SELF STUDY

SECTION TWO

Includes individual program assessments for Undergraduate and Graduate programs on Logan, Main Campus.
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College of Agriculture and Applied Sciences

School of Applied Sciences, Technology and Education (ASTE)

Utah State University

Assessment Plan

For the Undergraduate Program in
Agricultural Communication and Journalism (ACAJ)

Fall 2013
I. Program Description

The Agricultural Communication and Journalism Program prepares students for professional communication careers in the agricultural and environmental industries. The agricultural production and processing industry is faced with issues of image, ethics, and survival. American agriculture is scrutinized by consumers, government agencies, and environmental interest groups. The greatest deficiency in agricultural production is the effective communication of ideals and standards to wide and varied audiences. Students in the major learn to communicate about agricultural issues to audiences that include consumers, farmers, legislators, commodity groups, and government agencies. Students in agricultural communication and journalism develop skills in media writing, graphic design, sales, marketing, video and audio production, photography, technical writing and scientific writing. Graduates of this option are employed in: (1) communication or management positions with the numerous commodity or special-interest associations in agriculture and related fields; (2) communication positions in agricultural extension and research information departments of land-grant universities, the United States Department of Agriculture, state departments of agriculture; (3) advertising and public relations positions with agribusinesses, firms or commodity associations; and (4) media positions in radio, television, magazines and newspapers.

I. Degrees and Emphasis Options Offered

Students earn a bachelor’s of science degree in Agricultural Communication and Journalism. Students concentrate their journalism and communication coursework in one of three emphasis areas:

1. Public Relations/Corporate Communication
   A public relations/corporate communication emphasis trains students how to manage the public perceptions of an organization, business or person. Students learn writing, image building, media relations, event planning, web communications, social media and much more.

2. Broadcast/Video News
   A broadcast/video news emphasis prepares students with the skills and knowledge necessary for a career in radio, television and other communications industries. Students gain hands-on experiences working with technology used in the broadcasting field.

3. Print
   A print emphasis instructs students how to find, collect and report the news. Students typically find careers writing, editing, selling or designing for newspapers and magazines.
III. ACAJ Program Mission Statement

The mission of the Agricultural Communication and Journalism Program is to produce graduates who possess communication skills and a strong background in agricultural sciences that translate into the workplace.

IV. Alignment of Program Mission with Department Mission

The Agricultural Communication and Journalism Program prepares graduates to communicate about agricultural and environmental issues. Students learn to use technology, such as broadcasting equipment, digital cameras, graphic design software, website design software and social media tools, to disseminate news. Graduates can disseminate information that meets the needs of producers, consumers, government officials and the media.

V. Program Goals

Program Goals

1. To promote a broader understanding of agriculture among a diverse national and global citizenry.
2. To demonstrate and apply effective written, verbal, listening and visual skills in communication related to agricultural and environmental sciences.
3. To demonstrate the ability to work in a professional communications setting through experiential learning (i.e. internships, work experience, student organizations).

Operational Goals

1. Increase enrollment in the program by 10% (2 students) each academic year.
2. Strengthen recruiting efforts targeting traditional and non-traditional markets for agricultural communication and journalism.
3. Enhance recruiting efforts and collaborative programs targeting four-year colleges and community colleges.
4. Collaborate with Utah FFA to assist with the Ag Communication Career Development Events (those students are already interested in the major’s activities).
5. Have Agricultural Communication Club members participate in the CAAS Ag Week activities, promoting the club and academic program.
6. Obtain an 80% retention rate for first year students each academic year.
7. Offer professional development opportunities that interest students through Agricultural Communication Club activities, National Agricultural Communicators of Tomorrow and professional organizations.
8. Advise students throughout their internship experiences.
9. Require that students enrolled in ASTE 1710 meet with their academic advisor.
10. Provide experiential learning experiences in ASTE 1710 that show students what they can do with a degree in agricultural communication and journalism.
11. Develop an advisory board of professionals employed in agricultural communication and journalism who provide insight about curriculum and industry trends by 2015.
12. Identify alumni from the Agricultural Communication and Journalism Program who have a career in the field.
13. Identify professionals (not graduates from the program) who have expert knowledge in the program field.

VI. Learning Objectives

To meet the mission of the program, the Agricultural Communication and Journalism (ACAJ) Program will offer a varied program of study with the following objectives:

1. Students will possess a high degree of agricultural literacy and an adequate reservoir of skills and knowledge in agricultural subjects to meet the need of the agricultural communication profession.
2. Students will demonstrate knowledge of skills used in journalism and communication professions.
3. Students will explore career opportunities in agricultural communication and journalism.
4. Students will demonstrate knowledge of trends in agricultural communication and journalism.
5. Students will write professional and technical documents.
6. Students will gain experiences in leadership styles, program planning, and meeting organization while practicing leadership and communication principles.
7. Students will demonstrate knowledge of the practical understanding of the workings of mass communication principles and practice.
8. Students will demonstrate knowledge of the roles and responsibilities of mass communication in a democratic society.
9. Students will think critically and analytically.
10. Students will conduct, analyze and report social science research.
11. Students will use and evaluate technologies that enhance the communication process.
12. Students will demonstrate knowledge of the philosophical, ethical and legal frameworks of mass communication.

VII. Course Map (See Appendix 1A)

VIII. Course List with Descriptions (See Appendix 1B)
IX. Strengths, Weaknesses and Recommendations

Strengths

Agricultural Communication & Journalism Internship Program
Students who have accepted a legitimate communications internship can enroll in ASTE 2250-002 or ASTE 4250-002 to earn up to 3 credit hours for 150 hours completed. Several assignments help the student document the experience and reflect on what they have learned. Students complete these assignments:
1. A five-page paper evaluating the internship experience.
2. A hard copy or electronic portfolio that includes examples of the materials produced during the internship, including any writing, design, photography, social media, web design, educational materials or other tangible demonstrations. A detailed narrative must accompany each item in the portfolio.
3. A one-page summary of the internship with digital photographs taken during the internship. The summary and photos are published on the ASTE Department Student Blog.
4. An electronic evaluation of the internship experience from the supervisor.
6. A confidential evaluation of the student’s work experience, so the program has feedback about the employer for the interest of future student

Agricultural Communication Club
Agricultural Communication Club fosters career and professional development among industry professionals, faculty, and students within the agricultural communications field. The club is an official chapter of the National Agricultural Communicators of Tomorrow and an official university club.

Weaknesses and Recommendations

Lack of Experience in Graphic Design
Many students do not receive classroom training in editing photos, creating logos, and designing marketing materials that are commonly used in the agricultural communication field. The program identified this weakness and added ASTE 3090 – Graphic Communication in Agriculture starting spring 2014.

No Senior Capstone Course
Students take ASTE 4900 as a capstone course in the major. Many agricultural communication and journalism programs offer a capstone course that integrates all of the students’ pervious course experiences to produce a publication. Students would sell, design and layout advertisements; communicate with advertisers; search for, write, peer critique and edit feature stories about students, faculty and programs in a college or department; design and create feature story layouts; work with high-resolution graphics and interact with peers to solve problems and take advantage of opportunities. The program advisors would like to implement similar opportunities for seniors.
No Required Public Speaking Course

Industry professionals have participated in studies seeking out the competencies needed by agricultural communication undergraduates. The ability to effectively communicate verbally was ranked fifth in a list of communication skills. The program recommends listing speech courses as directed electives for students in the major.

X. Plan for Measuring the Achievement of Degree and Program Objectives

We assert that communication skills as well as an understanding of the roles and responsibilities of both the mass media and individuals, whether as producers or consumers of information, are essential to mutual understanding and individual freedom in the information age. Therefore, we seek to foster the development of agriculturally literate communication professionals.

Measures of program assessment will include the completion of a rigorous plan of study with a varied list of required and elective courses, entrance and graduation requirements, student academic career portfolios, capstone course requirements with the option of an internship, exit interviews with an emphasis on program development and other measurements which agricultural communication and journalism faculty is willing to develop as the program grows cooperatively within the framework of the Department of Journalism and Communication as well as the School of Applied Sciences, Technology and Education. For specific descriptions of measurement and assessment, refer to the next section of this document “Expected Standards of Performance”.

Expected Standards of Performance

To further the program goals, graduates should demonstrate the following abilities:

A. Communication skills: Writing and verbal skills, information-gathering, fact-checking, the synthesis of ideas, deductive logic
B. Philosophical grounding: Understanding of the philosophical, historical, ethical antecedents of modern mass communication practice in the context of the First Amendment and a free and open society, and how those lessons apply in day-to-day mass media practice for media producers and consumers
C. Critical thinking and analysis: The ability to evaluate mass media messages and campaigns, to understand how media and society interact and implications of that interaction
D. Professional and personal responsibility: Affirmation of the individual's responsibilities as either a producer or consumer of information in a democratic mass media age
E. Market savvy: Exposure to real-world situations that instruct and demonstrate application of classroom learning
Formative and Summative Assessment Measures

Coursework
The Agricultural Communication and Journalism major is designed to develop the needed background knowledge of the agricultural industry as students matriculate through the coursework in the Department of Journalism and Communication. Coursework covers topics in the following fields: animal science, biotechnology, plant science, agricultural business, textiles, agricultural sales, nutrition, landscape architecture, agricultural leadership, technical and professional communication, digital communication, journalism and communications with an emphasis in public relations.

Entrance/graduation requirements
All graduates from the department must satisfy requirements for the basic core curriculum and meet the following minimum requirements: (1) Grade point average must be 2.50 or higher in all courses required for the major; (2) Courses required for the major may be repeated only once to improve a grade; (3) Courses required for the major may not be taken for pass-fail credit.

Portfolios
Student portfolios are to be developed by all Agricultural Communication and Journalism majors. Portfolios will be introduced in the introductory course ASTE 1710 and assignments will be made to be appended to the portfolio during the career of the student within the context of ASTE Agricultural Communication courses. Portfolios will be completed and presented in the capstone course, ASTE 4900.

Exit interviews
All graduates in Agricultural Communication and Journalism Program will complete an exit interview in connection with ASTE 4900 – Senior Project. This strategy will be useful for program and student assessment.

1. Agricultural Communication and Journalism faculty prepare before the semester specific projects for all students as they complete their capstone projects/internships.
2. University-wide questions should be gathered from the appropriate USU assessment program(s).
3. Agricultural Communication and Journalism faculty will plan and update the Agricultural Communication program accordingly after the conclusion of the seminar.

Further program and student assessment
Agricultural Communication and Journalism faculty should develop additional measurement methods for determining the satisfaction of employers, placement success, and student satisfaction of the program post-graduate. These instruments are to be developed by Agricultural Communication and Journalism faculty.
XI. Outreach Efforts

Brian Warnick, Becki Lawver and Kelsey Hall collaborated together to develop an agricultural communication curriculum available for Utah agriculture teachers.

Students enrolled in ASTE 3090 – Graphic Communications in Agriculture – work with on-campus clients (AgrAbility of Utah, Aggie Ice Cream) to produce marketing materials to meet their communication needs.

Agricultural Communication and Journalism students serve as room moderators and judges for the Utah FFA Agricultural Communication CDE contest every April. The students use a rubric to evaluate the communication materials developed by high school FFA members during the contest, ranging from graphic design, electronic media and journalistic writing.

XII. Interaction with Other Programs (within ASTE and externally)

Agricultural Communication Club members have worked with the Dietetics Program at Utah State University to promote USU Food Day.

