AGRICULTURAL & ENVIRONMENTAL TECHNOLOGY (TAE)

College of Agricultural & Environmental Sciences

TAE 010 — Introduction to Agricultural & Environmental Technologies (3 units)

Course Description: Technologies of agriculture and the environmental sciences. History & revolution of industrial technology and its impacts on agriculture, environment, energy, and bioproducts; types of sensing technologies; communication and information transfer technologies; artificial intelligence, technologies for control of automatic processes; technologies for the production of food, bioproducts, clean energy and water purification; gene-editing technology; wearable technologies.
Learning Activities: Lecture 2 hour(s); Discussion 1 hour(s).
Enrollment Restriction(s): Pass One restricted to Agricultural & Environmental Technologies majors and students in College of Agricultural & Environmental Sciences.
Grade Mode: Letter.
General Education: Oral Skills (OL).

TAE 014 — Introduction to Wearable Materials & Bioproducts (4 units)

Course Description: Technical terminologies describing chemical structures and properties of polymers, biopolymers, fibers and fabrics. Introduction to manufacturing processes, colorations, coating, printing, and basic performances of fibers and fabrics, and properties for functional wearable products.
Prerequisite(s): CHE 002B; or consent of instructor.
Learning Activities: Lecture 3 hour(s), Discussion/Laboratory 2 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

TAE 015 — Agricultural & Wood Framed Structures (3 units)

Course Description: Construction technologies for small farms. Design and construction of typical farm structures utilizing CAD, common construction tools and techniques while exploring the effects of wood properties on structures.
Learning Activities: Lecture/Lab 3 hour(s), Lecture 1 hour(s); Extensive Problem Solving.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Oral Skills (OL); Visual Literacy (VL);

TAE 020 — Sustainable Energy Technologies (4 units)

Course Description: Sustainable and efficient energy technologies and their application in agriculture and other sectors. Basic principles of energy efficiency, conservation, and conversion technologies using solar, wind, water, biomass, geothermal, and other renewable sources. Environmental impacts and energy policy. Experiential learning about solar drying, controlled environment agriculture, net-zero energy building, electricity generation, energy storage, biofuels, and integrated waste management; field visits.
Learning Activities: Lecture/Discussion 3 hour(s), Lecture/Lab 3 hour(s).
Enrollment Restriction(s): Pass One restricted to Agricultural & Environmental Technology and Biological Systems Engineering students.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Quantitative Literacy (QL).

TAE 030 — Mobile Communication & Computing Technologies for Agriculture & the Environment (4 units)

Course Description: Modern computer technologies and the applications of sensing technologies and the Internet of Things (IoT) in agriculture and the environment. IoT and embedded devices; history and evolution of IoT, communication, and computing technologies; sensors and actuators; microcontrollers; data communication technology; introduction to data analysis and data visualization; designing web applications; and hands# on IoT-based projects.
Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s).
Enrollment Restriction(s): Pass One restricted to students in the College of Agricultural & Environmental Sciences.
Grade Mode: Letter.
General Education: Quantitative Literacy (QL); Visual Literacy (VL).

TAE 092 — Internship in Agricultural & Environmental Technology (1-12 units)

Course Description: Supervised internship in agricultural and environmental technology.
Prerequisite(s): Consent of instructor.
Learning Activities: Internship 3-36 hour(s).
Repeat Credit: May be repeated 12 unit(s).
Grade Mode: P/NP only.

TAE 098 — Directed Group Study (1-5 units)

Course Description: Directed group study.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable 1-5 hour(s).
Repeat Credit: May be repeated.
Grade Mode: Pass/No Pass only.
General Education: Science & Engineering (SE).

TAE 099 — Special Study for Lower Division Students (1-5 units)

Course Description: Special study for lower division students.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.
General Education: Science & Engineering (SE).

TAE 100 — Smart Control Systems for Agricultural & Environmental Technologies (4 units)

Course Description: Smart devices that communicate, sense their environment, and control their environment. Application examples include smart plant & animal care, and irrigation & fertigation. Technologies include Supervisory Control & Data Acquisition (SCADA) and Programmable Logic Controllers (PLCs) for applications in agricultural, environmental, and food sciences.
Prerequisite(s): Upper division standing; TAE 030 recommended.
Learning Activities: Lecture 2 hour(s), Discussion/Laboratory 2 hour(s).
Enrollment Restriction(s): Pass One restricted to Agricultural & Environmental Technology majors.
Credit Limitation(s): Only 3 units of credit if the student has taken EME 172 or EEC 157A or EEC 157AV or EEC 157B or EEC 157BY.
Grade Mode: Letter.

TAE 121 — Controlled Environments for Plants & Animals (4 units)

Course Description: Principles of environmental control (temperature, humidity, lighting, CO2, air circulation, air quality) for plants and animals. Psychrometrics and applications. Energy-efficient building envelopes for greenhouses, vertical farmings, and animal barns. Heating, ventilation, and air-conditioning (HVAC) systems, lighting and CO2 enrichment systems, growing substrates, and irrigation systems. Control systems (sensors and sensing for automated control). Visiting controlled environment facilities.
Prerequisite(s): Upper division standing in Agricultural Environmental Technology; or consent of instructor.
Learning Activities: Lecture/Discussion 3 hour(s); Laboratory 3 hour(s).
Enrollment Restriction(s): Pass One restricted to Agricultural & Environmental Technology or Biological Systems Engineering majors only.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Quantitative Literacy (QL); Writing Experience (WE).

TAE 192 — Internship in Agricultural & Environmental Technology (1-12 units)

Course Description: Supervised internship in agricultural and environmental technology.
Prerequisite(s): Consent of instructor; approval of project prior to period of internship.
Learning Activities: Internship 3-36 hour(s).
Enrollment Restriction(s): Restricted to upper division students.
Repeat Credit: May be repeated.
Grade Mode: Pass/No Pass only.

TAE 198 — Directed Group Study (1-5 units)

Course Description: Directed group study. May be taught abroad.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Repeat Credit: May be repeated.
Grade Mode: Pass/No Pass only.
General Education: Science & Engineering (SE).

TAE 199 — Special Study for Upper Division Students (1-5 units)

Course Description: Special study for advanced undergraduates. May be taught abroad.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.
General Education: Science & Engineering (SE).