UNIVERSITY OF GEORGIA

University of Georgia
Athens, Georgia 30602
univcouncil@uga.edu
www.uga.edu

University Council

February 14, 2020

UNIVERSITY CURRICULUM COMMITTEE – 2019-2020
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Undergraduate Student Representative – Melissa Hevener
Graduate Student Representative – Jordan Henley

Dear Colleagues:

The attached proposal from the College of Engineering for the following program changes will be an agenda item for the February 21, 2020, Full University Curriculum Committee meeting:

- Change the name of the major in Agricultural Engineering (B.S.A.E.) to Agricultural Systems Engineering (B.S.A.E.)
- Create a new Area of Emphasis in Agricultural Systems Automation Engineering under Agricultural Systems Engineering (B.S.A.E.)
- Create a new Area of Emphasis in BioLogistics under Agricultural Systems Engineering (B.S.A.E.)
- Create a new Area of Emphasis in Food Engineering under Agricultural Systems Engineering (B.S.A.E.)
- Create a new Area of Emphasis in Natural Resources Engineering under Agricultural Systems Engineering (B.S.A.E.)

Sincerely,

John Maerz, Chair
University Curriculum Committee

cc: Provost S. Jack Hu
Dr. Rahul Shrivastav

PROPOSAL FOR ACADEMIC UNIT NAME CHANGE

Date: January 29, 2020

Department/Division: School of Environmental, Civil, Agricultural and Mechanical Engineering

School/College/Unit: College of Engineering

Proposed Effective Date: Fall 2020

NAME CHANGE:

Current Name: Agricultural Engineering (B.S.A.E.)

Proposed Name: Agricultural Systems Engineering (B.S.A.E.)

JUSTIFICATION:

The existing Agricultural Engineering (B.S.A.E.) major, originally housed in the Department of Biological and Agricultural Engineering in the College of Agricultural and Environmental Sciences, now resides in the recently created College of Engineering. During the transition, Agricultural Engineering was used as a basis for launching the Civil, Mechanical, and Electrical and Environmental Engineering majors. This necessitates a need for revising the Agricultural Engineering major in order for it to remain viable. Given that agriculture is Georgia's largest industry, it is important to involve thought leaders from around the U.S. and Georgia to develop a plan that would be viable in the 21st century. A committee comprised of members of the National Academy of Engineering and former ASABE presidents, as well as Georgia Industry representatives, contributed input for the revising effort. The revised curriculum builds on expertise from Civil, Mechanical, and Electrical and Environmental Engineering to enable cutting-edge development work across the agricultural spectrum. A few key faculty lines are being recruited to further strengthen systems engineering capability. Agricultural Engineering is now the major in the College of Engineering portfolio that emphasizes systems engineering while serving the agricultural industry, hence the name change to Agricultural Systems Engineering (B.S.A.E.).

PROPOSAL FOR AN AREA OF EMPHASIS

Date: January 27, 2020

School/College: College of Engineering

Department/Division: School of Environmental, Civil, Agricultural, and Mechanical Engineering

Program (Major and Degree): Agricultural Systems Engineering (B.S.A.E.)

Area of Emphasis Title: Agricultural Systems Automation Engineering

Which campus(es) will offer this program? Athens

Proposed Effective Date: Fall 2020

CIP: 14030101

Area of Emphasis Description:
Recent rapid development in technologies, such as drones, robots, and advanced imaging sensors, is poised to help modern agriculture to be more productive and environmentally sustainable. This area of emphasis is envisioned to equip graduates with knowledge and skills in automation engineering to work in the agricultural systems domain. Required courses will help students build a strong foundation in electronics, control theory, advanced sensors, microcontrollers, machine vision, and robotics, whereas elective courses, such as Remote Sensing and Data Science, are designed to fit each student with a particular interest.

