# University Core and Graduation Requirements

## University Core Requirements:

### Religion Cornerstones
- Teachings and Doctrine of The Book of Mormon: 1 class, 2.0 hours, REL A 275
- Jesus Christ and the Everlasting Gospel: 1 class, 2.0 hours, REL A 250
- Foundations of the Restoration: 1 class, 2.0 hours, REL C 225
- The Eternal Family: 1 class, 2.0 hours, REL C 200

### The Individual and Society
- American Heritage: 1-2 classes, 3-6.0 hours, from approved list
- Global and Cultural Awareness: 1 class, 3.0 hours, ENG T 231*

### Skills
- First Year Writing: 1 class, 3.0 hours, from approved list
- Advanced Written and Oral Communications: 1 class, 3.0 hours, ENGL 316*
- Quantitative Reasoning: 1 class, 3-4.0 hours, from approved list
- Languages of Learning (Math or Language): 1 class, 4.0 hours, MATH 112*

### Arts, Letters, and Sciences
- Civilization 1: 1 class, 3.0 hours, from approved list
- Civilization 2: 1 class, 3.0 hours, from approved list
- Arts: 1 class, 3.0 hours, from approved list
- Letters: 1 class, 3.0 hours, from approved list
- Biological Science: 1 class, 3-4.0 hours, BIO 100* or BIO 130*
- Physical Science: 1 class, 3.0 hours, CE EN 204*
- Social Science: 1 class, 3.0 hours, ENG T 231*

### Core Enrichment: Electives
- Religion Electives: 3-4 classes, 6.0 hours, from approved list
- Open Electives: Variable hours, from approved list

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## Graduation Requirements:

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

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### Suggested Sequence of Courses

#### FRESHMEN YEAR

1st Semester
- First-Year Writing Elective: 3.0 hours
- BIO 100: 3.0 hours
- PHSCS 121: 3.0 hours
- MATH 112: 4.0 hours
- ME EN 191: 0.5 hours
- Religion Cornerstone Elective: 2.0 hours
- Total Hours: 15.5

2nd Semester
- CHEM 105: 4.0 hours
- MATH 113: 4.0 hours
- ME EN 101: 3.0 hours
- American Heritage Elective: 3.0 hours
- Religion Cornerstone Elective: 2.0 hours
- Total Hours: 16.0

#### SOPHOMORE YEAR

3rd Semester
- CE EN 203: 3.0 hours
- CE EN 204: 3.0 hours
- ENG T 231: 3.0 hours
- PHSCS 123: 3.0 hours
- MATH 302: 4.0 hours
- Religion Cornerstone Elective: 2.0 hours
- Total Hours: 18.0

4th Semester
- EC EN 301: 3.0 hours
- ME EN 250: 3.0 hours
- ME EN 272: 3.0 hours
- ME EN 273: 3.0 hours
- ME EN 274: 3.0 hours
- Core Elective: 3.0 hours
- Total Hours: 16.0

#### JUNIOR YEAR

5th Semester
- STAT 201: 3.0 hours
- ME EN 321: 3.0 hours
- ME EN 330: 3.0 hours
- ME EN 335: 3.0 hours
- ME EN 382: 3.0 hours
- Religion Cornerstone Elective: 2.0 hours
- Total Hours: 17.0

6th Semester
- ENGL 316: 3.0 hours
- ME EN 312: 3.0 hours
- ME EN 362: 2.0 hours
- ME EN 372: 3.0 hours
- ME EN 393: 1.0 hours
- Religion Elective: 2.0 hours
- Total Hours: 17.0

#### SENIOR YEAR

5th Semester
- ME EN 321: 3.0 hours
- ME EN 330: 3.0 hours
- ME EN 335: 3.0 hours
- ME EN 382: 3.0 hours
- Religion Cornerstone Elective: 2.0 hours
- Total Hours: 18.0

6th Semester
- ENGL 316: 3.0 hours
- ME EN 312: 3.0 hours
- ME EN 362: 2.0 hours
- ME EN 372: 3.0 hours
- ME EN 393: 1.0 hours
- Religion Elective: 2.0 hours
- Total Hours: 17.0