Kelsey Hall and Agricultural Communication and Journalism students attend the National Association of Farm Broadcasters to receive professional development training in radio and television broadcasting.
Appendix 1A

Course Maps
<table>
<thead>
<tr>
<th>ACAJ Program Learning Objectives</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td>Students will possess a high degree of agricultural literacy and an adequate reservoir of skills and knowledge in agricultural subjects to meet the need of the agricultural communication profession.</td>
<td>X  X  X  X  X  X  X  X  X  X  X  X  X</td>
</tr>
<tr>
<td>Students will demonstrate knowledge of skills used in journalism and communication professions.</td>
<td>X  X  X  X  X  X  X  X  X  X  X  X  X</td>
</tr>
<tr>
<td>Students will explore career opportunities in agricultural communication and journalism.</td>
<td>X  X</td>
</tr>
<tr>
<td>Students will demonstrate knowledge of trends in agricultural communication and journalism.</td>
<td>X</td>
</tr>
<tr>
<td>Students will write professional and technical documents.</td>
<td>X</td>
</tr>
<tr>
<td>Students will gain experiences in leadership styles, program planning and meeting organization while practicing leadership and communication principles.</td>
<td>X</td>
</tr>
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<td>ACAJ Program Learning Objectives</td>
<td>Required Classes</td>
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</tr>
<tr>
<td>Students will demonstrate knowledge of the practical understanding of the workings of mass communication principles and practice.</td>
<td>X X X X X X X X X X</td>
</tr>
<tr>
<td>Students will demonstrate knowledge of the roles and responsibilities of mass communication in a democratic society.</td>
<td>X X X X</td>
</tr>
<tr>
<td>Students will think critically and analytically.</td>
<td>X X X X X X X X X X</td>
</tr>
<tr>
<td>Students will conduct, analyze, evaluate and report social science research.</td>
<td>X X X X X X X X X X</td>
</tr>
<tr>
<td>Students will use and evaluate technologies that enhance the communication process.</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Provide students with a grounding in the philosophical, ethical and legal frameworks of mass communication.</td>
<td>X X X X X X</td>
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<td>Students will possess a high degree of agricultural literacy and an adequate reservoir of skills and knowledge in agricultural subjects to meet the need of the agricultural communication profession.</td>
<td>JCOM 3100  JCOM 3110  JCOM 3120</td>
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<td>Students will demonstrate knowledge of skills used in journalism and communication professions.</td>
<td>X  X  X</td>
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<td>Students will explore career opportunities in agricultural communication and journalism.</td>
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<td>-------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Students will demonstrate knowledge of the practical understanding of the workings of mass communication principles and practice.</td>
<td>JCOM 100 JCOM 110 JCOM 120</td>
</tr>
<tr>
<td>Students will demonstrate knowledge of the roles and responsibilities of mass communication in a democratic society.</td>
<td>X X X</td>
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<td>Students will think critically and analytically.</td>
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## Broadcast Emphasis

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<td>ACAJ Program Learning Objectives</td>
<td>Required Classes</td>
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<tr>
<td>Students will demonstrate knowledge of the practical understanding of the workings of mass communication principles and practice.</td>
<td>JCOM 2220</td>
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<tr>
<td>Students will demonstrate knowledge of the roles and responsibilities of mass communication in a democratic society.</td>
<td>X</td>
</tr>
<tr>
<td>Students will think critically and analytically.</td>
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<td>Students will conduct, analyze, evaluate and report social science research.</td>
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15
## PR & Corporate Communication Emphasis

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<td>Students will possess a high degree of agricultural literacy and an adequate reservoir of skills and knowledge in agricultural subjects to meet the need of the agricultural communication profession.</td>
<td>JCOM 2300</td>
</tr>
<tr>
<td>Students will demonstrate knowledge of skills used in journalism and communication professions.</td>
<td>JCOM 3310</td>
</tr>
<tr>
<td>Students will explore career opportunities in agricultural communication and journalism.</td>
<td>JCOM 3320</td>
</tr>
<tr>
<td>Students will demonstrate knowledge of trends in agricultural communication and journalism.</td>
<td>JCOM 5300</td>
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<tr>
<td>Students will write professional and technical documents.</td>
<td>JCOM 5320</td>
</tr>
<tr>
<td>Students will gain experiences in leadership styles, program planning and meeting organization while practicing leadership and communication principles.</td>
<td></td>
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<td>Students will demonstrate knowledge of the practical understanding of the workings of mass communication principles and practice.</td>
<td>JCOM 2300</td>
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<td>Students will demonstrate knowledge of the roles and responsibilities of mass communication in a democratic society.</td>
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Appendix 1B

Course Descriptions
Agriculture Communications & Journalism

Core Classes

**ADVS 1110. Introduction to Animal Science.** Admittance to a USU major, cumulative GPA of 2.67 or higher; completion of at least 40 credits. (F, Sp) (4cr).

**APEC 3010. Introduction to Agricultural Economics and Agribusiness (DSS).** Introduction to economic principles as they apply to the food and agricultural industry. Emphasizes production and consumption of food and fiber products, the structure of the agricultural/agribusiness industry, major farm problems, and public policy issues impacting agribusiness firms. (Sp) (3cr).

**FCSE 3030. Textile Science (DSC/QI).** Study of fibers, yarns, fabric constructions, and finishes related to suitability for desired end uses. Use of mathematics and descriptive statistics for reporting and interpreting data collected from lab experiments. Lectures and laboratory. Prerequisite: Must be an FCSE major and have completed at least 30 credits and C- or better in a QL course or permission of instructor. (Sp) (4cr).

**LAEP 1030. Introduction to Landscape Architecture (BCA).** Environment as a basis for land use and design decisions. Topics discussed include environmental awareness, the planning and design process, and design related to open space, communities, and the region. Three one-hour lectures per week. (F, Sp, Su) (3cr).

**NDFS 1020. Science and Application of Human Nutrition (BLS).** Role of dietary choices in providing nutrients and their relationship to the social, mental, and physical well-being of people. How to evaluate nutritional status with personal data using computer diet analysis program. (F, Sp, Su) (3cr).

**PSC 4000. Soil and Water Conservation.** Applied soil and water conservation in an agronomic setting. Management of soil-water-plant-atmosphere continuum. Soil conservation techniques as they apply to actual situations. (F) (4cr).

**ASTE 1710. Introduction to Agricultural Communication.** Overview of the history, importance to society, and role of mass communication in agriculture. Introduces students to the use of mass media in the agricultural industry. (F) (3cr).

**ASTE 2830. Agribusiness Sales and Marketing.** Basic principles of agribusiness sales and marketing. After completing a series of self-assessments relating to sales, learning, and personality preferences, students learn to complete each major step of the sales process. (F) (3cr).

**ASTE 2900. Food Matters: Ethics, Economics, and the Environment (BSS).** This course provides a broad overview of food systems as they relate to ethical, economic, and environmental issues. The complex challenges involved with feeding the world’s population are discussed using popular “foodie” media and science-based research. (Sp, Su) (3cr).

ASTE 3100. Personal Leadership in Agriculture. Study of personal leadership strengths, leadership and fellowship in small groups and teams. Emphasis is placed on the application of acquired knowledge to practical problems and personal development as a leader in Agriculture. (Sp) (3cr).

ASTE 4900. Senior Project Research and Creative Opportunity. Returning student teachers work to strengthen their weaknesses in areas such as scaled drawing, cost estimating, machine shop practices, construction, and small engines. (Sp) (1-6cr).


JCOM 1130. Beginning Newswriting for the Mass Media. Techniques of writing news for various media. News values, philosophy, and practice. Elementary news-gathering and interviewing skills. Practice in various newswriting forms. Structures of the news industries and work place. Prerequisite/Restriction: Fulfillment of Communications Literacy CL1 requirement through coursework or examination and English Proficiency Test offered through the Journalism and Communication Department. (F,Sp) (3cr).

JCOM 1500. Introduction to Mass Communication (BSS). History, philosophy, structures, and functions of the mass media (newspapers, magazines, TV and radio, advertising, and public relations) and their intersection with other social institutions. Media economics and the impacts of new technologies on media institutions and society. (F,Sp) (3cr).

JCOM 2010. Media Smarts: Making Sense of the Information Age (BSS). Critical analysis of the roles and performance of mass media content and messages, and their influence on society. Emphasizes critical reading of news, entertainment, and advertising content regarding women, minorities, children, and other groups. Basic mass media ethics and law. Prerequisite/Restriction: Fulfillment of Communications Literacy CL1 requirement through coursework or examination. (F,Sp) (3cr).

JCOM 2020. Communication Research Methods (QI). Covers research methods used in the mass communication field. Practical application of quantitative information within journalism and public relations. Emphasizes using numbers to help audiences make sense of issues and events. Prerequisite/Restriction: STAT 1040; and either JCOM 1500 or JCOM 2010. (F,Sp) (3cr).

JCOM 2030. Multimedia Boot Camp. Required core JCOM major course that provides basics of digital multimedia skills. Prerequisite/Restriction: JCOM major standing or permission of department head. (F,Sp) (3cr).
JCOM 4030. Mass Media Law (DSS). Principles and theories of constitutional and case law governing the mass media, including libel and privacy, copyright, press freedom, broadcast regulation, and press responsibility. Prerequisite/Restriction: Junior standing or permission of instructor. (F,Sp) (3cr).

PR & Corporate Communications Emphasis


JCOM 3310. Writing for Public Relations (CI). Theory and practice of information-gathering for public relations, including basic news releases, features, speeches, annual reports, newsletters and brochures, broadcasting, and other forms. Emphasizes advanced news gathering techniques, interviewing, media law, ethics, and cultural sensitivity. Prerequisite/Restriction: Minimum grades of C+ in JCOM 1130, JCOM 1500, and JCOM 2010. (F,Sp) (3cr).

JCOM 3320. Strategic Research Methods in Public Relations (DSS). Quantitative and qualitative research methods standard to real-life applications in public relations problems and campaigns, including survey methods, focus groups, case analysis, and strategic assessments. Prerequisite/Restriction: Minimum grade of C in JCOM 3310 or permission of instructor. (F,Sp) (3cr).


JCOM 5320. Public Relations Agency. Advanced hands-on experience in real-world workings of professional public relations agency, including client communications needs analysis, communications planning, strategies, market positioning, publicity, and campaign execution. Prerequisite/Restriction: Permission of instructor. (F,Sp) (3cr).

Print Emphasis

JCOM 3100. Reporting Public Affairs (CI). Theory and practice of reporting public affairs, community news, and features. Emphasizes advanced news gathering techniques, understanding local political structures, news and feature writing skills, interviewing, media law, ethics, and cultural sensitivity. Prerequisite/Restriction: Minimum grades of C+ in JCOM 1130, JCOM 1500, and JCOM 2010. (F,Sp) (3cr).

JCOM 3110. Beyond the Inverted Pyramid (CI). Theory and practice of longer literary forms for newspapers and magazines. Feature writing, investigative and interpretive journalism,
emphasizing advanced information-gathering and writing skills.

**Prerequisite/Restriction:** Minimum grade of C in JCOM 3100 or permission of instructor. (F,Sp) (3cr).

**JCOM 3120. Copy Editing and Publication Design (CI).** Editing and preparation of news stories and artwork for publication. Principles and practice of publication layout and design. **Prerequisite/Restriction:** Minimum grades of C in JCOM 3100, JCOM 3200, or JCOM 3310; or permission of instructor. (F,Sp) (3cr).

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**Broadcast Emphasis**

**JCOM 2220. Introduction to Video Media.** Introduction to the theories and practice of video production and functions in broadcasting and the electronic mass media, including concepts, techniques, and impacts of various video approaches. **Prerequisite/Restriction:** Minimum grades of C+ in JCOM 1130, JCOM 1500, and JCOM 2010. (F,Sp) (3cr).