Required Courses (22 hours):

CSCI 1301-1301L	Introduction to Computing and Programming	4 hrs.
ELEE 3270	Electronics I	3 hrs.
ELEE 4210/6210	Linear Systems	3 hrs.
ELEE 4220/6220	Feedback Control Systems	3 hrs.
ELEE 4230/6230	Sensors and Transducers	3 hrs.
ELEE 4235/6235	Industrial Control Systems	3 hrs.
ELEE 4280/6280	Introduction to Robotics Engineering	3 hrs.

Elective Courses (Choose two courses (minimum of 6 hours) hours from the following):

AENG 3100	Motion and Time Studies	3 hrs.
AENG 4130	Precision Farming Controls and Sensors	3 hrs.
AENG 4120/6120	Introduction to Logistical Engineering	3 hrs.
BCHE 4710/6710	Bioelectrochemical Engineering	3 hrs.
CSCI 3360	Data Science I	4 hrs.
CSEE 4620/6620	Biomedical Imaging	3 hrs.
ELEE 4260/6260	Introduction to Nanoelectronics	3 hrs.

ELEE 4270	Electronics II	3 hrs.
FANR 3800, FANR 3800L	Spatial Analysis of Natural Resources, Spatial Analysis of Natural Resources Laboratory	3 hrs.
FDST 3000	Introduction to Food Science and Technology	3 hrs.
FDST 3700**	Survey of Food Processing	1 hr.
FDST 4012/6012-4012L/6012L	Food Processing II	3 hrs.
POUL(FDST) 4860/6860-4860L/6860L	Poultry Processing	3 hrs.

**Pending CAPA approval

Information related to FDST 3700, Survey of Food Processing

Proposed course would act as a prerequisite for FDST 4012/6012-4012L/6012L and would have a prerequisite of ENGR 3150 and ENGR 3160. Currently, Food Science students are taught basic heat/mass transfer in FDST 4011/6011-4011/6011L, and that course is the prerequisite for FDST 4012/6012-4012L/6012L. This material would be taught to engineering students in ENGR 3150 and ENGR 3160.

PROPOSAL FOR AN AREA OF EMPHASIS

Date: January 27, 2020

School/College: College of Engineering

Department/Division: School of Environmental, Civil, Agricultural, and Mechanical Engineering

Program (Major and Degree): Agricultural Systems Engineering (B.S.A.E.)

Area of Emphasis Title: BioLogistics

Which campus(es) will offer this program? Athens

Proposed Effective Date: Fall 2020

CIP: 14030101

Area of Emphasis Description:
The Area of Emphasis in BioLogistics provides a pathway for the study of moving food, feed, and fiber from the farm gate to the consumer. Operations management and quality management are a major focus, with emphasis on the handling of biological materials through a logistics chain.

Note: Successful completion of (BIOL 1107, BIOL 1107L) or (PBIO 1210, PBIO 1210L) is needed to meet prerequisite requirements.

Required Courses (21 hours):

AENG 3100	Motion and Time Studies	3 hrs.
AENG 3540	Physical Unit Operations	3 hrs.
AENG 4120/6120	Introduction to Logistical Engineering	3 hrs.
AENG 4160/6160	Introduction to Operations Research	3 hrs.
ELEE 3270	Electronics I	3 hrs.
ENGR 2140*	Strength of Materials*	3 hrs.
ENVE 4550/6550	Environmental Life Cycle Analysis	3 hrs.

**Requires a grade of "C" (2.0) or better.*

Elective Courses (Choose 3 courses (minimum of 7 hours) from the following):

AENG 4110	Postharvest Facilities Engineering	3 hrs.
ELEE 4230/6230	Sensors and Transducers	3 hrs.
ELEE 4240	Introduction to Microcontrollers	3 hrs.
ELEE 4540/6540	Applied Machine Vision	3 hrs.
ENGR 4350/6350	Introduction to Finite Element Analysis	3 hrs.
ENGR 4490/6190	Renewable Energy Engineering	3 hrs.
FDST 3000	Introduction to Food Science and Technology	3 hrs.
FDST 3700**	Survey of Food Processing	1 hr.