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Note: Students are encouraged to complete between 15–17 credit hours each semester or 30–34 credit hours each year, which could include spring and/or summer terms. Taking fewer credits increases the cost and the number of semesters to graduate.
### BS in Mechanical Engineering (394950)
#### 2018-2019 Program Requirements (101.5 - 102.5 Credit Hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>ME EN 382</td>
<td>Manufacturing Processes</td>
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<tr>
<td>ME EN 393</td>
<td>Professional Skills in Mechanical Engineering</td>
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<td>ME EN 475</td>
<td>Integrated Product and Process Design 1</td>
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<tr>
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#### REQUIREMENT 5 Complete 3 courses

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<tr>
<th>SUPPORTING COURSES</th>
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<tr>
<td>*ENG T 231 - Foundations of Global Leadership</td>
</tr>
<tr>
<td>*ENGL 316 - Technical Communication</td>
</tr>
<tr>
<td>STAT 201 - Statistics for Engineers and Scientists</td>
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</table>

#### REQUIREMENT 6 Complete 12.0 hours from the following option(s)

**COMPLETE THE 12-HOUR REQUIREMENT WITH COURSES FROM THE FOLLOWING:**

- Complete 12 hours (four courses) of technical electives.
  - The purpose of these courses is to strengthen the engineering education of the student by a) deepening the student's understanding of engineering and/or science fundamentals, b) helping the student learn to apply engineering fundamentals in specific areas of interest, and/or c) helping the student to develop critical skills related to engineering practice.
  - The technical electives are normally 400-level or higher mechanical engineering courses, but other courses may be used as long as the following requirements are met:
  - At least two courses (6 credit hours) must be in mechanical engineering.
  - No courses may be below the 300 level.
  - A maximum of 3 credit hours in Me En 497R or other independent project courses may be applied to meet technical elective requirements.
  - All courses must be of an acceptable level from mechanical engineering, civil engineering, chemical engineering, computer engineering, electrical engineering, mathematics, statistics, physics, chemistry, or computer science or be on the approved elective list on the department website. If a student wishes to count a course outside these areas as an elective, approval must be granted before the course is taken. Approval is requested by submitting a one-page petition to the department undergraduate committee that lists all of the proposed electives and demonstrates how the proposed exception meets the purposes described above.
  - No course used to satisfy other major requirements for graduation may be used as an elective.

#### OPTION 6.1 Complete up to 12.0 hours from the following group(s)

**A. GENERAL ELECTIVE OPTION**

| GROUP 6.1.1 Complete up to 12.0 hours from the following course(s) |
|-------------------------------------------------------------|-----------------|
|                                                              |                 |

- ME EN 497R - Mentored Learning for Undergraduate Projects in Me 3.0v
- ME EN 412 - Applications of Fluid Dynamics                  | 3.0             |
- ME EN 415 - Applied Aerodynamics and Flight Mechanics       | 3.0             |
- ME EN 422 - Applied Thermodynamics                          | 3.0             |
- ME EN 425 - Internal Combustion Engines                     | 3.0             |
- ME EN 426 - Gas Turbine and Jet Engine Design               | 3.0             |
- ME EN 431 - (Me En-EC En 483) Design of Control Systems    | 4.0             |
- ME EN 437 - Kinematics                                     | 3.0             |
- ME EN 452 - Intermediate Materials                         | 3.0             |
- ME EN 455 - Composite Material Design                      | 3.0             |
- ME EN 471 - Computer-Aided Engineering Applications        | 3.0             |
- ME EN 472 - Mechanical Systems Design Applications         | 3.0             |
- ME EN 477 - Design for Manufacture and Assembly             | 3.0             |
- ME EN 479 - Singapore International Product Design and Develop 3.0v
- ME EN 482 - Manufacturing Systems Analysis and Design      | 3.0             |
- ME EN 486 - Automation                                     | 3.0             |
- ME EN 495R - Mentored Learning for Undergraduate Coursework I 6.0v
- ME EN 497R - Mentored Learning for Undergraduate Projects in Me 3.0v
- ME EN 500 - (MeEn-CEEn) Design and Materials Applications  | 3.0             |
- ME EN 501 - (MeEn-CEEn) Stress Analysis and Design of Mechanical 3.0v
- ME EN 503 - (MeEn-CEEn) Plasticity and Fracture            | 3.0             |
- ME EN 504 - (Me En-CE En) Computer Structural Analysis and Optimi 3.0v
- ME EN 505 - Applied Engineering Math                       | 3.0             |
- ME EN 507 - (Me En-CE En) Linear Finite Element Methods    | 3.0             |
- ME EN 508 - (Me En-CE En) Structural Vibrations             | 3.0             |
- ME EN 510 - Compressible Fluid Flow                        | 3.0             |
- ME EN 512 - Intermediate Fluid Dynamics                    | 3.0             |
- ME EN 515 - Aerodynamics                                  | 3.0             |
- ME EN 521 - Intermediate Thermodynamics                    | 3.0             |
- ME EN 522 - Combustion                                    | 3.0             |
- ME EN 523 - (Me En-CE En) Aircraft Structures              | 3.0             |
- ME EN 534 - Dynamics of Mechanical Systems                 | 3.0             |
- ME EN 535 - Mechanical Vibrations                          | 3.0             |
- ME EN 537 - Robotics - Kinematics, Dynamics, and Control   | 3.0             |
- ME EN 538 - Compliant Mechanisms                           | 3.0             |
- ME EN 540 - Intermediate Heat and Mass Transfer            | 3.0             |
- ME EN 541 - Computational Fluid Dynamics and Heat Transfer | 3.0             |
- ME EN 550 - (Me En-EC En) Microelectromechanical Systems (MEMS) 3.0v
- ME EN 552 - Neuromechanics of Movement                     | 3.0             |
- ME EN 555 - Introduction to Biomechanical Engineering      | 3.0             |
- ME EN 556 - Materials Modeling: Methods in Atomistic, Mesoscale, a 3.0v
- ME EN 558 - Metallurgy                                    | 3.0             |
BS in Mechanical Engineering (394950)
2018-2019 Program Requirements Cont...

