REQUIREMENTS FOR THE BACHELOR OF SCIENCE IN INDUSTRIAL 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 2007 through
Spring 2008

GENERAL REQUIREMENTS

Total Credit Hours ........................................... 155*

Minimum Retention/Graduation Grade Point Averages:
Overall - Combined and OU .......................... 3.00
Major - Combined and OU .......................... 3.00
Curriculum - Combined and OU ..................... 3.00

A minimum grade of C is required for each course in the curriculum.

<table>
<thead>
<tr>
<th>Year</th>
<th>FIRST SEMESTER</th>
<th>Hours</th>
<th>SECOND SEMESTER</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>FRESHMAN</td>
<td>ENGL 1113</td>
<td>3</td>
<td>ENGL 1213</td>
<td>3</td>
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<td></td>
<td>CHEM 1315</td>
<td>5</td>
<td>EXPO 1213</td>
<td>3</td>
</tr>
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<td></td>
<td>MATH 1823</td>
<td>3</td>
<td>MATH 2423</td>
<td>3</td>
</tr>
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<td></td>
<td>SC 1113</td>
<td>3</td>
<td>PHYS 1493</td>
<td>4</td>
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<td></td>
<td>ENGR 1410</td>
<td>0</td>
<td>C S 1323</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>3</td>
<td>ENGR 1420</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL CREDIT HOURS | 17 | TOTAL CREDIT HOURS | 16 |

| SOPHOMORE | MATH 2433 | 3 | CEES 2113 | 3 |
| | PHYS 2524 | 4 | I E 2303 | 4 |
| | SC 2003 | 3 | I E 2311 | 3 |
| | Elective | 3 | Q S 2393 | 3 |

TOTAL CREDIT HOURS | 16 | TOTAL CREDIT HOURS | 17 |

| JUNIOR | MATH 2443 | 3 | I E 4223 | 3 |
| | I E 3304 | 4 | I E 4563 | 3 |
| | I E 4553 | 3 | I E 4633 | 3 |
| | Elective | 3 | Elective | 3 |

TOTAL CREDIT HOURS | 16 | TOTAL CREDIT HOURS | 16 |

| SENIOR | I E 4333 | 3 | I E 4393 | 3 |
| | I E 4663 | 3 | I E 5363 | 3 |
| | ENGR 5853 | 3 | Facility Planning, Warehousing, & Material Handling |
| | Elective | 3 | Elective | 3 |

TOTAL CREDIT HOURS | 18 | TOTAL CREDIT HOURS | 15 |

| FIFTH YEAR | *5000-Level Graduate Elective | 3 | *5000-Level Graduate Elective | 3 |
| | *5000-Level Graduate Elective | 3 | *5000-Level Graduate Elective | 3 |
| | *5000-Level Graduate Elective | 3 | *5000-Level Graduate Elective | 3 |
| | Elective | 3 | ESL 5980 | 3 |

TOTAL CREDIT HOURS | 12 | TOTAL CREDIT HOURS | 12 |

* Admission to the accelerated program is by application and requires a minimum OU GPA and combined GPA of 3.25.

Students are eligible for graduate status upon graduation with the Bachelor of Science in Industrial Engineering.

* Students may enter the accelerated program based on the undergraduate degree pattern offered in the year they first enrolled in the Oklahoma State System of Higher Education or later.

NOTE: Engineering transfer students may take ENGR 3410 in place of ENGR 1410 and ENGR 1420.

Courses designated as Core I, II, III, IV, or Capstone are part of the General Education curriculum. Students must complete a minimum of 40 hours of General Education courses, chosen from the approved list.

†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.

In the College of Engineering, in order to progress in your curriculum, and as a specific graduation requirement, a grade of C or better is required in each course in the curriculum. Please refer to the General Catalog for additional enrollment limitations.

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

To be chosen from the C S Elective list available in the I E office, CEC 116.

‡This course fulfills the Computer Literacy Requirement for graduation as required by the Oklahoma State Regents for Higher Education.

