**Department of**

## MECHANICAL ENGINEERING

**Guidebook for Degree Program:**

**Bachelor of Science, Mechanical Engineering**

Effective Fall 2013

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**THE UNIVERSITY OF AKRON**



**Department of Mechanical Engineering**

College of Engineering

Akron, OH 44325-3903

330-972-7731 Office

330-972-6027 Fax

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dear \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I am pleased to inform you that your transfer into the College of Engineering takes effect as of the above date.

Your total degree requirements are identified on the attached Plan of Study. The Bachelor of Science in Mechanical Engineering requires a minimum of 137 semester credit hours. For your information, copies of the College of Engineering Policies on course withdrawal, academic probation, and academic dismissal are also provided.

As long as you remain in this department and complete all requirements within five years from this date or six years from entering The University of Akron, no additions can be made to the list of requirements or to the total hours. If you change majors you will be required to meet your new departmental requirements in effect on the date of your change in major. If, however, you do not complete your degree requirements within the five years, any change in University, College and Departmental requirements will affect you. Should you transfer colleges, a new set of College requirements will be effective as of the date of transfer, to be determined by the College into which you transfer.

Sincerely,

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| **Mechanical Engineering Grade Checklist** | | | | | | | | | | |
|  | **Course** | **CR** | **GR** | **Term/ Year Taken** |  | **Course** | | **CR** | **GR** | **Term/ Year Taken** |
| **General Education** | | | | | **Required Engineering** | | | | | |
| 5540 | Phys. Ed. | 0.5 |  |  | 4300:201 | Statics | | 3 |  |  |
| 5540 | Phys. Ed. | 0.5 |  |  | 4300:202 | Intro: Mechanics of Solids | | 3 |  |  |
| 7600:105 | Intro to Public Speaking –or– | 3 |  |  | 4400:320 | Basic Electrical Engineering | | 4 |  |  |
| 7600:106 | Effective Oral Communication |  |  | 4600:165 | Tools for Mechanical Engineering | | 3 |  |  |
| 3300:111 | English Composition I | 3 |  |  | 4600:203 | Dynamics | | 3 |  |  |
| 3300:112 | English Composition II | 3 |  |  | 4600:260 | Engineering Analysis I | | 2 |  |  |
|  | Social Science Elective 1 | 3 |  |  | 4600:300 | Thermodynamics I | | 3 |  |  |
| 3400:210 | Humanities in Western Tradition I | 4 |  |  | 4600:301 | Thermodynamics II | | 2 |  |  |
|  | Humanities Electives I 2 | 3 |  |  | 4600:310 | Fluid Mechanics I | | 2 |  |  |
|  | Humanities Electives II 2 | 3 |  |  | 4600:311 | Fluid Mechanics II | | 3 |  |  |
| 3250:244 | Intro to Economic Analysis (Soc. Sci.) | 3 |  |  | 4600:315 | Heat Transfer | | 3 |  |  |
|  | Area Studies & Cultural Diversity 3 | 2 |  |  | 4600:321 | Kinematics of Machines | | 2 |  |  |
|  | **Total General Education** | **28** |  |  | 4600:336 | Analysis of Mechanical Components | | 3 |  |  |
|  |  |  |  |  | 4600:337 | Design of Mechanical Components | | 3 |  |  |
| 1 Social Science Sets 2-7 (see bulletin) | |  |  |  | 4600:340 | System Dynamics and Response | | 3 |  |  |
| 2 Humanities Sets 1-4 (see bulletin) | |  |  |  | 4600:360 | Engineering Analysis II | | 2 |  |  |
| 3 Engineering students select one course (see bulletin) | | |  |  | 4600:380 | Mechanical Metallurgy | | 2 |  |  |
|  | | | | | 4600:400 | Thermal Systems Components | | 3 |  |  |
|  | | | | | 4600:402 | Senior Seminar | | 1 |  |  |
|  | | | | | 4600:431 | Fund. of Mechanical Vibrations | | 3 |  |  |
|  | | | | | 4600:441 | Control System Design | | 3 |  |  |
| **Math and Natural Science** | | | | | 4600: 460 | Concepts of Design | | 3 |  |  |
| 3150:151 | Principles of Chemistry I | 3 |  |  | 4600: 461 | ME Senior Design Project I | | 2 |  |  |
| 3150:152 | Principles of Chemistry Lab | 1 |  |  | 4600: 471 | ME Senior Design Project II | | 2 |  |  |
| 3150:153 | Principles of Chemistry II | 3 |  |  | 4600: 483 | Measurements Lab | | 2 |  |  |
| 3450:221 | Analytical Geometry & Calculus I | 4 |  |  | 4600: 484 | Measurements Engineering Lab | | 2 |  |  |
| 3450:222 | Analytical Geometry & Calculus II | 4 |  |  |  | **Total Required Engineering** | | **67** |  |  |
| 3450:223 | Analytical Geometry & Calculus III | 4 |  |  |  |  | |  |  |  |
