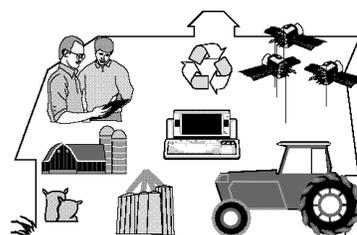


**2011-2012**

# **Agricultural Systems Management Student Handbook**

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Agricultural & Biological Engineering  
ABE Building  
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West Lafayette, IN 47907-2093

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If you do not find an answer in this document, contact Yvonne Hardebeck, 494-1172, [hardebey@purdue.edu](mailto:hardebey@purdue.edu) or Dan Taylor, 494-1181, [taylordc@purdue.edu](mailto:taylordc@purdue.edu).

This handbook is a guide. Changes may have been made since this version was completed. Please see your advisor if you have questions. If you need to see an older version of the handbook, please contact Yvonne (room 201 or [hardebey@purdue.edu](mailto:hardebey@purdue.edu)).

# Introduction

Welcome to Purdue University and the Department of Agricultural and Biological Engineering!

The Agricultural and Biological Engineering Department is dedicated to providing a stimulating, educational environment for *all* students. The faculty and staff in the Department are committed to assisting students toward enriching, rewarding, and professional experiences at Purdue.

This handbook has been prepared to help students understand the requirements for Agricultural Systems Management major, give guidance for selecting various elective courses in order to achieve success in their academic careers at Purdue University, and also provide useful information about the academic aspects of the department.

The Department of Agricultural and Biological Engineering (ABE) at Purdue University applies engineering and management principles to agriculture, food, and biological systems. A college education in one of the programs of the Agricultural and Biological Engineering Department will prepare students for many exciting career opportunities in the diverse areas of production of food and other biological materials, processing systems, and conservation management of land and water resources. A student can select from these programs: Agricultural Systems Management (ASM), Agricultural Engineering (AE) [specializing in either Machine Systems Engineering (MSE) or Environmental and Natural Resources Engineering (ENRE)], or Biological Engineering (BE). Both the AE and BE programs lead to a BS in Agricultural and Biological Engineering, while the ASM program leads to a BS in Agriculture. The Biological Engineering program offers dual degrees with either Pharmaceutical Sciences or Biochemistry. ABE also offers a BS/MS program. This handbook regards the ASM program. Information on the others is available at <https://engineering.purdue.edu/ABE>.

Employment opportunities for ASM students are excellent and will undoubtedly continue to increase as the world populations demand more abundant supplies of nutritious, high quality food and biologically based fuel, feed, and fiber products at affordable prices. Increased opportunities will also result from greater recognition of the needs for an abundant supply of clean water and preservation of natural resources. ASM students are uniquely qualified to cope with the various technical and management aspects of production and processing of food and other biological materials within the constraints of environmental protection and natural resources conservation.

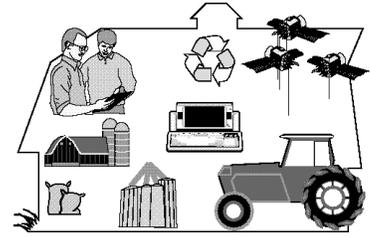
The mission of the ABE department is:

*“To prepare students, citizens, and industry for the future through innovative education and extension/outreach programs and the discovery of knowledge.”*

[www.purdue.edu/abe](http://www.purdue.edu/abe)

# What is Agricultural Systems Management?

***Agricultural Systems Management*** prepares individuals to organize and manage environmentally sound technology-based businesses. The emphasis is on planning and directing an industry or business project with responsibility for results. National and international job opportunities include:



- manufacturing and processing operations
- advice and trouble-shooting help on technical equipment (or projects)
- planning buildings and equipment to fit and work together, working with the handling and flow of materials such as grain, feeds, chemicals, vegetables, fruits, etc. and products made from them
- using technical training in selling or demonstrating products and equipment
- teaching people about product use and value
- managing and operating a farm or agri-business
- applying technology for precision agriculture

***Agricultural Systems Management*** is based on an understanding of how equipment and buildings are used with plants and animals and their products. These processes require an understanding of biological sciences to produce and maintain top product quality.

Computer skills are taught and used throughout the curriculum. Computers are used to collect and analyze data, and then using that information, to control machines and processes. Other uses involve planning layouts of equipment and buildings, creating graphics for reports, etc. While traditional computer programming is not taught, ASM students graduate with more computer application experience than other students in Agriculture.

***Agricultural Systems Management*** students also take a series of courses in communications, business management and biological sciences, in addition to their specialty courses based in the Agricultural and Biological Engineering Department. The program provides an in-depth technical knowledge for selecting and applying advanced technologies in the food system. Graduates are prepared to solve a wide variety of business and technical problems in a job field that continues to grow.

## CAREER OPPORTUNITIES

- Product Education - Use and Value
- Technical Assistance and Troubleshooting
- Technical Product Development, Testing, Application and Sales
- Farm & Agribusiness Management
- Coordinating, Directing and Supervising Manufacturing and Processing Operations
- Building and Equipment Layout, Use (Materials Handling, Flow, Processing)

# Educational Objectives and Program Outcomes

With input from various constituency groups and students, the Department of Agricultural and Biological Engineering has established education goals and objectives for its various programs.

## **Educational Goal**

Provide students with learning opportunities that prepare them for future challenges in food, agricultural and biological engineering through the application and discovery of knowledge.

## ***ASM Program Outcomes***

Program outcomes are important capabilities and skills that students should possess as a graduate of one of the undergraduate programs in the department. Outcomes for Agricultural Systems Management (ASM), are listed below.

ASM students will have the ability to:

1. understand and apply the basic principles of mathematics, science, technology, management, and economics to agricultural systems.
2. identify agricultural systems problems, locate relevant information, develop and analyze possible alternatives, and formulate and implement solutions.
3. effectively use economic principles, scientific technologies, techniques, and skills necessary to manage agricultural systems.
4. recognize and define agricultural systems problems and the impact of their proposed technological solutions in an international and societal context.
5. understand and participate in performance evaluations, collect, analyze and interpret the data, and communicate the results.
6. demonstrate appropriate listening, speaking, writing, presentation, and interpersonal skills needed to interact and communicate effectively.
7. function with, and contribute effectively to, multi-disciplinary teams.
8. understand professional and ethical responsibilities and put them into practice.

# Student Academic Center

In response to the department's strategic goal to: *“Provide students with effective educational opportunities to learn and grow as individuals, contribute to society, and attain maximum potential through life-long learning,”* the Student Academic Center was established. The Center is located in room 201 of the ABE building. Some of the services provided by the Center are:

- Assist students with course selection and registration information
- Maintain an up-to-date copy of each student's academic record
- Collect and disseminate information relative to all undergraduate activities such as registration procedures, changes in regulations, and new course offerings
- Serve as a distribution center for information related to internships, employment, and scholarships
- Arrange for interviews with potential employers
- Direct students to the correct resource on specific problems that cannot be resolved at the Center.
- Coordinate a senior resume CD\*
- Announce College and University level career fairs\*

## *Advising*

In addition to the advising services offered by the Center, each student in the Department meet with faculty advisors who have expertise in the student's area of interest. The advisor will counsel on the academic requirements of the major and serve as a resource to answer other academic concerns, and will assist the students to develop their career goals and objectives. The advisor will become a friend, listener, and source of information concerning non-academic matters if the need arises.

## *Student Responsibilities*

Specific interests or concerns regarding the Agricultural and Biological Engineering Department should be discussed with your advisor and/or the Student Services Coordinator. **Students have the responsibility of initiating and maintaining contact with their advisor for guidance.** It is important to remember that it is the student who is ultimately responsible for making sure course requirements are complete. The student record sheet (page 12) in this handbook should be kept up-to-date and checked periodically against the one in the advisor's file kept in the Center.

## *Employment Support*

Qualified students often find jobs prior to graduation. Notices of available positions received in the department are posted on the job placement bulletin board located in the hallway of the second floor between rooms 213 and 214. These notices include full- and part-time positions, summer and internship opportunities. Interview schedules are arranged by the Placement Coordinator. Many students find full-time employment with organizations that have employed them during previous summers/internships.

*\*For more career advice, see the Center for Career Opportunities ([www.cco.purdue.edu](http://www.cco.purdue.edu))*

## ***University Regulations***

Purdue has policies regarding discrimination, scholastic deficiency (probation or being dropped), harassment, honor code, fees, grade appeals, hazing, insurance, computer copyrights, and many other student concerns. Please take time to look over the University Regulations Handbook ([www.purdue.edu/univregs/index.html](http://www.purdue.edu/univregs/index.html)).

## **Student Clubs**

Many ASM students belong to professionally related clubs and societies.

There are also college-wide opportunities such as Ag Council or Purdue Engineering Student Council. In addition, Purdue is host to many different student organizations - from Alpha Phi Omega (a service organization) to the Recreational Fishing Club - there is something for everyone!

The following Student Organizations are based in ABE. A faculty member assumes advisory responsibility for each club and ABE provides the student clubs with secretarial and administrative services that help encourage student participation.

**Agricultural Systems Management (ASM)** - The Purdue University Agricultural Systems Management Club was established in 1968. The purpose of the club is to promote the Agricultural Systems Management program, its members, and to establish a social and personal atmosphere between students and faculty. Activities of the club include picnics, banquets, guest speakers, alumni relations, plant trips, service projects and various other activities. Club Advisors: Prof. D. Ess, ABE 311, 496-3977, [ess@ecn.purdue.edu](mailto:ess@ecn.purdue.edu) and Prof. D. Buckmaster, ABE 210, 496-9512, [dbuckmas@purdue.edu](mailto:dbuckmas@purdue.edu).

**Alpha Mu Honorary** - Alpha Mu is the honor society for the Agricultural Systems Management program. Students are elected to membership based primarily on their academic standing. The club seeks to promote scholarship and excellence in all areas of Agricultural Systems Management Club. Advisor: Prof. Dennis Buckmaster, Room 210, 496-9512, [dbuckams@purdue.edu](mailto:dbuckams@purdue.edu).

**Purdue Diesel Club (PDC)** – Established in 2010, PDC was created to fill a void in extracurricular clubs on campus. The mission of PDC is to be a unifying body of diesel enthusiasts. Membership in the club comes from all over campus, including mostly agriculture, engineering, and technology students, and interests lies in performance trucks and cars, agriculture and heavy equipment, on-highway transport, and bio-fuels, emissions, and engine technology and science. Activities include Show-N-Shine on Memorial Mall, DYNO Day, Tot's Day, and various speakers, learning modules, and tours to grow club member knowledge and awareness of the vast diesel industry.

# Professional Experience Programs

The Professional Experience Program includes internships (single periods of supervised work experience) and the Professional Practice program (a comprehensive program, formerly known as Co-Op) and combines education on campus with practical, career-oriented experience on the job.

Students must have completed the freshman year (30 semester credits) and be in good standing to be eligible (most employers expect at least a 3.0 GPA, however, some will accept a 2.8). Interested students are not guaranteed entry to the program since employers select students based upon normal interview procedures and approval of the position must be done by the departmental coordinator. A satisfactory summary report for each period of supervised work experience must be submitted by the student to the departmental coordinator.

Students who successfully complete an internship (minimum 10 weeks of supervised work experience) will be awarded an appropriate certificate by the School of Agriculture upon graduation.

## Honors Program

The College of Agriculture Honors Program can help you pursue an individually designed curriculum by working with a faculty mentor to do research or pursue other creative activities. In the Honors Program you'll find challenges and rewards.

Honors programs let you work with a faculty mentor to design your curriculum and set up additional research and learning activities.

### Honors Program Operating Policies

- Students must have completed a minimum of 32 semester credits and have attained a minimum graduation index of 3.25 at the time of admission. Transfer students must complete a minimum of 16 credits at Purdue University before applying for admission. Individual departmental honors programs may establish higher criteria for admission.
- Students will apply for admission to the Honors Program through their departmental honors committee. Before applying for admission, the student is expected to identify an Honors Program adviser who has agreed to serve as a mentor and to determine a mutually acceptable honors project. Admission is contingent upon the approval of the departmental honors committee and the College of Agriculture Director of Academic Programs.
- Within the first semester after admission to the Honors Program, the student is expected to develop a plan of study in cooperation with his or her mentor. Plans of study are to be submitted to the departmental honors committee for approval. While in the Honors Program, students must achieve minimum 3.0 semester grade indexes. Participants who fail to meet the semester index requirement may continue in the Honors Program upon recommendation of the departmental honors committee and with the approval of the College of Agriculture Director of Academic Programs.

- Students in the Honors Program must complete a minimum of 30 credits in residence at the Purdue University West Lafayette Campus.
- Under the direction of his or her Honors Program mentor, the student must complete an honors project of scholarly activity associated with research, teaching, extension, or another area acceptable to the departmental honors committee. A written summary report of the honors project must be submitted to the departmental honors committee for approval. At the discretion of the departmental honors committee, the student may also be required to conduct a seminar regarding his or her honors project.
- To achieve certification as a College of Agriculture Honors Program graduate, the student must successfully complete the approved plan of study and submit a written honors project report which is approved by the departmental honors committee.

