

ENGINEERING TECHNOLOGY & MANAGEMENT FOR AGRICULTURAL SYSTEMS: AGRICULTURAL PRODUCTION & PROCESSING, BS

for the degree of Bachelor of Science in Engineering Technology & Management for Agricultural Systems: Agricultural Production & Processing concentration

Students in the Agricultural Production & Processing concentration learn the technology, machinery, and management of the agricultural production system. Students will gain knowledge and skills in topics including:

1. the agricultural industry from an operational and management perspective;
2. agricultural machinery, grain storage systems, and bioprocessing systems;
3. numerical and scientific processes to drive management decisions; and
4. the science and management of the complete food production system.

Graduates of the Agricultural Production & Processing concentration are prepared for careers in industry with both small and large companies, agricultural retailers and service providers, production farming operations, government and environmental agencies, or for entrance into graduate or professional school.

for the degree of Bachelor of Science in Engineering Technology & Management for Agricultural Systems, Agricultural Production & Processing concentration

Concentration Requirements

Graduation Requirements

Minimum hours required for graduation: 126 hours.

University Requirements

Minimum of 40 hours of upper-division coursework, generally at the 300 and 400 level. These hours can be drawn from all elements of the degree. Students should consult their academic advisor for additional guidance in fulfilling this requirement.

The university and residency requirements can be found in the Student Code (<https://studentcode.illinois.edu/article3/part8/3-801/>) (§ 3-801) and in the Academic Catalog (<http://catalog.illinois.edu/general-information/degree-general-education-requirements/>).

General Education Requirements

Follows the campus General Education (Gen Ed) requirements (<https://courses.illinois.edu/gened/DEFAULT/DEFAULT/>). Some Gen Ed

requirements may be met by courses required and/or electives in the program.

Code	Title	Hours
	Composition I	4-6
	Advanced Composition	3
	fulfilled by AGCM 220, BADM 340, BTW 250, BTW 261, ECE 316, ESE 360, ETMA 311, NRES 419, or PLPA 200	
	Humanities & the Arts (6 hours)	6
	Natural Sciences & Technology (6 hours)	6
	fulfilled by CHEM 102, PHYS 101; and CHEM 104 or PHYS 102	
	Social & Behavioral Sciences (6 hours)	6
	fulfilled by ECON 102 or ACE 100 and one other courses approved as Social and Behavioral Sciences	
	Cultural Studies: Non-Western Cultures (1 course)	3
	Cultural Studies: US Minority Cultures (1 course)	3
	Cultural Studies: Western/Comparative Cultures (1 course)	3
	Quantitative Reasoning (2 courses, at least one course must be Quantitative Reasoning I)	6-8
	fulfilled by MATH 234, PHYS 101, CS 105; and ACE 262, CPSC 241, ECON 202, or STAT 107	
	Language Requirement (Completion of the third semester or equivalent of a language other than English is required)	0-15

Code	Title	Hours
Department Foundation		
	ACES 101	
	Communication Option:	3 or 6
	CMN 101 Public Speaking	
	ALEC 115 Let's Talk about Food, Agriculture, and the Environment	
	CMN 111 & CMN 112 Oral & Written Comm I and Oral & Written Comm II	
	Advanced ETMA Communication Option - Select one of the following:	3-4
	AGCM 220 Communicating Agriculture	
	BADM 340 Ethical Dilemmas of Business	
	BTW 250 Principles Bus Comm	
	BTW 261 Principles Tech Comm	
	ECE 316 Ethics and Engineering	
	ESE 360 Environmental Writing	
	ETMA 311 Humanity in the Food Web	
	NRES 419 Env and Plant Ecosystems	
	PLPA 200 Plants, Pathogens, and People	
	Statistics Option - Select one of the following:	3-4
	ACE 262 Applied Statistical Methods and Data Analytics I	
	CPSC 241 Intro to Applied Statistics	
	ECON 202 Economic Statistics I	
	STAT 107 Data Science Discovery	
	MATH 234 Calculus for Business I (or equivalent)	4
	CHEM 102 & CHEM 103 General Chemistry I and General Chemistry Lab I	4
	PHYS 101 College Physics: Mech & Heat	5
	Select one of the following:	4-5