| 3450:335 | Differential Equations | 3 |  |  | **Approved Electives** | | | | | |
| 3470:401 | Probabilities of Statistics | 2 |  |  | Mechanical Engineering Design Elective | | | 3 |  |  |
| 3650:291 | Elemental Classical Physics I | 4 |  |  | Technical Elective | | | 3 |  |  |
| 3650:292 | Elemental Classical Physics II | 4 |  |  | Mechanical Engineering Technical Elective | | | 3 |  |  |
|  | **Total Math/Natural Science** | **32** |  |  |  | **Total Electives** | | **9** |  |  |
|  |  |  |  |  |  |  | |  |  |  |
|  | **TOTAL:** |  |  |  |  |  | **137** | |  |  |
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| **Mechanical Engineering (Co-op)** | | | | | | | | |
| **FALL** | | | **SPRING** | | | **SUMMER** | | |
| **First Year** | | | | | | | | |
| 4600:165 | Tools for Mechanical Engineering | 3 | 7600:---- | Oral Communication Elective (105 or 106) | 3 |  |  |  |
| 5540:----- | Physical Education Elective | 1 | 3300:112 or | English Composition Elective | 3 |  |  |  |
| 3150:151 | Principles of Chemistry I | 3 | 2020:222 |  |  |  |
| 3150:152 | Principles of Chemistry I Lab | 1 | 3150:153 | Principles of Chemistry II | 3 |  |  |  |
| 3300:111 | English Composition I | 3 | 3450:222 | Analytical Geometry-Calculus II | 4 |  |  |  |
| 3450:221 | Analytical Geometry-Calculus I | 4 | -------:---- | Social Science Elective | 3 |  |  |  |
|  | **Total** | **15** |  | **Total** | **16** |  |  |  |
| **Second Year** | | | | | | | | |
| 3650:291 | Physics I | 4 | 3650:292 | Physics II | 4 |  |  |  |
| 4300:201 | Statistics | 3 | 3450:335 | Intro. to Ordinary Differential Equations | 3 |  |  |  |
| 3450:223 | Analytical Geometry-Calculus III | 4 | 4600:203 | Dynamics | 3 |  | **OPTIONAL** |  |
| 3400:210 | Humanities – Western Tradition I | 4 | 4300:202 | Mechanics of Solids | 3 |  | **Co-op** |  |
| 3250:244 | Intro. to Economic Analysis | 3 | 4600:260 | Engineering Analysis | 2 |  |  |  |
|  | **Total** | **18** |  | **Total** | **15** |  |  |  |
| **Third Year** | | | | | | | | |
| 4600:300 | Thermodynamics I | 3 |  |  |  | 4600:311 | Fluid Mechanics II | 3 |
| 4600:310 | Fluid Mechanics I | 2 |  |  |  | 4600:380 | Mechanical Metallurgy | 2 |
| 4600:321 | Kinematics of Machines | 2 |  | **MANDATORY** |  | 4600:340 | Systems Dynamics & Response | 3 |
| 4600:336 | Analysis of Mechanical Components | 3 |  | **Co-op** |  |  |  |  |
| 4600:360 | Engineering Analysis II | 2 |  |  |  |  |  |  |
| 3470:401 | Prob. & Stat. for Engineering | 2 |  |  |  |  |  |  |
|  | **Total** | **14** |  |  |  |  | **Total** | **8** |
| **Fourth Year** | | | | | | | | |
|  |  |  | 4600:315 | Heat Transfer | 3 |  |  |  |
|  |  |  | 4600:337 | Design of Mechanical Components | 3 |  |  |  |
|  | **MANDATORY** |  | 4600:431 | Fundamentals of Mechanical Vibrations | 3 |  | **MANDATORY** |  |
|  | **Co-op** |  | 4400:320 | Basic Electrical Engineering | 4 |  | **Co-op** |  |
|  |  |  | 4600:483 | ME Measurements Lab | 2 |  |  |  |
|  |  |  | 4600:301 | Thermodynamics II | 2 |  |  |  |
|  |  |  |  | **Total** | **17** |  |  |  |
| **Fifth Year** | | | | | | | | |
| 4600:400 | Thermal Systems Components | 3 | 4600:471 | ME Senior Design Project II | 2 |  |  |  |
| 4600:441 | Control Systems Design | 3 | -------:---- | Area Studies & Cultural Diversity Elective | 2 |  |  |  |
| 4600:460 | Concepts of Design | 3 | -------:---- | Humanities Elective I | 3 |  |  |  |
| 4600:484 | Mechanical Engineering Lab | 2 | -------:---- | Humanities Elective II | 3 |  |  |  |
| 4600:461 | ME Senior Design Project I | 2 | -------:---- | Mechanical Engineering Elective\* | 3 |  |  |  |
| 4600:402 | Senior Seminar | 1 | -------:---- | Mechanical Engineering Elective\* | 3 |  |  |  |
| -------:---- | Mechanical Engineering Elective\* | 3 |  |  |  |  |  |  |
|  | **Total** | **17** |  | **Total** | **16** |  |  |  |
| \* Electives must include 3 credits Mechanical Engineering design elective, 3 credits technical elective, and 3 credits Mechanical Engineering technical elective.  This course schedule is in effect for those students entering the University of Akron in the Fall 2010 or later, who are Co-op students who expect to graduate in May 2015 or later. It may also be in effect for students who have entered the University prior to Fall 2010 but have fallen behind in their course schedules. The appropriate course schedule in that case will be handled on an individual basis. | | | | | | | | |