Honors Program graduates will receive an appropriate certificate upon graduation, and the academic transcript will indicate successful completion of the Honors Program in the student's major program of study.

For more information, visit [www.purdue.edu/provost/honors/](http://www.purdue.edu/provost/honors/)

## International Studies

Purdue University offers students within all fields of study the opportunity to participate in international study programs in more than 30 countries. There are approximately 20 programs in 13 countries which focus on various aspects of agriculture. Choices are as diverse as Russia, Honduras, Japan, and France. In most programs, students earn Purdue credit for courses completed. Although the academic experience is rigorous, programs allow extensive contact with the local culture.

Every effort is made to keep program costs as close as possible to the cost of study on the West Lafayette Campus. Students eligible for financial aid may use most forms of aid on approved programs. Students are responsible for their own airfare, board, room, books, and other personal expenses. There are a few selected programs where all expenses are paid. Certain College of Agriculture study abroad programs offer special scholarships to cover some costs.

Students may spend a year, a semester, or a summer abroad. Foreign language requirements vary from none to the advanced level. The language of instruction is English in more than 50 programs. Some programs are designed for students in specific areas of study; others are open to all Purdue students regardless of major.

For more information, contact: International Programs in Agriculture, Agricultural Administration Building, Room 26, (494-6876), Programs for Study Abroad, International Programs, Young Graduate House, Room 120 (494-2383), or visit [www.agriculture.purdue.edu/ipiastudyabroad/index.shtml](http://www.agriculture.purdue.edu/ipiastudyabroad/index.shtml).

## International Studies Minor

The International Studies minor provides the opportunity for students to incorporate a special international component into their undergraduate program of study. Except for the overseas experiential component of the program, students usually are able to use the elective structure within their major program of study to earn the minor.

Students from any College of Agriculture major may earn the international studies minor. The Office of International Programs in Agriculture will provide special counsel to students regarding program operations including the identification and coordination of out-of-country experiences. To qualify for this minor, students normally will be expected to focus on a specific geographical region and complete the following requirements:

- Individuals must demonstrate proficiency in a second language
- Students must complete a minimum of 15 semester credits of courses with a principal international focus in the areas of culture, political science, history, or economics. A minimum of 6 credits of this coursework must be focused on the geographic region of choice.
- Individuals must participate in a cooperative work, internship, study abroad, or cultural exchange experience of eight weeks or more in the selected geographic region.
- Students must submit a summary paper and make an oral presentation.

For more information, see the College of Agriculture catalog at [www.agriculture.purdue.edu/ipia/minor.html](http://www.agriculture.purdue.edu/ipia/minor.html).

## Scholarships

Agricultural and Biological Engineering students are eligible for scholarships awarded through both the College of Agriculture and College of Engineering. Available scholarships will be announced at various times during the academic year. Students should watch the bulletin boards and read their email for notices.

To apply for scholarships administered by ABE, a student must complete and submit a scholarship application form online. You can apply online at [www.agriculture.purdue.edu/oap/scholarshipsFellowships.asp](http://www.agriculture.purdue.edu/oap/scholarshipsFellowships.asp).

From time to time scholarships will be made available from sources outside the department that will require a different application form. Those forms will be made available in the Academic Center.

Scholarships administered by ABE have included, but are not limited to: Caterpillar, John Deere, John Greiner, G.W. Krutz, Nelson Irrigation, Parker Hannifin, Archer Daniels Midland, Case New Holland, HUSCO, Mid America Equipment Retailers Association.

## Academic Minors Available to Agriculture Students

### Name

Aerospace Studies  
African American Studies  
Agr Systems Management  
Animal Sciences  
Anthropology  
Art and Design  
Art History  
Asian Studies  
Astrophysics  
Biological Sciences  
Biotechnology  
Chemistry  
Child Dev & Family Studies  
Chinese  
Classical Studies  
Communication  
Computer Science  
Creative Writing  
Crop Science  
Dance  
Earth and Atm Science  
Economics  
Electrical & Computer Engr  
English  
Entomology  
Envrmtl Politics and Policy  
Family Business  
Farm Management  
Film/Video Studies  
Food & Agribusiness Mgmt  
Food Science  
Foods and Nutrition  
Forensic Science  
French  
German  
Health Promotion  
History  
Horticulture

### Name

International Studies  
Italian  
Japanese  
Jewish Studies  
Latin  
Law and Society  
Linguistics  
Management  
Mathematics  
Mechanical Engineering  
Medieval Studies  
Military Sci & Leadership  
Music History and Theory  
Natl Res & Envrmtl Science  
Naval Science  
Nuclear Engineering  
Nutrition  
Occupational Health  
Org Leadership & Supervision  
Peace Studies  
Philosophy  
Physics  
Plant Biology  
Plant Pathology  
Political Science  
Portuguese  
Psychology  
Radiological Health  
Religious Studies  
Russian  
Sociology  
Soil Science  
Spanish  
Statistics  
Theatre  
Weed Science  
Wildlife Science  
Women's Studies  
Wood Products Manufac Tech

# Transfer Credit

Purdue University will accept transfer credit only for work done at those institutions fully approved by a regional accrediting association of secondary schools and colleges.

Students participating in college-credit courses taught concurrently for high school and college credit during the regular school day by local high school teachers must validate the credit through the subject department.

A CTR Form 5, Transfer Credit Evaluation Form, is to be used by Purdue degree seeking students who wish to take courses from another accredited college or university and have them approved for credit at Purdue prior to enrolling in the course(s). Students can do this in summer, while on Professional Practice, or intern jobs. CTR Forms are available from the Credit Evaluation Office in Schleman Hall.

Transfer Students -- New students transferring to Purdue from another school will have credits evaluated by the Credit Evaluation Office. Approved credits will be checked by the academic advisor to see if they meet graduation requirements for the ASM degree.

## ASM Plan of Study

The next several pages contain excerpts from a single Excel workbook which you should use as you select courses in consultation with your advisor. The checklist should be kept up-to-date because it helps you map your semesters out to graduation and keep prerequisite courses in the proper order; the completed checklist is also the first checkpoint for the degree audit (required prior to graduation). You can get an electronic copy of this workbook from your advisor or <https://engineering.purdue.edu/ABE/InfoFor/CurrentStudents/asm.html/ASMF10/>; the electronic copy has comments in the cells with course descriptions as well as lists of accepted courses.

In the plan of study, electives are unrestricted; selectives are selected from defined lists (these are list-restricted electives).

# Agricultural Systems Management Plan of Study

(& checklist for the 131 credits required) Name: \_\_\_\_\_

\* At least 3 credits of "other social sciences" or "humanities" must be at the 300+ level and 12 of the credits must be outside the College of Agriculture.

+ If the International Understanding requirement is met through Hum/SS selections, this elective may be more broadly chosen.

Courses to meet International Understanding and Multicultural Awareness requirements may come from:

[Humanities](#)  
[Social Sciences](#)  
 or other courses

Credits	Course	Description	Sem. taken	Course Grade
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**FIRST SEMESTER (16 credits)**

0.5	AGR 101	Intro to College of Ag and Purdue Univ.		
0.5	AGR 111	Intro to ABE programs		
3	ASM 104	Intro to Agricultural Systems		
3	CHM 111	General Chemistry		
3	COM 114	Fundamentals of Speech Communication		
3	MA 220	Introduction to Calculus		
3		<a href="#">Humanities Selective*</a>		

**THIRD SEMESTER (17 credits)**

3	AGEC 203	Introductory Microeconomics For Food And Agribusiness		
3	ASM 211	Technical Graphic Communication		
1	ASM 221	Career Opportunities Seminar		
3	ASM 222	Crop Production Equipment		
4		<a href="#">Biological Science Selective</a>		
3		<a href="#">Agricultural Selective</a>		

**FIFTH SEMESTER (18 credits)**

3	ASM 336	Environmental Systems Management		
3	ASM 345	Power Units and Power Trains		
3		AGEC 311 Accounting for Farm Business Planning OR MGMT 200		
3		Introductory Accounting		
3		<a href="#">Marketing Selection</a>		
3		<a href="#">Communications Selective</a>		
3		Elective – Unrestricted		

**SEVENTH SEMESTER (17 credits)**

3	ASM 420	Electric Power and Controls		
1	ASM 421	Senior Seminar		
1	ASM 494	Project Planning and Management		
3		AGEC 455 Agricultural Law or MGMT 455 Legal Background for Business I		
3		<a href="#">Agricultural Selective</a>		
3		<a href="#">Humanities – INTL UND OR</a>		
3		<a href="#">Social Science Selective – INTL UND</a>		
3		Elective – Unrestricted		

## Common Minor Choices

- Food & Agribusiness Management Minor     Farm Management Minor  
 Animal Science Minor     Crop Science Minor  
 Org & Leadership Supervision Minor

List three courses (9 credits) which meet the International Understanding requirement:


Indicate which course (3 credits) meets the Multicultural Awareness requirement:

Credits	Course	Description	Sem. taken	Course Grade
---------	--------	-------------	------------	--------------

**SECOND SEMESTER (16 credits)**

3	ASM 105	Agricultural Systems Computations and Communications		
3	CHM 112	General Chemistry		
4	ENGL 106	English Composition		
3	PHYS 214	The Nature of Physics		
3	OLS ____	252 Human Relations in Organizations or 274 Applied Leadership		

**FOURTH SEMESTER (16 credits)**

3	AGRY 255	Soil Science		
3	ASM 245	Materials Handling and Processing		
4		<a href="#">Biological Science Selective</a>		
3		<a href="#">Statistics Selective</a>		
3		<a href="#">Math or Science Selective</a>		

**SIXTH SEMESTER (16 credits)**

3	AGEC 331	Principles of Selling in Agricultural Business		
3	AGEC ____	310 Farm Organization OR 330 Management Methods for Agricultural Business		
3	ASM 333	Facilities Planning and Management		
1	ASM 350	Safety in Agriculture		
3		<a href="#">Social Science Selective*</a>		
3		Elective – INTL UND+		

**EIGHTH SEMESTER (15 credits)**

3	ASM 495	Agricultural Systems Management		
3		<a href="#">ASM 400+ Selective</a>		
3		<a href="#">Agricultural Selective</a>		
3		<a href="#">Humanities Selective*</a>		
3		<a href="#">Humanities – INTL UND OR</a>		
3		<a href="#">Social Science Selective – INTL UND</a>		

## Advisor Notes and Approvals

Requirement	Substitution or application of transfer credit	Rationale	Approval	Date
Degree Audit Target Date:				
Degree Audit Completed:				
Miscellaneous notes				

**College of Agriculture approved courses meeting requirements for at least one of the following categories:  
Written and Oral Communication, Humanities, Social Sciences, International Understanding, Multicultural  
Awareness, or Capstone**

Courses listed below may be used once to satisfy a requirement to the left of the green line. Also, they may be reused once to fulfill requirements to the right of the green line. **Courses in red are not currently offered.**

*Updated 5/11/2011*

<b>COURSE</b>	<b>COM</b>	<b>HUM</b>	<b>SOC</b>	<b>(an)</b>	<b>INTL</b>	<b>MULTI</b>	<b>CAPS</b>
(3) AAS 37000 - Black Women Rising		Y				Y	
(3) AAS 37500 - Black Family		Y				Y	
(3) AAS 37600 - African American Male		Y				Y	
(4) ABE 48500 - Agricultural and Biological Engineering and Design							Y
(4) ABE 55600 - Biological and Food Process Design							Y
(3) AGEC 20300 - Introductory Microeconomics for Food and Agribusiness			Y				
(3) AGEC 20400 - Introduction to Resource Economics and Environmental Policy			Y				
(3) AGEC 21700 - Economics			Y				
(3) AGEC 25000 - Economic Geography of World Food and Resources			Y		Y		
(3) AGEC 30500 - Agricultural Prices			Y				
(3) AGEC 34000 - International Economic Development			Y		Y		
(3) AGEC 40600- Natural Resource And Environmental Economics			Y				
(3) AGEC 41000 - Agricultural Policy			Y				
(4) AGEC 41100 - Farm Management							Y
(3) AGEC 41500 - Community And Resource Development			Y				
(2) AGEC 42900 - Agribusiness Marketing Workshop							Y
(3) AGEC 43000 - Agricultural and Food Business Strategy							Y
(3) AGEC 45000 - International Agricultural Trade			Y		Y		
(3) AGEC 49800 - Afghanistan Development Challenges			Y		Y		
(1-6) AGEC 49900 - Honors Thesis							Y
(3) AGR 20100 - Communicating Across Culture	Y	Y	Y			Y	
(1-3) AGR 49300 - Special Topics in International Agriculture					Y		
(0) AGR 49500 - Intl. Prof. Experience in Agr., Food, and Nat. Resources					Y		
(3) AGRY 28500 - World Crop Adaptation and Distribution					Y		
(1-3) AGRY 35000 - Global Awareness					Y		
(3) AGRY 39900 - Exploring International Agriculture					Y		
(3) AGRY 39900 - Afghanistan Development Challenges			Y		Y		
(1) AGRY 49800 - Agronomy Senior Seminar							Y
(3) AGRY 51200 - Integrated Turfgrass Systems							Y
(3) AGRY 57000 - Agronomy in International Development					Y		
(3) AGRY 58500 - Soils and Land Use							Y