**JCOM 3200. Writing for Electronic Media.** Theory and practice of reporting public affairs for broadcast and electronic media. Emphasizes news gathering, understanding local political structures, news and feature writing, interviewing, media law, ethics, and cultural sensitivity. **Prerequisite/Restriction:** Minimum grades of C+ in JCOM 1130, JCOM 1500, and JCOM 2010. (F) (3cr).

**JCOM 4210. Newscast I (CI).** Basics of electronic newsgathering and writing for electronic news media. Use of electronic video equipment for creation of on-air newscast and other visual news materials. **Prerequisite/Restriction:** Minimum grade of C in JCOM 2220. (F,Sp) (4cr).

**JCOM 4220. Newscast II (CI).** Newsroom organization and practice in electronic and video news production, including directing and producing, writing for video news, use of studio equipment, use of video production equipment, staff management, and control room operations. **Prerequisite/Restriction:** Minimum grades of C in JCOM 3200 and JCOM 4210. (F,Sp) (4cr).
College of Agriculture and Applied Sciences

School of Applied Sciences, Technology and Education (ASTE)

Utah State University

Assessment Plan

For the Agricultural Machinery Technology AAS, Cert
I. Program Description

USU offers both a one-year technology certificate and an Associate of Applied Science degree in agricultural machinery technology. This program is the only one of its kind in the western United States and is endorsed by the Implement Dealer’s Association, which represents dealers and manufacturers of agricultural machinery throughout the region. In addition to coursework training, machinery dealerships and companies hold in-service training at USU where students can receive training and certification for repairs and operations of the latest agricultural equipment. Upon completion of these programs, employers are always seeking students from USU’s program, resulting in extremely high job placement.

The one-year certificate program is designed to familiarize students with the agricultural equipment industry. Certificate requirements include technical hands-on training on engines, power trains, hydraulics, DC electrical and specialized forage, harvesting, tillage, planting and spraying equipment.

The Associate of Applied Science degree is a second-year continuation of the certificate program. Core curriculum includes equipment testing, diagnosis and retailing of parts and equipment. Because it is an Associate of Applied Science degree program, a minimum of fifteen credits of University Studies courses is required. The Associate of Applied Science degree also transitions very easily into a bachelor’s program in agricultural systems technology and agricultural education.

II. Degrees and Emphasis Options Offered

Agricultural Machinery Technology — Certificate
Agricultural Machinery Technology — Associate of Applied Science

III. Program Mission

The curriculum offered in Agricultural Machinery Technology (AMT) prepares students for careers in: agricultural machinery management; agricultural machinery sales, parts and service; along with agricultural farm suppliers, corporate farms and ranches positions and precision agriculture. Resident instruction develops students through acquisition of theoretical and vocational skills. These skills must support and stimulate critical thinking and reasoning through practical application of relevant theory necessary for intellectual achievement and practical applications in agricultural occupations.

IV. Alignment of Program Mission with Departmental Mission

The mission of the Agricultural Machinery Technology program aligns with the School of Applied Sciences, Technology and Education using the application of a multidisciplinary systems science approach for the resolution of agricultural and applied science matters through the advancement of education, research, and outreach for agricultural technology transfer.
V. Program Goals

The objectives for our students upon completion of the AMT program include:

1. Demonstrating competence in the basic and applied sciences necessary for situational analysis in agricultural and related settings.
2. Acquisition of professional skills necessary to contribute in diagnosing and managing agricultural equipment. These include not only manipulative skills, but also creative thinking and communication aptitudes & skills.
3. Applying management, diagnostic and problem solving principles to multi-disciplinary solutions.
4. Preparation for undergraduate studies in agricultural system technology and other related disciplines.

VI. Program Learning Objectives

Graduates from the AMT program should be able to:

1. Apply knowledge of equipment, science technology and applied sciences to agricultural situations and related industries.
2. Provide viable solutions to situations within existing economic, environmental, social, political, health & safety and sustainability constraints.
3. Work and communicate effectively individually and in teams.
4. Recognize personal limitations and the need for further education, knowledge or assistance.
5. Contribute to their community, and society in general, using their knowledge and professional expertise.

VII. Course Map (See Appendix 2A)

VII. Course List with Descriptions (See Appendix 2B)

IX. Strengths, Weaknesses and Recommendations

Strengths

Strengths of the program include:
- Faculty expertise in managing agricultural operations, machinery and businesses
- Support from intermountain equipment dealers
- Industry manufacturer support for current agricultural technology, laboratory teaching aids, and teaching facilities
- Strong introductory program with options to continue studies in Agricultural Systems Technology or Agricultural Education
Weaknesses

Weaknesses of the program include:
- Limited space for accommodating large machinery for instructional purposes
- Limited storage for laboratory teaching aids
- Lack of strategic interactions with industry partners regarding internships

Recommendations

Recommendations for the program include:
- Reorganization of laboratory policies for storage and reallocation of outdated surplus of teaching aids
- Curriculum alignment for emphasis to provide seamless transition for transfer students
- Build and maintain relationships with industry partners for internships

X. Plan for Measuring the Achievement of Degree and Program Objectives

All students complete classroom theory and hands-on lab instruction in the mechanization program and may also complete an occupational internship. Some students completing the program requirements are positioned to enter the Agricultural Systems Technology or Agricultural Education Program.

We assess our program in a number of ways:
- Individual class assessments
- Internship assessments
- Surveys of past graduates
- Surveys of employers
- Dealer/Manufacturer advisory board

Faculty members should continue to develop measurement methods for determining the satisfaction of employers, placement success and student satisfaction of the program post-graduates.

Exit Interviews

Graduates in Agricultural Machinery Technology will complete an exit interview in connection with their application of graduation. This is an opportunity for the student to express concerns and indicate strengths of the program from the perspective of a student completing the course.

- The department head or other faculty provides questions to gain the student’s thoughts regarding the program.
• Program faculty meet at the conclusion of each academic year to discuss needed curricular changes.
• The exit interview will be conducted by Royce Hatch, lecturer and the interview recorded, after which will sign off on the graduation requirements for the Agricultural Machinery Technology AAS, CERT.

XI. Outreach Efforts

Community

• Utah FFA Agricultural Mechanics Contest
• Utah State University annual Ag month parade and Ag Products BBQ to promote agricultural equipment used in crop management
• Service projects for local elementary schools
• Local elementary school agricultural seminars on agricultural around the world and in our community

Professional Development (designed for students enrolled in the program)

• Midwest Agricultural Machinery Manufacturers Tour
• Posting career news and information to the website
• Sponsoring equipment manufacturer and dealer schools and training on current production equipment.

XII. Interaction with Other Programs (within ASTE and externally)
Work with the Agricultural System Technology Program to coordinate curriculum for future transition into the four-year program.

Appendix 2A

Course Maps
<table>
<thead>
<tr>
<th>AST Learning Objectives</th>
<th>ENGL 1010</th>
<th>ECON 1500</th>
<th>USU 1350</th>
<th>ASTE 1010</th>
<th>ASTE 1120</th>
<th>ASTE 1130</th>
<th>ASTE 1610</th>
<th>ASTE 1615</th>
<th>ASTE 1620</th>
<th>ASTE 1625</th>
<th>ASTE 3710</th>
<th>ASTE 3720</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply knowledge of math, science, technology and applied science to solve technical</td>
<td>X</td>
<td>X</td>
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<tr>
<td>problems in agricultural and related industries.</td>
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<tr>
<td>Provide viable solutions to situations within existing economic, environmental, social,</td>
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<td>political, health &amp; safety and sustainability constraints.</td>
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<td>Function effectively in a global society both as a team member and a leader interacting</td>
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<td>successfully with agricultural industry professionals, government officials and an</td>
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<td>ethnically and culturally diverse general public.</td>
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<td>Continuously recognize the need to engage in lifelong learning and develop professionally</td>
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<tr>
<td>Implement and follow business principles and ethical practices necessary to build and</td>
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<tr>
<td>maintain a viable farm, ranch or agribusiness</td>
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</tbody>
</table>
Appendix 2B

Course Descriptions
Required Courses for Agricultural Machinery Technology AAS Program

Core Classes

**ENGL 1010. Introduction to Writing.** Students learn skills and strategies for becoming successful academic readers, writers, and speakers: how to read and write critically, generate and develop ideas, work through multiple drafts, collaborate with peers, present ideas orally, and use computers as writing tools. (F,Sp,Su) (3cr).

**ECON 1500. Introduction to Economic Institutions, History, and Principles (BAI).** Designed to build an understanding of economic institutions, history, and principles. Relationship between private and public sectors of U.S. economy. Analysis of major economic institutions, such as property rights, markets, business organizations, labor unions, money and banking, trade, and taxation. (F,Sp,Su) (3cr).

**USU 1350 (BLS). Integrated Life Science.** Interdisciplinary course focusing on basic concepts of life science. Demonstrates role of modeling, prediction, and observation in the process of scientific discovery, which occurs within an historical and social context. (F,Sp,Su) (3cr).

**ASTE 1010. Introduction to Agricultural Systems Technology.** Introduction to problem solving related to the areas of agricultural power and machinery, soil and water conservation, structures and animal environments, electrical circuits, and emerging technologies. (F) (3cr).

**ASTE 1120. Forage and Harvest Equipment.** Fundamentals and principles in operations, adjustments, and maintenance of technologies utilized in agricultural forage and combine harvesting. (F) (3cr).

**ASTE 1130. Planting and Tillage Equipment.** Fundamentals and principles in operation, maintenance, and repair of planting and tillage equipment. Exploration of different systems and their applications. (Sp) (3cr).

**ASTE 1610. Ag Machinery Engines.** Fundamental principles and components utilized in the power production for agricultural machinery. Diesel engines, as power plants, will be overhauled using a systems approach. (F) (3cr).

**ASTE 1615. Ag Machinery Engines Lab.** Gives students practical hands-on experience in engine diagnostics and repairs. **Prerequisite/Restriction:** ASTE 1610 (may be taken concurrently). (F) (3cr).

**ASTE 1620. Ag Machinery Power Trains.** Fundamental principles and components utilized in agricultural machinery transmittal of power through drive trains. A systems approach to overhauling these components will be developed. (Sp) (3cr).

**ASTE 1625. Ag Machinery Power Trains Lab.** Gives students practical hands-on experience in power trains diagnostics and repairs. **Prerequisite/Restriction:** ASTE 1620 (may be taken concurrently). (Sp) (3cr).
ASTE 3670. Agricultural Equipment Business Management, Marketing, and Communications. Introduction to principles and operation of computer software systems related to marketing and management within the agricultural machinery business industry. Emphasis on business communication principles for effective transfer of information and problem resolution. **Prerequisite/Restriction:** MATH 1050; fulfillment of Communications Literacy CL1 requirement or permission of instructor. (Sp) (3cr).

ASTE 3710. Ag Machinery Hydraulic Systems and Diagnosis. Fundamental principles and components overhaul of hydraulic systems as applied in agricultural machinery. Exploration of techniques for diagnosing malfunctions and related failures with a systems approach. (F) (3cr).