ME EN 561 - (Me En-Phsce) Fundamentals of Acoustics 3.0
ME EN 570 - (Me En-CE En) Computer-Aided Engineering Software 1 3.0
ME EN 574 - Product Development Automation 3.0
ME EN 575 - (Me En-CE En) Optimization Techniques in Engineering 3.0
ME EN 576 - Product Design 3.0
ME EN 578 - Systems Engineering and CAD Applications 3.0
ME EN 579 - Global Product Development 3.0
ME EN 585 - Manufacturing Competitiveness: Quality and Products 3.0
ME EN 595R - Topics in Mechanical Design 18.0v
ME EN 595R - Topics in Materials 18.0v
ME EN 595R - Special Topics in Mechanical Engineering 18.0v
ME EN 595R - Advanced Dynamics 18.0v

GROUP 6.1.2 Complete up to 6.0 hours from the following course(s)
HONRS 499R - Honors Thesis 6.0v
C S 301R - Topics in Computer Science 3.0
C S 312 - Algorithm Design and Analysis 3.0
C S 324 - Systems Programming 3.0
C S 330 - Concepts of Programming Languages 3.0
C S 340 - Software Design and Testing 3.0
C S 345 - Operating Systems Design 3.0
C S 355 - Introduction to Graphics and Image Processing 3.0
C S 356 - Designing the User Experience 3.0
C S 401R - Topics in Computer Science 3.0v
C S 404 - Ethics and Computers in Society 2.0
C S 405 - Creating and Managing a Software Business 3.0
C S 412 - Linear Programming and Convex Optimization 3.0
C S 418 - Bioinformatics 3.0
C S 428 - Software Engineering 3.0
C S 431 - Algorithmic Languages and Compilers 3.0
C S 450 - Computer Vision 3.0
C S 452 - Database Modeling Concepts 3.0
C S 453 - Fundamentals of Information Retrieval 3.0
C S 455 - Computer Graphics 3.0
C S 456 - Introduction to User Interface Software 3.0
C S 460 - Computer Communications and Networking 3.0
C S 462 - Large-Scale Distributed System Design 3.0
C S 465 - Computer Security 3.0
C S 470 - Introduction to Artificial Intelligence 3.0
C S 477R - Secondary Minor Student Teaching 4.0
C S 478 - Tools for Machine Learning 3.0
C S 484 - Parallel Processing 3.0
C S 486 - Verification and Validation 3.0

