

# BS in Agricultural Systems Technology

## Degree Program Description

Agricultural Systems Technology combines interests in technology, machines, and business. The business and technical skills acquired prepares students for a variety of careers in many industries, including Agricultural and Power Equipment Manufacturing, Equipment Sales, Food Production and Processing, and Government. In Agricultural and Power Equipment Manufacturing, companies such as Caterpillar, Case IH and John Deere seek product developers, managers and supervisors trained in the latest in precision agriculture, hydraulics, electrical circuits, engines and machinery management. In Equipment Sales, local and regional dealerships who sell agricultural machinery to agricultural producers seek technical sales representatives who possess strong product knowledge and an understanding of business finance and marketing to provide producers with the equipment they need. In Food Production and Processing, companies such as Anheuser-Busch, Archer Daniels Midland, Frito-Lay, Pioneer Hi-Bred, Cargill and Purina Mills seek grain elevator and mill operators and managers to properly handle, store and process agricultural crops and materials. In Government, state and federal agencies such as the Missouri Department of Natural Resources, the U.S. Department of Agriculture and the Natural Resources Conservation Service seek consultants and specialists to oversee and regulate pesticide application, water handling and irrigation systems, animal waste management systems, and watershed management.

## Major Program Requirements

Students who earn a Bachelor of Science in Agricultural Systems Technology, the management of technical agricultural systems, are required to complete all University general education (<http://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements/>), University graduation (<http://catalog.missouri.edu/academicdegreerequirements/universityrequirements/>) and degree requirements, including selected foundational courses, which may fulfill some University general education requirements. **Two tracks of learning are available:** 1) **Agricultural Systems Technology (AST)** and 2) **Precision Agriculture Technology (PAT)**.

If you are planning to transfer courses (including AP credit) and would like to information on how they apply to a degree program(s), you can email [CAFNRadvising@missouri.edu](mailto:CAFNRadvising@missouri.edu) for general recommendations.

### Foundational Courses

MATH 1100	College Algebra	3
ABM 2225	Statistical Analysis	3
or MATH 1140	Trigonometry	
or MATH 1400	Calculus for Social and Life Sciences I	
or MATH 1500	Analytic Geometry and Calculus I	
or STAT 1200	Introductory Statistical Reasoning	
or ABM 2123	Quantitative Applications in Agricultural and Natural Resource Sciences	
CHEM 1100	Atoms and Molecules with Lab	3
or CHEM 1100H	Atoms and Molecules with Laboratory - Honors	
or CHEM 1320	College Chemistry I	

or CHEM 1320H	College Chemistry I - Honors	
BIO_SC 1010 & BIO_SC 1020	General Principles and Concepts of Biology and General Biology Laboratory	3-5
or BIO_SC 1030	General Principles and Concepts of Biology with Laboratory	
or BIO_SC 1200	General Botany with Laboratory	
or BIO_SC 1500	Introduction to Biological Systems with Laboratory	
or BIO_SC 1500H	Introduction to Biological Systems with Laboratory Honors	

ABM 1041	Applied Microeconomics	3
ABM 1042	Applied Macroeconomics	3
COMMUN 1200	Public Speaking	3
or COMMUN 1200H	Public Speaking - Honors	
AGSC_COM 2220	Verbal Communication in Agriculture, Food and Natural Resources	3
or AGSC_COM 2220H	Verbal Communication in Agriculture, Food and Natural Resources - Honors	

### CORE Requirements

ACCTCY 2036	Accounting I	3
or ACCTCY 2010	Introduction to Accounting	
or ACCTCY 2026	Accounting I	
or ACCTCY 2136H	Honors Accounting I	
AG_S_TCH 1020	Introduction to Agricultural Systems Technology	3
AG_S_TCH 1040	Physical Principles for Agricultural Applications	3
AG_S_TCH 2199	Seminar in Professional Development	1
AG_S_TCH 2340	Pesticide Application Equipment	3
AG_S_TCH 3225	Sensors and Control for Agricultural Systems	3
AG_S_TCH 4140	Electricity: Wiring and Equipment	3
AG_S_TCH 4360	Precision Agriculture Science and Technology	3
AG_S_TCH 4460	Irrigation and Drainage	3
or AG_S_TCH 4420	Surface Water Management	
AG_S_TCH 4970	Agricultural Systems Technology-Capstone	3

**Two tracks of learning are available:** 1) **Agricultural Systems Technology (AST)** and 2) **Precision Agriculture Technology (PAT)**.