ASTE 3720 Ag DC electrical Systems and Diagnosis. Fundamental principles and components overhaul of DC electrical systems as applied in agricultural machinery. Exploration of techniques for diagnosing malfunctions and related failures with a systems approach. **Prerequisite/Restriction:** ASTE 1620 or permission of instructor. (F) (3cr).
Assessment Plan

For the Undergraduate Program in
Agricultural Systems Technology (AST)

Fall 2013
I. Program Description

The Agricultural Systems Technology degree combines an understanding of agricultural, biological and physical sciences with technical and business managerial skills. Graduates of the agricultural systems technology may be involved in one of numerous agricultural careers, like working for agricultural equipment corporations, managing a machinery dealership, serving as a sales representative for an equipment company or serving as a farm/ranch manager. However, skills taught in agricultural systems courses are applicable to other industries, making career opportunities almost limitless. Our students focus on the hands-on application of agricultural engineering principles, the function and use of agricultural technology and the integration of technology management concepts for the food, fiber and natural resources industries. The focal point of the program is on the management, use and troubleshooting of agricultural technology. Agricultural systems technology graduates are able to identify system problems, formulate possible solutions, and analyze the impact of alternative solutions on social and economic institutions. Students’ coursework typically involves a broad foundation through real-world instruction in power and machine systems, natural resources conservation, electricity and electronics, precision agriculture technologies and agricultural structural systems. Students are encouraged to incorporate business and management electives to develop a focus area of their choosing. USU’s program is recognized by the American Society of Agricultural and Biological Engineers (ASABE) as meeting the standards for an "Agricultural Technology and Management" program.

II. Degrees and Emphasis Options Offered

Students majoring in agricultural systems technology must choose one of two emphases which are Agribusiness or Agricultural Mechanization.

An Agribusiness emphasis provides in-depth, technical education in agricultural economics and business management. It is designed to provide basic knowledge of business concepts and approaches, as well as an understanding of current agricultural changes. This emphasis is for students who wish to become managers in agriculture and related industries. Students take courses in agricultural economics, agricultural business, and agricultural mechanics.

An Agricultural Mechanization emphasis provides a broad understanding of the production processes in agriculture, with a depth of understanding related to using machinery. Students take courses in agricultural mechanics, animal science, natural resources, plant science and soil science. Preparation in either emphasis includes technical agriculture, economics and business.

Students may also choose to complete a composite degree in agricultural systems technology and agribusiness. The composite program prepares graduates for managerial careers within the agriculture industry, including running a family farm or ranch. Graduates may also pursue other agricultural careers, such as working for an agricultural equipment corporation, managing a machinery dealership, serving as a sales representative for an equipment company or serving as a farm or ranch manager.
A dual degree option (meaning students graduate with two separate degrees) is also available in collaboration with the Applied Economics Department. The difference is that students in the composite program are not required to take as many higher-level, theoretical economics classes.

III. Program Mission

The curriculum offered in Agricultural Systems Technology (AST) prepares students for careers in: agricultural production and management; agribusiness; agricultural machinery sales and service; and agricultural extension and agency service positions. Resident instruction develops students through acquisition of theoretical and vocational skills. These skills must support and stimulate critical thinking and reasoning through practical application of relevant theory necessary for intellectual achievement and practical applications in agricultural occupations.

IV. Alignment of Program Mission with Departmental Mission

The mission of the Agricultural Systems Technology program aligns with the School of Applied Sciences, Technology and Education using the application of a multidisciplinary systems science approach for the resolution of agricultural and applied science matters through the advancement of education, research and outreach for agricultural technology transfer.

V. Program Goals

The goals for our students upon completion of the AST program include:

1. Competence in the basic and applied sciences necessary for situational analysis in agricultural and related settings.
2. Acquisition of professional skills necessary to contribute to managing agricultural and related systems. These include not only manipulative skills, but creative thinking and communication aptitudes & skills.
4. Preparation for graduate studies in agricultural systems technology, agribusiness, and other related disciplines.

VI. Program Learning Objectives

Graduates from the AST program should be able to:

1. Apply knowledge of math, science, technology and applied science to solve technical problems in agricultural and related industries.
2. Provide viable solutions to situations within existing economic, environmental, social, political, health & safety and sustainability constraints.
3. Function effectively in a global society both as a team member and a leader interacting successfully with agricultural industry professionals, government officials and an ethnically and culturally diverse general public.
4. Continuously recognize the need to engage in lifelong learning and develop professionally.
5. Implement and follow the business principles and ethical practices necessary to build and maintain a viable farm, ranch or agribusiness.

VII. Course Map (See Appendix 3A)

VIII. Course List with Descriptions (See Appendix 3B)

IX. Strengths, Weaknesses and Recommendations

Strengths

Strengths of the program included faculty expertise in managing agricultural operations and businesses, industry support for laboratory teaching aids and teaching facilities.

Weaknesses

Weaknesses of the program included limited space for accommodating large machinery for instructional purposes, low student enrollment and limited storage for laboratory teaching aids. There is a lack of strategic internships for students with industry.

Recommendations

Recommendations for the program include reorganization of laboratory policies for storage and reallocation of outdated surplus of teaching aids. Increase recruitment efforts to attach new students and curriculum alignment for emphasis to provide seamless transition for transfer students. An additional recommendation to address low student enrollments and limited strategic internships will be to identify new emphasis areas for curriculum development.

X. Plan for Measuring the Achievement of Degree and Program Objectives

The Bachelor of Science (BS) Degree in Agricultural Systems Technology is designed to develop the needed background knowledge of basic agricultural concepts and technologies for managing agricultural operations and businesses. Coursework covers topics in the following fields: agricultural business & economics, agricultural mechanization, animal, dairy and veterinary sciences, plant and soil science and natural resources. All students complete a senior project and while not required, many complete an Occupational Internship. Most students completing the program requirements also earn a minor area of study and some complete requirements for double majors.

Measurement of Other Student Outcomes

We assess our program in a number of ways:
• Individual class assessments
• Internship assessments
• Surveys of past graduates
• Surveys of employers

Faculty members should continue to develop measurement methods for determining the satisfaction of employers, placement success and student satisfaction of the program post-graduates.

*Exit Interviews*
All graduates in AST will complete an exit survey in connection with their application of graduation. This is an opportunity for the student to express concerns and indicate strengths of the program from the perspective of a program completer.

**XI. Outreach efforts**

*Extension Presentations*
These efforts are designed to provide useful, practical, research-based information to agricultural producers, small business owners, youth, consumers and others in rural areas and communities of all sizes.

• Shiprock Navajo Extension 2012 Agriculture Days Presenter “Tractor Preventive Maintenance and Safety”
• Pesticide Applicator Trainings
• Youth Tractor Driving Training Courses

*Public Schools*
These efforts are designed to inform public school students about global agriculture, food, fiber and natural resource systems and recruit potential students for the AST major.

• Utah FFA Agricultural Mechanics Contest
• Agriculture in the Classroom Service Projects
• Service projects for local elementary schools

*Professional Development:*
Designed for enrolled students in the AST major to promote career readiness and internship opportunities:

• Midwest Agricultural Machinery Manufacturers Tour
• Posting career news and information to the website

**XII. Interaction with other programs** (within ASTE and externally)

*Agricultural Education*
• Performed two student teacher site visits for agricultural education teacher education program; Spring 2010
• Performed concurrent enrollment site visits for Westside High School, Dayton ID; 2010, 2011, 2012
• Monument Valley High School New teacher induction site visit

College of Agriculture and Applied Sciences
• Ag Month Tractor Parade – assisted with organizing and driving in tractor parade during Ag Month – 2010, 2011, 2012, 2013

External Agricultural Systems Program Interactions
• ED-205, Engineering Technology and Management Education Committee, ASABE, 2012 - Present
• NCERA-197 Agricultural Safety and Health Research and Extension Committee, Multistate Project, 2012 - Present
• Traffic and Transportation Issues Committee, International Society for Agricultural Safety and Health, 2012- Present
• Farm and Ranch eXtension in Safety and Health Community of Practice, 2011 – Present

Agricultural Equipment Industry Interactions
• Kubota Dealer Technician Training Seminar
• Case IH Dealer Technician Training Seminars
• Briggs and Stratton Technical School Training
• Honda Engine Technical Training Curriculum Distribution
• Miller Electric Product Training Seminars
Appendix 3A

Course Maps
## Ag Systems Technology Common Core Course Map

<table>
<thead>
<tr>
<th>AST Program Learning Objectives</th>
<th>Required Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACCT 2010</td>
</tr>
<tr>
<td>1. Apply knowledge of math,</td>
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<td>science, technology and</td>
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<tr>
<td>applied science to solve</td>
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<td>technical problems in</td>
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<td>agricultural and related</td>
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<tr>
<td>industries.</td>
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<td>2. Provide viable solutions</td>
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<td>to situations within</td>
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<td>existing economic,</td>
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<td>environmental, social,</td>
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<td>political, health &amp;</td>
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<td>safety and sustainability</td>
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<td>constraints.</td>
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<tr>
<td>3. Function effectively in</td>
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<td>a global society both as</td>
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<td>a team member and a leader</td>
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<td>interacting successfully</td>
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<td>with agricultural industry</td>
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<td>professionals, government</td>
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<td>officials and an ethnically</td>
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<td>and culturally diverse</td>
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<td>general public.</td>
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<tr>
<td>4. Continuously recognize</td>
<td>x</td>
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<td>the need to engage in</td>
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<td>lifelong learning and</td>
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<td>develop professionally.</td>
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<td>5. Implement and follow the</td>
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<td>business principles and</td>
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<td>ethical practices necessary</td>
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<td>to build and maintain a</td>
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<td>viable farm, ranch or</td>
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<tr>
<td>agribusiness.</td>
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</table>
## Agribusiness Emphasis Course Map

| AST Program Learning Objectives                                                                 | ACCT 2020 | ACCT 3310 | APEC 5000 | ASTE 3100 | ASTE 3600 | ASTE 3900 | ASTE 4250 | MGT 2050 | MGT 3110 | MGT 3250 | MGT 3500 | MGT 3510 | MGT 3520 | MGT 3560 | MGT 3670 | MGT 3710 | MGT 3810 | MGT 3820 | MGT 4070 | MGT 4240 | MGT 4535 | MGT 4560 | MGT 4600 |
|------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1. Apply knowledge of math, science, technology and applied science to solve technical problems in agricultural and related industries. | x         | x         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 2. Provide viable solutions to situations within existing economic, environmental, social, political, health & safety and sustainability constraints. |           |           |           |           |           |           |           |           | x         | x         | x         | x         | x         |           |           |           |           |           |           |           |           |           |           |           |           |
| 3. Function effectively in a global society both as a team member and a leader interacting successfully with agricultural industry professionals, government officials and an ethnically and culturally diverse general public. |           |           |           |           |           |           |           |           |           |           |           |           |           |           | x         | x         | x         | x         | x         | x         | x         | x         | x         | x         | x         | x         |
| 4. Continuously recognize the need to engage in lifelong learning and develop professionally. |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 5. Implement and follow the business principles and ethical practices necessary to build and maintain a viable farm, ranch or agribusiness. |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
Agricultural Mechanization Emphasis Course Map

<table>
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<tbody>
<tr>
<td>1. Apply knowledge of math, science, technology and applied science to solve technical problems in agricultural and related industries.</td>
<td>ASTE 1120 ASTE 1610 ASTE 1615 ASTE 1620 ASTE 1625 ASTE 2250 ASTE 3600 ASTE 3670 ASTE 3710 ASTE 3720 ASTE 3900 ASTE 4250</td>
</tr>
<tr>
<td>2. Provide viable solutions to situations within existing economic, environmental, social, political, health &amp; safety and sustainability constraints.</td>
<td>x x x x x x x x x</td>
</tr>
<tr>
<td>3. Function effectively in a global society both as a team member and a leader interacting successfully with agricultural industry professionals, government officials and an ethnically and culturally diverse general public.</td>
<td>x x x x x x x</td>
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<tr>
<td>4. Continuously recognize the need to engage in lifelong learning and develop professionally.</td>
<td>x x x x x x x x x x x x</td>
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<tr>
<td>5. Implement and follow the business principles and ethical practices necessary to build and maintain a viable farm, ranch or agribusiness.</td>
<td>x x x x x x x x</td>
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</table>