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| **Mechanical Engineering (Non-Co-op)** | | | | | | | | |
| **FALL** | | | **SPRING** | | | **SUMMER** | | |
| **First Year** | | | | | | | | |
| 4600:165 | Tools for Mechanical Engineering | 3 | 7600:---- | Oral Communication Elective (105 or 106) | 3 |  |  |  |
| 5540:----- | Physical Education Elective | 1 | 3300:112 or | English Composition Elective | 3 |  |  |  |
| 3150:151 | Principles of Chemistry I | 3 | 2020:---- |  |  |  |
| 3150:152 | Principles of Chemistry I Lab | 1 | 3150:153 | Principles of Chemistry II | 3 |  |  |  |
| 3300:111 | English Composition 1 | 3 | 3450:222 | Analytical Geometry-Calculus II | 4 |  |  |  |
| 3450:221 | Analytical Geometry-Calculus I | 4 | -------:---- | Social Science Elective | 3 |  |  |  |
|  | **Total** | **15** |  | **Total** | **16** |  |  |  |
| **Second Year** | | | | | | | | |
| 3650:291 | Physics I | 4 | 3650:292 | Physics II | 4 |  |  |  |
| 4300:201 | Statistics | 3 | 3450:335 | Intro. to Ordinary Differential Equations | 3 |  |  |  |
| 3450:223 | Analytical Geometry-Calculus III | 4 | 4600:203 | Dynamics | 3 |  |  |  |
| 3400:210 | Humanities – Western Tradition I | 4 | 4300:202 | Mechanics of Solids | 3 |  |  |  |
| 3250:244 | Intro. to Economic Analysis | 3 | 4600:260 | Engineering Analysis | 2 |  |  |  |
|  | **Total** | **18** |  | **Total** | **15** |  |  |  |
| **Third Year** | | | | | | | | |
| 4600:300 | Thermodynamics I | 3 | 4600:315 | Heat Transfer | 3 | 4600:311 | Fluid Mechanics II | 3 |
| 4600:310 | Fluid Mechanics I | 2 | 4600:337 | Design of Mechanical Components | 3 | 4600:380 | Mechanical Metallurgy | 2 |
| 4600:321 | Kinematics | 2 | 4600:340 | System Dynamics & Response | 3 | 4600:431 | Fundamentals of Mechanical Vibrations | 3 |
| 4600:336 | Analysis of Mechanical Components | 3 | 4600:483 | ME Measurements Lab | 2 |  |  |  |
| 4600:360 | Engineering Analysis II | 2 | 4600:301 | Thermodynamics II | 2 |  |  |  |
| 3470:401 | Prob. & Stat. for Engineering | 2 | -------:---- | Humanities Elective I | 3 |  |  |  |
|  | **Total** | **14** |  | **Total** | **16** |  | **Total** | **8** |
| **Fourth Year** | | | | | | | | |
| 4600:400 | Thermal Systems Components | 3 | 4600:471 | ME Senior Design Project II | 2 |  |  |  |
| 4600:441 | Control System Design | 3 | -------:---- | Area Studies & Cultural Diversity Elective | 2 |  |  |  |
| 4600:460 | Concepts of Design | 3 | -------:---- | Humanities Elective II | 3 |  |  |  |
| 4600:484 | Mechanical Engineering Lab | 2 | 4400:320 | Basic Electrical Engineering | 4 |  |  |  |
| 4600:461 | ME Senior Design Project I | 2 | -------:---- | Mechanical Engineering Elective\* | 3 |  |  |  |
| 4600:402 | Senior Seminar | 1 | -------:---- | Mechanical Engineering Elective\* | 3 |  |  |  |
| -------:---- | Mechanical Engineering Elective\* | 3 |  |  |  |  |  |  |
|  | **Total** | **17** |  | **Total** | **17** |  |  |  |
| \* Electives must include 3 credits Mechanical Engineering design elective, 3 credits technical elective, and 3 credits Mechanical Engineering technical elective.  This course schedule is in effect for those students entering the University of Akron in the Fall 2010 or later, who are Non-Co-op students who expect to graduate in May 2014 or later. It may also be in effect for students who have entered the University prior to Fall 2010 but have fallen behind in their course schedules. The appropriate course schedule in that case will be handled on an individual basis. | | | | | | | | |



**Structures and Motions Stem**

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|  |  |  |  |  |  | Design of  Mechanical  Systems  (Project)  4600:461 |  |  |  |  |  |  |
|  |  |  |  |  |  | ↑ |  |  |  |  |  |  |
|  |  |  |  | Mechanical Engineering Laboratory  4600:484 |  | Concepts of Design  4600:460 |  | Control System Design  4600:4411 |  |  |  |  |
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|  |  | Metallurgy  4600:380 |  | Design of Mechanical Components  4600:337 |  | Fundamentals of Mechanical Vibrations  4600:431 |  | Measurements Laboratory  4600:483 |  | System Dynamics & Response  4600:340 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | Analysis of Mechanical Components  4600:336 |  | Engineering Analysis  4600:380 |  | Kinematics of Machines  4600:321 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | Into. to Ordinary Differential Equations  3450:335 |  | Mechanics of Solids  4300:202 |  | Dynamics  4600:203 |  |  |  |  |
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|  |  |  |  |  |  | Statics  4300:201 |  |  |  |  |  |  |
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|  |  |  |  |  |  | Tools for Mechanical Engineering  4600:165 |  |  |  |  |  |  |

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**Technical Elective**

The available credits of electives are divided as follows:

* At least three credits must be Mechanical Engineering design elective (available choices are marked in the list of Mechanical Engineering electives with this designation: 1.
* At least three credits must be technical electives, selected from the listed Mechanical Engineering electives, other engineering electives, basic science electives, construction technology electives, polymer science electives, mechanical engineering technology electives, math/statistics electives, computer science electives, professional development, polymer engineering electives, or mechanical engineering graduate courses, unless specifically excluded.
* The remaining three credits are mechanical engineering technical electives, selected from the listed Mechanical Engineering electives.