*Must be approved by the Thesis Committee in accordance with current Master of Science requirements available in the I E office, CEC 116.

5-07
COURSES IN CHEMISTRY AND BIOCHEMISTRY (CHEM)

1315 General Chemistry. Prerequisite: Mathematics 1503 or 1643, or math ACT equal to or greater than 21. First of a two-semester sequence in general chemistry. Topics covered: basic measurement, gas laws, stoichiometry, periodicity, bonding, molecular structure and thermodynamics. Laboratory (F, Sp, Su) [V-LAB]

COURSES IN CIVIL ENGINEERING AND ENVIRONMENTAL SCIENCE (CEES)

2113 Statics and Dynamics. Prerequisites: Physics 2514 and Mathematics 2433 or concurrent enrollment in Mathematics 2433. Vector representations of forces and moments; general three-dimensional theorems of statics and dynamics; centroids and moments of area and inertia. Free-body diagrams, equilibrium of a particle and of rigid bodies, principles of work and energy, kinematics, concepts of conservation, Newton’s laws of motion and translation and rotation of reference frames. Newton’s law of motion and LaGrange’s equation, including application to lumped-parameter systems. Analyses of trusses, frames and machines. (F)

2153 Mechanics of Materials. Prerequisites: 2113. Basic principles of mechanics, including the definition of stress and strain, transformations and principal values for the stress and strain tensors, kinematics of stress, concepts of constitutive equations for anisotropic media, and analysis of widely-used structures and associated algorithms. Design of systems of software. Written communications required in some projects. Discussion of ethical issues including computer crime, abuse, and hacker ethics. The Microsoft Windows operating system will be used. A debugging tool will be used. (F, Sp)

COURSES IN COMPUTER SCIENCE (CS)

1323 Introduction to Computer Programming. Prerequisite: Mathematics 1523 or equivalent. Introduction to the design and implementation of computer software with an emphasis on abstraction and program organization. (F, Sp)

2334 Programming Structures and Abstractions. Prerequisite: 1323 and Mathematics 1821. Applications of programming to problem solving using modern programming languages and modern computer science. Use of abstract data types such as stacks, queues, lists, trees, file processing. Introduction to ethics in computer science, including philosophical ethics theories. Discussion of intellectual property rights and privacy. A program design tool will be used. (F, Sp)

2413 Data Structures. Prerequisites: 2334 and 1813 or Mathematics 2513, or concurrent enrollment. Environments. Design and analysis of widely-used data structures and associated algorithms. Design of software systems. Written communications required in some projects. Discussion of ethical issues including computing crime, abuse, and hacker ethics. The Microsoft Windows operating system will be used. A debugging tool will be used. (F, Sp)

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 in this spring continuation course. One hour of this seminar a week is in a large group setting where all students meet and cover details on all engineering disciplines. Additional topics would be continuums of majors, success in the College of Engineering, the College of Business administration, study abroad programs, admission issues, graduate school opportunities, career planning, and information related to technical/honor societies and participation. A second hour a week is a required small group session with an upper-class mentor from the College of Engineering/Dean’s Leadership Council. This second hour will focus on basic enrollment and retention strategies such as adding and dropping classes and choosing electives in addition to a weekly topical area. (F)

1420 Freshman Engineering Orientation II. Prerequisite: declared major in engineering. All entering freshmen with a declared engineering major are required to enroll in this spring continuation course. One hour of this seminar a week is in a large group setting where all students meet and cover details on all engineering disciplines. Additional topics would be continuums of majors, success in the College of Engineering, the College of Business administration, study abroad programs, admission issues, graduate school opportunities, career planning, and information related to technical/honor societies and participation. A second hour a week is a required small group session with an upper-class mentor from the College of Engineering/Dean’s Leadership Council. This second hour will focus on basic enrollment and retention strategies such as adding and dropping classes and choosing electives in addition to a weekly topical area. (Sp)

2003 Engineering Practice I. Prerequisite: 1410, 1420, and English 1213. Introduction to basic principles of successful engineering enterprise. (F, Sp)

