Applied Engineering Sciences

1. University Requirements: (23-24)
   Writing, Rhetoric and American Cultures (WRA) 4
   Integrative Studies in Humanities (IAH) 8
   IAH 201-210 and IAH 211 or >
   Integrative Studies in Social Sciences (ISS) 8
   ISS 2XX and ISS 3XX
   Bioscience (one of the following):
      BS 161, ENT 205, IBIO 150, MMG 141
       MMG 201, PLB 105, PSL 250 3-4

2. College Requirements: (30)
   *CEM 141 General Chemistry 4
   *EGR 100 Introduction to Engineering Design 2
   *EGR 102 Introduction to Engineering Modeling 2
   *MTH 132 Calculus I 3
   *MTH 133 Calculus II 4
   MTH 234 Multivariable Calculus 4
   MTH 235 Differential Equations 3
   *PHY 183 Physics for Scientists & Engineers I 4
   PHY 184 Physics for Scientists & Engineers II 4
   *College Admission Requirement

3. Major Requirements: (61-64)
   a. Complete all of the following courses: (43)
      ACC 230 Survey of Accounting Concepts 3
      CE 221 Statics 3
      CEM 161 Chemistry Laboratory I 1
      EC 201 Introduction to Microeconomics 3
      EC 202 Introduction to Macroeconomics 3
      ECE 201 Circuits and Systems I 3
      ENE 280 Principles of Environ Engr & Science 3
      AESC 210 Global Sys: Econ, Engr, Environment 3
      AESC 310 Sustainable Systems Analysis 3
      AESC 410 Capstone Project in Applied Egr Sci(W) 3
      ME 201 Thermodynamics 3
      ME 280 Graphic Communications 2
      MKT 317 Quantitative Bus Research Methods 3
      MSE 250 Materials Science and Engineering 3
      PHY 191 Physics Lab for Scientists, I 1
      STT 315 Intro to Prob & Statistics for Business 3
   b. Select one of the following courses: (3)
      COM 225 Intro to Interpersonal Communication 3
      MGT 325 Management Skills and Processes 3
   c. Concentrations: (15-18)
      In consultation with their academic advisor, students must
      select one of the following concentrations: business law,
      computer science, packaging, supply chain management,
      technical sales, or media and information. For students
      interested in computer science, the minimum criteria for
      acceptance is the completion of Computer Science and
      Engineering 231 and 260 with a combined grade-point
      average in those two courses of 3.0. The concentration will
      be noted on the student’s academic record.

Business Law: (16-17)
   1. All of the following courses: (13)
      EC 301 Intermediate Microeconomics 3
      EC 425 Law and Economics (W) 3
      GBL 285 Business Law, Public Policy & Ethics 3
      GBL 480 Environmental Law & Sustainability for
         Business: From Local to Global 3
      PHY 192 Physics Laboratory for Scientists, II 1
   2. One of the following courses: (3-4)
      PHL 345 Business Ethics 4
      PHL 354 Philosophy of Law 3
      PLS 320 Judicial Politics 3
      PLS 321 Constitutional Law 3
      PLS 322 Comparative Legal Systems 3

Computer Science: (18)
   1. All of the following courses: (12)
      CSE 231 Introduction to Programming I 4
      CSE 232 Introduction to Programming II 4
      CSE 260 Discrete Structures in Computer Sci 4
   2. One of the following courses: (3)
      CSE 320 Computer Organization & Architecture 3
      CSE 331 Algorithms and Data Structures 3
      CSE 335 Object-oriented Software Design 4
   3. One of the following courses: (3)
      CSE 410 Operating Systems 3
      CSE 420 Computer Architecture 3
      CSE 440 Intro to Artificial Intelligence 3
      CSE 471 Media Processing & Multimedia 3
      Computing
      CSE 472 Computer Graphics 3
      CSE 476 Mobile Application Development 3
      CSE 477 Web Application Architecture and
         Development 3
      CSE 480 Database Systems 3
      CSE 482 Big Data Analysis 3
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<tr>
<th>Media and Information: (18)</th>
<th>Packaging: (17)</th>
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<tr>
<td>MI 101 Understanding Media and Info</td>
<td>CEM 143 Survey of Organic Chemistry</td>
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<td>MI 201 Media &amp; Information Tech</td>
<td>PKG 101 Principles of Packaging</td>
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<td>MI 302 Networks, Markets and Socie</td>
<td>PKG 221 Packaging with Glass and Metal</td>
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<td>MI 305 Media and Information Policy</td>
<td>PKG 322 Packaging with Paper and Paperboard</td>
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<td>MI 361 IT Network Management &amp; Secu</td>
<td>PKG 323 Packaging with Plastics</td>
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<td>MI 488 Information &amp; Communication</td>
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<td>Technology &amp; Development Project (W)</td>
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<td>Supply Chain Management: (15)</td>
<td>Technical Sales: (18)</td>
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<td>FI 320 Introduction to Finance</td>
<td>COM 360 Advanced Sales Communication</td>
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<td>MKT 327 Introduction to Marketing</td>
<td>**COM 483 Practicum in Sales Communication</td>
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<td>SCM 303 Introduction to Supply Mgt</td>
<td>FI 320 Introduction to Finance</td>
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<td>SCM 371 Procurement &amp; Supply Mgmt</td>
<td>MKT 313 Personal Selling and Buying Processes</td>
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<td>SCM 372 Manufacturing Planning &amp; Cn</td>
<td>MKT 327 Introduction to Marketing</td>
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<td>Note: Suggested Elective SCM 373</td>
<td>MKT 383 Sales Management</td>
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<td>SCM 474 Negotiations</td>
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**Note:** Requires a sales-based internship

Other Electives (Variable)

Total Credits Required for Degree 120

Last revised May 2017

The requirements listed above apply to students admitted to the major of Applied Engineering Sciences in the Engineering Undergraduate Studies Office (UGS) beginning Fall, 2017. The Engineering Undergraduate Studies Office constantly reviews requirements and reserves the right to make changes as necessary. Consequently, each student is strongly encouraged to consult with his/her adviser to obtain assistance in planning and appropriate schedule of courses. Students who have questions about Applied Engineering Sciences should contact the Engineering Undergraduate Studies Advising Office, 3508 Engineering Building, phone (517) 432-1352.

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**Sample Program**

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<th>Sophomore Year</th>
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**Program Objectives**

The Applied Engineering Sciences (AES) major is an undergraduate BS degree program in the MSU College of Engineering. AES is a multidisciplinary program that integrates core studies in mathematics, statistics, and science, core studies in multiple engineering disciplines, and core studies in business fundamentals and management. Built on this strong technical and business base, an AES student completes his or her studies by selecting one of six concentration areas: business law, computer science, packaging, supply chain management, technical sales or media and information.

AES is focused on developing strong problem solvers who have good people skills, and who bring to their workplace an integrated approach to understanding and managing complex business and engineered systems. More specifically, the AES program objectives are for each AES graduate to have the ability to:

- a. apply an integrated knowledge of engineering and business to problem solving, and;
- b. effectively function at the interfaces of engineering, design, production, procurement, marketing, distribution, sales, and management;
- c. effectively function in work teams, including functioning as a manager and a leader;
- d. effectively communicate in oral, written, and new media contexts;
- e. effectively apply the strengths of a technically based education to all problem solving contexts; and
- f. effectively demonstrate the nimbleness and flexibility to respond to new types of problems and new opportunities based on being a lifelong learner.

Last revised February 2017