C S 493R - Computing Competitions 3.0
C S 494 - Capstone 1 3.0
C S 495 - Capstone 2 3.0
C S 497R - Undergraduate Research 3.0
C S 498R - Undergraduate Special Projects 3.0v
C S 500 - (C S-Chem-Geol-Math-MEd-Phsce-Stat) Business Career 1.5
C S 501R - Advanced Topics in Computer Science 3.0v
C S 513 - Robust Control 3.0
HONRS 499R - Honors Thesis 6.0v
CE EN 300A - Civil and Environmental Engineering Seminar 0.5
CE EN 300B - Civil and Environmental Engineering Seminar 0.5
CE EN 304 - Civil Engineering Materials: Metals, Woods, and Compo 1.5
CE EN 306 - Civil Engineering Materials: Concrete, Masonry, and Asq 1.5
CE EN 321 - Structural Analysis 3.0
CE EN 332 - Hydraulics and Fluid Flow Theory 3.0
CE EN 341 - Elementary Soil Mechanics 3.0
CE EN 361 - Introduction to Transportation Engineering 3.0
CE EN 400A - Civil and Environmental Engineering Seminar 0.5
CE EN 400B - Civil and Environmental Engineering Seminar 0.5
CE EN 400C - Civil and Environmental Engineering Online Seminar 0.5
CE EN 414 - Engineering Applications of GIS 3.0
CE EN 421 - Structural Steel Design 3.0
CE EN 424 - Reinforced Concrete Design 3.0
CE EN 427 - International Megastructures 3.0
CE EN 431 - Hydrology 3.0
CE EN 433 - Hydraulic Engineering 3.0
CE EN 439 - Water Resources Study Abroad 3.0
CE EN 442 - Foundation Engineering 3.0
CE EN 451 - Environmental Engineering Processes 3.0
CE EN 461 - Geometric Design of Highways 3.0
CE EN 467 - International Magacities 3.0
CE EN 471A - Civil Engineering Practice 1.0
CE EN 471B - Civil Engineering Practice 1.0
CE EN 472 - Civil Engineering Design 3.0
CE EN 498R - Directed Studies in Civil and Environmental Engineering 18.0v
CE EN 500 - (CE En-Me En) Design and Materials Applications 3.0
CE EN 501 - (CE-En-MeEn) Stress Analysis and Design of Mechanical 3.0
CE EN 503 - (CE En-Me En) Plasticity and Fracture 3.0
CE EN 504 - (CE En-Me En) Computer Structural Analysis and Optim 3.0
CE EN 505 - Portland Cement Concrete Mixture Design and Analysis 3.0
CE EN 507 - (CE En-Me En) Linear Finite Element Methods 3.0
CE EN 508 - (CE En-Me En) Structural Vibrations 3.0
CE EN 514 - Geospatial Environmental Engineering 3.0
CE EN 523 - Seismic-Resistant Steel Buildings 3.0
CE EN 523 - (CE En-Me En) Aircraft Structures 3.0
CE EN 525 - Bridge Structures 3.0
CE EN 528 - Masonry Design 3.0
CE EN 529 - Timber Design 3.0
CE EN 531 - Principles of Hydrologic Modeling 3.0
CE EN 534 - Hydroinformatics 3.0
CE EN 535 - Hydraulic Design of Channels and Control Structures 3.0
CE EN 540 - Geo-Environmental Engineering 3.0
CE EN 544 - Seepage and Slope Stability Analysis 3.0
CE EN 545 - Geotechnical Analysis of Earthquake Phenomena 3.0
CE EN 547 - Groundwater Modeling 3.0
CE EN 551 - Water Treatment Facilities Design 3.0
CE EN 555 - Environmental Chemistry 3.0
CE EN 562 - Traffic Engineering: Characteristics and Operations 3.0
CE EN 563 - Pavement Design 3.0
CE EN 565 - Urban Transportation Planning 3.0
CE EN 570 - (CE En-Me En) Computer-Aided Engineering Software Design 3.0
