is the product of some form of manufacturing, it is easy to see that manufacturing is an integral part of society and generates an ever-growing workforce. Progressive companies worldwide seek qualified individuals who can provide leadership in improving the quality and productivity of their manufacturing operations.

MAP DISCLAIMER
While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

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BS in Manufacturing Engineering (396541)
2021-2022