# REQUIREMENTS FOR THE BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING/MASTER OF SCIENCE

(Accredited by the Accreditation Board for Engineering and Technology)

## COLLEGE OF ENGINEERING

THE UNIVERSITY OF OKLAHOMA

For Students Entering the Oklahoma State System for Higher Education
Summer 2008 through Spring 2009

**GENERAL REQUIREMENTS**

<table>
<thead>
<tr>
<th>Year</th>
<th>FIRST SEMESTER</th>
<th>Hours</th>
<th>SECOND SEMESTER</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRESHMAN</td>
<td></td>
<td></td>
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<tr>
<td>ENGL 1113, Prin. of English Composition (Core I)</td>
<td>3</td>
<td>ENGL 1213, Prin. of English Composition (Core I), or 144-148†</td>
<td>2</td>
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<tr>
<td>CHEM 1315, General Chemistry (Core II)</td>
<td>5</td>
<td>EXPO 1213, Expository Writing (Core I)</td>
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<tr>
<td>MATH 1823, Calculus &amp; Analytic Geometry I (Core I)</td>
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<td>MATH 2423, Calculus &amp; Analytic Geometry II (Core I)</td>
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<tr>
<td>ENGR 1410, Freshman Engineering Orientation I</td>
<td>0</td>
<td>PHYS 2514, General Physics for Engineering &amp; Science Majors (Core III)</td>
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<tr>
<td>HIST 1483, U.S., 1492-1865, or 1493, U.S., 1865-Present (Core IV)</td>
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<td>PSC 1113, American Federal Government (Core III)</td>
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<td>ENGR 1420, Freshman Engineering Orientation II</td>
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<tr>
<td></td>
<td></td>
<td>Approved Elective: Social Science (Core III)</td>
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<tr>
<td>TOTAL CREDIT HOURS</td>
<td>14</td>
<td>TOTAL CREDIT HOURS</td>
<td>16</td>
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**FRESHMAN**

- **MATH 2433, Calculus & Analytic Geometry III**
- **PHYS 2524, General Physics for Engineering & Science Majors (Core II)**
- **AME 2113, Statics**
- **AME 2213, Thermodynamics**
- **AME 2401, Engineering Computing**
- **ENGR 2003, Engineering Practice I**

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<tr>
<th>Year</th>
<th>TOTAL CREDIT HOURS</th>
<th>14</th>
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</thead>
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**SOPIHOMORE**

- **AME 3112, Solid Mechanics Lab**
- **AME 3143, Solid Mechanics**
- **AME 3153, Fluid Mechanics**
- **AME 3723, Numerical Methods for Engineering Computation**
- **ENGR 3023, Engineering Practice I**
- **ENGR 3023, Engineering Practice I**

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<tr>
<th>Year</th>
<th>TOTAL CREDIT HOURS</th>
<th>17</th>
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**JUNIOR**

- **AME 3112, Solid Mechanics Lab**
- **AME 3143, Solid Mechanics**
- **AME 3153, Fluid Mechanics**
- **AME 3723, Numerical Methods for Engineering Computation**
- **ENGR 3023, Engineering Practice I**
- **ENGR 3023, Engineering Practice I**

<table>
<thead>
<tr>
<th>Year</th>
<th>TOTAL CREDIT HOURS</th>
<th>17</th>
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**SENIOR**

- **AME 5573, Advanced Engineering Analysis I, or 5980, Thesis Research**, or | 3 |
- **AME 5980, Thesis Research, or 5573, Advanced Engineering Analysis I, or 5980, Thesis Research**, or | 3 |
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**

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<tr>
<th>Year</th>
<th>TOTAL CREDIT HOURS</th>
<th>11-12</th>
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**FIFTH YEAR**

- **AME 5573, Advanced Engineering Analysis I, or 5980, Thesis Research**, or | 3 |
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**
- **AME Graduate-level Elective**

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<tr>
<th>Year</th>
<th>TOTAL CREDIT HOURS</th>
<th>12-13</th>
</tr>
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**Mechanical Engineering (Standard)**

<table>
<thead>
<tr>
<th>Bachelor of Science in Mechanical Engineering/</th>
<th>Master of Science</th>
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OU encourages students to complete at least 31 hours of applicable coursework each year to have the opportunity to graduate in four years.