CE EN 572 - Computer-Aided Geometric Design 3.0
CE EN 575 - (CE En-Me En) Optimization Techniques in Engineering 3.0
CE EN 594R - Selected Problems in Civil and Environmental Engineering 3.0v
HONRS 499R - Honors Thesis 6.0v
CH EN 311 - Chemical Engineering and Society-Health, Safety, and 3.0
CH EN 345 - Materials and Reactions Lab 0.5
CH EN 373 - Chemical Engineering Thermodynamics 3.0
CH EN 374 - Fluid Mechanics 3.0
CH EN 376 - Heat and Mass Transfer 3.0
CH EN 378 - Science of Engineering Materials 3.0
CH EN 385 - Thermodynamics and Transport Lab 0.5
CH EN 386 - Chemical Reaction Engineering 3.0
CH EN 391 - Career Skills 2 0.5
CH EN 400 - Creative Skills in Chemical Engineering 1.0
CH EN 410 - Principles of Reservoir Engineering 3.0
CH EN 412 - Introductory Nuclear Engineering 3.0
CH EN 433 - Energy Engineering 3.0
CH EN 436 - Process Control and Dynamics 3.0
CH EN 445 - Separations and Process Control Lab 0.5
CH EN 451 - Chemical Engineering Plant Design and Process Synth 4.0
CH EN 461 - Chemical Engineering Problem Solving through Exper 3.0
CH EN 475 - Unit Operations Laboratory 1 2.0
CH EN 476 - Separations 3.0
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<th>Course Title</th>
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<td>Microwave Remote Sensing</td>
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<td>EC EN 576</td>
<td>Medical Imaging and Image Reconstruction</td>
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<td>EC EN 595</td>
<td>Fundamentals of Patents and Other Intellectual Proper</td>
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<tr>
<td>HONRS 499R</td>
<td>Honors Thesis</td>
<td>6.0v</td>
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<tr>
<td>MATH 402</td>
<td>Modeling with Uncertainty and Data</td>
<td>3.0</td>
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<tr>
<td>MATH 403</td>
<td>Modeling with Uncertainty and Data Laboratory</td>
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<tr>
<td>MATH 404</td>
<td>Modeling with Uncertainty and Data</td>
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<tr>
<td>MATH 405</td>
<td>Modeling with Uncertainty and Data Laboratory</td>
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<tr>
<td>MATH 406R</td>
<td>Topics in Mathematics</td>
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<tr>
<td>MATH 410</td>
<td>Introduction to Numerical Methods</td>
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<tr>
<td>MATH 411</td>
<td>Numerical Methods</td>
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<tr>
<td>MATH 425</td>
<td>Mathematical Biology</td>
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<tr>
<td>MATH 431</td>
<td>Probability Theory</td>
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<tr>
<td>MATH 435</td>
<td>Mathematical Finance</td>
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</table>
### BS in Mechanical Engineering (394950)
#### 2018-2019 Program Requirements Cont...

