# Department of Agricultural and Biological Engineering

## 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, 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-chimical 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 1163 | Accelerated Composition I | |
| EN 1113 | English Composition II | 3 |
| or EN 1173 | Accelerated Composition II | |
| **Mathematics** | | |
| MA 1713 | Calculus I [1] | 3 |
| Choose one of the following: | | 3 |
| BQA 2113 | Business Statistical Methods I | |
| MA 2113 | Introduction to Statistics | |
| ST 2113 | Introduction to Statistics | |
| **Science** | | |
| PH 1113 | General Physics I [1] | 3 |
| PH 1123 | General Physics II [1] | 3 |
| **Humanities** | | |
| Select from General Education courses | | 6 |
| **Fine Arts** | | |
| Select from General Education courses | | 3 |
| **Social Science** | | |
| AEC 2713 | Introduction to Food and Resource Economics | 3 |
| Select from General Education courses | | 3 |
| **Major Core** | | |
| ABE 1073 | Technology Design I. [1] | 3 |
| ABE 1083 | Technology Design II | 3 |
| ABE 1863 | Engineering Technology in Agriculture | 3 |
| ABE 2873 | Land Surveying [1] | 3 |
| ABE 3513 | The Global Positional System and Geographic Information Systems in Agriculture and Engineering [1] | 3 |
| ABE 4263 | Soil and Water Management | 3 |
| ABE 4383 | Building Construction | 3 |
| ABE 4473 | Electrical Applications | 3 |
| ABE 4961 | Seminar | 1 |
| **Science Courses** | | |
| CH 1043 | Survey of Chemistry I | 3 |
| CH 1053 | Survey of Chemistry II | 3 |
| CH 1051 | Experimental Chemistry | 1 |
| **Mathematics or Restricted Electives** [2] | | 6 |
| **Business Courses** | | |
| ACC 2013 | Principles of Financial Accounting [1] | 3 |
| ACC 2023 | Principles of Managerial Accounting [1] | 3 |
| AEC 3133 | Introductory Agribusiness Management | 3 |
| BL 2413 | The Legal Environment of Business [1] | 3 |
| MGT 3513 | Introduction to Human Resource Management | 3 |
| **Oral Communication Requirement** | | |
| CO 1003 | Fundamentals of Public Speaking | 3 |
| or CO 1013 | Introduction to Communication | |
| **Writing Requirement** | | |
| AIS 3203 | Professional Writing in Agriculture, Natural Resources, and Human Sciences [1] | 3 |
| **Computer Literacy Requirement** | | |
| Satisfied by successful completion of ABE 1073, ABE 1083, ABE 1863, and ABE 3513 | | |
| Concentration Courses -- see specific lists for courses | | 30-32 |
| **Total hours** | | 122-124 |

## Natural Resource & Environmental Management (NREM) Concentration

| | | |
|---|---|---|
| ADS 1113<br>& ADS 1121 | Animal Science<br>and Animal Science Laboratory | 4 |
| or BIO 1134 | Biology I | |
| PSS 1313 | Plant Science | 3 |
| or BIO 1023 | Plants and Humans | |
| GR 2313 | Maps and Remote Sensing | 3 |
| GR 4303 | Principles of GIS | 3 |
| PSS 3303 | Soils | 3 |
| PSS 3301 | Soils Laboratory | 1 |
| **NREM Courses - choose 15 hours from the following:** [2] | | |
| 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 | Animal Science | 3 |
| PSS 1313 | Plant Science | 3 |
| or BIO 1023 | Plants and Humans | |
| 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 |
| **PRAG Courses - choose 12 hours from the following:** [2] | | |
| 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 | Animal Science | 3 |
| PSS 1313 | Plant Science | 3 |
| or BIO 1023 | Plants and Humans | |
| PSS 3303 | Soils | 3 |
| PSS 3301 | Soils Laboratory | 1 |

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|---|---|---|
| **EMGT Courses - choose 21 hours from the following:** [2] | | |
| 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

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|---|---|---|
| CE 2213 | Surveying [1] | 3 |
| CE 4233 | Control Surveys [1] | 3 |
| CE 4243 | Land Surveys [1] | 3 |
| **SGEO Courses - choose 21 hours from the following:** [2] | | |
| BL 4333 | Real Estate Law [1] | 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 |

1 Partial requirements to take the Fundamentals of Surveying Exam

2 See advisor for full list of courses