CHEM 104 & CHEM 105	General Chemistry II and General Chemistry Lab II	
OR		
PHYS 102	College Physics: E&M & Modern	
ECON 102 or ACE 100	Microeconomic Principles Introduction to Applied Microeconomics	3 or 4
Major Core		
CS 105	Intro Computing: Non-Tech	3
ETMA 100	Technical Systems in Agr	3
ETMA 339	Optimization in Engineering Technology and Management	3
ETMA 421 or ETMA 422	Industrial and Agricultural Safety-Injury Prevention Industrial and Agricultural Occupational Illness Prevention	3
ETMA 430	Project Management	2
ETMA 439	Capstone Experience	4
Business Electives 6		
A total of six hours from the Business Electives list, which do not satisfy any other requirements.		
ACCY 200	Fundamentals of Accounting	3
ACCY 201	Accounting and Accountancy I	3
ACCY 202	Accounting and Accountancy II	3
ACE 210	Environmental Economics & Policy	3
ACE 221	Negotiation	2
ACE 240	Personal Financial Planning	3
ACE 310	Natural Resource Economics	3
ACE 345	Small Business Finance	3
ACE 346	Tax Policy and Finan Planning	3
ACE 432	Advanced Farm Management	3 or 4
ACE 435	Global Agribusiness Management	3
BADM 300	The Legal Environment of Bus	3
BADM 310	Mgmt and Organizational Beh	3
BADM 311	Leading Individuals and Teams	3
BADM 312	Designing and Managing Orgs	3
BADM 313	Strategic Human Resource Management	3
BADM 314	Leading Negotiations	3
BADM 320	Principles of Marketing	3
FIN 230	Introduction to Insurance	3
LER 290	Introduction to Employment Law	3
LEAD 260	Foundations of Leadership	3
LEAD 340	Leadership Ethics & Society: Addressing Contemporary Challenges	3
LEAD 425	Leading Teams	3
SE 361	Emotional Intelligence Skills	3
SE 400	Engineering Law	3 or 4
TE 230	Design Thinking/Need-Finding	3
TE 450	Startups: Incorporation, Funding, Contracts, & Intellectual Property	3

Code	Title	Hours
Agricultural Production & Processing Concentration Core		
Introductory-Related Courses		6-8
Select two introductory-related courses from this list:		

ACES 102	Intro Sustainable Food Systems	
ANSC 100	Intro to Animal Sciences	
CPSC 112	Introduction to Crop Sciences	
FSHN 101	The Science of Food and How it Relates to You	
HORT 100	Introduction to Horticulture	
LEAD 260	Foundations of Leadership	
NRES 201	Introductory Soils	
ETMA Electives. A minimum of 11 hours at the advanced level are required.		20
ETMA 103	Agricultural Machinery and Technology	2
ETMA 262	Agricultural Machine Systems Management	3
ETMA 381	Grain Drying & Storage Systems	3
Select an additional 12 hours from the list below for a total of 20 hours:		
ETMA 130	Basics of CAD	
ETMA 132	Basics of Project Management	
ETMA 232	Materials and Construction Sys	
ETMA 233	Metallurgy & Welding Processes	
ETMA 234	Wiring, Motors and Control Sys	
ETMA 295	Undergrad Research or Thesis	
ETMA 352	Land and Water Mgt Systems	
ETMA 363	Fluid Power Systems	
ETMA 371	Residential Housing Design	
ETMA 372	Environ Control & HVAC Systems	
ETMA 396	UG Honors Research or Thesis	
ETMA 425	Managing Industrial and Agricultural Safety Risks	
ETMA 435	Elec Computer Ctrl Sys	
ETMA 464	Heavy Equipment Powertrains	
ETMA 467	Precision Agric Technology	
ETMA 486	Grain Bioprocessing Coproducts	
ETMA 496	Independent Study	
Concentration Electives		18
Select 18 hours from the lists below with a minimum of 12 hours at the advanced level.		
Select two courses from the Food and Agricultural Marketing Management and Law category:		6
Food and Agricultural Marketing Management and Law		
ACE 222	Agricultural Marketing	
ACE 231	Food and Agribusiness Mgt	
ACE 232	Farm Management	
ACE 306	Food Law	
ACE 403	Agricultural Law	
ACE 427	Commodity Price Analysis	
ACE 428	Commodity Futures and Options	
ACE 430	Corporate Food Marketing	
ACE 431	Agri-food Strategic Management	
ACE 432	Advanced Farm Management	
ACE 435	Global Agribusiness Management	
Select four courses from no more than two of these categories:		12
Animal Production & Processing		

ANSC 223	Animal Nutrition	
ANSC 301	Food Animal Production, Management, and Evaluation	
ANSC 310	Meat Selection and Grading	
ANSC 322	Livestock Feeds and Feeding	
ANSC 400	Dairy Herd Management	
ANSC 401	Beef Production	
ANSC 402	Sheep and Goat Production	
ANSC 403	Pork Production	
ANSC 404	Poultry Science	
ANSC 424	Pet Food & Feed Manufacturing	
Food Production & Processing		
FSHN 232	Science of Food Preparation	
FSHN 260	Raw Materials for Processing	
FSHN 345	Strategic Operations Management	
FSHN 460	Food Processing Engineering	
FSHN 465	Principles of Food Technology	
FSHN 469	Package Engineering	
FSHN 471	Food & Industrial Microbiology	
FSHN 472	Applied Food Microbiology	
Horticultural Production & Processing		
HORT 205	Local Food Systems	
HORT 341	Greenhouse Mgmt and Production	
HORT 360	Vegetable Crop Production	
HORT 361	Small Fruit Production	
HORT 363		
HORT 435	Urban Food Production	
PLPA 405	Plant Disease Diagnosis & Mgmt	
Crop Production & Processing		
CPSC 304	Plant Pathology	
CPSC 370	Applied Entomology	
CPSC 408	Integrated Pest Management	
CPSC 412	Principles of Crop Production	
CPSC 414	Forage Crops & Pasture Ecology	
CPSC 415	Bioenergy Crops	
CPSC 418	Crop Growth and Management	
CPSC 426	Weed Mgt in Agronomic Crops	
CPSC 473	Mgmt of Field Crop Insects	
NRES 474	Soil and Water Conservation	
NRES 488	Soil Fertility and Fertilizers	
PLPA 405	Plant Disease Diagnosis & Mgmt	