**MATH 436 - Modeling with Dynamics and Control 1**  
3.0  
**MATH 437 - Modeling with Dynamics and Control 1 Laboratory**  
1.0  
**MATH 438 - Modeling with Dynamics and Control 2**  
3.0  
**MATH 439 - Modeling with Dynamics and Control 2 Laboratory**  
1.0  
**MATH 447 - Introduction to Partial Differential Equations**  
3.0  
**MATH 450 - Combinatorics**  
3.0  
**MATH 451 - Introduction to Topology**  
3.0  
**MATH 465 - Differential Geometry**  
3.0  
**MATH 473 - Group Representation Theory**  
3.0  
**MATH 485 - Mathematical Cryptography**  
3.0  
**MATH 487 - Number Theory**  
3.0  
**MATH 495R - Readings in Mathematics**  
2.0v  
1.5  
**MATH 510 - Numerical Methods for Linear Algebra**  
3.0  
**MATH 511 - Numerical Methods for Partial Differential Equations**  
3.0  
**MATH 513R - Advanced Topics in Partial Differential Equations**  
3.0  
**MATH 521 - Methods of Applied Mathematics 1**  
3.0  
**MATH 522 - Methods of Applied Mathematics 2**  
3.0  
**MATH 532 - Complex Analysis**  
3.0  
**MATH 534 - Introduction to Dynamical Systems 1**  
3.0  
**MATH 536 - Applied Discrete Probability**  
3.0  
**MATH 540 - Linear Analysis**  
3.0  
**MATH 541 - Real Analysis**  
3.0  
**MATH 547 - Modeling and Analysis of Partial Differential Equations**  
3.0  
**MATH 553 - Foundations of Topology 1**  
3.0  
**MATH 554 - Foundations of Topology 2**  
3.0  
**MATH 561 - Introduction to Algebraic Geometry 1**  
3.0  
**MATH 562 - Introduction to Algebraic Geometry 2**  
3.0  
**MATH 565 - Differential Geometry**  
3.0  
**MATH 570 - Matrix Analysis**  
3.0  
**MATH 571 - Algebra 1**  
3.0  
**MATH 572 - Algebra 2**  
3.0  
**MATH 586 - Introduction to Algebraic Number Theory**  
3.0  
**MATH 587 - Introduction to Analytic Number Theory**  
3.0  
**HONRS 499R - Honors Thesis**  
6.0v  
**PHSCS 318 - Introduction to Mathematical Physics**  
3.0  
**PHSCS 321 - Mechanics**  
3.0  
**PHSCS 330 - Computational Physics Lab 2**  
1.0  
**PHSCS 360 - Statistical and Thermal Physics**  
3.0  
**PHSCS 416 - Writing in Physics**  
3.0  
**PHSCS 427 - Introduction to Astrophysics**  
3.0  
**PHSCS 428 - Introduction to Astrophysics**  
3.0  
**PHSCS 430 - Computational Physics Lab 3**  
1.0  
**PHSCS 441 - Electrostatics and Magnetism**  
3.0  
**PHSCS 442 - Electrodynamics**  
3.0  
**PHSCS 451 - Quantum Mechanics**  
3.0  
**PHSCS 452 - Applications of Quantum Mechanics**  
3.0  
**PHSCS 461 - Introduction to Acoustics**  
3.0  
**PHSCS 471 - Principles of Optics**  
3.0  
**PHSCS 477R - Secondary Minor Student Teaching**  
4.0  
**PHSCS 492R - Capstone Project in Applied Physics**  
2.0  
**PHSCS 497R - Research in Physics**  
3.0v  
**PHSCS 498R - Senior Thesis**  
3.0v  
**PHSCS 500 - (Phscs-Chem-C S-Geol-MthEd-Stat) Business Cap 1**  
1.5  
**PHSCS 513R - Special Topics in Contemporary Physics**  
3.0v  
**PHSCS 529 - Advanced Observational Astronomy**  
3.0  
**PHSCS 540 - Electrical Engineering Principles and Practices for Phy**  
2.0  
**PHSCS 545 - Introduction to Plasma Physics**  
3.0  
**PHSCS 551 - Fundamentals of Acoustics**  
3.0  
**PHSCS 557 - Lasers and Atoms**  
3.0  
**PHSCS 558 - Solid-State Physics**  
3.0  
**PHSCS 583 - Physics of Nanostructures, Surfaces, and Interfaces**  
3.0  
**PHSCS 585 - Thin-Film Physics**  
3.0  
**PHSCS 586 - Transmission Electron Microscopy for Physical Science**  
3.0  
**PHSCS 587 - Physics of Semiconductor Devices**  
3.0  
**PHSCS 588 - Scanning Electron Microscopy (SEM) for Physical Science**  
3.0  
**PHSCS 599R - Academic Internship**  
9.0v  
**STAT 496R - Academic Internship: Statistics**  
9.0v  
**STAT 497R - Introduction to Statistical Research**  
3.0v  
**STAT 500 - (Stat-Chem-C S-Geol-MthEd-Phscs) Business Care 1**  
1.5  
**STAT 511 - Statistical Methods for Research 1**  
3.0  
**STAT 512 - Statistical Methods for Research 2**  
3.0  
**STAT 531 - Experimental Design**  
3.0  
**STAT 535 - Linear Models**  
3.0  
**STAT 536 - Statistical Learning and Data Mining**  
3.0  
**STAT 537 - Mixed Model Methods**  
3.0  
**STAT 538 - Survival Analysis**  
3.0  
**STAT 599R - Statistical Consulting**  
3.0v  
**STAT 591R - Graduate Seminar in Statistics**  
0.0  
**STAT 595R - Statistical Computations**  
3.0v  
**STAT 595R - Biostatistical Methods**  
3.0v  
**STAT 595R - Theory of Risk**  
3.0v  
**STAT 595R - Quality Methods**  
3.0v  
**STAT 595R - Special Topics in Statistics**  
3.0v  
**STAT 599R - Expert Systems in Statistics**  
3.0v  
**STAT 599R - Sampling Practicum**  
3.0v  
**STAT 599R - Academic Internship: Statistics**  
9.0v  

