PROPOSED PROGRAM SUMMARY

Institution: Kentucky State University
Program Name: Biological and Agricultural Engineering
Degree Destination: Master of Science

CIP Code: 14.0301
Credit Hours: 36
Implementation Date: 8/1/2025

Program Description

As one of 19 land-grant HBCUs nationwide, Kentucky State University has long been recognized for its work in aquaculture, and this program will build upon that reputation. The proposed Master of Science in Biological and Agricultural Engineering program will prepare students to apply mathematical and scientific principles to the design, development, and operational evaluation of equipment and facilities to produce, process, store, handle, and distribute food, feed, and fibers. The program will emphasize research competency, including designing and conducting experiments and interpreting data. In addition to typical agricultural applications, the program will also promote applications to aquaculture and forestry.

As part of the graduation requirement, students will work on a real-world engineering problem, in partnership with a sponsoring industry partner. A regional board of industry leaders will provide feedback on the curriculum and assess potential internship opportunities with corporate entities throughout the world.

As a result of this program, graduates will be able to:

- identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
- apply engineering design to produce solutions that consider public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;
- recognize ethical and professional responsibilities in engineering situations and make informed judgments that consider global, economic, environmental, and societal contexts; and
- conduct independent research using appropriate research design, methods, and analysis.

Connection to Other Programs

Kentucky State University currently offers master's degrees in Aquaculture and Aquatic Sciences, and in Environmental Studies. Therefore, the institution currently has faculty with expertise in the areas of aquaculture and aquatic sciences, horticulture, soil science, soil-less science, entomology, food technology, and agricultural economics. The proposed program will benefit from these existing faculty, as well as the facilities and physical resources used by the existing graduate programs. The institution also has sufficient facilities (including library and learning resources, and science and technology laboratories) and student support services for the program. Kentucky State University received approval last academic year for a baccalaureate program in the same field, which can supply students for the master's program.

A similar program exists at the University of Kentucky, but Kentucky State University demonstrated sufficient student and market demand.

Student Demand

Initial estimates of enrollment are:
Year 1 – 10
Year 2 – 20
Year 3 – 40
Year 4 – 60
Year 5 – 80

Employment Demand

Based on data from the Bureau of Labor Statistics, heightened public awareness of the hazards facing the environment is contributing to the demand for agricultural and environmental engineers. For example, these workers will help design solutions to mitigate pollution and promote access to clean drinking water. Employment of agricultural and environmental engineers is projected to grow 6% from 2022 to 2032, faster than the average for all occupations. Regional demand suggests graduates can anticipate strong earning potential, with an entry-level salary of $73,812 and post-entry median salary of $96,218. Nationally, approximately 3,400 openings for agricultural and environmental engineers are projected each year, on average, over the next decade.

Budget

Funding is available from the USDA and other governmental funding agencies, including scholarships for HBCU master's programs. These funds will cover three-quarters of the cost of the two faculty members needed for the program, with tuition covering the remaining twenty-five percent.

Projected Revenue over Next Five Years ($):	$ 2,693,500
Projected Expenses over Next Five Years ($):	$ 2,136,200