42
# Agricultural Systems Technology and Agribusiness Composite Course Map (in addition to Agricultural Systems Technology Common Core)

<table>
<thead>
<tr>
<th>AST Program Learning Objectives</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td>1. Apply knowledge of math, science, technology and applied science to solve technical problems in agricultural and related industries.</td>
<td>ACCT 2020</td>
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<tr>
<td>2. Provide viable solutions to situations within existing economic, environmental, social, political, health &amp; safety and sustainability constraints.</td>
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<tr>
<td>3. Function effectively in a global society both as a team member and a leader interacting successfully with agricultural industry professionals, government officials and an ethnically and culturally diverse general public.</td>
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<tr>
<td>4. Continuously recognize the need to engage in lifelong learning and develop professionally.</td>
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<tr>
<td>5. Implement and follow the business principles and ethical practices necessary to build and maintain a viable farm, ranch or agribusiness.</td>
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<tr>
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<th>ACCT 2020</th>
<th>APEC 3310</th>
<th>ECN 3010 or APEC 4010</th>
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Appendix 3B

Course Descriptions
Course Descriptions for Agriculture Systems Technology

**ACCT 2010 Financial Accounting Principles:** Survey of uses of accounting information by investors and creditors for decision making. Emphasis on basic accounting principles used to prepare, analyze, and interpret financial statements. Prerequisites: STAT 1040 or MATH 1030 or MATH 1050. (F,Sp,Su) (3cr).

**APEC 2010 Introduction to Microeconomics:** Designed to build an understanding of the economics of the marketplace from the perspectives of individual consumer and producer or business. Development and application of microeconomic principles to demonstrate the role and limitations of competitive markets in motivating socially efficient consumer, business, and public sector choices. Prerequisite: ECN 1500. (F,Sp,Su) (3cr)

**APEC 3010 Introduction to Agricultural Economics and Agribusiness:** Introduction to economic principles as they apply to the food and agricultural industry. Emphasizes production and consumption of food and fiber products, the structure of the agricultural/agribusiness industry, major farm problems, and public policy issues impacting agribusiness firms. (Sp) (3cr)

**APEC 3020 Firm Finance and Records Analysis (DSS):** Construction, analysis, and comparison of key financial statements using cash and accrual systems of accounting. Introduction to computerized financial and management record-keeping systems to meet tax and management purposes. Prerequisites: ACCT 2010 and APEC 3010. (Sp) (3cr)

**CHEM 1110 General Chemistry I:** For non-science majors. This course is designed for students whose major does not require the more mathematically intensive CHEM 1210 or CHEM 1220 courses. First of a two-semester sequence. Progression is made from the basic tenets of general chemistry through an introduction to organic chemistry, with topics being presented in order of practical importance and sophistication. Prerequisite: Math ACT of 23 or higher, or MATH 1050 or higher. (F,Sp) (4cr).

**ECN 1500 Introduction to Economic Institutions, History, and Principles (BAI):** Designed to build an understanding of economic institutions, history, and principles. Relationship between private and public sectors of U.S. economy. Analysis of major economic institutions, such as property rights, markets, business organizations, labor unions, money and banking, trade, and taxation. (F,Sp,Su) (3cr).

**MATH 1050 College Algebra (QL):** Functions: graphs, transformations, combinations, and inverses. Polynomial, rational, exponential, logarithmic functions, and applications. Systems of equations and matrices. Partial fractions. Graphing calculator required. Prerequisite: One of the following within the last year or three consecutive semesters (including summer); ACT Math score of at least 23; SAT Math score of at least 540; AP Calculus AB score of at least 3; Grade of C or better in MATH 1010; or satisfactory score on the Math Placement Exam. (F,Sp,Su) (4cr).

**PSC 3000 Fundamentals of Soil Science:** Fundamentals of soil science, emphasizing physical, chemical, mineralogical, and biological properties of soils, and how these properties relate to plant
growth and environmental quality. Prerequisite: CHEM 1110 and MATH 1050 or higher. (F,Sp) (4).

**ASTE 1010 Introduction to Agricultural Systems Technology:** Introduction to problem solving related to the areas of agricultural power and machinery, soil and water conservation, structures and animal environments, electrical circuits, and emerging technologies. (F) (3cr).

**ASTE 2200 Electricity in Agricultural Systems:** Fundamentals of electricity (AC) as used on farms and ranches. Residential and commercial agricultural applications of the National Electric code. Electrical supply and service, distribution, proper grounding, and installation of components. (Sp) (3cr).

**ASTE 2830 Agribusiness Sales and Marketing:** Basic principles of agribusiness sales and marketing. After completing a series of self-assessments relating to sales, learning, and personality preferences, students learn to complete each major step of the sales process. (F) (3cr).

**ASTE 3030 Metal Welding Processes and Technology in Agriculture:** Selection of ferrous and nonferrous welding techniques in agricultural applications. Welding, cold- and hot-working metal in agricultural construction and maintenance. (F) (3cr).

**ASTE 3050 Technical and Professional Communication Principles (CI):** Technical communication principles and practices used in the workplace. Emphasizes technical writing of reports and correspondence using electronic information retrieval and presentation. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (F,Sp,Su) (3cr).

**ASTE 3080 Compact Power Units for Agricultural and Turfgrass Applications:** Operation and application of agricultural and turfgrass equipment powered by internal combustion engines having less than 40 horsepower. (Sp) (3cr).

**ASTE 4100 Agricultural Structures and Environment (QI):** Overview of agricultural structures and environmental considerations related to livestock, livestock waste management, and commodity storage. This USU class is a quantitative intensive (QI) course and as such will emphasize mathematical calculations related to wood and metal products, wood and metal construction, and various calculations related to constructing and maintaining agricultural structures. Prerequisite: ASTE 1010 or instructor approval. (Sp) (3cr).

**ASTE 4900 Senior Project Research and Creative Opportunity:** Returning student teachers work to strengthen their weaknesses in areas such as scaled drawing, cost estimating, machine shop practices, construction, and small engines. (Sp) (1-6cr).

**ASTE 5260 Environmental Impacts of Agricultural Systems (CI):** Investigation of relationship between agricultural practices and environmental quality, including control of agricultural nonpoint-source pollution. (F) (3cr).
Agricultural Mechanization Emphasis

ASTE 1120 Forage and Harvest Equipment: Fundamentals and principles in operations, adjustments, and maintenance of technologies utilized in agricultural forage and combine harvesting. (F) (3cr).

ASTE 1610 Agricultural Machinery Engines: Fundamental principles and components utilized in the power production for agricultural machinery. Diesel engines, as power plants, will be overhauled using a systems approach. (F) (3cr).

ASTE 1615 Agricultural Machinery Engine Laboratory: Gives students practical hands-on experience in engine diagnostics and repairs. Prerequisite: ASTE 1610 (may be taken concurrently). (F) (3cr).

ASTE 1620 Agricultural Machinery Power Trains: Fundamental principles and components utilized in agricultural machinery transmittal of power through drive trains. A systems approach to overhauling these components will be developed. (Sp) (3cr).

ASTE 1625 Agricultural Machinery Power Trains Laboratory: Gives students practical hands-on experience in power trains diagnostics and repairs. Prerequisite: ASTE 1620 (may be taken concurrently). (Sp) (3cr).

ASTE 2250 Occupational Experience in Agriculture: Supervised occupational experiences for technical vocational preparation. (F,Sp) (1-6cr).

ASTE 3600 Management of Agriculture Machinery Systems (QI): Management principles for evaluation and selection of agricultural implements for performance, optimization, economics, environmental impact, and long-term sustainable agricultural practices. Prerequisite: MATH 1050 or STAT 1040. (Sp) (3cr).

ASTE 3670 Agricultural Equipment Business Management, Marketing, and Communications: Introduction to principles and operation of computer software systems related to marketing and management within the agricultural machinery business industry. Emphasis on business communication principles for effective transfer of information and problem resolution. Prerequisite: MATH 1050. (Sp) (3cr).

ASTE 3710 Agricultural Machinery Hydraulic Systems and Diagnosis: Fundamental principles and components overhaul of hydraulic systems as applied in agricultural machinery. Exploration of techniques for diagnosing malfunctions and related failures with a systems approach. (F) (3cr).

ASTE 3720 Agricultural DC Electrical Systems and Diagnosis: Fundamental principles and components overhaul of DC electrical systems as applied in agricultural machinery. Exploration of techniques for diagnosing malfunctions and related failures with a systems approach. Prerequisite: ASTE 1620 or permission from instructor. (F) (3cr).
ASTE 3900 Special Problems in Agricultural Systems Technology and Education: Students conduct short-term investigation and/or literature analysis with critical review of contemporary issues in Agricultural Systems Technology. Formal contract with approved faculty. Activities culminate with a written report. Repeatable for credit. (F,Sp,Su) (1-6cr).

ASTE 4250 Occupational Experiences in Agriculture: Supervised occupational experience for technical and professional preparation in teacher education and/or agricultural business. (F,Sp,Su) (1-6cr).

Agribusiness Emphasis

ACCT 2020 Managerial Accounting Principles: Survey of uses of accounting information by managers for decision making, including planning, budgeting, and controlling operations. Emphasizes accumulation, analysis, and control of product and service costs. Prerequisite: ACCT 2010. (F,Sp,Su) (3cr).

ACCT 3310 Strategic Cost Management: Contemporary theory and applications in the accumulation, analysis, and interpretation of accounting information for internal decision-making and control. Prerequisite: Cumulative GPA of 3.0 or higher; grade of B or better in ACCT 2010; ACCT 2020; MIS 2100; successful completion of the accounting entrance exam. (F,Sp,Su) (3cr).

APEC 5000 Macroeconomics and Trade: Explores the business cycle, monetary policy, interest rates, inflation, employment, and production as they apply to agribusiness and related industries. Includes discussion of exchange rates, balance of trade, comparative advantage, and various policy tools used to influence trade. Prerequisite: ECN 1500. (Sp) (3cr).

ASTE 3100 Personal Leadership in Agriculture: Study of personal leadership strengths, leadership and fellowship in small groups and teams. Emphasis is placed on the application of acquired knowledge to practical problems and personal development as a leader in Agriculture. (Sp) (3cr).

ASTE 3600 Management of Agriculture Machinery Systems (QI): Management principles for evaluation and selection of agricultural implements for performance, optimization, economics, environmental impact, and long-term sustainable agricultural practices. Prerequisites: MATH 1050 or STAT 1040. (Sp) (3cr).

ASTE 3900 Special Problems in Agricultural Systems Technology and Education: Students conduct short-term investigation and/or literature analysis with critical review of contemporary issues in Agricultural Systems Technology. Formal contract with approved faculty. Activities culminate with a written report. (F,Sp,Su) (1-6cr).

ASTE 4250 Occupational Experience in Agriculture: Supervised occupational experience for technical and professional preparation in teacher education and/or agricultural business. (F,Sp,Su) (1-6cr).
MGT 2050 Legal and Ethical Environment of Business: Surveys the legal and ethical environment of business. Introduction to elementary legal research and writing and critical thinking techniques. Lecture. Prerequisite: GPA of 2.5 or higher and completion of 30 credit hours. (F,Sp,Su) (3cr).

