

# Department of Agricultural and Biological Engineering

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## Agricultural Engineering Technology and Business (AETB)

**Department Head: Dr. Jonathan Pote**

Office: 150 Agricultural and Biological Engineering Building

Agricultural Engineering Technology and Business (AETB) graduates can find rewarding careers in a variety of agricultural, environmental, and industrial businesses. Technologists focus on managing, operating, and troubleshooting technology systems (rather than engineering design) by applying their knowledge of technology and business applications. This hands-on curriculum teaches students to manage equipment and machinery, biological processes, computers, computer simulations, and other technologies to create and maintain current and new production systems. A Bachelor of Science degree is offered by the Agricultural and Biological Engineering Department through the College of Agriculture and Life Sciences.

Students may pursue one of four concentrations within AETB:

1. Natural Resources & Environment Management
2. Precision Agriculture
3. Enterprise Management
4. Surveying & Geomatics

The concentrations are achieved by completing 30-32 hours of specific technical electives as approved by an AETB advisor. Concentration descriptions and employment opportunities are discussed below.

Students who plan to attend a community college before transferring to Mississippi State University are strongly encouraged to contact the AETB Undergraduate Coordinator regarding their proposed community college schedule and transfer requirements. Transfer credits with a grade of C or higher will be considered toward fulfillment of the degree requirements in the AETB curriculum. A maximum of 12 transfer hours of technical credit can be applied toward degree requirements. Students are required to earn a "C" or better in all ABE core courses.

Internships or co-op experiences are highly encouraged and help students translate their classroom and laboratory experiences into the reality of the business setting.

The **Natural Resource & Environmental Management** (NREM) concentration is appropriate for students interested in developing skills to manage and solve problems in systems that impact our natural resources and the environment. Skill sets include knowledge in geology, hydrogeology, GIS, water quality, watershed management, and natural resource conservation. A few career paths for NREM Technologists include: Firm Environmental Manager, Conservation District Manager, Mapping/GIS Specialist, Nonpoint Source Pollution Specialist, and Watershed Planner. Employment opportunities include private and public firms with environmental issues, soil and water conservation districts, as well as national, state, county, or city highway and urban planning departments. National government agencies include the USDA NRCS, US EPA, US Army Corps of Engineers, US Geological Survey, US Forest Service, and US Bureau of Land Management to name a few.

The **Precision Agriculture** (PRAG) concentration is appropriate for students interested in developing skills in global positioning systems (GPS), geographical information systems (GIS), remote sensing, and digital mapping technologies. A few career paths for PRAG Technologists include: Food/Fiber Production (Farming), Precision Agriculture Specialist, Mapping/GIS Specialist, Crop Consulting, and Equipment Test Engineer.

The **Enterprise Management** (EMGT) concentration is appropriate for students interested in acquiring the skills to manage and solve problems for a wide variety of systems. Students will get a broad foundation in the management of machine systems, electricity, soil and water conservation, grain, precision agriculture, biorenewables, and animal production systems. A few career paths for EMGT Technologists include: Banking & Ag Lending, Crop Consulting, and Agricultural Technical Sales. Employment opportunities include small and large agricultural production operations, banking and farm credit lenders, Agri-chemical and machinery sales and consulting to name a few.

The **Surveying & Geomatics** (SGEO) concentration provides students with the necessary prerequisites to begin a three-step process (academic training, supervised surveying experience, testing) to become a registered Land Surveyor in Mississippi. A few career paths for SGEO Technologists include: Boundary/Construction Surveyor, Hydrographic Surveyor, Mining Surveyor, Mapping/GIS Specialist, and Image Analyst. Employment opportunities include large and small engineering, architectural, and surveying firms as well as national, state, county, or city highway and urban planning departments. National government agencies include the U.S. Army Corp of Engineers, U.S. Geological Survey, U.S. Forest Service, and U.S. Bureau of Land Management to name a few.

## Degree Requirements

### English Composition

EN 1103

English Composition I

3

or EN 1104	Expanded English Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	
<b>Mathematics</b>		
MA 1713	Calculus I <sup>1</sup>	3
Choose one of the following:		
BQA 2113	Business Statistical Methods I	
MA 2113	Introduction to Statistics	
ST 2113	Introduction to Statistics	
<b>Science</b>		
PH 1113	General Physics I <sup>1</sup>	3
PH 1123	General Physics II <sup>1</sup>	3
<b>Humanities</b>		
Select from General Education courses		6
<b>Fine Arts</b>		
Select from General Education courses		3
<b>Social Science</b>		
AEC 2713	Introduction to Food and Resource Economics	3
Select from General Education courses		3
<b>Major Core</b>		
ABE 1073	Technology Design I. <sup>1</sup>	3
ABE 1083	Technology Design II	3
ABE 1863	Engineering Technology in Agriculture	3
ABE 2873	Land Surveying <sup>1</sup>	3
ABE 3513	The Global Positional System and Geographic Information Systems in Agriculture and Engineering <sup>1</sup>	3
ABE 4263	Soil and Water Management	3
ABE 4383	Building Construction	3
ABE 4473	Electrical Applications for Agriculture	3
ABE 4961	Seminar	1
<b>Science Courses</b>		
CH 1043	Survey of Chemistry I	3
CH 1053	Survey of Chemistry II	3
CH 1051	Experimental Chemistry	1
<b>Mathematics or Restricted Electives <sup>2</sup></b>		<b>6</b>
<b>Business Courses</b>		
ACC 2013	Principles of Financial Accounting <sup>1</sup>	3
ACC 2023	Principles of Managerial Accounting <sup>1</sup>	3
AEC 3133	Introductory Agribusiness Management	3
BL 2413	The Legal Environment of Business <sup>1</sup>	3
MGT 3513	Introduction to Human Resource Management	3
<b>Oral Communication Requirement</b>		
CO 1003	Fundamentals of Public Speaking	3
or CO 1013	Introduction to Communication	
<b>Writing Requirement</b>		
AELC 3203	Professional Writing in Agriculture, Natural Resources, and Human Sciences	3
<b>Computer Literacy Requirement</b>		
Satisfied by successful completion of ABE 1073, ABE 1083, ABE 1863, and ABE 3513		
Concentration Courses -- see specific lists for courses		30-32
<b>Total hours</b>		<b>122-124</b>