FDST 4012/6012-4012L/6012L	Food Processing II	3 hrs.
HORT(CRSS) 4430/6430	Plant Physiology	3 hrs.
MGMT 4000	Operations Management	3 hrs.
POUL(FDST) 4860/6860-4860L/6860L	Poultry Processing	3 hrs.
STAT 4260/6260	Statistical Quality Assurance	3 hrs.

**Pending CAPA approval

Information related to FDST 3700, Survey of Food Processing

Proposed course would act as a prerequisite for FDST 4012/6012-4012L/6012L and would have a prerequisite of ENGR 3150 and ENGR 3160. Currently, Food Science students are taught basic heat/mass transfer in FDST 4011/6011-4011/6011L, and that course is the prerequisite for FDST 4012/6012-4012L/6012L. This material would be taught to engineering students in ENGR 3150 and ENGR 3160.

PROPOSAL FOR AN AREA OF EMPHASIS

Date: January 27, 2020

School/College: College of Engineering

Department/Division: School of Environmental, Civil, Agricultural, and Mechanical Engineering

Program (Major and Degree): Agricultural Systems Engineering (B.S.A.E.)

Area of Emphasis Title: Food Engineering

Which campus(es) will offer this program? Athens

Proposed Effective Date: Fall 2020

CIP: 14030101

Area of Emphasis Description:
The Area of Emphasis in Food Engineering was envisioned to create graduates who can design equipment and processes for the food industry. A basic understanding of the food matrix and food industry-specific knowledge is fundamental and reflected in the required courses, while the elective courses are designed to allow flexibility for the individual student and their advisor to tailor a program to fit their specific interests.

Note: Successful completion of (BIOL 1107, BIOL 1107L) is required for this area of emphasis.

Required Courses (21 hours):

ELEE 3270	Electronics I	3 hrs.
ELEE 4230/6230	Sensors and Transducers	3 hrs.
ENGR 2140*	Strength of Materials*	3 hrs.
FDST 4012/6012-4012L/6012L	Food Processing II	3 hrs.
FDST 4013/6013-4013L/6013L	Food Processing III	3 hrs.
MCHE 3300	Machine Design I	3 hrs.
MCHE 4300	Mechanical Systems	3 hrs.

**Requires a grade of "C" (2.0) or better.*

Elective Courses (Choose 3 courses (minimum of 7 hours) from the following):

AENG 3540	Physical Unit Operations	3 hrs.
AENG 4110	Postharvest Facilities Engineering	3 hrs.
ELEE 4240	Introduction to Microcontrollers	3 hrs.
ELEE 4710	Fundamentals of Power Engineering	3 hrs.
FDST 3000	Introduction to Food Science and Technology	3 hrs.
FDST(MIBO) 4030/6030-	Food Microbiology	4 hrs.

4030L/6030L		
FDST 4250/6250-4250L/6250L	Principles of Food Product Development	2 hrs.
FDST(EHSC)(MIBO) 4320/6320-4320L/6320L	Food Safety Control Programs	3 hrs.
FDST 3700**	Survey of Food Processing	1 hr.
MCHE 4650/6650	HVAC Systems for Buildings and Industry	3 hrs.
PATH(HORT)(FDST) 3050	Viticulture and Enology in the Mediterranean Region	4 hrs.
POUL(FDST) 4860/6860-4860L/6860L	Poultry Processing	3 hrs.
STAT 4260/6260	Statistical Quality Assurance	3 hrs.

**Pending CAPA approval

Information related to FDST 3700, Survey of Food Processing

Proposed course would act as a prerequisite for FDST 4012/6012-4012L/6012L and would have a prerequisite of ENGR 3150 and ENGR 3160. Currently, Food Science students are taught basic heat/mass transfer in FDST 4011/6011-4011/6011L, and that course is the prerequisite for FDST 4012/6012-4012L/6012L. This material would be taught to engineering students in ENGR 3150 and ENGR 3160.