Students with a specific profession objective (e.g., management, bioengineering, computer applications, graduate study, military service) will be permitted, upon petition to and approval of their advisor, to use their technical elective and their Mechanical Engineering technical elective to take courses in management/business administration, computer science, military science, polymer specialization, or graduate courses if these courses are all in a single area and total at least six (6) credits.

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| **Electives** | | | | | | | | |
| **Mechanical Engineering** | | | **Basic Science** | | | **Math/Statistics** | | |
| 4600:410 | Heating & Air Conditioning | 3 | 3100:111 | Principles of Biology I2 | 4 | 3450:312 | Linear Algebra | 3 |
| 4600:411 | Compressible Fluid Mechanics | 3 | 3100:112 | Principles of Biology II2 | 4 | 3450:414 | Vector Analysis | 3 |
| 4600:412 | Fundamentals of Flight1 | 3 | 3100:130 | Principles of Microbiology | 3 | 3450:415 | Combinatorics & Graph Theory | 3 |
| 4600:413 | Introduction to Aerodynamics | 3 | 3100:200, 201 | Human Anatomy & Physiology & Lab | 4 | 3450:421 | Advanced Calculus I | 3 |
| 4600:414 | Intro. to Aerospace Propulsion | 3 | 3100:265 | Intro to Human Physiology | 4 | 3450:422 | Advanced Calculus II | 3 |
| 4600:415 | Energy Conversion1 | 3 | 3150:154 | Qualitative Analysis2 | 2 | 3450:425 | Complex Variables | 3 |
| 4600:416 | Heat Transfer Processes | 3 | 3150:263 | Organic Chemistry Lecture I | 3 | 3450:427 | Applied Numerical Methods I | 3 |
| 4600:420 | Intro. to Finite Element Methods1 | 3 | 3150:264 | Organic Chemistry Lecture II | 3 | 3450:428 | Applied Numerical Methods II | 3 |
| 4600:422 | Experimental Stress Analysis | 3 | 3150:265 | Organic Chemistry Lab I | 2 | 3450:430 | Num Solutions for Partial Diff. Equations | 3 |
| 4600:430 | Machine Dynamics1 | 3 | 3150:266 | Organic Chemistry Lab II | 2 | 3450:432 | Partial Differential Equations | 4 |
| 4600:432 | Vehicle Dynamics1 | 3 | 3370:101 | Introductory Physical Geology | 4 | 3450:435 | Sys. of Ordinary Differential Equations | 3 |
| 4600:442 | Industrial Auto Control1 | 3 | 3370:441 | Fundamentals of Geophysics | 3 | 3450:436 | Math Models | 3 |
| 4600:443 | Optim Meth. in Mech. Eng.1 | 3 | 3370:446 | Exploration Geophysics | 3 | 3450:438 | Advanced Engineering Math I | 3 |
| 4600:444 | Robot Design, Control and App.1 | 3 | 3650:301 | Elementary Modern Physics | 3 | 3450:439 | Advanced Engineering Math II | 3 |
| 4600:450 | Intro. Comp. Fluid Flow & Conv. | 3 | 3650:320 | Waves | 3 | 3450:441 | Concepts of Geometry | 4 |
| 4600:462 | Pressure Vessel Design1 | 3 | 3650:331 | Intermediate Astronomy | 3 | 3470:450 | Probability | 3 |
| 4600:463 | Comp Aided Design & Manuf.1 | 3 | 3650:340 | Thermal Physics | 3 | 3470:451 | Theoretical Statistics I | 3 |
| 4600:486 | Special Topics | 1-3 | 3650:350 | Modeling & Simulation | 3 | 3470:452 | Theoretical Statistics II | 3 |
| 4600:427 | Mold Design1 | 3 | 3650:406 | Optics | 3 | 3470:460 | Statistical Methods | 4 |
| **Other Engineering** | | | 3650:432 | Mechanics II |  | 3470:461 | Applied Statistics I | 4 |
| 4200:463 | Pollution Control | 3 | 3650:436 | Electromagnetism I | 3 | 3470:462 | Applied Statistics II | 4 |
| 4300:306 | Theory of Structures | 3 | 3650:437 | Electromagnetism II | 3 |  |  |  |
| 4300:313 | Soil Mechanics | 3 | 3650:481 | Methods of Mathematical Physics I | 3 | **Computer Science** | | |
| 4300:321 | Intro. to Environmental Eng. | 3 | 3650:482 | Methods of Mathematical Physics II | 3 | 3460:210 | Data Structures & Algorithms I | 4 |
| 4300:323 | Water Supply & Pollution Cntl | 3 | **Polymer Science** | | | 3460:306 | Assy Language Programming | 3 |
| 4300:341 | Hydraulic Engineering | 4 | 9871:401 | Intro. to Elastomers | 3 | 3460:307 | Applied System Programming | 3 |
| 4300:361 | Transportation Engineering | 3 | 9871:402 | Intro. to Plastics | 3 | 3460:316 | Data Structures & Algorithms II | 3 |
| 4300:380 | Engineering Materials Lab | 3 | 9871:407 | Polymer Science | 4 | 3460:440 | Compiler Design | 3 |
| 4300:401 | Steel Design | 3 | 9871:411 | Mole Struct. & Physical Prop Polymer I | 2 | **Management/Business Administration3** | | |
| 4300:403 | Reinforced Concrete Design | 3 | 9871:412 | Mole Struct & Physical Prop Polymer II | 2 | 6140:331 | Personal Finance | 3 |
| 4300:423 | Chemistry for Environmental Eng. | 3 | 9871:413 | Mole Struct & Physical Prop Polymer III | 2 | 6140:300 | Introduction to Finance | 3 |
| 4300:450 | Urban Planning | 3 | **Polymer Engineering** | | | 6200:201 | Accounting | 3 |
| 4300:451 | Comp. Meth. of Structural Analysis | 3 | 4700:321 | Polymer Fluid Mechanics | 3 | 6200:202 | Managerial Accounting | 4 |
| 4300:471 | Construction Admin | 3 | 4700:425 | Intro Blend & Compound. of Polymers | 3 | 6200:301 | Cost Mgmt. & Enterprise Res. Plan. | 3 |
| 4450:410 | Computer Methods | 3 | 4700:427 | Mold Design | 3 | 6200:220 | Legal & Social Environment in Bus. | 3 |
| 4450:432 | System Simulation | 3 | 4700:450 | Eng. Prop. & Processes of Polymers | 3 | 6400:371 | Business Finance | 3 |
| 4450:441 | Expert Systems Design & Dev. | 3 | 4700:499 | Polymer Engineering Project | 1-3 | 6400:432 | Personal Finance Planning | 3 |
| **Mechanical Engineering Technology** | | | **Polymer Science & Polymer Engineering** | | | 6400:473 | Financial Statement Analysis | 3 |
| 2870:348 | CNC Programming I | 3 | 4700:281 | Polymer Science for Engineers | 2 | 6500:221 | Quantitative Business Analysis I | 3 |
| 2870:348 | CNC Programming II | 3 | 4700:381 | Polymer Morphology for Engineers | 3 | 6500:222 | Quantitative Business Analysis II | 3 |
| 2920:247 | Technology of Machine Tools | 3 | **Military Science** | | | 6600:300 | Marketing Principles | 3 |
| 2920:347 | Production Machinery and Processes | 3 | 1500:303,304 | Third Year Aero Studies | 3,3 | 6500:324 | Data Management for Info Systems | 3 |
| **Professional Development** | | | 1500:453,454 | Fourth Year Aero Studies | 3,3 | 6500:301 | Management Principles & Concepts | 3 |
| 2020:222 | Tech Report Writing | 3 | 1600:300,301 | Advanced Leadership I,II | 3,3 | 6600:475 | Business Negotiations | 3 |
| 3300:489 | Seminar in English: Science Writing | 3 | 1600:400,401 | Military Management I,II | 3,3 | 6600:490 | Marketing Strategy | 3 |
| 1 M.E. Design Elective  2 May NOT be used for Technical Elective credit  3 Some course provide “bridge-up” for MBA degree  Check with the College of Business Administration for an updated and complete list of “bridge-up” courses. | | | | | | | | |