**GROUP 6.1.3 Complete up to 6.0 hours from the following course(ies)**  

**CFM 412 - Construction Scheduling and Cost Control**  
3.0  
**ENG T 497R - Global Engineering Outreach Projects**  
3.0  

You may take up to 3 credit hours.

**GEOL 440 - Solid Earth Geophysics**  
3.0  
**IT 444 - (Not currently offered)**  
3.0  
**IT 548 - Cyber-Physical Systems**  
3.0  
**MFG 331 - Metals Processes**  
4.0  
**MFG 333 - Industrial Automation**  
3.0  
**MFG 340 - Quality Systems in Manufacturing**  
3.0  
**MFG 355 - Plastics Materials and Processing**  
3.0  
**MFG 381 - Lean Manufacturing & System Design**  
3.0  
**MFG 431 - Tool Design**  
3.0  
**MFG 456 - Introduction to Composites**  
3.0  
**MFG 531 - Advanced Computer-Aided Manufacturing Programming**  
3.0  
**MFG 532 - Manufacturing Systems**  
3.0  
**MFG 533 - Manufacturing Information Systems**  
3.0  
**MFG 574 - Advanced Tool Design**  
3.0  
**MFG 575 - Packaging Technologies**  
3.0  
**MFG 580 - Manufacturing Simulation**  
3.0  
**MFG 672 - (Not currently offered)**  
1.5  
**MSB 430 - Introduction to International Business**  
3.0
**Option 6.2 Complete up to 12.0 hours from the following group(s)**

**B. Manufacturing Option**

The Society of Manufacturing Engineers has identified four areas of competency for manufacturing engineering as follows: (1) materials and manufacturing processes; (2) process, assembly, and product engineering; (3) manufacturing competitiveness; and (4) manufacturing systems design.

An option in manufacturing engineering is available. It may be completed by taking the following 15 hours of technical electives:

<table>
<thead>
<tr>
<th>GROUP 6.2.1 Complete 3.0 hours from the following course(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ME EN 585 - Manufacturing Competitiveness: Quality and Product</td>
<td>3.0</td>
</tr>
<tr>
<td>MFG 532 - Manufacturing Systems</td>
<td>3.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUP 6.2.2 Complete 3.0 hours from the following course(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ME EN 486 - Manufacturing Systems Analysis and Design</td>
<td>3.0</td>
</tr>
<tr>
<td>ME EN 482 - Automation</td>
<td>3.0</td>
</tr>
<tr>
<td>ME EN 537 - Robotics - Kinematics, Dynamics, and Control</td>
<td>3.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUP 6.2.3 Complete 3.0 hours from the following course(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ME EN 452 - Intermediate Materials</td>
<td>3.0</td>
</tr>
<tr>
<td>ME EN 456 - Composite Material Design</td>
<td>3.0</td>
</tr>
<tr>
<td>ME EN 477 - Design for Manufacture and Assembly</td>
<td>3.0</td>
</tr>
<tr>
<td>ME EN 558 - Metallurgy</td>
<td>3.0</td>
</tr>
<tr>
<td>ME EN 584 - (Not currently offered)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUP 6.2.4 Complete 3.0 hours from the following course(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ME EN 452 - Intermediate Materials</td>
<td>3.0</td>
</tr>
<tr>
<td>ME EN 456 - Composite Material Design</td>
<td>3.0</td>
</tr>
<tr>
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<td>3.0</td>
</tr>
<tr>
<td>MFG 532 - Manufacturing Systems</td>
<td>3.0</td>
</tr>
</tbody>
</table>

When combined with required courses for all mechanical engineering majors related to manufacturing, namely Me En 250, 282, 475/476, and Stat 201, this option provides a strong foundation in manufacturing engineering.

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**THE DISCIPLINE:**

Mechanical engineers work with concepts, ideas, and products that are primarily mechanical or energy related. Mechanical engineering is a broad discipline that prepares a person to contribute in a wide range of fields such as aerospace, computer graphics, power generation, machine tools, petroleum, agricultural and construction equipment, medicine, robotics, government, and all types of transportation. A mechanical engineer may work in research, design, analysis, manufacturing, testing, operations, sales, or management. Engineers use critical problem-solving methods and basic principles of mathematics and science to creatively solve problems.

**EDUCATIONAL OBJECTIVES:**

The objectives of the undergraduate Bachelors of Science program in the Department of Mechanical Engineering at Brigham Young University are to:

1. Teach the fundamental concepts of math, science, and mechanical engineering in order to produce graduates who demonstrate technical excellence and provide service to their profession, community, family, and church.
2. Instill a desire and ability to learn continuously, both through study and faith, to enable graduates to meet the changing demands of their profession and personal life.
3. Provide practical and open-ended engineering experiences in order to develop graduates who think independently and demonstrate leadership and creativity.
4. Engage students in activities to produce graduates who communicate and work effectively and ethically with people of diverse backgrounds.