(3) ANSC 29400 - Exploring International Animal Agriculture				Y		
(3) ANSC 29500 - Exploring International Agriculture				Y		
(3) ANSC 44000 - Horse Management						Y
(3) ANSC 44100 - Beef Management						Y
(3) ANSC 44200 - Sheep Management						Y
(3) ANSC 44300 - Swine Management						Y
(3) ANSC 44400 - Dairy Management						Y
(3) ANSC 44500 - Commercial Poultry Management						Y
(3) ANSC 44600 - Companion Animal Management						Y
(0.5) ANSC 48100 - Contemporary Issues in Animal Sciences I						Y
(0.5) ANSC 48300 - Contemporary Issues in Animal Sciences I						Y
Any Anthropology course may be a social science selection		Y				
(3) ANTH 10000 - Introduction to Anthropology		Y		Y		
(3) ANTH 20500 - Human Cultural Diversity		Y		Y		
(3) ANTH 23000 - Gender Across Cultures		Y			Y	
(3) ANTH 30300 - Gender Across Cultures		Y			Y	
(3) ANTH 37900 - Indians of North America		Y			Y	
(3) ANTH 39200 - Globalization and Culture		Y		Y		
(3) ANTH 48200 - Sexual Diversity in Global Perspectives					Y	
(3) ANTH 57800 - Peoples of Middle America		Y		Y		
Any American Sign Language course may be a communications selection	Y					
(3) ASM 49500 - Agricultural Systems Management						Y
Up to 3 credits of BAND may be used to fulfill humanities requirements		Y				
(1) BCHM 49000 - Undergraduate Seminar						Y
(1-6) BCHM 49800 - Undergraduate Thesis						Y
(3) BCHM 57200 - Advanced Biochemical Techniques						Y
(3) BTNY 20100 - Plants and Civilization				Y		
(1) BTNY 49700 - Undergraduate Seminar						Y
(1-3) BTNY 40800 - Research in Plant Science						Y
(3) CDFS 30100 - Families in a multicultural society					Y	
(1-2) CE 49600 - Senior Participations in EPICS						Y
Any Classics course may be a humanities selection		Y				
Any Communications course above 200000 may be a communication selection	Y					
(3) COM 22400 - Communicating in the Global Workplace	Y			Y		
(3) COM 30300 - Intercultural Communication	Y				Y	
(3) COM 32800 - Diversity at Work: A Rhetorical Approach	Y				Y	
(3) COM 37600 - Communication and Gender	Y				Y	
(3) COM 38100 - Gender and Feminist Studies in Communication	Y				Y	
(3) COM 42400 - Communication in International Organizations	Y			Y		
Any Economics course may be a social science selection		Y				
(3) ECON 21000 - Principles of Economics		Y				
(3) ECON 25100 - Microeconomics		Y				
(3) ECON 25200 - Macroeconomics		Y				
(3) ECON 37000 - International Trade		Y		Y		

(3) ECON 46600 - International Economics			Y		Y		
(3) EDCI 28500 - Multiculturalism and Education						Y	
(8-10) EDCI 49800 - Supervised Teaching of Agricultural Education							Y
(3) EDPS 23500 - Learning And Motivation			Y				
(3) EDPS 26500 - The Inclusive Classroom			Y				
(3) EDST 20000 - History And Philosophy Of Education				Y			
Any English course above 200000 may be a communication selection	Y						
(3) ENGL 22700 - Elements Of Linguistics			Y				
(3) ENGL 23000 - Great Narrative Works			Y				
(3) ENGL 23100 - Introduction To Literature			Y				
(3) ENGL 23200 - Thematic Studies In Literature			Y				
(3) ENGL 23500 - Introduction To Drama			Y				
(3) ENGL 23700 - Introduction To Poetry			Y				
(3) ENGL 23800 - Introduction To Fiction			Y				
(3) ENGL 23900 - Introduction To Biography			Y				
(3) ENGL 24000 - Ecological Literature			Y				
(3) ENGL 24100 - Survey Of The British Literature: From The Rise Of Romanticism To The M			Y				
(3) ENGL 25000 - Great American Books			Y				
(3) ENGL 25700 - Literature of Black America	Y	Y				Y	
(3) ENGL 26200 - Greek And Roman Classics In Translation			Y				
(3) ENGL 26400 - The Bible As Literature			Y				
(3) ENGL 26600 - World Literature: From the Beginnings to 1700 A.D.	Y	Y			Y		
(3) ENGL 26700 - World Literature: From 1700 A.D. to the Present	Y	Y			Y		
(3) ENGL 27600 - Shakespeare On Film			Y				
(3) ENGL 27900 - The American Short Story In Print And Film			Y				
(3) ENGL 33100 - Medieval English Literature			Y				
(3) ENGL 33300 - Renaissance English Literature			Y				
(3) ENGL 33500 - Restoration And Eighteenth-Century English Literature			Y				
(3) ENGL 33700 - Nineteenth-Century English Literature			Y				
(3) ENGL 35000 - Survey Of American Literature From Its Beginnings To 1865			Y				
(3) ENGL 35100 - Survey Of American Literature From 1865 To The Post-World War II Perio			Y				
(3) ENGL 35600 - American Humor			Y				
(3) ENGL 35800 - Black Drama	Y	Y				Y	
(3) ENGL 36000 - Gender and Literature	Y	Y				Y	
(3) ENGL 36400 - Religious Classics In The Western Tradition			Y				
(3) ENGL 37200 - American Folklore			Y				
(3) ENGL 37300 - Science Fiction And Fantasy			Y				
(3) ENGL 37500 - British Drama To 1800, Exclusive Of Shakespeare			Y				
(3) ENGL 37700 - Major Modern Poetry			Y				
(3) ENGL 37900 - The Short Story			Y				
(3) ENGL 38100 - The British Novel			Y				
(3) ENGL 38200 - The American Novel			Y				
(3) ENGL 38300 - Modern Drama: Ibsen To The Absurdists			Y				
(3) ENGL 38600 - History Of The Film To 1938			Y				

(3) ENGL 38700 - History Of The Film From 1938 To The Present		Y				
(3) ENGL 39600 - Studies In Literature And Language		Y				
(3) ENGL 41100 - Studies In Major Authors		Y				
(3) ENGL 41200 - Studies In Genre		Y				
(3) ENGL 41300 - Studies In Literature And History		Y				
(3) ENGL 41400 - Studies In Literature And Culture		Y				
(3) ENGL 44100 - Chaucer's Canterbury Tales		Y				
(3) ENGL 44200 - Shakespeare		Y				
(3) ENGL 44400 - Milton		Y				
(3) ENGL 46200 - The Bible As Literature: The Old Testament		Y				
(3) ENGL 46300 - The Bible As Literature: The New Testament		Y				
(3) ENGL 46800 - Problems In The History Of Criticism		Y				
(3) ENGL 46900 - Issues In Contemporary Criticism And Theory		Y				
(3) ENGL 49200 - Literature In The Secondary Schools		Y				
(1) ENTM 49200 - Capstone EYperience in Entomology I						Y
(1) ENTM 49200 - Capstone EYperience in Entomology II						Y
(3) ENTR 47000 - Women and Leadership					Y	
Any Foreign language or literature course may be a humanities selection and is also international understanding. However, a minimum of 6 credits of a foreign language must be earned to be included in a plan of study		Y			Y	
(3) FNR 23000 - The World's Forests and Society					Y	
(3) FNR 37500- Human Dimensions of Natural Resource Management			Y			
(3) FNR 40800 - Ecosystem Management Practice						Y
(3) FNR 46000 - International Natural Resources Summer Program					Y	
(3) FNR 48800 - Global Environmental Issues					Y	
(3) FS 44300 - Food Processing III						Y
Any History course may be a humanities selection		Y				
(3) HIST 24000 - East Asia and Its Historic Transition		Y			Y	
(3) HIST 24100 - East Asia and the Modern World		Y			Y	
(3) HIST 24300 - South Asian History and Civilizations		Y			Y	
(3) HIST 24500 - Middle East History and Culture		Y			Y	
(3) HIST 24600 - Modern Middle East and North Africa		Y			Y	
(3) HIST 27100 - Latin American History to 1824		Y			Y	
(3) HIST 27200 - Latin American History from 1824		Y			Y	
(3) HIST 30000 - Eve of Destruction: Global Crisis and World Organization in the 20th Century		Y			Y	
(3) HIST 30200 - History of Horticulture		Y			Y	
(3) HIST 32300 - German History		Y			Y	
(3) HIST 32400 - Modern France		Y			Y	
(3) HIST 32900 - History of Women in Modern Europe		Y			Y	
(3) HIST 34000 - Modern China		Y			Y	
(3) HIST 34100 - History of Africa South of the Sahara		Y			Y	
(3) HIST 34200 - Africa and the West		Y			Y	
(3) HIST 34300 - Traditional Japan		Y			Y	

(3) HIST 34400 - History of Modern Japan		Y		Y		
(3) HIST 34500 - Modern Middle East		Y		Y		
(3) HIST 35400 - Women in America to 1870		Y			Y	
(3) HIST 36500 - Women in America		Y			Y	
(3) HIST 36600 - Hispanic Heritage of the United States		Y			Y	
(3) HIST 37500 - Women in America Since 1870		Y			Y	
(3) HIST 37700 - History and Culture of Native America		Y			Y	
(3) HIST 39600 - The Afro-American to 1865		Y			Y	
(3) HIST 39800 - The Afro-American since 1865		Y			Y	
(3) HIST 44100 - Africa in the Twentieth Century		Y		Y		
(3) HIST 45000 - The English Landscape: Integrating HIST, HORT and LA		Y		Y		
(3) HIST 47200 - History of Mexico		Y		Y		
(3) HIST 59500 - The Holocaust and Genocide		Y		Y		
(3) HK 22600 - Contemporary Women's Health					Y	
(3) HONR 19900 - Malaria: First World Science v Third World Disease				Y		
(3) HONR 19900 - The Role of Animals in Societies of the World				Y		
(3) HONR 19900 - Science and Pseudoscience		Y				
(3) HONR 29900 - Insects in Literature and Art		Y				
(3) HORT 30600 - History of Horticulture		Y		Y		
(3) HORT 40300 - Tropical Horticulture				Y		
(3) HORT 42500 - Landscape Horticulture Capstone Project						Y
(1) HORT 44000 - Management Strategies in Public Horticulture						Y
(1) HORT 44500 - Strategic Analysis of Horticultural Production and Marketing						Y
(3) HORT 45000 - The English Landscape: Integrating HIST, HORT and LA		Y		Y		
(1) HORT 49200 - Horticultural Science Capstone Seminar						Y
(3) HTM 39800 - Cuisine and Culture Abroad				Y		
Any Interdisciplinary Studies course may be a humanities selection		Y				
(3) IDIS 27100 - Introduction to Afro-American Studies		Y			Y	
(3) IDIS 28000 - Women's Studies: An Introduction		Y			Y	
(3) IDIS 33000 - Introduction to Jewish Studies		Y			Y	
(3) IDIS 37000 - Black Women Rising		Y			Y	
(3) IDIS 37500 - Black Family		Y			Y	
(3) IDIS 37600 - African American Male		Y			Y	
(3) IDIS 38000 - Gender and Multiculturalism					Y	
(3) IDIS 48100 - Women of Color in the United States		Y			Y	
(3) IT 48300 - Facility Design for Lean Manufacturing						Y
(3) LA 16600 - History and Theory of Landscape Architecture				Y		
(5) LA 42600 - Capstone Course in Landscape Architecture						Y
(3) LA 45000 - The English Landscape: Integrating HIST, HORT and LA		Y		Y		
(3) NRES 58100 - Ecological Impact Analysis						Y
(3) OLS 49900 - Women and Work					Y	
Any Philosophy course may be a humanities selection		Y				
(3) PHIL 22500 - Philosophy of Women		Y			Y	
(3) PHIL 24200 - Philosophy, Culture and the African American Experience		Y			Y	