MGT 3110 Managing Organizations and People (DSS): Overview of the role of management, and an introduction to leadership theory and practice. Includes defining of mission and goals, organizing work, and managing human performance. Prerequisite: Admittance to a USU major; cumulative GPA of 2.67 or higher and completion of at least 40 credits. (F,Sp,Su) (3cr).

MGT 3200 Business Career Management: This course teaches students the skills necessary to develop an in-depth understanding of the career they are pursuing (or would like to pursue) through dedicated research. The course will teach how to prepare a targeted resume and cover letter. Students will develop the skills required to build and manage a network, successfully interview, including business etiquette and how to properly prepare for an interview. Finally, students will learn the steps and elements required to enter and manage a career throughout their lifetime, in short how to build a career more than simply landing a job. (Required to be taken during the junior year). Prerequisite: Admittance to a USU major, cumulative GPA of 2.67 or higher; completion of at least 40 credits. (F,Sp,Su) (2cr).

MGT 3250 Introduction to Human Resource Management: Introduces the process of managing human resources, including human resource planning, recruitment, selection, training, performance evaluation, compensation, career management, labor relations, human resource strategy, and related ethical issues. Prerequisite: Admittance to a USU major, cumulative GPA of 2.67 or higher, and completion of at least 40 credits. (F,Sp) (3cr).

MGT 3500 Fundamentals of Marketing: Overview of marketing function, emphasizing concepts and terminology. Includes basic marketing activities of product management, pricing, distribution, promotion, marketing research, and consumer behavior. Prerequisite: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp,Su) (3cr).

MGT 3510 New Venture Fundamentals: Introduction to entrepreneurship and the processes of new ventures. The objective is to help students become familiar with entrepreneurship and ascertain the degree to which it represents a viable career path. Focuses on identifying, analyzing, and developing business opportunities. Prerequisite: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp,Su) (2cr).

MGT 3520 New Venture Management: Development of the relationship and organizational competencies for entrepreneurs. Focuses on the development of persuasion, delegation, and organizational skills for individuals who launch businesses and/or play a key role in their growth. Prerequisite: MGT 3510; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp,Su) (2cr).

MGT 3560 New Venture Planning: Theoretical and practical aspects of starting or buying a business are taught in this class. This includes the development of a business plan, as well as conducting due diligence for buying a business or extensive consulting with a start-up or growth
business. Students learn that entrepreneurial planning is an ongoing process that is centered upon organizational mission, vision, values and goals. As part of the instruction, students learn how to create an annual execution plan and a Personal Placement Memorandum (PPM). Prerequisite: MGT 3510; admittance to a USU major, cumulative GPA of 2.67 or higher and completion of at least 40 credits. (F,Sp,Su) (2cr).

**MGT 3670 Employee Relations and Contract Negotiations**: Surveys union-management relations, including labor markets, labor history, labor law, union organization and governance, contract negotiations, and grievance processing. Includes cases and simulations to develop negotiating and grievance processing skills. Prerequisite: Admittance to a USU major, cumulative GPA of 2.67 or higher; completion of at least 40 credits. (F) (3cr).

**MGT 3710 Team Management**: Experientially-driven course focusing on the role of teams in organizations and on developing skills which individuals and teams need to be effective. Topics include self-awareness, supportive communication, problem solving, and conflict management. Prerequisite: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp) (2cr).

**MGT 3810 Employment Law and Policy Development (DSS)**: Examines laws related to employment, labor relations, civil rights, compensation, safety, health, and retirement. Provides hands-on experience in drafting and reviewing human resource policies in a business setting. Addresses implementing and influencing public policy. Prerequisite: MGT 2050; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp) (3cr).

**MGT 3820 International Management (DSS)**: Exploration of international culture and context of management, the impact of globalization on businesses today, and the pressures and complexities of operating in global markets, including the processes of managing multi-cultural human resources. Prerequisite: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp) (2cr).

**MGT 4070 Retail Management (CI)**: Basic issues related to retail management, such as merchandising, location, promotion, store management, and retail image. Prerequisite: Grade of B- (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. Prerequisites do not apply to students taking MGT 6070. (Sp) (3cr).

**MGT 4240 Merchandise Planning and Control**: Issues related to pricing, budgeting, open-to-buy, and planning inventory. Prerequisite: Grade of B- (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits.

**MGT 4535 Marketing Campaigns**: This course introduces the student to the area of marketing campaigns by exploring areas essential for the communication strategies necessary for the successful marketing of products and services. The course focuses on various elements of campaign strategy, including advertising, promotions, point-of-purchase communications, direct techniques, and other topics. The course will focus on the development of marketing campaigns from
conception to implementation. Prerequisite: Grade of B- (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher; completion of at least 40 credits. (F,Sp) (2cr).

**MGT 4560 Strategic Sales Management:** This course focuses on the development and management of strategic accounts. Emphasis paid to understanding and practicing all phases of the key account process including prospecting, contacting, qualifying, proposal presentation and closing. Prerequisite: Grade of B- (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher; completion of at least 40 credits. (F,Sp) (2cr).

**MGT 4600 Negotiations:** This course is designed to teach the skills necessary to complete successful negotiations while maintaining both integrity and relationships. It is based on a series of simulated negotiations in a variety of situations including candidate-employer negotiations, resolving conflicts and cross-cultural. Prerequisite: Admittance to a USU major, cumulative GPA of 2.67 or higher; completion of at least 40 credits. (F,Sp) (2cr).

**Composite**

**ACCT 2020 Managerial Accounting Principles:** Survey of uses of accounting information by managers for decision making, including planning, budgeting, and controlling operations. Emphasizes accumulation, analysis, and control of product and service costs. Prerequisite: ACCT 2010. (F,Sp,Su) (3cr).

**APEC 3310 Analytical Methods in Applied Economics (QI):** Explores application of mathematics to agricultural, resource, environmental, and regional economics. Reviews algebraic, single-variable calculus (differentiation and integration); multivariate calculus optimization; and linear algebra and applications to economics. **Corequisite:** MATH 1100 and (APEC 2010 or ECN 2010) or instructor’s permission. (F) (3cr).

**APEC 4010 Intermediate Microeconomics:** Analysis of behavior of consumers and business firms. Application of theory to the solution of real world problems. Credit will not be given for both ECN 3010 and APEC/ECN 4010. **Prerequisite:** APEC 2010/ECN 2010, MATH 1100, and STAT 2300. **Cross-listed as:** ECN 4010. (F,Sp) (3cr).

**APEC 5010 Firm Marketing and Price Analysis (QI):** Students learn strategies for product and commodity marketing. Explores risk management, including futures and options, as well as price analysis and forecasting technique. **Prerequisite:** APEC 4010 or ECN 3010 or ECN 4010. (F) (3cr).

**APEC 5015 Firm Management, Planning, and Optimization (QI):** Application of principles and practices used by managers of agribusiness firms. Evaluation of alternative actions using budgeting (enterprise, cash flow, partial, whole firm, and capital) and optimization programs. **Prerequisite:** APEC 4010 or ECN 3010 or ECN 4010. (F) (3cr).

**MATH 1100 Calculus Techniques (QL):** Techniques of elementary calculus, differentiation, integration, elementary optimization, and introduction to partial derivatives. Applications in business, social science, and natural resources. Graphing calculator required. **Prerequisite:** One of the following within the last year or three consecutive semesters (including summer); ACT Math
score of at least 25; SAT Math score of at least 580; AP Calculus AB score of at least 3; Grade of C- or better in MATH 1050; or satisfactory score on the Math Placement Exam. (F,Sp,Su) (3cr).

**STAT 2300 Business Statistics (QL):** Descriptive and inferential statistics, probability, sampling, estimation, tests of hypotheses, linear regression and correlation, chi-square tests, analysis of variance, and multiple regression. **Prerequisite:** One of the following within the last year or three consecutive semesters (including summer); ACT Math score of at least 25; SAT Math score of at least 580; Grade of C- or better in MATH 1050 or MATH 1100; or satisfactory score on the Math Placement Exam. (F,Sp,Su) (3cr).

**MGT 2050 Legal and Ethical Environment of Business:** Surveys the legal and ethical environment of business. Introduction to elementary legal research and writing and critical thinking techniques. Lecture and laboratory. **Prerequisite:** STAT 1040 or MATH 1030 or MATH 1050 (MATH 1050 or equivalent is required for Huntsman School of Business majors); and GPA of 2.5 or higher. (F,Sp,Su) (3cr).

**PSC 4000 Soil and Water Conservation:** Applied soil and water conservation in an agronomic setting. Management of soil-water-plant-atmosphere continuum. Soil conservation techniques as they apply to actual situations. (F) (3cr).
College of Agriculture and Applied Sciences

School of Applied Sciences, Technology and Education (ASTE)

Utah State University

Assessment Plan

For the Undergraduate Program in
Aviation Technology – Maintenance Management (ATMM)

Fall 2013
I. Program Description

During the freshman and sophomore years, students in the Aviation Technology Maintenance Management (ATMM) major will complete most of the courses required for the Federal Aviation Administration (FAA) Airframe and Powerplant (A&P) licenses. Students will also take advanced turbine engines, aviation law, and composites structures. Management and communications courses are incorporated into the program to provide essential business skills. Industry internships are available and encouraged in the junior and senior years. This major prepares students for entry-level positions in management and maintenance programs within the airline industry, corporate aviation, and general aviation. The FAA approved airframe and powerplant (A&P) curricula form the basis for this degree, and most positions will require the A&P licenses. Employment opportunities include:

- Positions with major airlines as maintenance personnel
- Maintenance supervisors
- Fixed-base operators
- Maintenance directors
- Repair station managers
- FAA inspectors
- Aircraft powerplant, and component manufacturers, as well as aerospace manufacturers
- Manufacturing engineers for aircraft producers such as Boeing, Airbus, Cessna, Bombardier, Lockheed Martin, and NASA

These industries are expanding at a rapid rate with excellent employment opportunities. This is forecast to continue well into the twenty-first century.

II. Degrees and Emphasis Options

The program offers students the Bachelor of Science (BS) in Aviation Technology Maintenance Management. By taking a few additional classes students can, and are encouraged to, earn a Management minor which will further increase their career opportunities.

III. Program Mission

The mission of the Utah State University Aviation Program is to prepare, educate and enhance the professional development of student’s industry skills, attitudes and knowledge of aircraft maintenance, management, utilizing instructional excellence and experience in real world aviation. The synergy of dual curricula in professional pilot and maintenance management will prepare team leaders with diverse, industry-ready skills. Our courses are aligned with the Federal Aviation Administration’s (FAA) Part 147 requirements as a guide to help students earn their Airframe and Power plant (A&P) licenses.
IV. Alignment of Program Mission with Department Mission

The ATMM program mirrors the ASTE department’s philosophy by utilizing the same methods of learning, discovery and engagement with an interdisciplinary systems science approach. This approach facilitates the efficient development of the knowledge and skills in our students that meet and exceed the FAA’s requirements for Aviation Maintenance Technician Airframe & Powerplant licensing. Further education in airline operations, business and management disciplines prepares our students to excel in their careers and become leaders in the aviation industries, as well as related disciplines outside of aviation.

V. Program Goals

1. Each student will pass the FAA written exams with a 90% or better.
2. Each student will obtain an FAA airframe and power plant license.
3. Each graduating student will be familiar with career opportunities and have a clear career goal and pathway.