**PROGRAM LEARNING OUTCOMES:**

To assure that these objectives are reached, the department has articulated twelve outcomes of the BS program. Each student graduating from this program is expected to have:

1. A basic understanding of fundamental physical phenomena and governing principles.
2. The ability to develop and solve mathematical models of fundamental physical phenomena and apply them to predict the behavior of engineering systems.
3. The ability to use engineering principles to design an innovative system, component, or process to meet desired needs.
4. The expertise to plan and conduct an experimental program and evaluate the results.
5. The ability to use modern engineering tools and techniques in engineering practice.
6. An understanding of manufacturing processes and planning.
7. Effective oral and written communication skills.
8. The ability to work with and lead others to accomplish goals.
9. An appreciation of history, philosophy, literature, science, and the fine arts and how they influence the culture and behavior of societies.
10. Personal behavior demonstrating and practicing high moral and ethical standards.
11. The ability to practice engineering in a global environment.
12. A desire for and commitment to lifelong learning and service.

All courses in the curriculum are designed to help achieve these outcomes. The curriculum in mechanical engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET).

**CAREER OPPORTUNITIES:**

A bachelor of science degree in mechanical engineering provides widely recognized professional training for careers in industry, government, and other areas. Most industrial companies hire some mechanical engineers. Companies that make mechanical or energy-related products may hire mostly mechanical engineers. As a result, many mechanical
engineering positions are available worldwide. Mechanical engineers have job opportunities in companies involved in such areas as aircraft and spacecraft design; manufacturing processes; product safety and reliability; solar energy; electronic equipment packaging and cooling; power plant design; jet, train, truck, and automobile engines; environmental protection; artificial intelligence; robotics; medical and hospital equipment; new material development and applications; and technical writing. Increasing numbers of positions utilize foreign language experience. A graduate in mechanical engineering is prepared for advanced studies in the field as well as in a variety of other disciplines, including law, medicine, and business administration. Perhaps most important to graduates are the problem-solving strategies and thinking processes acquired in the study of mechanical engineering that help one to succeed in any area of endeavor.

UNDERGRADUATE ADMITTANCE REQUIREMENTS:
Any student may choose to major in Mechanical Engineering, and to enroll in any of the preprofessional program courses, meeting the necessary prerequisites.

PROFESSIONAL PROGRAM ACCEPTANCE:
Students must be accepted into the professional program before they may take the professional Me En core courses. To apply, students must receive a grade in the courses outlined below. They must also be in good academic standing. Admissions decisions are made by equally weighting the GPA from these courses. (See policies below regarding AP courses and transfer courses.)

- The first physics course taken at BYU from the sequence: PHSCS 121, PHSCS 123
- The first math course taken at BYU from the sequence: MATH 112, 113, 302, 303, 313, 314, 334
- The first mechanics course taken at BYU from the sequence: ME EN 101, CE EN 203, CE EN 204
- ME EN 191 at BYU (PASS Grade required)

AP Courses. These courses can fulfill graduation requirements; however, since there is no grade assigned to AP courses, students must take the next course in the physics, math, or mechanics sequence OR repeat the AP equivalent course for application to the professional program.

Transfer Courses. If students have transferred equivalent courses from an ABET-accredited school, the grades from the transferred courses can be used in calculating the Application GPA. Alternatively, transfer students may retake the BYU equivalent course. Credit for non-ABET-accredited courses can count toward graduation, but cannot be used to calculate the Admissions GPA. Students must either (a) take the BYU equivalent course or (b) take the next course in the sequence. Transfer students should talk to the undergraduate advisor to ensure compliance with admissions requirements.

Acceptance Criteria. 220 students are granted acceptance to the professional program each year based on the Application GPA. Students may apply for admission more than once, however, each course may be retaken only ONE time. When a course is retaken, the higher grade will be used to calculate the Application GPA. Please see our website: http://me.byu.edu/content/applying-professional-program, for further information and recent admission data.

ACADEMIC STANDARDS AND CONTINUANCE:
On gaining acceptance into the ME professional program, students must maintain a minimum university cumulative GPA of 2.0. No more than 6 credit hours or two courses of grades below C– in required program courses (including preprofessional and professional courses) may be applied toward graduation. A professional program course may not be retaken more than once. At least 30 of the 48.5 credit hours of Mechanical Engineering courses (ME EN) must be earned at BYU.

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.

DEPARTMENT INFORMATION
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Brigham Young University

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Provo, UT 84602
Telephone: 801-422-2625
Email: mecheng@byu.edu

ADVISEMENT CENTER INFORMATION
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Telephone: 801-422-4325
Email: engineering_advisement@byu.edu