(3) PHIL 33000 - Religions of the East		Y			Y	Y	
(3) PHIL 33100 - Religions of the West		Y			Y		
Any Political Science course may be a social science selection			Y				
(3) POL 13000 - Introduction to International Relations			Y		Y		
(3) POL 14100 - Governments of the World			Y		Y		
(3) POL 22200 - Women, Politics, and Public Policy			Y			Y	
(3) POL 23100 - Introductions to United States Foreign Policy			Y		Y		
(3) POL 23200 - Contemporary Crises in International Relations			Y		Y		
(3) POL 23500 - International Relations Among Rich and Poor Nations			Y		Y		
(3) POL 23700 - Modern Weapons and International Relations			Y		Y		
(3) POL 29000 - Russia: Yesterday, Today, and Tomorrow			Y		Y		
(3) POL 30400 - Israel and World Politics			Y		Y		
(3) POL 32600 - Black Political Participation in America			Y			Y	
(3) POL 34400 - Introduction to Politics of the Third World			Y		Y		
(3) POL 34500 - West European Democracies in the Post-Industrial Era			Y		Y		
(3) POL 34800 - East Asian Politics			Y		Y		
(3) POL 36000 - Women and the Law			Y			Y	
(3) POL 43300 - International Organizations			Y		Y		
(3) POL 43400 - United States Foreign Policy, Central America and the Caribbean			Y		Y		
(3) POL 43500 - International Law			Y		Y		
(3) POL 44200 - Government and the Politics of Russia			Y		Y		
(3) POL 44700 - The British Political System and the Commonwealth of Nations			Y		Y		
(3) POL 45600 - African American Political Thought			Y			Y	
Any Psychological Sciences course may be a social science selection			Y				
(3) PSY 22500 - Stereotyping and Prejudice			Y			Y	
(3) PSY 33500 - Stereotyping and Prejudice			Y			Y	
(3) PSY 23900 - The Psychology of Women			Y			Y	
(3) PSY 36800 - Children's Development in Cross Cultural Perspective			Y			Y	
(3) REL 23000 - Religions of the East						Y	
(3) REL 23100 - Religions of the West						Y	
Any Sociology course may be a social science selection			Y				
(3) SOC 22000 - Social Problems			Y			Y	
(3) SOC 31000 - Racial and Ethnic Diversity			Y			Y	
(3) SOC 35600 - Hate and Violence			Y			Y	
(3) SOC 45000 - Gender Roles in Modern Society			Y			Y	
(3) SPAN 23500 - Mexican and Latino Culture		Y			Y	Y	
Any Visual and Performing Arts course may be a humanities selection		Y					
(3) WOST 28000 - Women's Studies: An Introduction						Y	
(3) WOST 38300 - Women and Work						Y	
(3) WOST 48000 - Feminist Theory						Y	
(3) WOST 48200 - Interdisciplinary Studies in Sexuality: Scholarship on Lesbian and Gay Issues						Y	
(3) YDAE 38500 - Urban Service Learning						Y	
(3) YDAE 44000 - Methods of Teaching Agricultural Education	Y						
(3) YDAE 48000 - Agricultural Communication Capstone Seminar							Y

### ASM 400+ Selectives (3 credits needed)

Course	Credits	Description or notes	Offered
ASM 510	3	Agrosecurity -- Emergency Management for Agricultural Production Operations	Fall
ASM 521	3	Soil and Water Conservation Management	Fall
ASM 530	3	Power and Machinery Management	Fall
ASM 540	3	Geographical Information System Applications	Fall
ASM 545	3	Remote Sensing of Land Resources	Fall
ASM 550	3	Grain Drying and Storage	Spring of even numbered years

### Math or Science Selective

*1 credit is required if PHYS 220 was taken;  
2 credits are required if PHYS 214 was taken.*

### Typical and very good course choices

Course	Credits	Description or notes
AGEC 352	3	Quantitative Techniques for Firm Decision Making
AGRY 335	3	General Meteorology
ANSC 221	3	Principles of Animal Nutrition
ENTM 206	2	General Entomology
ENTM 207	1	General Entomology Laboratory

### Other allowable selections

[Refer to the College of Agriculture Bulletin for a much longer list of options](#)

### Marketing Selectives (3 credits needed)

Course	Credits	Description or notes
AGEC 220	3	Economics Of Agricultural Markets
OR		
AGEC 321	3	Principles Of Commodity Marketing
OR		
AGEC 327	3	Principles Of Food And Agribusiness Marketing

### Agricultural Selectives (11 credits needed)

Course	Credits	Description or notes
<b>Typical course choices</b>		
AGEC 411	4	Farm Management
AGEC 420	1	Grain and Grain Products Marketing
AGEC 424	4	Financial Management of Ag Business
AGEC 426	3	Marketing Management of Agricultural Business
AGRY 105	3	Crop Production
AGRY 365	3	Soil Fertility
AGRY 375	3	Crop Production Systems
ANSC 102	3	Introduction to Animal Agriculture
ANSC 221	3	Principles of Animal Nutrition
ANSC 440-445	3	Horse/Beef/Sheep/Swine/Dairy/Poultry Management
BTNY 304	3	Weed Science
ENTM 105	3	Insects: Friend & Foe
FNR 103	3	Introduction to Environmental Conservation
FNR 240	3	Wildlife in America
HORT 101	3	Fundamentals of Horticulture
<b>Other allowable selections</b>		
Any course offered in the College of Agriculture		

### Biology Selectives (8 credits needed)

Course	Credits	Description or notes
BIOL 110	4	Fundamentals of Biology I
BIOL 111	4	Fundamentals of Biology II
BTNY 210	4	Introduction to Plant Science
HORT 301	4	Plant Physiology
<a href="#">Refer to the College of Agriculture Bulletin</a>		

### Statistics Selective (3 credits required)

Course	Credits	Description or notes
STAT 301	3	Elementary Statistics Methods
STAT 501	3	Experimental Statistics I
STAT 503	3	Statistical Methods for Biology
STAT 511	3	Statistical Methods

### Farm Management Minor

Course for the Minor	Credits	Applies to ASM Major as
AGEC 310	3	AGEC choice to take rather than AGECE 330, choose wisely
AGEC 311 or MGMT 200	3	Accounting choice, already prescribed for the major
AGEC 411	4	Agricultural selection, choose wisely
OLS 252 or OLS 274	3	Organization and Leadership choice, already prescribed for the major
AGEC 220	3	Already prescribed for the major
AGEC 455 or MGMT 455	3	Legal/Law choice, already prescribed for the major

### Food and Agribusiness Management Minor

Course for the Minor	Credits	Applies to ASM Major as
AGEC 220	3	Already prescribed for the major
AGEC 330	3	AGEC choice to take rather than AGECE 310, choose wisely
MGMT 200 or AGECE 311	3	Accounting choice, already prescribed for the major
AGECE 331	3	Already prescribed for the major
OLS 252 or OLS 274	3	Organization and Leadership choice, already prescribed for the major
AGECE 455 or MGMT 455	3	Already prescribed for the major

### Crop Science Minor

Course for the Minor	Credits	Applies to ASM Major as
AGRY 105 or AGRY 375	3	Agricultural selective
AGRY 255	3	Already prescribed for the major
AGRY 525	3	Agricultural selective
minor choices from list	3	Agricultural selective
minor choices from list	3	unrestricted elective
minor choices from list*	3	unrestricted elective

\* If ENTM 206 & 207 are taken, they can apply to the ASM major as the math/science selective

Highly suggested package for ASM students:

AGRY 105  
 AGRY 255  
 AGRY 365  
 AGRY 375  
 AGRY 525  
 ENTM 206  
 ENTM 207

### Organizational Leadership and Supervision Minor

Course for the Minor	Credits	Applies to ASM Major as
OLS 252	3	OLS choice, already prescribed for the major
OLS 274	3	Unrestricted elective
OLS 284	3	Unrestricted elective
OLS 386	3	Unrestricted elective

## Animal Sciences Minor

Course for the Minor	Credits	Applies to ASM Major as
courses from ANSC, BIOL, and BMS	12	Agricultural selections, choose wisely
courses from ANSC, BIOL, and BMS	6	Unrestricted electives, choose wisely

# Agricultural Systems Management Course Descriptions

## Required Courses (Catalog Descriptions)

**AGEC 20300 Introductory Microeconomics For Food And Agribusiness.** Credit Hours: 3.00. This course introduces the application of microeconomics as used by farms and agribusiness firms. The behavior of individual firms is evaluated as price and output are determined in various market structures (pure competition, pure monopoly, monopolistic competition, and oligopoly). Other topics include pricing and employment of resources, market failure and the social control of industry (government, economics policy, and regulation), cost and production theory. Typically offered Fall Spring.

**AGEC 22000 Marketing Farm Products.** Credit Hours: 3.00. This class provides an overview of U.S. and international agricultural markets, and develops a framework for analyzing those markets. Concepts include determination of agricultural prices, spatial dimensions of agricultural markets, and trade; temporal dimensions of agricultural markets, and futures and options markets; and public policy in agricultural markets. Typically offered Fall Spring. Prerequisites: Undergraduate level [AGEC 20300](#) Minimum Grade of D- or Undergraduate level [AGEC 20400](#) Minimum Grade of D- or Undergraduate level [ECON 25100](#) Minimum Grade of D- or Undergraduate level [ECON E1030](#) Minimum Grade of D- or Undergraduate level [ECON E2010](#) Minimum Grade of D-.

**AGEC 31000 Farm Organization.** Credit Hours: 3.00. Economic factors controlling success in farming; types of farming; business records and analysis; adjustment in organization to meet changing economic conditions; organization and management of successful farms. Typically offered Fall Spring. **OR AGECE 33000**

**AGEC 32100 Principles of Commodity Marketing.** Credit Hours: 3.00. An in-depth background on the origin, operation, and application of futures and options in risk management for agriculture. Covers grain, livestock, and yield futures and options. Applications of futures and options to price and yield risk management is provided. Comparison of expected results from various risk management alternatives and decision-making processes to use in selecting a risk management strategy. Typically offered Fall. Prerequisites: Undergraduate level [AGEC 20300](#) Minimum Grade of D- or Undergraduate level [AGEC 20400](#) Minimum Grade of D- or Undergraduate level [ECON 25100](#) Minimum Grade of D- or Undergraduate level [ECON E2010](#) Minimum Grade of D- or Undergraduate level [ECON E1030](#) Minimum Grade of D-.

**AGEC 32700 Principles Of Food And Agribusiness Marketing.** Credit Hours: 3.00. This course is a study of the major components of marketing decisions made by food and agribusiness firms. The course examines the marketing process, market research, marketing opportunities, and marketing strategies. Students will work on developing skills for evaluating and making marketing decisions. Typically offered Fall Spring. Prerequisites: Undergraduate level [ENTR 20000](#) Minimum Grade of D- or Undergraduate level [AGEC 33000](#) Minimum Grade of D-.

**AGEC 33000 Management Methods for Agricultural Business.** Credit Hours: 3.00. Management of nonfarm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Case studies and computer simulation game. Typically offered Fall Spring. **OR AGECE 31000**

**AGEC 33100 Principles of Selling in Agricultural Business.** Credit Hours: 3.00. The principles of salesmanship and their application to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, the purchase decision process, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, handling objections, and closing sales. Emphasis is placed on application of principles to real-world situations and on building selling skills through class projects. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring. Restrictions: May not be enrolled as the following Classifications: Freshman: 0 - 14 hours.

**AGEC 45500 Agricultural Law.** Credit Hours: 3.00. Selected general legal topics (courts, contracts, torts, property and commercial law) with emphasis on farming problems (e.g., landowner-tenant, grain contracts, fences, and animal liability) and cases. Typically offered Fall. **OR MGMT 45500** Restrictions: Must have at least 45 credit hours.

**AGR 10100 Introduction to the College of Agriculture and Purdue University.** Credit Hours: 0.50. Students are introduced to the College of Agriculture and Purdue University. Specific areas discussed include the diversity of career opportunities within agriculture, the relationships between different areas of agriculture, ethics, the impact of undergraduate coursework, including the core curriculum, on scholarship and career preparation, and the challenges facing the food, agricultural, and natural resource system. The use of guest lecturers provides a networking opportunity for students. Enrollment in this course is restricted to beginning freshmen students. Course meets weeks 1-8. Typically offered Fall. Restrictions: Must not have more than 29 credit hours.

**AGRY 25500 Soil Science.** Credit Hours: 3.00. Differences in soils; soils genesis; physical, chemical, and biological properties of soils; relation of soils to problems of land use and pollution; soil management relative to tillage, erosion, drainage, moisture supply, temperature, aeration, fertility, and plant nutrition. Introduction to fertilizer chemistry and use. Not available to students who have taken AGRY 27000. Typically offered Fall Spring. Prerequisites: Undergraduate level [CHM 11200](#) Minimum Grade of D- or Undergraduate level [CHM 11600](#) Minimum Grade of D- or Undergraduate level [CHM 12600](#) Minimum Grade of D- or Undergraduate level [CHM 12400](#) Minimum Grade of D- or Undergraduate level [CHM 11000](#) Minimum Grade of D- or Undergraduate level [CHM 13600](#) Minimum Grade of D- or (Undergraduate level [CHEM C1020](#) Minimum Grade of D- and Undergraduate level [CHEM C1220](#) Minimum Grade of D-) or (Undergraduate level [CHEM C1060](#) Minimum Grade of D- and Undergraduate level [CHEM C1260](#) Minimum Grade of D-).

**ASM 10400 Introduction to Agricultural Systems.** Credit Hours: 3.00. Basic principles of selection and operation of agricultural production equipment, including farm tractors and machines and crop-processing equipment. Planning considerations for crop storage and animal production systems and devices for water conservation and erosion control. Typically offered Fall Spring.