## Natural Resource & Environmental Management (NREM) Concentration

ADS 1113 & ADS 1121 or BIO 1134	Animal Science and Animal Science Laboratory Biology I	4
PSS 1313 or BIO 1023	Plant Science Plants and Humans	3
GR 2313	Maps and Remote Sensing	3
GR 4303	Principles of GIS	3
PSS 3303	Soils	3
PSS 3301	Soils Laboratory	1
<b>NREM Courses - choose 15 hours from the following: <sup>2</sup></b>		
AEC 3233	Introduction to Environmental Economics and Policy	3
AEC 4223	Applied Quantitative Analysis in Agricultural Economics	3
AEC 4233	Environmental Economics	3
BIO 2503	Environmental Quality	3
BL 4263	Environmental Law	3
FO 4313	Spatial Technologies in Natural Resources Management	3
FO 4353	Natural Resource Law	3
FO 4463	Forest Hydrology and Watershed Management	3
GG 3133	Introduction to Environmental Geology	3
GG 3613	Water Resources	3
GG 4613	Physical Hydrogeology	3
GR 3113	Conservation of Natural Resources	3
PSS 4333	Soil Conservation and Land Use	3
PSS 4373	Geospatial Agronomic Management	3

## Precision Agriculture (PRAG) Concentration

ADS 1113 & ADS 1121	Animal Science and Animal Science Laboratory	4
PSS 1313 or BIO 1023	Plant Science Plants and Humans	3
GR 2313	Maps and Remote Sensing	3
GR 4303	Principles of GIS	3
PSS 3303	Soils	3
PSS 3301	Soils Laboratory	1
PSS 4373	Geospatial Agronomic Management	3
<b>PRAG Courses - choose 12 hours from the following: <sup>2</sup></b>		
ABE 2173	Principles of Agricultural and Off-Road Machines	3
ABE 4163	Agricultural and Off-Road Machinery Management	3
AEC 4413	Public Problems of Agriculture	3
GR 4323	Cartographic Sciences	3
GR 4313	Advanced GIS	3
GR 4333	Remote Sensing of the Physical Environment	3
FO 4453	Remote Sensing Applications	3
PSS 4123	Grain Crops	3
PSS 4133	Fiber and Oilseed Crops	3

## Enterprise Management (EMGT) Concentration

ADS 1113 & ADS 1121	Animal Science and Animal Science Laboratory	4
PSS 1313 or BIO 1023	Plant Science Plants and Humans	3

PSS 3303	Soils	3
PSS 3301	Soils Laboratory	1
<b>EMGT Courses - choose 21 hours from the following: <sup>2</sup></b>		
ABE 2173	Principles of Agricultural and Off-Road Machines	3
ABE 4163	Agricultural and Off-Road Machinery Management	3
ADS 4323	Beef Cattle Science	3
AEC 3213	International Trade in Agriculture	3
AEC 3233	Introduction to Environmental Economics and Policy	3
AEC 4413	Public Problems of Agriculture	3
PO 4334	Broiler Production	4
PSS 4103	Forage and Pasture Crops	3
PSS 4123	Grain Crops	3
PSS 4133	Fiber and Oilseed Crops	3

### Surveying & Geomatics (SGEO) Concentration

CE 2213	Surveying <sup>1</sup>	3
CE 4233	Control Surveys <sup>1</sup>	3
CE 4243	Land Surveys <sup>1</sup>	3
<b>SGEO Courses - choose 21 hours from the following: <sup>2</sup></b>		
BL 4333	Real Estate Law <sup>1</sup>	3
FO 4313	Spatial Technologies in Natural Resources Management	3
FO 4453	Remote Sensing Applications	3
GR 2313	Maps and Remote Sensing	3
GR 3303	Survey of Geospatial Technologies	3
GR 4303	Principles of GIS	3
GR 4313	Advanced GIS	3
GR 4323	Cartographic Sciences	3
GR 4333	Remote Sensing of the Physical Environment	3
MGT 3323	Entrepreneurship	3

<sup>1</sup> Partial requirements to take the Fundamentals of Surveying Exam

<sup>2</sup> See advisor for full list of courses