VI. Program Learning Objectives

All students who complete the Aviation Maintenance Program should:

1. Understand the fundamentals of:
   a. Aerodynamics
   b. Aircraft systems and components
   c. Aircraft structures
   d. Aircraft powerplants
2. Have developed the skills, techniques and accepted practices necessary for aircraft and aircraft component manufacturing, maintenance, repair, overhaul and airworthiness determination.
3. Have developed an attitude of lifelong learning and keeping up to date with FAA regulations, current events and technological advancements.
4. Have developed skills and abilities in oral and written communication at a professional level.
5. Have developed an understanding of, and practice teamwork and leadership skills necessary for employment in the professional aviation industry and other diverse professional settings.

VII. Course Map (See Appendix 4A)

VIII. Course List with Descriptions (See Appendix 4B)

IX. Strengths, Weaknesses and Recommendations

Strengths

- Excellent reputation in the aviation manufacturing, maintenance, repair, and overhaul industries with graduates in these career fields throughout the US and worldwide.
• Strong relations with numerous companies in Western and central U.S. seeking our graduates for employment.
• Strong international relations contributing to a more diverse international Aviation Maintenance student population.
• Extensive and diverse faculty experience and expertise within the aviation maintenance and flight industry contributing to real world training scenarios for our students.
• Our graduates are capable of securing employment in general aviation, commercial airlines, testing labs, NASA programs, aircraft manufactures, and many non-aviation companies due to the diversity of subject areas studied, and quality of training received.
• Our graduates typically secure higher compensation and have better job security than other comparable disciplines.
• Our faculty have developed and utilize creative methods of acquiring additional training aids with minimal financial burden.

Weaknesses
• Training and testing equipment is becoming antiquated and worn out, and as such do not accurately reflect standards or the latest technologies in the aviation industry.
• Instructors need to maintain currency with industry-specific maintenance and flight training to be able to teach the technologies found in aircraft reflective of the current aviation industry.
• Program name does not accurately reflect program professionalism, student capabilities and career path opportunities. Sometimes this is confusing or misleading to potential employers.
• Limited interaction with other aviation maintenance training academic institutions.
• The fact that USU has a Maintenance management program is not as widely known as similar programs among potential students, or aviation employers.

Recommendations
• Faculty should solicit and collaborate with aviation companies for donations of newer technologies. This may allow us to replace obsolete equipment in our curriculum with newer technologies.
• The ATMM faculty and students should participate in competitions, forums and magazines to increase our visibility in the aviation industry, with potential students, and future employers.
• The ATMM instructors should attend more professional conferences such as Aviation Technician Education Council as well as manufacturer and maintenance specific training.
• The aviation maintenance advisory board should be reconvened annually to ensure that the ATMM program continues to progress in a direction that will continue to prepare our graduates for successful careers the aviation industry.

X. Plan for Measuring the Achievement of Degree and Program Objectives
• In the student’s senior year they will be required to pass the FAA knowledge tests with a score of 90%.
• Students will be assessed on their ability to pass the FAA practical test required for licensing.
• The Federal Aviation Administration annually inspects our curriculum to assure it meets or exceeds FAR Part 147 requirements.
• Employers of graduating students will be surveyed to verify satisfaction of graduate’s training and professionalism.
• Individual classes will be assessed on their effectiveness in reaching program objectives.
• Students will complete a senior design project and possibly an internship. Employers of these internships will be surveyed to find strengths and weaknesses within the curriculum.

XI. Outreach Efforts

• Displays and attendance at multiple airshows throughout Utah, Nevada, and Idaho to inform aviation enthusiasts of maintenance training and career opportunities
• Aviation profession presentations to 4th – 6th grade students at their classrooms
• Facilities tours for pre-K through 12 groups to introduce the aviation profession
• Facilities tours for BSA and church groups, including Aviation merit badge programs
• Aviation open house with aircraft displays from the industry and university as well as hands on activities held at Logan Cache airport, and free to the public
• Presentation at international Maintenance Repair and Overhaul (MRO) conference and university, Seoul Korea

XII. Interactions with Other Programs (within ASTE and externally)

• Synergistic relationship with the Aviation Technology – Professional Pilot program, including multiple courses required for both flight and maintenance students
• Special seminars for graduating flight students to prepare them for employment interviews by equipping them with a thorough understanding of turbine engines required by their potential employers
• Technology & Engineering Education provides courses in Material Processing and Electronics Fundamentals, and many of their students take the Advanced Composite Manufacturing course taught by the aviation maintenance faculty.
• Many Professional Pilot majors enroll in maintenance courses and obtain their A&P license, potentially making them superior pilot as well as widening potential career paths.
• Long relationship with MAE department hybrid rocket development program with extensive use of Jet Engine Test Cell
• Consultation and collaboration with MAE department composites projects including assisting with Bio drag car body
• Developing aircraft fuselage designs for the UAV lab and fabrication of these aircraft for platform testing of electronic flight controls
• Provide welding training and fabrication techniques for MAE senior design teams
• Sponsor of the “Aviation and Aerospace Welding Club” which is open to any student at USU. This club teaches basic welding to beginners and advanced processes to experienced welders.
Appendix 4A

Course Map
### Aviation Technology – Maintenance Management

<table>
<thead>
<tr>
<th>ATMM Program Learning Objectives</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td><strong>1. Have an understanding of the fundamentals of:</strong></td>
<td>AV 1100 AV 1130 AV 1140 AV 1170 AV 1240 AV 2100 AV 2110 AV 2140 AV 2150 AV 2170 AV 2180 AV 2190 AV 2200 AV 2420 AV 2430 AV 2440 AV 3120</td>
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<tr>
<td>a. Aerodynamics</td>
<td>x x</td>
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<tr>
<td>b. Aircraft systems and components</td>
<td>x x x x x x x</td>
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<tr>
<td>c. Aircraft structures</td>
<td>x x x</td>
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<tr>
<td>d. Aircraft powerplants</td>
<td>x x x x</td>
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<tr>
<td><strong>2. Have developed the skills, techniques and accepted practices necessary for accurate aircraft and aircraft component manufacturing, maintenance, repair, overhaul and determination of airworthiness.</strong></td>
<td>x x x x x x x x x x x</td>
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<tr>
<td><strong>3. Have developed an attitude of lifelong learning and keeping up to date with FAA regulations, current events and technological advancements.</strong></td>
<td>x x x x x x x x x x x</td>
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<tr>
<td><strong>4. Have developed skills and abilities in oral and written communication and computation.</strong></td>
<td>x x x x x x x x x x x</td>
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</tbody>
</table>
| **5. Have developed an understanding of, and practice teamwork and leadership skills necessary for employment in the professional aviation industry and other diverse professional settings.** | x x x x x x x x x x x x x x
<table>
<thead>
<tr>
<th>ATMM Program Learning Objectives</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td>1. Have and understanding of the fundamentals of:</td>
<td>AV 3280 AV 3610 AV 4200 AV 4280 AV 4490 AV 4610 AV 4620 MATH 1050 MATH 1060 MATH 1100 MGT 3110 MGT 3710 PHYS 1800 STAT 2300 TEE 1030 TEE 1200 TEE 2300</td>
</tr>
<tr>
<td>a. Aerodynamics</td>
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<tr>
<td>b. Aircraft systems and components</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>c. Aircraft structures</td>
<td>X X</td>
</tr>
<tr>
<td>d. Aircraft powerplants</td>
<td>X</td>
</tr>
<tr>
<td>2. Have developed the skills, techniques and accepted practices necessary for accurate aircraft and aircraft component:</td>
<td></td>
</tr>
<tr>
<td>a) Manufacturing</td>
<td>X X X X X</td>
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<tr>
<td>b) Maintenance</td>
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</tr>
<tr>
<td>c) Repair</td>
<td></td>
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<tr>
<td>d) Overhaul</td>
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<tr>
<td>e) Determination of airworthiness.</td>
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<td>3. Have developed an attitude of lifelong learning and keeping up to date with FAA regulations, current events and technological advancements.</td>
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<td>4. Have developed skills and abilities in oral and written communication and computation.</td>
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<td>5. Have developed an understanding of, and practice teamwork and leadership skills necessary for employment in the professional aviation industry and other diverse professional settings.</td>
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Appendix 4B

Course Descriptions
Aviation Technology Maintenance Management Course Descriptions

AV 1100 The Aviation Profession: Covers attributes of aviation professional, career planning, and certification process.

AV 1130 Flight Principles: Basic flight theory and physics of flight. Aircraft control systems related to flight. Ground handling and servicing of aircraft.

AV 1140 Aircraft Components and Principles: Materials and hardware, as well as nondestructive inspection applicable to aircraft. Plumbing methods, maintenance publications, and aircraft weight and balance control.

AV 1170 Aircraft Structures: Accepted methods and repair for metal structures. Organic finishes and application techniques with laboratory applications and practical experience.

AV 1240 Aircraft Maintenance: Maintenance, repair, alteration, and inspection of aircraft. Assembly and rigging of control systems with laboratory application of maintenance assembly and rigging procedures. Prerequisites: AV 1130, 1140.

AV 2100 Aircraft Reciprocating Powerplants and Accessories: Theory of operation, maintenance, and repair of reciprocating engines, propellers, exhaust systems, ignition systems, and fuel systems with laboratory applications of principles and components studied. Prerequisite: AV 2110 (must be taken concurrently).

AV 2110 Aircraft Reciprocating Powerplants and Accessories Lab: Laboratory application of principles studied in AV 2100. Prerequisite: AV 2100 (must be taken concurrently).

AV 2140 Aircraft Turbine Powerplants and Maintenance Operations: Theory of turbine powerplants, including turbine engine and components operation, hot section inspection, and servicing. Aircraft engine 100-hour inspections and maintenance, with laboratory applications of principles and components studied. Prerequisite: AV 2150 (must be taken concurrently).

AV 2150 Aircraft Turbine Powerplant Maintenance Operations Lab: Theory of turbine powerplants, including turbine engine and components operation, hot section inspection, and servicing. Aircraft engine 100-hour inspections and maintenance, with laboratory applications of principles and components studied. Prerequisite: AV 2140 (must be taken concurrently).

AV 2170 Aircraft Systems: Theory and operation of aerospace environmental systems, communication, navigation and guidance systems, fuel and propellant systems, fire detection, and warning.


AV 2190 Aircraft Systems Lab: Laboratory application of principles and components studied in AV 2170. Prerequisite: AV 2170 (must be taken concurrently).
AV 2200 Aircraft Hydraulics and Pneumatics Systems Lab: Laboratory application of principles and components studied in AV 2180. Prerequisite: AV 2180 (must be taken concurrently).

AV 2420 FAA Regulations, Records, and Certification: Maintenance forms, records, and regulations releasing aircraft to airworthy status. Certification of maintenance technicians is also included.

AV 2430 Aircraft Electrical Systems and Components: Aircraft electrical power generating systems. Theory of generation, alternators, regulation, and control systems with laboratory application of principles and systems studied. Prerequisite: ETE 2300.