**ASM 10500 Agricultural Systems Computations And Communication.** Credit Hours: 3.00. Use of computers to solve problems related to agricultural technology and businesses. Spreadsheets, word processors, and presentation software will be the focus. Emphasis will be on logical problem solving and data presentation using advanced features of office software. A 10000-level number is being used because it is intended as a first-year course. Typically offered Spring. Prerequisites: Undergraduate level [ASM 10400](#) Minimum Grade of D- [may be taken concurrently].

**ASM 21100 Technical Graphics Communications.** Credit Hours: 3.00. Introduction to graphic communication methods using traditional techniques and emphasizing modern computer-based techniques. Topics covered include: free-hand sketching, lettering, and dimensioning; selection of data presentation methods; and plan interpretation and cost calculations. A majority of assignments will include use of commercially available computer-aided drawing packages. Typically offered Fall Spring. Prerequisites: Undergraduate level [ASM 23100](#) Minimum Grade of D- or Undergraduate level [ASM 49100](#) Minimum Grade of D- or Undergraduate level [ASM 10500](#) Minimum Grade of D-.

**ASM 22100 Career Opportunities Seminar.** Credit Hours: 1.00. An introductory course to acquaint students with career and employment opportunities in the field of agricultural systems management. Guest speakers are invited to share their experiences and philosophies with the students. Special emphasis is given to improving communication skills. Typically offered Fall. Prerequisites: Undergraduate level [ASM 10400](#) Minimum Grade of D- [may be taken concurrently].

**ASM 22200 Crop Production Equipment.** Credit Hours: 3.00. Principles of machine performance, capacity, machinery components, and operation. Study of tractors, trucks, utility vehicles, and combines. Equipment topics include chemical application, tillage tools, planters and seeders, hay and forage harvesters, electronic monitors and controllers. Computer-based analysis of equipment sizing and systems selection. Typically offered Fall. Prerequisites: Undergraduate level [ASM 10500](#) Minimum Grade of D- or Undergraduate level [ASM 23100](#) Minimum Grade of D- or Undergraduate level [ASM 49100](#) Minimum Grade of D- or (Undergraduate level [ASM 10400](#) Minimum Grade of D- and Undergraduate level [AGEC 20200](#) Minimum Grade of D-).

**ASM 24500 Materials Handling And Processing.** Credit Hours: 3.00. Principles of materials handling and processing. Physical properties and characteristics of food, fiber, and feed materials as related to harvesting, handling, processing, and storage. Processing of agricultural materials including drying, preservation, size reduction (e.g. grinding, crushing, shredding), mixing and blending, refrigeration, extrusion, and pelleting. Conveying and transport systems with consideration of their effects on damage and quality. The course elements are tied together by a treatment of scheduling and coordination of biologically based systems, which involve production, handling, quality control, and processing. Typically offered Spring. Prerequisites: Undergraduate level [ASM 10500](#) Minimum Grade of D- or Undergraduate level [ASM 23100](#) Minimum Grade of D- or Undergraduate level [ASM 49100](#) Minimum Grade of D- or (Undergraduate level [ASM 10400](#) Minimum Grade of D- and Undergraduate level [AGEC 20200](#) Minimum Grade of D-).

- ASM 33300 Facilities Planning And Management.** Credit Hours: 3.00. Principles of facility (system) planning and management involving buildings, equipment, and materials handling and flow. Student teams select a case firm (problem) with instructor approval. Principles learned week by week are applied to the development of an overall plan for the complex, over the course of the semester. Case examples can include firms handling supplies, seeds, grains, feeds, chemicals, wastes, and farm produce, as well as farming operations producing grain, forage, and/or livestock products. Students will learn to use AutoCAD to develop drawings, without prior computer drafting experience. Typically offered Spring. Prerequisites: Undergraduate level [ASM 10500](#) Minimum Grade of D- or Undergraduate level [ASM 23100](#) Minimum Grade of D- or Undergraduate level [ASM 49100](#) Minimum Grade of D- or (Undergraduate level [ASM 10400](#) Minimum Grade of D- and Undergraduate level [AGEC 20200](#) Minimum Grade of D-).
- ASM 33600 Environmental Systems Management.** Credit Hours: 3.00. Analysis of environmental systems with special emphasis on non-urban and agribusiness needs. Technological and sociological solutions to environmental problems. Computer-based tools are used to analyze global environmental issues, chemical use and management, waste disposal and management, water and air quality, soil and water conservation, sustainable agriculture, regulatory and policy issues. Typically offered Fall. Prerequisites: Undergraduate level [ASM 10500](#) Minimum Grade of D- or Undergraduate level [ASM 23100](#) Minimum Grade of D- or Undergraduate level [ASM 49100](#) Minimum Grade of D- or (Undergraduate level [ASM 10400](#) Minimum Grade of D- and Undergraduate level [AGEC 20200](#) Minimum Grade of D-).
- ASM 34500 Power Units And Power Trains.** Credit Hours: 3.00. An introduction to power generation and transfer in mechanical and fluid power systems. Internal combustion engines, fuels, and cycles are introduced. Clutches, mechanical transmissions, automatic transmissions, hydrostatic transmissions, and final drives are discussed. Principles of hydraulics, fluids, cylinders, pumps, motors, valves, hoses, filters, reservoirs, and accumulators are studied. Typically offered Fall. Prerequisites: Undergraduate level [ASM 10500](#) Minimum Grade of D- or Undergraduate level [ASM 23100](#) Minimum Grade of D- or Undergraduate level [ASM 49100](#) Minimum Grade of D- or (Undergraduate level [ASM 10400](#) Minimum Grade of D- and Undergraduate level [AGEC 20200](#) Minimum Grade of D-) and (Undergraduate level [PHYS 21400](#) Minimum Grade of D- or Undergraduate level [PHYS 22000](#) Minimum Grade of D-).
- ASM 35000 Safety in Agriculture.** Credit Hours: 1.00. An overview of the agricultural safety movement in the United States with consideration given to the specific human environmental and technological factors influencing farm-related accidents. Special emphasis is given to reduction of unnecessary risks in agricultural production. Course meets during weeks 1-8. Typically offered Spring.
- ASM 42000 Electric Power & Controls.** Credit Hours: 3.00. Fundamentals and application of electric power for agricultural facilities; safe wiring principles; operation and performance characteristics of electric motors; applications of control systems that include monitors, sensors, relays, and programmable logic controllers. Typically offered Fall. Prerequisites: Undergraduate level [PHYS 21400](#) Minimum Grade of D- or Undergraduate level [PHYS 22000](#) Minimum Grade of D- or Undergraduate level [PHYS 21800](#) Minimum Grade of D- or Undergraduate level [PHYS 15200](#) Minimum Grade of D- or Undergraduate level [PHYS 17200](#) Minimum Grade of D- or Undergraduate level [PHYS 20100](#) Minimum Grade of D- or Undergraduate level [PHYS P2010](#) Minimum Grade of D- or (Undergraduate level [PHYS 16200](#) Minimum Grade of D- and Undergraduate level [PHYS 16300](#) Minimum Grade of D-).
- ASM 42100 Senior Seminar.** Credit Hours: 1.00. Professional attitudes and ethics, resume preparation and interview procedures, business correspondence, meetings, and career planning. Typically offered Fall. Restrictions: Must have at least 90 credit hours. Prerequisites: Undergraduate level [ASM 22100](#) Minimum Grade of D-.
- ASM 49400 Project Planning And Management.** Credit Hours: 3.00. Discussion of topics relevant to project planning and execution in industry, including technical communication, budgeting, team management, intellectual property, and timelines. Student teams will develop project proposal to address contemporary issues in agricultural systems management. Typically offered Fall. Restrictions: Must have at least 90 credit hours. Prerequisites: Undergraduate level [ASM 22100](#) Minimum Grade of D-.
- ASM 49500 Agricultural Systems Management.** Credit Hours: 3.00. Planning, organization, and analysis of individual or team projects related to contemporary issues in agricultural systems management. Typically offered Spring. Prerequisites: Undergraduate level [ASM 49400](#) Minimum Grade of D-.

**CHM 11100 General Chemistry.** Credit Hours: 3.00. Not available for credit toward graduation in the School of Science. Required of all freshmen in the School of Agriculture who are not in CHM 11500 and required of students in the School of Consumer and Family Sciences in retailing, textile, RHIT, and dietetics options who are not in CHM 11500. Required of students in physical therapy who are not in CHM 11500. Not available for credit toward graduation in the School of Science. Metric and S.I. Units; dimensional analysis; density; the atomic concept; elements, compounds, and mixtures; the mole concept; equations and stoichiometry; atomic structure, spectra; the periodic table; chemical bonding, gases; descriptive chemistry of the common elements. Prerequisite: two years of high school algebra. Typically offered Fall Spring.

**CHM 11200 General Chemistry.** Credit Hours: 3.00. Continuation of CHM 11100. Liquids and solids; solutions; chemical kinetics; equilibrium; acids and bases; oxidation and reduction; electrochemistry; descriptive chemistry of the metals and nonmetals; introduction to organic chemistry; nuclear chemistry. Not available for credit toward graduation in the School of Science. Typically offered Spring. Prerequisites: Undergraduate level [CHM 11100](#) Minimum Grade of D- or Undergraduate level [CHM 11500](#) Minimum Grade of D- or (Undergraduate level [CHEM C1010](#) Minimum Grade of D- and Undergraduate level [CHEM C1210](#) Minimum Grade of D-).

**COM 11400 Fundamentals of Speech Communication.** Credit Hours: 3.00. A study of communication theories as applied to speech; practical communicative experiences ranging from interpersonal communication and small group process through problem identification and solution in discussion to informative and persuasive speaking in standard speaker-audience situations. Typically offered Fall Spring Summer.

**ENGL 10600 First-Year Composition.** Credit Hours: 4.00. Extensive practice in writing clear and effective prose. Instruction in organization, audience, style, and research-based writing. Typically offered Fall Spring Summer.

**MA 22000 Introduction to Calculus.** Credit Hours: 3.00. A survey of differential and integral calculus. Applications to the agricultural, life, managerial, and social sciences. Not available for credit toward graduation in the School of Science. Typically offered Fall Spring.

**MGMT 45500 Legal Background For Business I.** Credit Hours: 3.00. The nature and place of law in our society, national and international, social and moral bases of law enactment, regulation of business, legal liability, and enforcement procedures. Special emphasis on torts, contracts, and agency. No credit to students in the School of Management. Typically offered Fall Spring Summer. *OR AGEC 45500*

### **Selective Courses (Catalog Descriptions)**

**AGEC 25000 Economic Geography of World Food and Resources.** Credit Hours: 3.00. A study of the important issues and economic decisions about worldwide resource use for food and fiber production as influenced by geography, climate, history, social institutions, national self-interest, and the environment. Typically offered Fall Spring.

**AGEC 31100 Accounting for Farm Business Planning.** Credit Hours: 3.00. This course emphasizes the development of procedures for providing and using data in decision making. Methods will be addressed for finding and organizing both financial and physical data to provide the business information needed in planning and control. Topics discussed include budgeting, reporting unit costs of production, measuring profitability and wealth accumulation, estimating credit needs and income tax liability, and evaluating the strengths and weaknesses of the business as the basis for improving the business. Typically offered Fall. *OR MGMT 20000*

**AGEC 34000 International Economic Development.** Credit Hours: 3.00. This course is designed to introduce students to issues and problems related to international economic development. Topics covered include a description of the current situation in developing countries and the history of growth and development. The course is grounded in the body of theory associated with economic development, but concentrates on the many practical problems such as poverty, population growth, urbanization, education and the environment. The three areas with the greatest attention are agricultural development, international trade, and policy analysis for developing countries. Typically offered Spring. Prerequisites: Undergraduate level [AGEC 20300](#) Minimum Grade of D- or Undergraduate level [AGEC 20400](#) Minimum Grade of D- or Undergraduate level [AGEC 21700](#) Minimum Grade of D- or Undergraduate level [ECON 21700](#) Minimum Grade of D- or Undergraduate level [ECON 25100](#) Minimum Grade of D- or Undergraduate level [ECON E1030](#) Minimum Grade of D- or Undergraduate level [ECON E2010](#) Minimum Grade of D- or Undergraduate level [ECON 25200](#) Minimum Grade of D- or Undergraduate level [ECON E1040](#) Minimum Grade of D- or Undergraduate level [ECON E2020](#) Minimum Grade of D-.

**AGEC 35200 Quantitative Techniques For Firm Decision Making.** Credit Hours: 3.00. Introduction to mathematical programming and computing as an aid to agricultural decision making by firms, linear programming, game theory and strategy, simulation, the waiting-line problem, the equipment replacement decision, and multiproduct scheduling methods. Typically offered Fall Spring. Prerequisites: (Undergraduate level [STAT 22500](#) Minimum Grade of D- or Undergraduate level [STAT 31100](#) Minimum Grade of D- or Undergraduate level [STAT 51600](#) Minimum Grade of D- or Undergraduate level [STAT 41600](#) Minimum Grade of D-) or (Undergraduate level [STAT 30100](#) Minimum Grade of D- or Undergraduate level [STAT 51100](#) Minimum Grade of D- or Undergraduate level [ECON E2700](#) Minimum Grade of D- or Undergraduate level [ECON 26000](#) Minimum Grade of D- or Undergraduate level [STAT 35000](#) Minimum Grade of D- or Undergraduate level [STAT 50300](#) Minimum Grade of D- or Undergraduate level [STAT 50100](#) Minimum Grade of D-) or (Undergraduate level [STAT 50100](#) Minimum Grade of D- or Undergraduate level [STAT 35000](#) Minimum Grade of D- or Undergraduate level [STAT 51100](#) Minimum Grade of D- or Undergraduate level [STAT 50300](#) Minimum Grade of D-).

