**Agricultural Systems Technology (AST)**

**Machine Systems Option (MS)**

A Curricular Program in the College of Agriculture and Life Sciences

Department of Agricultural and Biosystems Engineering

Iowa State University

Student Enrollment, Fall 2022: 123

Students Graduated (Spring 2022, Summer 2022, and Fall 2022): 32

The mission of the AST-MS degree program at Iowa State University is to prepare individuals to manage applied engineering and technology systems and people for agricultural machinery and off-road equipment used in producing, processing, marketing, and distributing food, feed, and other biological products worldwide.

**General Outcomes:**

At two to five years after graduation, graduates of the AST-MS program, through professional practice, should:

1. Have demonstrated competence in methods of analysis involving use of mathematics, fundamental physical and biological sciences, technology, and computation needed for the professional practice in the field of agricultural technology.
2. Have developed skills necessary to contribute to the design process; including the abilities to think creatively, to formulate problem statements, to communicate effectively, to synthesize information, and to evaluate and implement problem solutions.
3. Be capable of addressing issues of ethics, safety, professionalism, cultural diversity, globalization, environmental impact, and social and economic impact in professional practice.
4. Have demonstrated continuous professional and technical growth, with practical experience, so as to be licensed in their field or achieve that level of expertise, as applicable.
5. Have demonstrated the ability to be a successful leader of multi-disciplinary teams.
6. Have demonstrated the ability to efficiently manage multiple simultaneous projects.
7. Have demonstrated the ability to work collaboratively.
8. Have demonstrated the ability to implement multi-disciplinary systems-based solutions.
9. Have demonstrated the ability to apply innovative solutions to problems through the use of new methods or technologies.
10. Have demonstrated the ability to contribute to the business success of their employer.
11. Have demonstrated the ability to build community.

**Program Learning Outcomes:**

Outcomes are statements of measurable knowledge, skills, and abilities. At the time of graduation, students should be able to:

1. Apply knowledge of mathematics, science, computation, and applied engineering to identify and solve applied science and technology problems
2. Develop and conduct experiments, and analyze and interpret resulting data
3. Evaluate and adapt systems, components, processes, or programs to meet specified needs
4. Function effectively on multi-disciplinary teams
5. Communicate effectively, ethically, and professionally in written, oral, and other formats to technical and non-technical audiences
6. Understand the potential impacts and limitations of solutions in global and societal contexts
7. Recognize the need for, and demonstrate an ability to engage in life-long learning
8. Effectively apply modern scientific and technical tools necessary for professional practice to address contemporary issues in applied engineering and technology

**Option outcomes**

1. Specify, manage, and test machine systems in the context of a complete agricultural, biological production or processing system
2. Use and apply the technology of machine systems including power and information flows, function and interaction with biological materials
3. Perform energy and costs analyses of complete machine systems to ensure the success and sustainability of an enterprise.