To be chosen from the University-Wide General Education Approved Course List. Three of these 12 hours must be upper-division (3000-4000). See list in the Class Schedule.

- **Students must successfully complete prerequisite courses with a minimum C grade before proceeding to the next course.**

- **Two college-level courses in a single foreign language are required; this may be satisfied by successful completion of 2 years in a single foreign language in high school. Students who must take foreign language at the University will have an additional 6-10 hours of coursework.**

- **A list of Technical, Experimental, and Engineering Science electives is available in the AME Office, FH 212.**

- **AME courses are sequential and usually offered only in the semester shown. Note prerequisites on the back of this page.**

- **This course fulfills the Computer Literacy Requirement for graduation as required by the Oklahoma State Regents for Higher Education.**
4613 Multilinear in Engineering (Slashlisted with 5613). Prerequisite: junior, senior, or graduate standing or permission of instructor. Introduces engineering students to electronic media. Topics will center on engineering and how electronic media can be used by engineers to illustrate technical topics such as three-dimensional motion, data visualization, time-based physical actions, and real-time simulations. Emphasizes developing effective interactive media programs for all engineers in all disciplines. No student may earn credit for both 4613 and 5613. (F)

G4812 Dynamics and Controls Laboratory. Prerequisite: 3112 or equivalent or graduate standing. May be repeated with change of project; maximum credit four hours. Objectives are to teach the implementation of instrumentation and controls for mechanical systems and explore design and control of automated systems. Laboratory assignments may vary from year to year. (Sp)

G4822 Fluid and Thermal Laboratory. Prerequisite: 3173; 3112 or graduate standing. May be repeated with change of content; maximum credit six hours. Experimental studies in heat transfer or fluid mechanics. Lecture and Laboratory (F)

G5573 Advanced Engineering Analysis I. Prerequisite: Mathematics 3113. Vector and tensor fields; first-order equations; second-order equations of variations followed by variational methods and/or the method of weighted residuals. (Irreg.)

G5980 Research for Master’s Thesis. Variable enrollment, two to nine hours; maximum credit applicable toward degree, six hours. (F, Sp, Su)

COURSES IN ENGINEERING (ENGR)

1410 Freshman Engineering Orientation I. Prerequisite: declared major in engineering. All entering freshmen with a declared engineering major are required to enroll. One hour of this seminar a week is held to introduce students to the major engineering disciplines. No student may earn credit for both 1410 and 1411. (F, Sp, Su) [I]

1420 Freshman Engineering Orientation II. Prerequisite: declared major in engineering. All entering freshmen with a declared engineering major are required to enroll. Four hours of this seminar a week is held to introduce students to the major engineering disciplines. No student may earn credit for both 1420 and 1410. (F, Sp, Su) [I]

PHYS

1823 Calculus and Analytic Geometry I. Prerequisite: 1243 or OU, or satisfactory score on the placement test, or satisfactory score on the ACT/SAT. Topics covered include equations of straight lines; conic sections; functions, limits and continuity; differentiation; maximum-minimum theory and curve sketching. A student may not receive credit for this course and 1743, 1743L, or 1753. (F, Sp, Su) [I-NL]

2423 Calculus and Analytic Geometry II. Prerequisite: 2123. Integration and its applications; the calculus of transcendental functions; techniques of integration; and the introduction to differential equations. A student may not receive credit for this course and 2123. (F, Sp, Su) [I-M]

3433 Calculus and Analytic Geometry III. Prerequisite: 2423. Polar coordinates, parametric curves, infinite sequences and series, power series, functions of several variables; partial derivatives; gradients, extreme values and differentials of multivariate functions; multiple integrals; and line and surface integrals. (F, Sp, Su)

G5131 Introduction to Ordinary Differential Equations. Prerequisite: 2423. Duplicates two hours of 3433. Lecture and Laboratory (F, Sp, Su) [II]

G5223 Modern Physics for Engineers. Prerequisite: Mathematics 3113 or equivalent. Relativity, atomic structure, nuclear theory, wave mechanics, statistical physics, solid state physics. (F, Sp, Su)