**AGEC 41100 Farm Management.** Credit Hours: 4.00. Principles of farm organization and management, farmer interviews, and the application of computerized farm decision-making methods. Typically offered Fall. Prerequisites: Undergraduate level [AGEC 31000](#) Minimum Grade of D- and (Undergraduate level [AGEC 31100](#) Minimum Grade of D- or Undergraduate level [MGMT 20000](#) Minimum Grade of D- or Undergraduate level [MGMT 20010](#) Minimum Grade of D- or Undergraduate level [BUS A2010](#) Minimum Grade of D-).

**AGEC 42400 Financial Management of Agricultural Business.** Credit Hours: 4.00. A study of the major types of financial decisions made by agriculturally related firms, including investment in inventory, receivables and cash, property, plant, and equipment; sources and types of short-term, intermediate, and long-term capital; legal patterns of the business organization, emphasis on implementation involving agribusiness case problems. Typically offered Fall Spring. Prerequisites: Undergraduate level [AGEC 31100](#) Minimum Grade of D- or (Undergraduate level [MGMT 20000](#) Minimum Grade of D- or Undergraduate level [BUS A2010](#) Minimum Grade of D-).

**AGEC 42600 Marketing Management of Agricultural Business.** Credit Hours: 3.00. A study of the major types of marketing strategy decisions that must be made by agribusiness firms, including target market selection; marketing research; sales forecasting; product policies; distribution channels; pricing, advertising, and personal selling; and marketing control. Typically offered Fall Spring. Prerequisites: (Undergraduate level [AGEC 31100](#) Minimum Grade of D- or (Undergraduate level [MGMT 20000](#) Minimum Grade of D-) or Undergraduate level [BUS A2010](#) Minimum Grade of D-) and (Undergraduate level [AGEC 33000](#) Minimum Grade of D- or Undergraduate level [ENTR 20000](#) Minimum Grade of D-).

**AGEC 45000 International Agricultural Trade.** Credit Hours: 3.00. Study of U.S. agricultural trade with emphasis on international trade theory, exchange rates and their determination, relationships between domestic agricultural policies and trade policies, and analysis of institutional arrangements for world trade in agricultural products. Typically offered Fall. Prerequisites: (Undergraduate level [AGEC 21700](#) Minimum Grade of D- or Undergraduate level [ECON 21700](#) Minimum Grade of D- or Undergraduate level [ECON 25200](#) Minimum Grade of D- or Undergraduate level [ECON E1040](#) Minimum Grade of D- or Undergraduate level [ECON E2020](#) Minimum Grade of D-) and (Undergraduate level [AGEC 20300](#) Minimum Grade of D- or Undergraduate level [AGEC 20400](#) Minimum Grade of D- or Undergraduate level [ECON 25100](#) Minimum Grade of D- or Undergraduate level [ECON E1030](#) Minimum Grade of D- or Undergraduate level [ECON E2010](#) Minimum Grade of D-).

**AGEC 45100 Applied Econometrics.** Credit Hours: 3.00. Application of strategies to economic problems. Simple and multiple regression, dummy variables, logit analysis, time series, and forecasting. Typically offered Spring. Prerequisites: (Undergraduate level [STAT 22500](#) Minimum Grade of D- or Undergraduate level [STAT 51600](#) Minimum Grade of D- or Undergraduate level [STAT 41600](#) Minimum Grade of D- or Undergraduate level [STAT 31100](#) Minimum Grade of D-) or (Undergraduate level [STAT 30100](#) Minimum Grade of D- or Undergraduate level [STAT 35000](#) Minimum Grade of D- or (Undergraduate level [STAT 50100](#) Minimum Grade of D- or Undergraduate level [STAT 51100](#) Minimum Grade of D- or Undergraduate level [STAT 50300](#) Minimum Grade of D- or Undergraduate level [STAT 35000](#) Minimum Grade of D-) or Undergraduate level [STAT 51100](#) Minimum Grade of D- or Undergraduate level [STAT 30100](#) Minimum Grade of D- or Undergraduate level [STAT E2700](#) Minimum Grade of D- or Undergraduate level [STAT 26000](#) Minimum Grade of D-) or Undergraduate level [STAT 50100](#) Minimum Grade of D-).

**AGRY 10500 Crop Production.** Credit Hours: 3.00. Fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding. Typically offered Spring Fall.

**AGRY 27000 Forest Soils.** Credit Hours: 3.00. Development, distribution, and classification of soil profile; soil characteristics related to forest practices; nature and cause of soil differences; fertility and plant nutrition. Not available to students who have taken AGRY 25500 or NRES 25500. Typically offered Spring. Prerequisites: Undergraduate level [CHM 11200](#) Minimum Grade of D- or Undergraduate level [CHM 11600](#) Minimum Grade of D- or Undergraduate level [CHM 12400](#) Minimum Grade of D- or Undergraduate level [CHM 13600](#) Minimum Grade of D- or Undergraduate level [CHM 11000](#) Minimum Grade of D- or Undergraduate level [CHM 12600](#) Minimum Grade of D- or (Undergraduate level [CHEM C1020](#) Minimum Grade of D- and Undergraduate level [CHEM C1220](#) Minimum Grade of D-) or (Undergraduate level [CHEM C1060](#) Minimum Grade of D- and Undergraduate level [CHEM C1260](#) Minimum Grade of D-).

**AGRY 28500 World Crop Adaptation and Distribution.** Credit Hours: 3.00. Examination of how environmental factors, including climate and soils, impact the global distribution of major food crops. Identification of the types of naturally occurring plant communities and comparison of these communities with those of environmentally and economically sound field cropping systems. Exploration of how man's intervention has maintained or modified the productivity of food crops in agricultural communities and how his intervention has affected the environment. Typically offered Spring.

**AGRY 32000 Genetics.** Credit Hours: 3.00. The transmission of heritable traits; probability; genotypic-environmental interactions; chromosomal aberrations; polyploidy; gene mutations; genes in populations; the structure and function of nucleic acids; biochemical genetics; molecular genetics; coding. Typically offered Fall Spring. Prerequisites: (Undergraduate level [BIOL 11000](#) Minimum Grade of D- and Undergraduate level [BIOL 11100](#) Minimum Grade of D-) or (Undergraduate level [BIOL 11000](#) Minimum Grade of D- and Undergraduate level [BTNY 21000](#) Minimum Grade of D-) or (Undergraduate level [BIOL 11100](#) Minimum Grade of D- and Undergraduate level [BTNY 21000](#) Minimum Grade of D-) or (Undergraduate level [BIOL 12100](#) Minimum Grade of D- and Undergraduate level [BIOL 13100](#) Minimum Grade of D-) or (Undergraduate level [BTNY 21000](#) Minimum Grade of D- and Undergraduate level [HORT 30100](#) Minimum Grade of D-).

**AGRY 32100 Genetics Laboratory.** Credit Hours: 1.00. Experiments with plants and microorganisms to elucidate the basic concepts of molecular and classical genetics as applied to genome analysis. Typically offered Fall Spring. Prerequisites: Undergraduate level [AGRY 32000](#) Minimum Grade of D- [may be taken concurrently].

**AGRY 35000 Global Awareness.** Credit Hours: 1.00 to 3.00. A seminar-type course about world geography, cultures, and agriculture. Speakers are selected from the many Purdue graduate students and visiting scholars from around the world. Extra credit may be earned through independent study of a global issue. Typically offered Spring.

**AGRY 36500 Soil Fertility.** Credit Hours: 3.00. Principles of soil chemistry and physics influencing plant nutrition; emphasis on diagnosis and solution of problems on soil reaction and nutrient status; fertilizer chemistry and use; reaction of pesticides and growth regulators with soils. Typically offered Spring. Prerequisites: (Undergraduate level [AGRY 25500](#) Minimum Grade of D- or Undergraduate level [NRES 25500](#) Minimum Grade of D-) or Undergraduate level [AGRY 27000](#) Minimum Grade of D-.

**AGRY 37500 Crop Production Systems.** Credit Hours: 3.00. Factors affecting management decisions in crop production systems. Development of small grain and row cropping systems. Interaction of factors affecting efficient production systems, including seed selection, tillage, planting management, pest management, and harvesting and storage considerations. Typically offered Fall Spring.

**ANSC 10200 Introduction to Animal Agriculture.** Credit Hours: 3.00. A study of animal agriculture emphasizing the efficient production of animal food products from poultry, dairy and meat animals. Credit cannot be obtained for both ANSC 10100 and 10200. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by Department of Animal Sciences. Typically offered Fall Spring. Restrictions: Must not have more than 89 credit hours.

**ANSC 22100 Principles of Animal Nutrition.** Credit Hours: 3.00. Classification and function of nutrients, deficiency symptoms, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. Typically offered Summer Fall Spring. Prerequisites: Undergraduate level [CHM 11100](#) Minimum Grade of D- or (Undergraduate level [CHEM C1010](#) Minimum Grade of D- and Undergraduate level [CHEM C1210](#) Minimum Grade of D-) or Undergraduate level [CHM 11500](#) Minimum Grade of D- or Undergraduate level [CHM 10900](#) Minimum Grade of D- or Undergraduate level [CHM 12300](#) Minimum Grade of D- or Undergraduate level [CHM 13500](#) Minimum Grade of D- or (Undergraduate level [CHEM C1050](#) Minimum Grade of D- and Undergraduate level [CHEM C1250](#) Minimum Grade of D-).

- ANSC 23000 Physiology of Domestic Animals.** Credit Hours: 4.00. A lecture course designed to present physiology of domestic farm animals. Function of tissues and organs, maintenance of internal steady-state conditions, and body responses to external environmental conditions will be presented. Physiological mechanisms involved in lactation, growth, and reproduction will be included. Typically offered Fall Spring. Prerequisites: Undergraduate level [BIOL 11000](#) Minimum Grade of D- or Undergraduate level [BIOL 11100](#) Minimum Grade of D- or Undergraduate level [BIOL 12100](#) Minimum Grade of D- or Undergraduate level [BIOL 13100](#) Minimum Grade of D-.
- ANSC 44000 Horse Management.** Credit Hours: 3.00. Current breeding, feeding, housing, selection, disease control, and other management practices essential for sound economic planning of horse operations in today's horse industry. Laboratory farm visits provide students with real application examples and industry contacts. Typically offered Fall. Restrictions: Must have at least 60 credit hours. Prerequisites: Undergraduate level [ANSC 22100](#) Minimum Grade of D-.
- ANSC 44100 Beef Management.** Credit Hours: 3.00. Breeding, feeding, and management practices essential for economical beef production, including performance testing. Typically offered Fall. Restrictions: Must have at least 60 credit hours. Prerequisites: Undergraduate level [ANSC 22100](#) Minimum Grade of D-.
- ANSC 44200 Sheep Management.** Credit Hours: 3.00. Breeding, feeding, and management practices essential for economical sheep production and commercial lamb feeding, including performance testing. Typically offered Spring. Restrictions: Must have at least 60 credit hours. Prerequisites: Undergraduate level [ANSC 22100](#) Minimum Grade of D-.
- ANSC 44300 Swine Management.** Credit Hours: 3.00. Breeding, feeding, and management practices essential for commercial swine production, including performance testing. Typically offered Spring. Restrictions: Must have at least 60 credit hours. Prerequisites: Undergraduate level [ANSC 22100](#) Minimum Grade of D-.
- ANSC 44400 Dairy Management.** Credit Hours: 3.00. Current breeding, feeding, physiology, disease prevention, and management practices essential for economical milk production. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Spring. Restrictions: Must have at least 60 credit hours. Prerequisites: Undergraduate level [ANSC 22100](#) Minimum Grade of D-.
- ANSC 44500 Commercial Poultry Management.** Credit Hours: 3.00. Current developments and practices in the commercial production of eggs, broilers, and turkeys; principles of breeding, physiology, nutrition, management, and disease prevention. Typically offered Spring. Restrictions: Must have at least 60 credit hours. Prerequisites: Undergraduate level [ANSC 22100](#) Minimum Grade of D-.
- ASM 20100 Construction and Maintenance.** Credit Hours: 3.00. Fundamental principles in the selection and use of tools for the construction and maintenance of agricultural and related facilities, equipment, and machines. Areas covered include small engines, concrete and masonry, wood, plumbing, electricity, and metal. Typically offered Fall Spring.
- ASM 21500 Surveying.** Credit Hours: 3.00. Introduction to plane surveying. Instruction and practice in the use of surveying instruments for distance measurement, leveling, angle measurement, direction determination, traversing, and mapping. Office procedures for surveying data reduction. Practical problems and field exercises of the type encountered by the landscape architect and forester. Typically offered Fall Spring.
- ASM 32200 Technology for Precision Agriculture.** Credit Hours: 3.00. Technology and applications of electronics for precision agriculture. Characteristics of personal computer hardware, electronic sensors, monitors, machine controllers, environmental monitors, and global positioning systems. Production management information systems; processing and marketing information systems; and yield mapping, geographic information system data handling, and software options. Typically offered Fall. Prerequisites: Undergraduate level [ASM 22200](#) Minimum Grade of D-.
- BIOL 11000 Fundamentals of Biology I.** Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Principles of biology, focusing on diversity, ecology, evolution, and the development, structure, and function of organisms. Typically offered Summer Fall.
- BIOL 11100 Fundamentals of Biology II.** Credit Hours: 4.00. This course is designed primarily to provide an introduction to the principles of biology for students in agriculture and health sciences. Continuation of BIOL 11000. Principles of biology, focusing on cell structure and function, molecular biology, and genetics. Typically offered Spring. Prerequisites: Undergraduate level [BIOL 11000](#) Minimum Grade of D-.