Code	Title	Hours
Total Hours		126

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Sample Sequence

This sample sequence is intended to be used only as a guide for degree completion. All students should work individually with their academic

advisors to decide the actual course selection and sequence that works best for them based on their academic preparation and goals. Enrichment programming such as study abroad, minors, internships, and so on may impact the structure of this four-year plan. Course availability is not guaranteed during the semester indicated in the sample sequence.

Students must fulfill their Language Other Than English requirement by successfully completing a third level of a language other than English. For more information, see the corresponding section on the Degree and General Education Requirements page (<http://catalog.illinois.edu/general-information/degree-general-education-requirements/>).

First Year			
First Semester	Hours	Second Semester	Hours
ETMA 100	3	CHEM 102	3
ACES 101		CHEM 103	1
Composition I or Communication Option	3	Communication Option or Composition I	4
ECON 102 or ACE 100	3	MATH 234	4
Language Other than English (3rd level)	4	ETMA Elective	3
		13	15

Total Hours 28

Second Year			
First Semester	Hours	Second Semester	Hours
PHYS 101	5	CHEM 104 or PHYS 102	3
CS 105	3	CHEM 105 (or Free Elective course)	1
ETMA 103	2	Statistics course	3
Business Elective	3	ETMA 262	3
ETMA Elective	3	ETMA 381	3
		Introductory-Related course	3
		16	16

Total Hours 32

Third Year			
First Semester	Hours	Second Semester	Hours
ETMA 421 or 422	3	ETMA 339	3
ETMA Elective	3	Business Elective	3
Concentration Elective	3	Advanced ETMA Communication course	3
Introductory-Related course	3	General Education course	3
General Education course	3	General Education course	3

Free Elective course	1	
	16	15

Total Hours 31**Fourth Year**

First Semester	Hours	Second Semester	Hours
ETMA 430	2	ETMA 439	4
ETMA Elective	3	Concentration Elective	3
Concentration Elective	3	Concentration Elective	3
Concentration Elective	3	General Education course	3
Concentration Elective	3	General Education course	3
General Education course	3		
	17		16

Total Hours 33**Total Hours: 126**

for the degree of Bachelor of Science in Engineering Technology & Management for Agricultural Systems: Agricultural Production & Processing concentration

The Engineering Technology and Management for Agricultural Systems (formerly Technical Systems Management) program is designed to prepare graduates for careers in management, marketing, operations, maintenance, and application of agricultural and biological engineering technologies within the realms of agriculture, food, energy, water, and the environment. Graduates are expected to understand problems and concerns in engineering technologies from production to processing through distribution and their social and cultural implications.

Specific program learning objectives are:

- Objective 1: Provide academic and technical knowledge and experiences needed for success in an increasingly technological agricultural industry and world.
- Objective 2: Enhance students' abilities to formulate questions and find solutions both individually and as a part of a team.
- Objective 3: Improve students' abilities to communication both written and oral forms.
- Objective 4: Enhance the use and understanding of mathematics and calculation for analysis in technology and business.
- Objective 5: Provide opportunities to learn and enhance professional and ethical values and leadership skills.
- Objective 6: Understand their role in society and the social and cultural implications of practice in their profession.
- Objective 7: Recognize the need for and develop the abilities to engage in life-long learning.
- Objective 8: Understand the global nature of agriculture and business.

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Agricultural & Biological Engineering

Agricultural & Biological Engineering Department website (<https://abe.illinois.edu/>)

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College of Agricultural, Consumer & Environmental Sciences

College of Agricultural, Consumer & Environmental Sciences website (<https://aces.illinois.edu/>)

ACES Office of Academic Programs

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217-333-3380

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Advising

ABE Advising website (<https://abe.illinois.edu/academics/advising/>)
(217) 333-3570

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Admissions

ACES Undergraduate Admissions (<https://aces.illinois.edu/admissions/>)
University of Illinois Urbana-Champaign Undergrad Admissions (<https://www.admissions.illinois.edu/>)

(217) 333-3380

visitACES@illinois.edu

The Grainger College of Engineering

The Grainger College of Engineering website (<https://grainger.illinois.edu/>)