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**Humanities and Social Science Electives**

Studies in the humanities and social sciences meet the objectives of a broad education as well as those of the engineering profession. These courses, which are important to the general education of an engineer, are intended to make engineers fully aware of their social responsibilities and have the objective of improving your ability to consider related factors in decision-making processes. Humanities are the branches of knowledge concerned with the arts, literature and culture; while social sciences comprise studies of relationships in society. These electives are part of the General Education requirements of the University College as listed in the Undergraduate Bulletin of the University. In your freshman year, you are to select one of the listed courses for your social science elective. In your sophomore and senior year you are to select two courses, each from a different set (1-4) for your humanities electives. In your senior year, you are to select a single course in Area Studies and Cultural Diversity.

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| ***Social Science Electives*** | | |
| 3350:100 | Introduction to Geography | 3 cr |
| 3400:250 | U.S. History to 1877 | 4 cr |
| 3400:251 | U.S. History since 1877 | 4 cr |
| 3600:125 | Theory and Evidence | 3 cr |
| 3700:100 | Government and Politics in the U.S. | 4 cr |
| 3700:150 | World Politics and Governments | 3 cr |
| 3750:100 | Introduction to Psychology | 3 cr |
| 3850:100 | Introduction to Sociology | 4 cr |
| 3870:150 | Cultural Anthropology | 4 cr |
| 5100:150 | Democracy and Education | 3 cr |