**BTNY 20100 Plants and Civilization.** Credit Hours: 3.00. This course, intended primarily for non-majors, covers the history of agriculture, with focus on the centers of origin of our major food, fiber, and medicinal plants, and their historical, cultural, and economic relevance. The course also surveys the biology of crop plants, with respect to taxonomy, anatomy, cell structure, physiology, development, and genetics. Discussions also center on the roles plant biotechnology may play in sustainable agriculture and in helping to alleviate problems caused by overpopulation and ecological stress. Typically offered Spring.

**BTNY 21000 Introduction to Plant Science.** Credit Hours: 4.00. An introduction to the major groups in the plant kingdom, their origin, classification, and economic importance. The areas of anatomy, morphology, cytology, physiology, biochemistry, molecular biology, genetics, and ecology will be explored as they relate to plant sciences and agriculture. Course may also be offered for dual credit with cooperating Indiana high schools upon documented approval by the Department of Botany and Plant Pathology. Typically offered Fall Spring.

**BNTY 30100 Introduction Plant Pathology.** Credit Hours: 3.00. Basic principles of plant pathology, including etiology, symptomatology, control, and epidemiology of representative diseases of plants. Typically offered Fall Spring.

Prerequisites: Undergraduate level [BTNY 21000](#) Minimum Grade of D-.

**BTNY 30400 Introductory Weed Science.** Credit Hours: 3.00. A survey of the scientific principles underlying weed control practices; emphasis is on the ecology of weeds and control in crop associations. It is recommended that this course be followed by BTNY 50400. Typically offered Spring. Prerequisites: Undergraduate level [BIOL 11000](#) Minimum Grade of D- or Undergraduate level [BIOL 11100](#) Minimum Grade of D- or Undergraduate level [BTNY 21000](#) Minimum Grade of D-.

**BTNY 30500 Fundamentals of Plant Classification.** Credit Hours: 3.00. The principles of classification of seed plants, with emphasis on methods of identification in laboratory and field. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall. Prerequisites: Undergraduate level [BIOL 11000](#) Minimum Grade of D- or Undergraduate level [BIOL 11100](#) Minimum Grade of D- or Undergraduate level [BTNY 21000](#) Minimum Grade of D-.

**BTNY 31600 Plant Anatomy.** Credit Hours: 4.00. The internal structure of seed plants. Description and recognition of cell and tissue types, tissue systems, and their interrelations in vegetative and reproductive structures. Developmental changes of the plant body from embryo to mature plant and from meristems to mature tissues. Experimental approaches where relevant to structure-function relationships and to development will be introduced. Typically offered Fall.

Prerequisites: Undergraduate level [BTNY 21000](#) Minimum Grade of D-.

**ENTM 10500 Insects: Friend and Foe.** Credit Hours: 3.00. A one-semester course for nonscience students who want to know more about insects - the most numerous organisms on earth. An introduction to insects and their relationship with humankind, including interesting aspects of insect biology; insects in music, decoration, history; use of insects in teaching at the elementary school level; their use in art, photography, and drawing; insects as human food. Typically offered Fall Spring.

**FNR 10300 Introduction to Environmental Conservation.** Credit Hours: 3.00. Introduction to ecological principles, history of conservation, natural resource management, human impacts on the environment, and environmental ethics. For all students interested in an introductory natural resource or environmental science elective. Typically offered Fall Spring.

**FNR 23000 The World's Forests and Society.** Credit Hours: 3.00. Examination of structure, function, and environmental and cultural significance of forest ecosystems throughout the world. Typically offered Fall.

**FNR 24000 Wildlife in America.** Credit Hours: 3.00. History of the occurrence, exploitation, and management of North America's wildlife resources. Life histories, habitat relationships, and human impacts on selected species. Current conservation practices and future prospects. Typically offered Fall.

**FNR 48800 Global Environment Issues.** Credit Hours: 3.00. Examination of the state of the world in terms of natural resource consumption, environmental quality, and global change. Techniques to analyze and evaluate information. Survey threats to soil productivity, the changing atmosphere, water quality and quantity, energy impacts, and biodiversity from an ecosystem perspective. Typically offered Fall.

**HORT 10100 Fundamentals of Horticulture.** Credit Hours: 3.00. Biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development. Requires class trips. Students will pay individual lodging or meal expenses when necessary. Typically offered Fall Spring.

- HORT 30100 Plant Physiology.** Credit Hours: 4.00. Basic physiological processes of higher plants, particularly as related to the influence of environmental factors on growth, metabolism, and reproduction. Laboratory experiments involve hands-on experience with numerous aspects of plant physiology, including water relations, photosynthesis, growth, dormancy, hormones, and flowering. Typically offered Fall. Prerequisites: ( (Undergraduate level [BIOL 11000](#) Minimum Grade of D- or Undergraduate level [BTNY 21000](#) Minimum Grade of D-) or (Undergraduate level [BIOL 13100](#) Minimum Grade of D- and Undergraduate level [BIOL 13200](#) Minimum Grade of D-) ) and (Undergraduate level [CHM 25500](#) Minimum Grade of D- or Undergraduate level [CHM 25700](#) Minimum Grade of D- or Undergraduate level [CHM 26200](#) Minimum Grade of D- or Undergraduate level [CHEM C3410](#) Minimum Grade of D- or Undergraduate level [CHM 26100](#) Minimum Grade of D- or Undergraduate level [CHEM C3420](#) Minimum Grade of D-).
- HORT 30600 History of Horticulture.** Credit Hours: 3.00. The origins and development of agriculture, with specific emphasis on horticulture from prehistory to the present in relation to civilization and modern culture. Typically offered Fall Spring Summer.
- HORT 40300 Tropical Horticulture.** Credit Hours: 3.00. An introduction to the agriculture of the tropics and subtropics, emphasizing horticultural crops. Offered in even-numbered years. Typically offered Fall.
- MGMT 20000 Introductory Accounting.** Credit Hours: 3.00. The objectives of the course are to help students: (1) understand what is in financial statements and what the statements say about a business, (2) identify the business activities that caused the amounts that appear in the statements, and (3) understand how, when, and at what amount the effects of manager and employee actions will appear in the statements. Typically offered Fall Spring Summer. **OR** *AGEC 31100*
- OLS 25200 Human Behavior in Organizations.** Credit Hours: 3.00. A survey of the concepts that provide a foundation for the understanding of individual and group behavior in organizations. Special emphasis on typical interpersonal and leadership relationships. Typically offered Fall Spring Summer.
- OLS 27400 Applied Leadership.** Credit Hours: 3.00. Introduction to applied leadership in the context of organizational functions, structures, and operation. Typically offered Fall Spring Summer.
- STAT 30100 Elementary Statistical Methods.** Credit Hours: 3.00. Introduction to statistical methods with applications to diverse fields. Emphasis on understanding and interpreting standard techniques. Data analysis for one and several variables, design of samples and experiments, basic probability, sampling distributions, confidence intervals and significance tests for means and proportions, correlation and regression. Software is used throughout. Credit cannot be given for more than one of STAT 30100, 30500, 35000, 43300 50100, 50300, and 51100. Prerequisite: college algebra. Typically offered Summer Fall Spring.
- STAT 50100 Experimental Statistics I.** Credit Hours: 3.00. Concepts and methods of applied statistics. Exploratory analysis of data. Sample design and experimental design. Normal distributions. Sampling distributions. Confidence intervals and tests of hypotheses for one and two samples. Inference for contingency tables, regression and correlation, and one-way analysis of variance. Use of the SAS statistical software. Intended primarily for students who have not had calculus. Not open to students in mathematical sciences or engineering. Credit cannot be given for more than one of STAT 30100, 30500, 35000, 43300, 50100, 50300, or 51100. Prerequisite: College Algebra. Typically offered Summer Fall. Restrictions: Must have at least 60 credit hours.

**STAT 50300 Statistical Methods for Biology.** Credit Hours: 3.00. Introductory statistical methods, with emphasis on applications in biology. Topics include descriptive statistics, binomial and normal distributions, confidence interval estimation, hypothesis testing, analysis of variance, introduction to nonparametric testing, linear regression and correlation, goodness-of-fit tests, and contingency tables. Open only to majors related to the life sciences. Credit cannot be given for more than one of STAT 30100, 30500, 35000, 43300, 50100, 50300, or 51100. Prerequisite: Two semesters of college calculus. Typically offered Fall Spring. Restrictions: Must have at least 45 credit hours.

Prerequisites: GR-STAT 50300 Requisites

General Requirements: (Student Attribute: GR - May not be taken concurrently)

or (Course or Test: [MA](#) 16200 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MA](#) 16600 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MA](#) 17300 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MA](#) 18100 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MA](#) 16400 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MATH](#) 16400 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MATH](#) M2160 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MA](#) 16900 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MA](#) 22200 - Minimum Grade of D- [May not be taken concurrently])

or (Course or Test: [MA](#) 23200 - Minimum Grade of D- [May not be taken concurrently]).

# Special Problems Courses

## **ASM 39000 COOP, ASM 49000 Special Problems, ASM 49800 Directed Experience in Teaching Mechanized Agriculture, ASM 49900H Honors Thesis, ASM 59000 Special Problems**

Due to the extensive time required to plan and complete a special topics course, instructor selection and completion of the appropriate contract should take place in the semester *prior* to the one in which the course is to be completed.

### **Purpose of Special Problems Course Offerings**

Special Problems course offerings should be designed to provide capable students the opportunity to work on carefully selected special problems which are not covered in regular course offerings. The problems should be closely related to the students' field of study and be of mutual interest to both the individual student and supervising faculty member.

The selected problem should be such that it will require the student to perform a combination of laboratory, field, and/or library studies and result in a professionally written report of the activities relating to the project, findings if any, and other related documentation.

### **Student Eligibility**

Students requesting enrollment in Special Problems courses should have a record of exhibiting a great deal of personal initiative and the ability to work toward a solution of problems with limited direct supervision from instructors.

### **Registration for the Special Problem**

Due to the extensive time required to plan and complete a Special Problem course, instructor selection and completion of the contract should take place during the semester *prior* to the one in which the course is to be completed.

### **Student/Faculty Contract for Special Problems**

To provide documentation of the problem to be addressed and to ensure a clear understanding between the student and supervising faculty member of their respective expectations, a formal course contract must be completed and kept on file by the faculty member. An additional copy will be placed in the student's permanent file, and a copy will be furnished to the student.

### **Approval of the Special Problems Courses by the Department**

In order to ensure that proposed courses meet the expectations of the department with respect to content, level of effort and credit hour distribution, each Special Problems course must be approved by the Agricultural & Biological Engineering Academic Programs Committee (or, in the case of a graduate student, the Graduate Committee). Approval should be obtained by the end of the semester *prior* to the one during which the course will be completed.

***Enrollment in ASM 49000/59000*** – In addition to the above, the student should fulfill the following requirements:

1. Be enrolled as an undergraduate or graduate student at Purdue.
2. Be classified as a "Junior 6" or higher at the time the course begins.
3. Have a minimum grade point average (GPA) of 3.00.

Exceptions to the above requirements will be considered by the ABE Academic Programs Committee/ Graduate Committee upon request of the instructor.

# Admission to Graduate School

Undergraduate students looking forward to graduation frequently consider graduate work as a possibility after graduation. The advisor should encourage students to go to graduate school provided the student is qualified and able to benefit from graduate study.

The basic requirements for admission to graduate study are:

- Graduation with a baccalaureate degree.
- An applicant is generally expected to maintain a cumulative grade point average of at least 3.0.

Most students enrolled in graduate study in the Agricultural and Biological Engineering Department receive graduate research assistantships. Current stipends for M.S. and Ph.D. assistantships are approximately \$19,000 and \$21,000 per year, respectively. Plus full waiver of tuition and most fees making the true value of an assistantship approximately \$31,500 per year for Indiana residents and \$53,500 for non-Indiana residents.

