

November 15, 2018

**Subject: Proposal for Advanced SmartAg Systems Certificate**

The Agricultural & Biological Engineering Department proposes a new Advanced SmartAg Systems Certificate. Engineering graduate students and professionals will be trained in several topical areas relevant to modern computation-based innovations in agriculture termed SmartAg. A tiered course structure introduces students to concepts of precision agriculture, instrumentation, and control methods in SmartAg applications. SmartAg which has been identified as the nexus of future technology development in agriculture combining aspects of previous trends such as Precision Agriculture, Digital Agricultural, Agriculture 4.0, Agricultural IOT, and Big Data into a new paradigm that would draw technical expertise and support from across engineering disciplines.

Requirements: Students will be required to successfully complete 15 credit hours of courses listed below to earn the Advanced SmartAg Systems Certificate. A 3-tier sequence of courses was devised based on current catalog of courses with emphasis on precision agriculture, instrumentation and SmartAg concepts. The 3-tier sequence consists of three required courses followed by electives that can be selected according to the student's area of focus or interest. The first three courses introduce students to precision agriculture concepts such as data collection and mapping, yield monitoring, prescription application, temporal and spatial variability of soil, moisture and crop factors. Instrumentation will expose students to data analysis, systems characterization, uncertainty analysis, analog and digital devices and circuits, sensors, multisim, labview and Arduino based data acquisition and control. Meanwhile, the SmartAg course introduces students to fundamental computational control approaches such as, decision support, fuzzy logic, neural networks, classifiers, process control and motion control applied to agriculture.

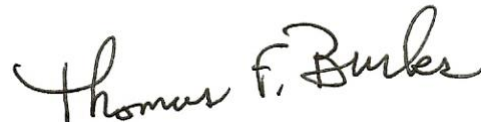
Tier 1: AOM5435 Precision Agriculture and ABE6031 Instrumentation

Tier II: ABE5XXX Control Methods in SmartAg Systems

Tier III: Choose two from ABE5038 Fundamentals Biosensors, ABE5152 Advanced Fluid Power Circuits and Control, ABE6005 Applied Control for Automation and Robotics, ABE6035 Advanced Remote Sensing, ABE6645C Computer Simulation Crop, ABE6933 Statistical Machine Learning, ABE6933 Logistics of Agricultural Food Chains, GIS6116 GIS

Analysis (other classes will be added). All tier I, II, III courses are 3 credits and letter grade.

Sincerely,

A handwritten signature in black ink that reads "Thomas F. Burks". The signature is written in a cursive style with a large, looping 'T' and 'B'.

Thomas F. Burks, Ph.D.  
Professor