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|  | **Humanities Electives** | | |
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|  | |  | **Prerequisites** |
| **Fine Arts** | | | |
| 7100:210 | Visual Arts Awareness | 3 cr | 3400:210 |
| 7500:201 | Exploring Music | 3 cr | 3400:210 |
| 7800:301 | Introduction to Theatre and Film | 3 cr | 3400:210 |
| 7900:200 | Viewing Dance | 3 cr | 3400:210 |
| **Philosophy/Classics** | | | |
| 3200:220 | Introduction to the Ancient World | 3 cr | 3400:210 |
| 3200:289 | Mythology of Ancient Greece | 3 cr | 3400:210 |
| 3200:230 | Sports & Society in Ancient Greece & Rome | 3 cr | none |
| 3600:101 | Introduction to Philosophy | 3 cr | none |
| 3600:120 | Introduction to Ethics | 3 cr | none |
| 3600:170 | Introduction to Logic | 3 cr | none |
| **Literature** | | | |
| 3200:361 | Literature of Greece | 3 cr | 3400:210 |
| 3300:250 | Classic and Contemporary Literature | 3 cr | 3300:111, 112 |
| 3300:251 | Topics in World Literature | 3 cr | 3300:111, 112, 3400:210 |
| 3300:252 | Shakespeare and His World | 3 cr | 3300:111, 112 |
| 3300:281 | Fiction Appreciation | 3 cr | 3300:111, 112, 3400:210 |
| 3520:350 | Themes in French Literature in Trans. | 3 cr | 3400:210 |
| 3580:350 | Literature of Spanish-American in Trans. | 3 cr | 3400:210 |
| **Western Culture** | | | |
| 3400:211 | Humanities in the Western Tradition II | 4 cr | 3400:210 |
| **Area Studies and Cultural Diversity** | | | |
| 2040:254 | The Black Experience I | 2 cr | 2020:121 or 3300:112 |
| 3001:300 | Intro to Women’s Studies | 3 cr | none |
| 3005:300 | Canadian Studies: An Interdis. Approach | 3 cr | none |
| 3350:375 | Geography of Cultural Diversity | 2 cr | none |
| 3400:385 | World Civilization: China | 2 cr | 64 credits |
| 3400:386 | World Civilization: Japan | 2 cr | 64 credits |
| 3400:387 | World Civilization: S.E. Asia | 2 cr | 64 credits |
| 3400:388 | World Civilization: India | 2 cr | 64 credits |
| 3400:389 | World Civilization: Near East | 2 cr | 64 credits |
| 3400:390 | World Civilization: Africa | 2 cr | 64 credits |
| 3400:391 | World Civilization: Latin America | 2 cr | 64 credits |
| 3870:251 | Human Diversity | 3 cr | None |

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**College of Engineering Withdrawal Policy**

**UNIVERSITY POLICY**

A student may withdraw from a course up to the midpoint of the course with the signature of the student's advisor.

After the midpoint of a course, a student must have the written approval of both instructor and advisor to withdraw. Such approval must be dated and processed through the offices of the Registrar and the Cashier prior to the final examination period. Should the instructor or advisor refuse to sign the withdrawal form, the student may appeal to the dean of the student's college, who shall make the final decision after consultation with those who declined to approve the withdrawal.

**COLLEGE OF ENGINEERING**

Instructors and advisors from the College of Engineering will observe the following:

There are only three valid reasons for withdrawal after the midpoint of a course:

1. **Instructor Responsibility:** To permit better evaluation a student may be advised to remain in a course until the “next” exam (after the midpoint). If a withdrawal is in order it must be accomplished within one week after exam results are returned.

2. **Unavoidable Interruption:** If a properly documented illness, accident, or other unavoidable event interrupts a student's academic routine, a withdrawal could be considered for load reduction. For a part-time student a documented forced change of work schedule could be a valid reason for withdrawal.

3. **Change of Objective:** If an engineering student is transferring out of a department in the College of Engineering and the appropriate transfer is completed, consideration will be given for a withdrawal. This is not automatic. If a student is failing and has not done the required work, a grade of F is appropriate.

Withdrawing from a course after midterm to avoid a low grade is not permitted. Any withdrawal during the last week of class requires the approval of the Dean of the College.

***Note to students on probation:*** If you withdraw from a course listed on your Approved Group of Courses, the agreement cannot be met and you are subject to “dismissal action”.

An approved withdrawal will be indicated on the University official academic record by a WD. A student who leaves a course without going through the withdrawal procedure will receive an F in the course.

Although the laboratory portion of a combined lecture-laboratory course may constitute a minority of the total credit of that course, a student cannot pass the course without having satisfactorily completed the laboratory. This includes attendance at and participation in all laboratory experiments, and submission of required laboratory reports by designated deadlines. Students failing to meet these and related requirements (as set forth by their various laboratory instructors) will be subject to a grade of F without regard to their performance in the lecture portion of the course.

A student may be dropped from a course by the Dean if absences are repeated and the instructor recommends this action. A dismissed student may gain readmission only with the permission of the instructor and the Dean. A student dropped from a course receives an F which counts as work attempted whenever grade-point ratio calculations are made. (Passed May 5, 1983; Revised February 1988; Revised March 1991)

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**Policy**

**College Probation**

**College of Engineering**

**The University of Akron**

EFFECTIVE Spring Semester, 1982, i.e., students who fall under this definition during the Spring Semester, 1982, will be on probation during the next term when enrolled.

1. A student is placed on Collegiate Probation when any one of the following events occur:
   1. Half or more of the credit hours or courses for any semester result in grades of D+, D, D-, F, I and/or W. Students taking one course are exempted from this rule. W grades may be excluded by action originated by the student's department head.
   2. The overall or engineering grade point average for the semester is less than 1.50. Students taking one course are exempted from this rule.
   3. The overall or engineering grade point average for two successive semesters is less than 2.000.
   4. The cumulative grade point average for all engineering courses taken is less than 2.000.
2. A student on Collegiate Probation must file an “Approved Group of Courses” developed through the auspices of the appropriate department head or BSE advisor before commencing the next semester or summer session.
3. A student on Collegiate Probation is subject to immediate administrative withdrawal from any course(s) not listed on that individual's “Approved Group of Courses”.
4. At the end of a semester on Collegiate Probation, a student is returned to good standing if a grade point average ≥ 2.2500 is received for a fully completed “Approved Group of Courses”.
5. A student is continued on Collegiate Probation only when recommended by the department head, usually when the grade point average is > 2.000 but < 2.2500 and the student has completed all of the “Approved Group of Courses”, or the student has a grade point average ≥ 2.2500 but has failed to complete all of the “Approved Group of Courses”.
6. Students not removed from probation or recommended for continued Collegiate Probation by the department head will be suspended from the College of Engineering or dismissed from the University.