2431 Electrical Circuits. Prerequisites: Mathematics 2423 and Physics 2524 or concurrent enrollment. Introduction to basic principles of electrical circuits. Topics include circuits (DC circuits, AC circuits, AC/DC circuits, transient electrical fields, static magnetic fields, and electronic devices, (diodes, operational amplifiers). (F, Sp)

2461 Thermodynamics. Prerequisite: Mathematics 2433 and Physics 2524 or concurrent enrollment. Introduction to basic principles of thermodynamics. Topics include density, pressure, temperature, entropy, system, flow, laws of thermodynamics, and thermodynamics for a control volume, the second law of thermodynamics, and psychrometrics. (F)

4411 Fluid Mechanics. Prerequisite: Mathematics 2433. Introduction to basic principles of fluid mechanics. Topics include fluid properties, fluid statics, dimensionless parameters and similitude, control volume equations, open channel flow, and external flow. (F)

COURSES IN INDUSTRIAL ENGINEERING (IE)

2303 Materials, Design and Manufacturing Processes (Crosslisted with Aerospace and Mechanical Engineering 2303). Prerequisite: Aerospace and Mechanical Engineering 2113 or by permission. Introduction to the physical properties of engineering materials. Introduction to design concepts, manufacturing processes and equipment used in manufacturing. (Sp)

2311 Computer Aided Design and Graphics Laboratory for Industrial Engineers. Corequisite: 2303. Computer-aided design and computer-aided drafting. SOLIDWORKS/AutoCAD. Solidworks will be taught as a tool to solve mechanical problems. The course will introduce basic concepts of computer-aided design and graphics. Students will learn basic concepts of design, manufacturing, and quality improvement. (F)

2823 Enterprise Engineering. Prerequisite: sophomore standing. Introduction to the industrial engineering role as enterprise system integrator. Concepts systems, modeling and analysis; integrated product/service and operational process design; productivity and quality improvement; computer technology insertion; project, operations, and global supply chain management. (F)

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COURSES IN MECHANICAL ENGINEERING (ME)

2423 Calculus and Analytic Geometry I. Prerequisite: 1253 at OU, or satisfactory score on the placement test, or satisfactory score on the ACT/SAT. Topics covered include equations of straight lines, conics, limits, continuity, differentiation, maximum–minimum theory, and curve sketching. A student may not receive credit for this course and 1741. (F, Sp) (F, Sp) [I-M]

2424 Calculus and Analytic Geometry II. Prerequisite: 2423. 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]

2433 Calculus and Analytic Geometry III. Prerequisite: 2424. Polar coordinates, parametric equations, sequences, infinite series, vector analysis. (F, Sp)

2443 Calculus and Analytic Geometry IV. Prerequisite: 2433. Vector calculus; functions of several variables; partial derivatives; gradients, extreme values and differentials of multivariable functions; multiple integrals; line and surface integrals; (F, Sp) [I-M]

2513 Discrete Mathematical Structures. Prerequisite: 2423 or concurrent enrollment. A course for math majors or prospective math majors. Provides an introduction to discrete concepts such as finite sets and structures, and their properties and applications. Also exposes students to the basic principles of computer science and principles of discrete mathematical proof. Topics include basic set theory, functions, integers, sequences, induction, counting, recurrence relations, generating functions, and discrete probability. Other topics include combinatorics, probability, relations, Boolean algebra and automata theory may be covered as time permits. (F, Sp, Su)

COURSES IN PHYSICS (PHYS)

2514 General Physics for Engineering and Science Majors. Prerequisite: Mathematics 1823. Not open to students with credit in 1205. Vectors, kinematics and dynamics of particles, work and energy systems of particles, rotational kinematics and dynamics, oscillations, gravitation, fluid mechanics. (F, Sp, Su)

2524 General Physics for Engineering and Science Majors. Prerequisite: 2514 and Mathematics 2423. Not open to students with credit in 1215. Temperature, heat, thermodynamics, electricity, magnetism, optics. (F, Sp, Su)