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APPLIED ENGINEERING SCIENCES

The Applied Engineering Sciences major provides undergraduate opportunities leading to the Bachelor of Science degree. The core goal of applied engineering sciences is to prepare technically competent, broad-based engineering graduates who have acquired a systems perspective for problem-solving and business expertise. The program provides a broad foundation in science and mathematics, engineering, and business management and is designed to develop graduates who can apply the rigor of their technical education to diverse problems and settings. The program is structured to establish skills in areas such as effective management, contemporary technical issues, deployment of new technologies, resolving ethical dilemmas, effective communication across technical disciplines both in oral and written communication, and lifelong learning.

Requirements for the Bachelor of Science Degree in Applied Engineering Sciences

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Applied Engineering Sciences.
   The University's Tier II writing requirement for the Applied Engineering Sciences major is met by completing Applied Engineering Sciences 410. That course is referenced in item 3. a. below.
   Students who are enrolled in the College of Engineering may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading **Graduation Requirements for All Majors** in the College statement. Certain courses referenced in requirement 3. below may be used to satisfy the alternative track.
2. The requirements of the College of Engineering for the Bachelor of Science degree.
   The credits earned in certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.
3. The following requirements for the major:

				CREDITS
a.	All of the following courses:			41
	ACC	230	Survey of Accounting Concepts	3
	AESC	210	Global Systems: Economics, Engineering, Environment	3
	AESC	310	Sustainable Systems Analysis	3
	AESC	410	Capstone Project in Applied Engineering Sciences	3
	CE	221	Statics	3
	CEM	161	Chemistry Laboratory I	1
	EC	201	Introduction to Microeconomics	3
	EC	202	Introduction to Macroeconomics	3
	ECE	345	Electronic Instrumentation and Systems	3
	~~ENE~~	~~280~~	~~Principles of Environmental Engineering and Science~~	~~3~~
	ME	201	Thermodynamics	3
	ME	280	Graphic Communications	2
	MKT	317	~~Quantitative Business Research Methods~~	~~3~~
	MSE	250	Materials Science and Engineering	3
	PHY	191	Physics Laboratory for Scientists, I	1
	~~STT~~	~~351~~	~~Probability and Statistics for Engineering~~	~~3~~
b.	One of the following courses:			3
	COM	225	An Introduction to Interpersonal Communication	3
	MGT	325	Management Skills and Processes	3
c.	**Concentration**:			~~15 to 19~~

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~~ credits)

1. All of the following courses (13 credits):

EC	301	Intermediate Microeconomics	3
EC	425	Law and Economics (W)	3
GBL	385	Business Law and Ethical Leadership	3
GBL	480	Environmental Law and 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 or 19 credits)

Students who select the Business Analytics concencentration will be required to complete 133 credits for the degree.

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AESC 110 AES as a Profession 1

ENE 371 Sustainable Civil and Environmental Engineering Systems 3

Market Analytics

c. One of the following courses (3 or 4 credits):
STT 351 Probability and Statistics for Engineering 3
STT 380 Probability and Statistics for Data Science 4

15 to 38

16 or 17

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1. All of the following courses (12 credits):
   - CSE 231 Introduction to Programming I 4
   - CSE 232 Introduction to Programming II 4
   - CSE 260 Discrete Structures in Computer Science 4
2. Two of the following courses (6 or 7 credits):
   - CSE 320 Computer Organization and Architecture 3
   - CSE 325 Computer Systems 3
   - CSE 331 Algorithms and Data Structures 3
   - CSE 335 Object-oriented Software Design 4
   - CSE 404 Introduction to Machine Learning 3
   - CSE 420 Computer Architecture 3
   - CSE 429 Interdisciplinary Topics in CyberSecurity 3
   - CSE 431 Algorithm Engineering 3
   - CSE 440 Introduction to Artificial Intelligence 3
   - CSE 471 Media Processing and Multimedia Computing 3
   - 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

Packaging (17 credits);
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 credits)
All of the following courses:
- FI 320 Introduction to Finance 3
- MKT 327 Introduction to Marketing 3
- SCM 303 Introduction to Supply Chain Management 3
- SCM 371 Procurement and Supply Management 3
- SCM 372 Manufacturing Planning and Control 3

Technical Sales (18 credits)
All of the following courses:
- COM 360 Advanced Sales Communication 3
- COM 483 Practicum in Sales Communication 1
- FI 320 Introduction to Finance 3
- MKT 313 Consultative Selling 3
- MKT 327 Introduction to Marketing 3
- MKT 383 Sales Management 3
- SCM 474 Negotiations 2

~~**Media and Information**(18 credits)~~
~~All of the following courses:~~
- ~~MI 101 Understanding Media and Information . . . . . 3~~
- ~~MI 201 Media and Information Technologies and Industries . . . . . 3~~
- ~~MI 302 Networks, Markets and Society . . . . . 3~~
- ~~MI 305 Media and Information Policy . . . . . 3~~
- ~~MI 361 IT Network Management and Security . . . . . 3~~
- ~~MI 488 Information and Communication Technology Development Project (W) . . . . . 3~~

MGT 474 Negotiations 2

Business Analytics (38 credits)
1. All of the following courses (15 credits):
   - EC 301 Intermediate Microeconomics 3
   - FI 320 Introduction to Finance 3
   - GBL 385 Business Law and Ethical Leadership 3
   - MKT 327 Introduction to Marketing 3
   - SCM 303 Introduction to Supply Chain Management 3
2. Completion of the Minor in Data Science.