

# Applied Engineering Sciences

## 1. University Requirements: (23)

Writing, Rhetoric and American Cultures (WRA)	4
Integrative Studies in Humanities (IAH)	8
Integrative Studies in Social Sciences (ISS)	8
Bioscience (one of the following):	
BS 161, ENT 205, IBIO 150, MMG 141	
MMG 201, PLB 105, PSL 250	3-4

## 2. College Requirements: (27)

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
PHY 183	Physics for Scientists & Engineers I	4
PHY 184	Physics for Scientists & Engineers II	4

## 3. Major Requirements: (64-67)

### a. Complete all of the following courses: (46)

ACC 230	Survey of Accounting Concepts	3
CE 221	Statics	3
CEM 161	Chemistry Laboratory I	1
COM 225	Intro to Interpersonal Communication	3
EC 201	Introduction to Microeconomics	3
EC 202	Introduction to Macroeconomics	3
ECE 201	Circuits and Systems I	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
MGT 325	Management Skills and Processes	3
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)

BE 230	Engr Analysis of Biological Systems	3
ENE 280	Principles of Environ Engr & Science	3

**Total credits Required for Degree 120**

The requirements listed above apply to students admitted to the major of Applied Engineering Sciences in the Engineering Undergraduate Studies Office (UGS) beginning Fall, 2015. 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.

## 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	3
GBL 295	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 or 4 credits):

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 Computing	3
CSE 472	Computer Graphics	3

### Packaging (17)

#### All of the following courses:

CEM 143	Survey of Organic Chemistry	4
PKG 101	Principles of Packaging	3
PKG 221	Packaging with Glass and Metal	2
PKG 322	Packaging with Paper and Paperboard	4
PKG 323	Packaging with Plastics	4

### Supply Chain Management: (15)

FI 320	Introduction to Finance	3
MKT 327	Introduction to Marketing	3
SCM 303	Introduction to Supply Chain Mgt	3
SCM 371	Procurement & Supply Management	3
SCM 372	Manufacturing Planning and Control	3

**Technical Sales: (18)**

COM 360	Advanced Sales Communication	3
COM 483*	Practicum in Sales Communication	1
FI 320	Introduction to Finance	3
MKT 313	Personal Selling and Buying Processes	3
MKT 327	Introduction to Marketing	3
MKT 383	Sales Management	3
SCM 474	Negotiations	2

**Media and Information: (18)**

MI 101	Understanding Media and Information	3
MI 201	Media & Information Technologies & Industries	3
MI 301	Bringing Media to Market	3
MI 305	Media & Information Policy	3
MI 361	IT Network Management & Security	3
MI 458	Project Management (W)	3

**Other Electives (Variable)**

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\*Requires a sales-based internship

**Sample Program**

Freshman Year				Sophomore Year			
Fall	Credits	Spring	Credits	Fall	Credits	Spring	Credits
CEM 161	1	PHY 183	4	PHY 184	4	CONC	3
CEM 141	4	EGR 102	2	PHY 191	1	ME 201	3
EGR 100	2	MTH 133	4	CE 221	3	ACC 230	3
MTH 132	3	WRA XXX	4	MTH 234	4	AESC 210	3
COM 225	3			IAH 201-210	4	STT 315	3
<b>Total</b>	<b>13</b>	<b>Total</b>	<b>14</b>	<b>Total</b>	<b>16</b>	<b>Total</b>	<b>15</b>

  

Junior Year				Senior Year			
Fall	Credits	Spring	Credits	Fall	Credits	Spring	Credits
MSE 250	3	CONC	3	CONC	3	CONC	3
MKT 317	3	MGT 325	3	ME 280	2	CONC	3
AESC 310	3	EC 201	3	Bioscience	3/4	AESC 410	3
ENE 280 or BE 230	3	ECE 201	3	EC 202	3	Elective	3
ISS 2XX	4	IAH 211 or >	4	ISS 3XX	4	Elective	3
<b>Total</b>	<b>16</b>	<b>Total</b>	<b>16</b>	<b>Total</b>	<b>15/16</b>	<b>Total</b>	<b>15</b>

**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:

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

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