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**Policy**

**Suspension from the College of Engineering**

**and**

**Dismissal from the University**

**College of Engineering**

**The University of Akron**

EFFECTIVE January 1983, i.e., a student can be suspended from the College only after completion of the Fall Semester, 1982.

1. A student who has been on Collegiate Probation for at least one semester, and who is not removed from probation or continued on probation on recommendation of the Department Head, will be suspended from the College of Engineering for a period of two consecutive semesters or a consecutive semester and summer session only if the student's cumulative grade point average is <2.000. If the student's grade point average is <2.000, the student will be dismissed from the University unless accepted by another College of The University of Akron.
2. A student who attempts any course for a third time (by reason of previous D+, D, D-, F, W and/or I grades) and obtains a grade below C‑ will be suspended from the College of Engineering for two consecutive semesters or a consecutive semester and summer session.
3. When a student is placed on suspension, that student's records will be transferred to the Office of the Dean. Advisement for students suspended from the College of Engineering will also be performed by the Dean's Office.
4. While a student is suspended from the College of Engineering, no engineering courses can be audited or taken for credit.
5. At the end of two consecutive semesters or a consecutive semester and summer session on suspension from the College of Engineering, a student with an overall grade point average >2.000 may be reinstated with Collegiate Probation upon submission and approval of a petition.
6. A student reinstated from Collegiate Suspension must remove himself/herself from Probation at the end of that semester or be subject to dismissal.
7. A student who has been dismissed from the University may petition for readmission after one year. Readmitted students are placed on Collegiate Probation.

**ANTI-CHEATING RESOLUTION**

* WHEREAS, the Faculty of the College of Engineering recognizes cheating in any form is unethical and is contrary to all Codes of Ethics of our profession and is not to be condoned and
* WHEREAS, students as prospective and graduate engineers are often ill-informed in ethical matters and are frequently tempted to cheat and
* WHEREAS, the Faculty of the College of Engineering has endorsed the report “Handling the Cheater” during its deliberations
* BE IT RESOLVED that we, the Faculty of the College of Engineering, immediately make a concentrated effort to guide students in proper ethical behavior and to identify and discipline students who cheat.

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**Policy**

**Transferring to the College of Engineering**

1. Complete 30 hours.
2. Complete Calculus II
3. Have 2.3 GPA in three of four categories:
4. All course work
5. Engineering course work (4x00:xxx)
6. Required Mathematics
7. Required Physics and Chemistry
8. No more than three grades in one course unless illness, etc.\*
9. All mathematics grades ≥ C-. Only the highest grade is counted for each repeated course. B required in any course taken a third time.
10. Only six repeats for change-of-grade is permitted in the entire phase of study before transfer

\* Different from University policy

**Program Educational Objectives**

The Mechanical Engineering program objectives, effective as of Fall 2006 semester, are:

1. Practice the mechanical engineering discipline successfully within community accepted stands.
2. Acquire teamwork and communications skills to develop a successful career in mechanical or mechanical-polymer engineering.
3. Fulfill professional and ethical responsibilities in the practice of mechanical engineering, including social, environmental and economic considerations.
4. Engage in professional service, such as participation in professional society and community service.
5. Engage in life-long learning activities, such as graduate studies or professional workshops.
6. Develop a professional career in the prevailing market that meets personal goals, objectives and desires.



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| **The University of Akron**  **Department of Mechanical Engineering Faculty** | | |
| **Faculty Member** | **Education** | **Research Interests** |
| Dr. Sergio FelicelliProfessor and Chair sergio@uakron.edu | Ph.D.  University of Arizona | Solidification processes, heat & mass transfer, computational mechanics |
| Dr. Celal Batur Professor  batur@uakron.edu | Ph.D.  University of Leicester | Neural network and fuzzy logic-based process control, system identification, nonlinear control |
| **Dr. M.J. Braun**  Distinguished Professor  mbraun@uakron.edu | Ph.D.  Carnegie-Mellon University | Energy conversion, fluid dynamics, lubrication, heat transfer |
| **Dr. Abhilash Chandy**  Assistant Professor  ac76@uakron.edu | Ph.D.  Purdue University | Fluid dynamics, combustion, numerical methods and high-performance computing |
| **Dr. Jae-Won Choi**  Assistant Professor  jchoi1@uakron.edu | Ph.D.  Pusan National University | Development of Advanced Multi-Scale, Multi-Material Manufacturing Systems, 3D Structural Electronics, 3D Molded Interconnect Devices, Functional Additive Manufacturing, Direct Writing, Tissue Engineering, Biomedical Devices, Transdermal Drug Delivery System, and CAD/CAM |
| **Dr. Fred Choy**  Professor  fchoy@uakron.edu | Ph.D.  University of Virginia | Dynamics of rotating machinery, lubrication, vibrations, experimental signal analysis |
| **Dr. B.T.F. Chung**  F. Theodore Harrington Professor Emeritus  bchung@uakron.edu | Ph.D.  Kansas State University | Heat and mass transfer, fluid mechanics, numerical methods |
| **Dr. Yalin Dong**  Assistant Professor  ydong@uakron.edu | Ph.D.  Purdue University | Computational modeling of friction, adhesion, wear and lubrication at micro/nano scales, laser-matter interaction in material processes, and energy transport at interfaces |
| **Dr. Jerry E. Drummond**  Associate Professor Emeritus  drummon@uakron.edu | Ph.D.  Ohio State University | Computational fluid mechanics, heat transfer, natural convection, laminar flow stability |
| **Dr. Erik Engeberg**  Assistant Professor  ee9@uakron.edu | Ph.D.  University of Utah | Control of autonomous mobile robots, biological signal processing, bio-inspired control algorithms and sensor, hybrid forms of robotic locomotion, Intelligent grasp force control of robotic manipulators |
| **Dr. Siamak Farhad**  Assistant Professor  sfarhad@uakron.edu | Ph.D.  University of Waterloo | Lithium-ion batteries for hybrid and electric vehicles; heat & power generation and storage systems |
| **Dr. Xiaosheng Gao**  Professor  xgao@uakron.edu | Ph.D.  Brown University | Solid mechanics, crack growth models |
| **Dr. Nicholas Garafolo**  Assistant Professor  ngarafol@uakron.edu | Ph.D.  University of Akron | Thermo-fluid sciences and fluid-material interaction, advanced aerospace seals and near-hermetic fluid flows |
| **Dr. Jon Gerhardt**  Design Professor  jgerhar@uakron.edu | Ph.D.  University of Cincinnati | Design and manufacturing |
| **Dr. Richard Gross**  Associate Professor Emeritus  rgross@uakron.edu | Ph.D.  Carnegie-Mellon University | Heat transfer, fluid flow, thermodynamics |