In certain cases undergraduate students may subsequently apply credits they have earned in 500-series courses toward an advanced degree at Purdue. Upon admission to the Graduate School, and with the approval of the major field, a maximum of 6 credits relevant to the graduate program of study which were not used to satisfy undergraduate requirements may be applied toward an advanced degree. For these courses to be available for graduate credit, they must be designated as “excess undergraduate credit” **at the time they are taken**. The necessary form, available in the Student Academic Center, Room 201, must be presented to the instructor at the beginning of the semester in which you are taking the course. This cannot be done after the fact.

**Research Opportunities.** Modern, well-equipped laboratories support all research specializations; exceptional computing facilities being a noteworthy example. Departmental computing is centered on server-based, advanced engineering workstations. Departmental networks have integrated global capabilities as part of the Engineering Computer Network, a system of more than 1,000 workstations/ servers with supercomputer and Internet connectivity through the Purdue University Computing Center.

Bioprocess engineering is rapidly becoming a critical forefront research area as advances in genetic engineering lead to new types of crops and new methods for processing them into value added products. As a consequence, the department has a strong biological and biochemical technology research program. Research topics include bioreactor design and modeling, enzyme kinetics and biocatalysis, site-directed mutagenesis, foam fractionation and liquid chromatography of proteins, and genetic engineering. Extensive laboratory facilities include liquid chromatographs, glucose analyzers, fermenters, centrifuge, spectrophotometers, and preparative scale protein purification systems.

Areas of machinery research include electro hydraulic systems and their control, microprocessor applications for control and monitoring, the development of robotic systems for agricultural production/ processing, the development of design expert systems, finite element analysis and optimization of mechanical systems, design automation, soil-vehicle interactions, and operator safety. Facilities include engine dynamometers and hydraulics, as well as machine vision laboratories.

Research in water resources planning and management includes studies of the mechanics of soil erosion, water quality control, mathematical simulation of agricultural watershed hydrology, geographical information systems (GIS) applications, and land drainage. The USDA/ARS National Soil Erosion Laboratory, located near the Agricultural & Biological Engineering Building, offers both facility and personnel support through cooperative projects.

Knowledge engineering, the art and science of automating the utilization of intelligence to manage and control tomorrow's increasingly interdependent subsystems, is an area of rapid research growth. This field spans such diverse areas as developing pattern recognition technologies for machine vision to creation of expert systems for both strategic management decision support and advanced machine controls.

Designing advanced methods for producing and processing biological products requires knowledge of the physical properties of biological materials and of soils. Many challenging research opportunities may be found in studying the mechanical, electrical, optical, rheological or other properties of such materials and in the development of transducers for machine monitoring and control of product characteristics.

**Areas of Study.** The Department of Agricultural and Biological Engineering offers opportunity for creative endeavor in academic coursework and in fundamental and applied research. Both the Master of Science and Doctor of Philosophy programs are offered in a broad range of areas including: artificial intelligence applied to decision support systems and to intelligent machine control, biochemical and food process engineering, agricultural systems management, physical properties of biological materials, computer-aided agricultural machinery design, soil and water resource design and management, crop processing and storage, systems engineering, fluid power, agricultural structures, renewable resource utilization, vehicle mechanics, and environmental control.

**Requirements for Graduate Study.** Applications for graduate study in agricultural and biological engineering are accepted from qualified individuals who have a baccalaureate degree in engineering or agricultural systems management from a college or university of recognized standing. These students may work toward Master of Science in Agricultural and Biological Engineering (M.S.A.B.E.), Master of Science in Engineering (M.S.E.), Master of Science (M.S.), and Doctor of Philosophy (Ph.D.) degrees.

The doctoral degree candidate must have demonstrated superior scholastic and research ability either at Purdue or some other university. Research ability normally is assumed if the applicant has written an acceptable master's thesis. Students who complete a nonthesis M.S. degree program normally will not be permitted to pursue a Ph.D. program.

**Programs of Study.** The master's degree candidate may elect either a thesis or nonthesis option program. A thesis is required for the Ph.D. degree. Research assistantships generally are not available to individuals electing the nonthesis option.

A minimum of 21 semester hours for the master's degree with a thesis, 30 semester hours for the master's degree without a thesis, and 48 semester hours for the doctoral degree normally are required. Acceptable master's degree coursework may be applied to the doctoral degree program. Outstanding students may petition to work directly toward the Ph.D. without the M.S. A minimum of six semester hours of departmental courses is required in the master's degree program with a thesis and 12 semester hours for the nonthesis master's degree and doctoral degree programs.

Mathematical sciences must be pursued in depth. Normally, for the master's degree a minimum of six credit hours of mathematical, statistical, or computer science courses beyond ordinary differential equations is required. For the doctoral degree, a minimum of 12 credit hours is required.

Programs of study must be established during the first full semester for the master's, or full year for the doctoral degree, of residency at Purdue University. These programs are oriented toward the proposed thesis research work in one of the research areas in agricultural engineering.

There are no foreign language requirements for the M.S. and Ph.D. degrees.

Specific inquiries concerning the opportunities for graduate study in ABE should be addressed to the ABE Graduate Administrator (ABE room 201).

<https://engineering.purdue.edu/ABE/Academics/Grad/index.html>

Faculty	Office	Campus Phone (49-_____)	Email (____@purdue.edu)	Area of Specialization
Vincent F. Bralts (Assoc. Dean of Engineering)	ENAD 111	45349	bralts	<i>Irrigation design and management; Hydraulic network analysis using Finite Element Method; Water quality modeling; International development.</i>
Dennis Buckmaster	ABE 217	69512	dbuckmas	<i>Machine systems: forage and biomass harvest, storage and delivery</i>
Osvaldo Campanella	FS 2151	66330	campa	<i>Food process engineering. Food Rheology. Food Extrusion, evaporation. Food processes simulation.</i>
Natalie J. Carroll	AGAD 216	48433	carroll	<i>Soil and water engineering; Finite Element Models; Youth environmental programs.</i>
Indrajeet Chaubey	ABE 216	45013	ichaubey	<i>Ecohydrology, solute and sediment transport, best management practices to minimize nonpoint source pollution, spatial variability of natural processes, land use terrestrial and aquatic processes, integrated watershed/water quality management technology, mathematical modeling, and application of geographic information systems and remote sensing</i>
Keith A. Cherkauer	ABE 312	67982	cherkaue	<i>Remote sensing, hydrology models, environmental change, land-atmosphere interactions, the hydrologic cycle, the impact of snow and soil frost on the surface water, energy balance in the upper Mississippi River basin, applicability of aircraft- and satellite-based thermal remote sensing to monitoring stream temperatures.</i>
Heidi Diefes-Dux	ENAD 206	43887	hdiefes	<i>Educational methods research as it pertains to the development of engineering courses and curricula. Food process engr - unit operations, process, and plant modeling and optimization through experimentation and theory.</i>
Bernard A. Engel (Dept. Head)	ABE 218	41162	engelb	<i>Artificial intelligence; Expert systems; Simulation; Soil and water engineering; Natural resource conservation and management; Geographical information systems.</i>
Daniel R. Ess	ABE 311	63977	ess	<i>Development and analysis of information intensive agricultural production systems.</i>
William E. Field	ABE 308B	41191	field	<i>Agricultural safety and health; Breaking New Ground Resource Center.</i>
Dennis C. Flanagan (Adjunct)	SOIL 107	47748	flanagan	<i>Soil and water resources; Erosion mechanics, prediction, and control; Sediment deposition; Water quality</i>
Jane Frankenberger	ABE 208A	41194	frankenb	<i>Water quality; Watershed protection; Soil and water engineering; Geographical information systems; Hydrologic simulation modeling</i>
Albert J. Heber	ABE 215	41214	heber	<i>Building ventilation; Indoor air quality; Air pollution; Wood coatings.</i>
Klein E. Iileleji	ABE 309	41198	ileleji	<i>Grain quality , post-harvest engineering, sensors and Process Controls, biomass production and handling, production of energy crops, new technology development, biomass characterization, and production, densification and post-harvest technologies for biomass utilization.</i>
Joseph Irudayaraj	NA	41162	josephi	<i>Sensor device fabrication and study of individual molecules using confocal spectroscopy and microscopy to better understand their mobility and interaction. Applications include health and food.</i>
Monika Ivantysynova	ABE 314	66578	mivantys	<i>Modeling of pumps, motors, actuators, and complex fluid power systems, advanced CVT transmission concepts, energy saving actuator technology</i>
Gary W. Krutz	ABE 213	41179	krutz	<i>Power and machinery; Fluid power electronic control for machinery applications; Agricultural sensor development.</i>
Michael R. Ladisch	POTR 216	47022	ladisch	<i>Biotechnology and bioprocess engineering; Bioseparations; Chemical reactor design and kinetics; Biomass conversion.</i>
Chang Lu	ABE 217	41188	changlu	<i>Microfluidics and Nanobiotechnology. Microfabricated biosensors for food safety. Drug delivery using microfluidic devices. Single molecule biophysics using fluorescence spectroscopy.</i>
John Lumkes	ABE 216	41173	lumkes	<i>Electrohydraulics; on- and off-road vehicle design; drive-by-wire control systems; and diagnostics and prognostics for hydraulic and pneumatic systems</i>
Rabi H. Mohtar	ABE 321	41791	mohtar	<i>Environmental resources engineering; Numerical methods; Simulation models to improve utilization of natural resources; Hydrological systems interaction with the environment; Irrigation systems.</i>
Mark T. Morgan	FS 1161	41180	mmorgan	<i>Electronic sensing of food properties; Design of food processing control systems.</i>
Nathan S. Mosier	ABE 211	62044	mosiern	<i>Bioprocessing Rrenewable resources to fuels, chemicals, &amp; pharmaceuticals. Biocatalysis.</i>
Patrick T. Murphy	ABE 217	41175	ptmurphy	
Ganesan Narsimhan	FS 2247	41199	narsimha	<i>Food engineering; Bioseparations; Food emulsions and foams; Functional properties of proteins.</i>
Martin R. Okos	FS 1171	41211	okos	<i>Food process engineering; Computer aided design of food processes; Heat and mass transfer in foods; Fermentation and biological reactor design; Properties of food; Biological products.</i>
Marshall Porterfield	ABE 319	41195	porterf	<i>Biological engineering, sensor technology and instrumentation, BioMEMS, eukaryotic cell signaling, space and gravitational biology</i>

Jenna L. Rickus	ABE 214	41197	rickus	<i>Biosensors; Bio-nanotechnology; Mathematical Modeling.</i>
Richard L. Stroshine	ABE 308	41192	strosh	<i>Physical properties of agricultural materials; Sensing food quality; Grain quality; Grain drying; Handling storage; Grain Harvesting.</i>
Bernard Y. Tao	FS 3239	41183	tao	<i>Biocatalysis; Biomaterials utilization; Recombinant genetic engineering; Carbohydrate enzyme technology.</i>
David Umulis	ABE 313	41223	dumulis	<i>Systems biology. Interdisciplinary research to discover mechanisms of development and the regulation of Bone Morphogenetic Proteins. Finite-element modeling of biological systems. Quantitative image analysis, microscopy, and data-driven modeling.</i>
Andrea Vacca	Kepner/ABE 208		avacca	

## Useful Websites

ABE Department - <https://engineering.purdue.edu/ABE>

CCO - [www.cco.purdue.edu](http://www.cco.purdue.edu)

Admissions - <http://www.purdue.edu/Purdue/admissions/>

Distance Learning - <https://www.continuinged.purdue.edu/>

College of Agriculture - <http://www.agriculture.purdue.edu/>

Purdue Directory - <http://www.itap.purdue.edu/directory/>

Purdue Maps - [http://www.purdue.edu/campus\\_map/](http://www.purdue.edu/campus_map/)

myPurdue - <https://mypurdue.purdue.edu>

Schedule of Classes - <http://www.courses.purdue.edu/cgi-bin/relay.exe/query?qid=courseOfferingSubjectList>

Bursar - <http://www.purdue.edu/Bursar/>

Scholarships - [www.agriculture.purdue.edu/oap/scholarshipsFellowships.asp](http://www.agriculture.purdue.edu/oap/scholarshipsFellowships.asp)

Honors Program - [www.purdue.edu/provost/honors/](http://www.purdue.edu/provost/honors/)

International Studies - [www.agriculture.purdue.edu/ipiastudyabroad/index.shtml](http://www.agriculture.purdue.edu/ipiastudyabroad/index.shtml)

ABE Department Career/Internship Postings - [https://engineering.purdue.edu/ABE/ResourcesFor/Student/job\\_postings/job-descriptions/index.html](https://engineering.purdue.edu/ABE/ResourcesFor/Student/job_postings/job-descriptions/index.html)

Ag Core Course List – [http://www.ag.purdue.edu/oap/Pages/core\\_requirements.aspx](http://www.ag.purdue.edu/oap/Pages/core_requirements.aspx)

Scheduling Aid - <http://www.emilstefanov.net/Projects/PurdueCourses/>