### Agricultural Systems Technology (AST):

#### Courses Required for AST Track (AST)

AG_S_TCH 2220	Agricultural/Industrial Facility Systems	3
AG_S_TCH 2360	Fluid Power	3
AG_S_TCH 4020	Agricultural Safety and Health	3
AG_S_TCH 4160	Internet of Things for Agricultural Technology	3
AG_S_TCH 4220	Material Handling and Conditioning	3
AG_S_TCH 4320	Agricultural Equipment and Machinery	4
AG_S_TCH 4390	Optimization and Management of Food and Agricultural Systems	3
ABM 3241W	Ethical Issues in Agriculture - Writing Intensive	3
ABM 3256	Agribusiness and Biotechnology Law	3
ABM 3260	General Farm Management	3

**Select 35 semester hours Professional Electives to Strengthen the AST Track**

AG_S_TCH 2320	Internal Combustion Power	3
AG_S_TCH 4365	Machinery Management Using Precision Agriculture Technology	3
AG_S_TCH 4366	Data Management and Analysis Using Precision Agriculture Technology	3
AG_S_TCH 4368	Profit Strategies Using Precision Agriculture Technology	3
AG_S_TCH 4420 or AG_S_TCH 4460	Surface Water Management Irrigation and Drainage	3
AG_S_TCH 3350	Problems in Agricultural Systems Technology	1-5
AG_S_TCH 4350	Problems in Agricultural Systems Technology	1-5
AFNR 2191	International Agriculture and Natural Resources - Humanities	1-6

**Courses to strengthen your Minor in Ag Business Management with the AST Track**

ABM 1200	Applied Computer Applications	3
ABM 2183	The Economics of the Food, Fiber and Fuel Supply Chain	3
ABM 2223	Agricultural Sales	3
ABM 3230	Agricultural and Rural Economic Policy	3
ABM 3283	Fundamentals of Entrepreneurship	3
ABM 3294	Agricultural Marketing and Procurement	3
ABM 3295	Real Money: Speculative Trading for Beginners	3
ABM 4223	Professional Solution Selling	3
ABM 4230	Understanding the Agricultural Policy Process	3

**Precision Agriculture Technology (PAT)**
**Precision Agricultural Technology Track (PAT)**

AG_S_TCH 4365	Machinery Management Using Precision Agriculture Technology	3
AG_S_TCH 4366	Data Management and Analysis Using Precision Agriculture Technology	3
AG_S_TCH 4368	Profit Strategies Using Precision Agriculture Technology	3
AG_S_TCH 4940	Agricultural Systems Technology Internship	2-5
ABM 1200	Applied Computer Applications	3
ABM 2223	Agricultural Sales	3
ABM 2225 or ABM 2123	Statistical Analysis Quantitative Applications in Agricultural and Natural Resource Sciences	3
SOIL 2100	Introduction to Soils	3
SOIL 2106	Soil Science Laboratory	2
PLNT_SCI 2125	Plant Structure and Function	3
PLNT_SCI 3275	Grain Crops	3
PLNT_SCI 4313 or SOIL 4313	Soil Fertility and Plant Nutrition Soil Fertility and Plant Nutrition	3
NAT_R 2325	Introduction to Geographic Information Systems	3

**Select 31 semester hours AST Professional Electives to Strengthen the PAT Track**

AG_S_TCH 4160	Internet of Things for Agricultural Technology (Select from these AST electives to strengthen your AST Track)	3
AG_S_TCH 4320	Agricultural Equipment and Machinery	4
AG_S_TCH 4390	Optimization and Management of Food and Agricultural Systems	3
AG_S_TCH 3350	Problems in Agricultural Systems Technology	1-5
AG_S_TCH 4350	Problems in Agricultural Systems Technology	1-5
AG_S_TCH 4940	Agricultural Systems Technology Internship	2-5
AFNR 2191	International Agriculture and Natural Resources - Humanities	1-6

**Select one course from the following to earn a Minor in Plant Science with the Precision Ag Track**

PLNT_SCI 3210	Principles of Weed Science	4
PLNT_SCI 3270	Forage Crops	3
PLNT_SCI 3710	Introductory Entomology	3

In consultation with their advisor, students may select elective courses to bring their total credit hours to the 120 hour minimum. Typically electives are chosen to provide emphasis in one of the following areas:

- Natural resource and environment
- Materials handling and crop processing
- Power and machinery systems
- Production agriculture

## Accelerated BS to MS in Food and Hospitality Systems

The accelerated BS to MS in Food and Hospitality Systems allows students to complete a bachelors and masters degree within five years.

Students will need to select the Agricultural Systems Technology track in the MS in Food and Hospitality Systems. Eligible students will need to complete at least 90 credit hours, (including all general education and academic course requirements), with a cumulative GPA of 3.0 or higher.

Each student will be accepted by at least one graduate faculty advisor who will advise and mentor the student from when they are a Provisional Graduate Student (year 1) until completion of the MS program. Once students complete 120 credit hours, they will be conferred the BS degree.

Students accepted to the program may enroll in up to 15 credit hours of graduate level courses, (7000 or 8000 level), during their Provisional Graduate year that will count towards both their BS and MS degrees as shared credits. The remaining 15 credit hours of graduate credit will be completed during their Graduate Student year (year 2) for a total of 30 graduate credit hours. At least 15 credit hours must be at the 8000 level or higher.