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| letterhead**The University of Akron**  **Department of Mechanical Engineering Faculty** | | |
| **Faculty Member** | **Education** | **Research Interests** |
| **Dr. Michelle S. Hoo Fatt**  Professor  hoofatt@uakron.edu | Ph.D.  Massachusetts Institute of Technology | Dynamic plasticity, impact mechanics, composite structures, structural crashworthiness |
| **Dr. S. Graham Kelly**  Associate Professor  sgraham@uakron.edu | Ph.D.  Virginia Polytechnic Institute & State University | Nonlinear mechanics, acoustics, open cavity flows, boundary layer stability |
| **Dr. Frank Loth**  F. Theodore Harrington Endowed Professor  loth@uakron.edu | Ph.D.  Georgia Institute of Technology | Fluid dynamics, biofluids, biological flows, unsteady flows, fluid structure interaction, transitional flows, laser Doppler anemometry, Doppler ultrasound, computational fluid dynamics |
| **Dr. Gaurav Mittal**  Assistant Professor  gm29@uakron.edu | Ph.D.  Case Western Reserve University | Design of novel and well-characterized experimental facilities for combustion studies, combustion at elevated pressures relevant to practical combustors and engines, chemical kinetics of hydrocarbon fuels, flame phenomena, laser diagnostics, development of reduced mechanisms, alternative fuels |
| **Dr. Gregory Morscher**  Associate Professor  gm33@uakron.edu | Ph.D.  Case Western Reserve University | Microstructure/property relationships of ceramic matrix composites and Nondestructive evaluations |
| **Dr. Alex Povitsky**  Associate Professor  povitsky@uakron.edu | Ph.D.  Moscow Institute for Steel and Alloys | Heat transfer and computational fluids |
| Dr. D. Dane Quinn Professor  quinn@uakron.edu | Ph.D.  Cornell University | Applied dynamical systems, mechanics, combustion instability modeling |
| **Dr. Scott Sawyer**  Associate Professor  ssawyer@uakron.edu | Ph.D.  Purdue University | Fluid mechanics, turbo machinery, active noise control, computational fluid dynamics |
| **Dr. Tirumalai Srivatsan**  Professor  tsrivatsan@uakron.edu | Ph.D.  Georgia Institute of Technology | Mechanical behavior of materials, materials science, metallurgy, fatigue analysis, fracture mechanics, electron microscopy, composite materials |
| **Dr. Joseph Walter**  Adjunct Professor  walterj@uakron.edu | Ph.D.  Virginia Polytechnic Institute and State University | Tire technology, vehicle mechanics and dynamics |
| **Dr. Guo-Xiang Wang**  Associate Professor  gwang@uakron.edu | Ph.D.  University of California at Santa Barbara | Heat and mass transfer, materials processing, solidification theory and applications |
| **Dr. Shengyong Wang**  Assistant Professor  wangs@uakron.edu | Ph.D.  Purdue University | Systems engineering, healthcare delivery systems modeling and optimization, supervisory control for flexible manufacturing systems, supply chain management |
| **Dr. Shing-Chung “Josh” Wong**  Professor  swong@uakron.edu | Ph.D.  University of Sydney | Nanomaterials, polymer-matrix composites, functional materials, fracture behavior of polymers and biomaterials, processing-structure-property relationships |
| **Dr. Chang Ye**  Assistant Professor  cye@uakron.edu | Ph.D.  Purdue University | Laser Assisted Advanced Manufacturing, Laser Shock Peening, Laser Surface Engineering |
| **Dr. John Zhe**  Professor  jzhe@uakron.edu | Ph.D.  Columbia University | Micro/nano scale devices for bio-related applications, microfluidics and nanofuidics, smart materials and structures, micro/nano actuators for bio applications |