PROPOSAL FOR AN AREA OF EMPHASIS

Date: January 27, 2020

School/College: College of Engineering

Department/Division: School of Environmental, Civil, Agricultural, and Mechanical Engineering

Program (Major and Degree): Agricultural Systems Engineering (B.S.A.E.)

Area of Emphasis Title: Natural Resources Engineering

Which campus(es) will offer this program? Athens

Proposed Effective Date: Fall 2020

CIP: 14030101

Area of Emphasis Description:
The Area of Emphasis in Natural Resources Engineering addresses problems at the rural-urban interface where environmentally associated issues of land development and cultivation meet the quality of life expected by suburban residents. Sustainable food, feed, and fiber production, along with environmental sustainability, are emphasized.

Required Courses (21 hours):

CVLE 3420	Introduction to Soil Mechanics	3 hrs.
CVLE 3440	Hydraulics of Closed Conduit Flow	3 hrs.
ENGR 2140*	Strength of Materials*	3 hrs.
ENVE 4435/6435	Natural Resources Engineering	3 hrs.
ENVE 4470/6670	Environmental Engineering Unit Operations	3 hrs.
ENVE 4710	GIS for Urban Engineering, Planning, and Development	3 hrs.
WASR(CRSS)(ECOL)(ENGR)(GEOG)(GEOL) 4700L/6700L	Hydrology, Geology and Soils of Georgia	3 hrs.

**Requires a grade of "C" (2.0) or better.*

Elective Courses (Choose 3 courses (minimum of 7 hours) from the following):

AENG 4150/6150	Environmental Biophysics	3 hrs.
AENG(CVLE) 4170	Wind and Water Erosion Prediction	3 hrs.
AENG(CVLE) 4180	Irrigation Systems Design	3 hrs.
AENG 4130	Precision Farming Controls and Sensing	3 hrs.
BCHE(ENVE) 4490/6490	Environmental Engineering Remediation Design	3 hrs.

CRSS(FANR) 3060, CRSS(FANR) 3060L	Soils and Hydrology, Soils and Hydrology Laboratory	4 hrs.
CRSS 4600/6600	Soil Physics	3 hrs.
CVLE 2210	Principles of Surveying and Transportation	2 hrs.
CVLE 3450	Civil Engineering Laboratory - Soils	1 hr.
CVLE 3460	Civil Engineering Laboratory - Hydraulics	1 hr.
CVLE 3610	Structural Design	3 hrs.
CVLE(MCHE) (LAND) 4660/6600	Sustainable Building Design	3 hrs.
ELEE 4230/6230	Sensors and Transducers	3 hrs.
ELEE 4240	Introduction to Microcontrollers	3 hrs.
ENGR(ATSC)(GEOG) 4161/6161, ENGR(ATSC) (GEOG) 4161L/6161L	Environmental Microclimatology	3 hrs.
ENGR 4490/6190	Renewable Energy Engineering	3 hrs.
ENVE 4410/6410	Open Channel Hydraulics	3 hrs.
MCHE 4650/6650	HVAC Systems for Buildings and Industry	3 hrs.
WASR 4500/6500	Quantitative Methods in Hydrology	3 hrs.

Approvals on File

Proposal: Name Change and New Areas of Emphasis under Agricultural Systems Engineering (B.S.A.E.)

College: College of Engineering

Department: School of Environmental, Civil, Agricultural, and Mechanical Engineering

Proposed Effective Term: Fall 2020

Department:

- School of Environmental, Civil, Agricultural, and Mechanical Engineering Chair, Dr. Sidney Thompson, 1/27/20

School/College:

- College of Engineering Associate Dean, Dr. Ramaraja Ramasamy, 1/21/20
- College of Engineering Dean, Dr. Don Leo, 1/27/20