Total credits required for graduation must be at least 138 total credit hours.

- Total undergraduate credits: 120
- Total dual credits: 12-15
- Total graduate credits: 30

<b>First Year (as Provisional Graduate Student)</b>	<b>12-15</b>
7000 level courses <sup>1</sup>	12-15
<b>Second Year (as Graduate Student)</b>	<b>15-18</b>
STAT 7070	Statistical Methods for Research 3

F_S 8402	Research Methods in Food Science	2
F_S 8087	Seminar in Food Science	1
F_S 8090	Research in Food Science	6
or AG_S_TCH 8090	Thesis Research in Agricultural Systems Technology	
8000 level courses <sup>1</sup>		6

<sup>1</sup> According to course options of each track.

### Requirements for Thesis/Non-Thesis

Students may choose the thesis or non-thesis option. Students must take at least 6 credit hours of research credit (F\_S 8090 or AG\_S\_TCH 8090) for either option.

**Thesis Option:** Students conduct independent research on a topic approved by the students advisor and graduate committee. Students present and defend their theses, and complete a manuscript on their research that is suitable for publication at the end of their program.

**Non-Thesis Option:** Students conduct independent research on a topic approved by the students advisor and graduate committee. Students present their research and write a technical report on their research at the end of their program.

### Example AST Track Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	CR	Spring	CR
AG_S_TCH 1020		3 AG_S_TCH 1040	3
AG_S_TCH 2199		1-3 ABM 1042	3
ABM 1041		3 ENGLISH 1000	3
MATH 1100		3 HIST 1100, 1200, POL_SC 1100, or POL_SC 2100	3
BIO_SC 1010		3 BIO_SC 1020	2
			<b>14</b>
<b>13-15</b>			
Second Year			
Fall	CR	Spring	CR
AG_S_TCH 2360		3 AG_S_TCH 2220	3
Humanistic Studies and/or Fine Arts		3 AG_S_TCH 2340	3
AGSC_COM 2220		3 AG_S_TCH 3220	3
ABM 2223		3 SOIL 2100	3
CHEM 1100		3 STAT 1200	3
			<b>15</b>
Third Year			
Fall	CR	Spring	CR
AG_S_TCH 4140		3 AG_S_TCH 4020	3
AG_S_TCH 4160		3 AG_S_TCH 4220	3
AG_S_TCH 4360		3 AG_S_TCH 4365	3
AGSC_COM 3240		3 ABM 3224W	3
COMMUN 1200		3 ACCTCY 2036	3
			<b>15</b>
Fourth Year			
Fall	CR	Spring	CR
AG_S_TCH 4320		4 AG_S_TCH 4368	3
AG_S_TCH 4366		3 AG_S_TCH 4390	3
AG_S_TCH 4970W		3 AG_S_TCH 4460	3

PLNT_SCI 2110	3 ABM 3256	3
ABM 3260	3 PLNT_SCI 3275	3
		<b>15</b>

**Total Credits: 118-120**

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### Example PAT Track Semester Plan

First Year			
Fall	CR	Spring	CR
AG_S_TCH 1020		3 AG_S_TCH 1040	3
AG_S_TCH 2199		1-3 ABM 1042	3
ABM 1041		3 ENGLISH 1000	3
MATH 1100		3 AGSC_COM 2220	3
BIO_SC 1200		5 HIST 1100	3
			<b>15-17</b>
			<b>15</b>
Second Year			
Fall	CR	Spring	CR
AG_S_TCH 2360		3 AG_S_TCH 2340	3
AG_S_TCH 4140		3 AG_S_TCH 3220	3
ABM 1200		3 AG_S_TCH 4390	3
ABM 3224W		3 SOIL 2100	3
CHEM 1100		3 SOIL 2106	2
			<b>14</b>
			<b>15</b>
Third Year			
Fall	CR	Spring	CR
AG_S_TCH 4320		4 AG_S_TCH 4220	3
AG_S_TCH 4360		3 AG_S_TCH 4365	3
AG_S_TCH 4940		2-5 NAT_R 2325	3
PLNT_SCI 3210		4 PLNT_SCI 2125	3
AGSC_COM 3240		3 SOIL 4313	3
			<b>15</b>
			<b>16-19</b>
			<b>15</b>
Fourth Year			
Fall	CR	Spring	CR
AG_S_TCH 4366		3 AG_S_TCH 4368	3
AG_S_TCH 4970W		3 AG_S_TCH 4460	3
ABM 2223		3 ABM 2225	3
ABM 3260		3 PLNT_SCI 3275	3
SOIL 4320		4 ABM 3256	3
			<b>16</b>
			<b>15</b>

**Total Credits: 121-126**