AV 2440 Aircraft Electrical Systems Laboratory: Laboratory application of principles and systems studied in AV 2430. Prerequisites: ETE 2300; AV 2430 (must be taken concurrently). AV 3120 Aviation Law: Law as it affects aviation industry. Rights and responsibilities of individual organizations and the aviation community. Regulation and liability pertaining to design, manufacturing, operation, and maintenance of aircraft. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 3280 Advanced Turbine Engines: Advanced study of turbo-jet propulsion. Comparative examination of jet, fan, turbo-prop, and turbo-shaft engines. Prerequisites: AV 1100, 2150, and a grade of C- or better in MATH 1050

AV 3610 AeroTechnology Design I: Students select and plan a senior project. Requires written proposal, including technical description of the project and management plans. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 4200 Composite Manufacturing Processes and Repair: Composite manufacturing processes, composite materials survey, tooling design and fabrication, autoclave processes, vacuum bag techniques, filament winding processes, equipment requirements, materials cutting and storage, and composite materials testing. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 4280 Airline Management: Study of airline operations and their organizational structure. Examines functions of airline dispatcher, operations specialists, managers, and cockpit flight crew. Discussion of advanced flight planning, aircraft performance and loading considerations, and impact of weather on flight operations and routing priorities. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 4490 Human Factors in Aviation Safety: Examines major causative agent in aircraft accidents: the human being. Emphasizes psychological and physiological factors enhancing accident probability. Includes detailed analysis of ergonomics (human engineering) and its influence on safety. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 4610 AeroTechnology Design II: Execution and completion of a team or individual project. Requires design reviews and written reports. Prerequisites: AV 1100, 3610, and a grade of C- or better in MATH 1050
AV 4620 AeroTechnology Design III: Preparation and presentation of a team or individual project. Writing and speaking skills emphasized through technical reports and presentations. Prerequisites: AV 1100, 4610, and a grade of C- or better in MATH 1050


Math 1060 Trigonometry: Trigonometric functions, equations, identities, and applications. Graphing calculator required.

Math 1100 Calculus Techniques: Techniques of elementary calculus, differentiation, integration, elementary optimization, and introduction to partial derivatives. Applications in business, social science, and natural resources. Graphing calculator required.

MGT 3110 Managing Organizations and People: Overview of the role of management, and an introduction to leadership theory and practice. Includes defining of mission and goals, organizing work, and managing human performance.

MGT 3710 Team Management: Experientially-driven course focusing on the role of teams in organizations and on developing skills which individuals and teams need to be effective. Topics include self-awareness, supportive communication, problem solving, and conflict management.

STAT 2300 Business Statistics: Descriptive and inferential statistics, probability, sampling, estimation, tests of hypotheses, linear regression and correlation, chi-square tests, analysis of variance, and multiple regression.

TEE 1030 Material Processing Systems: Introduction to properties of industrial materials (metallic, polymeric, ceramic, and composite), processes used to produce standard stock and finished products, and the use of precision measuring instruments in manufacturing.

TEE 1200 Computer-Aided Drafting and Design: Provides students with ability to accurately produce basic engineering, 2-D, and pictorial drawings using traditional and computer-aided drafting techniques. Introduction to drafting fundamentals and equipment associated with the drafting industry, including drawings, reproductions, and computer-aided techniques.

TEE 2300 Electronic Fundamentals: Study and application of DC and AC concepts, semiconductors, digital electronics, and microcomputers.
College of Agriculture and Applied Sciences
School of Applied Sciences, Technology and Education (ASTE)
Utah State University

Assessment Plan

For the Undergraduate Program in
Aviation Technology – Professional Pilot (ATPP)

Fall 2013
I. Program Description

The Utah State University Aviation Program is certified under Federal Aviation Regulation Part 141 for both ground and flight training. 170 students are enrolled in the program. In 2006, Utah State University purchased a fleet of 12 new Diamond DA-40 and DA-42 aircraft to replace the old, generic fleet of Cessna’s. All of the new aircraft have glass cockpits and the latest instrument/navigation technology. Five flight training devices supplement and enhance student learning and experience in a controlled environment notwithstanding inclement weather and aircraft availability. Flight training is conducted at the Logan Cache Airport where the University maintains aircraft hangars and operations facilities. Courses which provide professional industry knowledge, technical skills, and the regional jet program are taught on the main University campus.

II. Degrees and Emphasis Options Offered

This program is a Bachelor of Science degree in Aviation Technology – Professional Pilot.

III. Program Mission

The mission of the Utah State University Aviation Program is to prepare, educate and enhance the professional development of students enrolled. Each individual will gain knowledge of flight principles and operations, aircraft mechanical systems, the aviation environment to include meteorology, physiology and resource management. Department faculty and instructors will utilize instructional excellence and industry accepted training and practices. Safety management system knowledge will include risk and error management to complement program objectives and create a safety-oriented attitude. The development of life-long learning skills will ensure individual success and leadership throughout an aviation career.

IV. Alignment of Program Mission with Department Mission

The Professional Pilot Program follows the mission of Land-Grant University philosophy in making this program available to every individual utilizing an interdisciplinary systems science approach to the training and enhancement of individuals utilizing proven educational processes including formal and informal instruction, experiential learning, leadership and personal development at an undergraduate level. The program values all individuals, developing the whole person, responding to the needs of the marketplace and functioning as part of the total higher education system.

V. Program Goals

The major goals of the Aviation Technology – Professional Pilot program are:

1. Develop in students a high degree of aviation literacy with a variety of aviation experiences which will provide an adequate reservoir of skills and knowledge in aviation subjects to meet the expectations of the aviation industry.

2. Students will acquire necessary people skills to successfully interact as teams and crews in adverse and normal conditions representative of the industry.
3. Students will gain practical skills and knowledge required to work in the aviation industry.
4. Provide students with a grounding of the philosophical, ethical, and legal frameworks of aviation, as well as an understanding of the roles and responsibilities of aviation in society.
5. Develop critical thinking in students, analytical abilities, and strong written and oral communication skills within the context of the aviation industry.
6. Help our students gain the ability to know, feel and understand the aviation industry culture by hiring experienced individuals who are also proven academic educators.
7. Teach intermediate and upper-level courses, which build a depth and breadth of knowledge and development of industry skills and the application of teamwork to accomplish tasks, solve problems and discover life-long learning skills.
8. Each graduating senior be certificated and licensed as a Commercial Pilot with an Instrument Rating, have a Certified Flight Instructor License, have the knowledge and social skills, attitudes and leadership qualities to enter the workforce and become a productive, integral team player.

VI. Program Learning Objectives

All students who complete the Professional Pilot Program will:

1. Understand the fundamentals of aerodynamics, aircraft systems and weather.
2. Demonstrate proficient flight skills and knowledge to acquire a Private, Commercial and Flight Instructor License with an Instrument Rating during FAA certification evaluations.
3. Participate and gain the ability to interact positively in team/group activities valuing the diversity and applying the principles of crew resource management.
4. Gain a working knowledge of regulatory and legal issues involved in the aviation industry.
5. Apply the principles of effective decision making in the classroom and the aircraft.
6. Achieve the ability to communicate effectively in both written and spoken forms.
7. Demonstrate an attitude of safety awareness.

VII. Course Map (See Appendix 5A)

VIII. Course List with Descriptions (See Appendix 5B)

IX. Strengths, Weaknesses and Recommendations

Strengths
- Committed and industry experienced staff, faculty and instructors
- Outstanding maintenance of equipment
- Technologically advanced aircraft and simulators
- Industry-supported internship programs
- Active Industry Advisory Committee
• Excellent Safety Record and Safety Program
• Affordable excellence in education and training
• Making Aviation benefits available to veterans

Weaknesses
• Poor follow through in the process of assessing the effectiveness and accomplishment of program goals and objectives
• Standardized procedures do not effectively manage assessment of the program
• Ground school faculty do not completely utilize the record keeping program (ETA)

Recommendations
• Assign a department assessment specialist to create a model and procedures for each program to follow. Have that individual collect and file program data in one data base.
• Review mission, goals and program objectives at each department retreat utilizing assessment data and advisory committee input to evaluate adequacy and currency of program goals and objectives.
• Have an ETA training meeting each semester or as often as needed.

X. Plan for Measuring the Achievement of Degree and Program Objectives

The plan for measuring the achievement of degrees and program objectives for flight labs and ground schools is built into the Federal Aviation Administration's requirements for certification under FAA regulation part 141. Flight students during each flight lab are evaluated by their flight instructors. FAA regulation 141 requires that each of these students receive a progress check from a supervising instructor several times during the various flight courses. Any deficiencies or weaknesses are identified and corrected. An assistant chief flight instructor identifies trends and weaknesses during weekly standardization meetings with all instructors. End of course evaluations are conducted by FAA certified evaluators. The number of successful student evaluations are recorded and measured by FAA standards.

Aviation ground schools conducted by University faculty instruct and grade student progress in accordance with federal regulations. Again, students are evaluated and graded in a similar manner. Students must achieve an 80% exam average to be entitled to take the FAA ground course evaluation. Students not achieving this goal are given additional instruction and are reevaluated. Flight instructors add valuable critique to the ground instruction based on student performance in flight operations.

The program offers introductory courses which create a solid foundation upon which to build and develop the knowledge, skills and experience necessary for success in the aviation industry and life. These outcomes will be measured and assessed by the faculty responsible for the particular course utilizing traditional evaluation systems.

The program teaches intermediate and upper-level courses, which build a depth and breadth of knowledge, development of industry skills, and the application of teamwork to accomplish tasks, solve problems and discover life-long learning skills. These outcomes will be measured during
assessment of each student’s course performance evaluation. Learning outcomes for each academic course will be evaluated.

The program utilizes the latest technology and educational pedagogy to give our students the greatest advantage to compete for employment. Faculty members and program constituents will evaluate this outcome based on Industry standards as suggested by industry representatives during advisory meetings.

The program will develop and coordinate practical industry experience through work programs and internship opportunities. University internship coordinators, students, and industry supervisors will jointly create learning objectives, and evaluate interns and work project students based upon cooperatively established outcomes.

Graduating seniors will be certificated and licensed as Commercial Pilots with Instrument Ratings, have Certified Flight Instructor Licenses, and have the knowledge, industry and social skills, attitudes, and leadership qualities to enter the workforce and become productive, integral team players. Each prospective graduate will be assessed by the Chief or Assistant Chief Flight Instructor as to the course requirements and then certificated by an FAA Inspector or designee.

Each graduate will successfully complete a culminating experience consisting of a capstone course, an internship or a special project. Student attributes and outcomes will be evaluated by the capstone course faculty, internship coordinator or the special project mentor. An end of program evaluation and interview will be administered by the professional pilot program coordinator for inclusion and discussion at the spring semester retreat for all faculty.

Program faculty will meet at least each semester during the academic school year to discuss program objectives, curriculum issues and assessment results. Goals and outcomes will be re-evaluated and any changes coordinated and published for the program.

XI. Outreach efforts

The aviation program has been exemplary in the support of the Boy Scouts of America, conducting hundreds of tours and merit badge training sessions. The program is also involved in the Granite School District Aviation Program for High School Students, making aviation experience and symposiums available to students in the Salt Lake School System. Participation in air shows and community activities has also supported outreach objectives. The Aviation Program has sponsored many local elementary and middle school visits to support the aviation industry and promote community relations.

XII. Interaction with other programs (within ASTE and externally)

The professional Pilot Program interfaces in a synergistic effort with the Maintenance Management Program. Students from both majors increase industry technical and educational knowledge in joint classes. The Aviation Program interfaces with programs from the College of Agriculture and Applied Sciences as well as programs in the University to add diversity and support to university and program activities.
Appendix 5A

Course Map
## Aviation Technology – Professional Pilot

| ASTE Department Learning Objectives                                                                 | AV 1100 | AV 1130 | AV 2170 | AV 2180 | AV 2330 | AV 2350 | AV 2510 | AV 2430 | AV 2520 | AV 2540 | AV 2550 | AV 2620 | AV 2660 | AV 2740 | AV 2860 | AV 2880 | AV 3010 |
|-----------------------------------------------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. Understand the fundamentals of aerodynamics, aircraft systems and weather.                          | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       |
| 2. Demonstrate proficient flight skills and knowledge to acquire a Private, Commercial and Flight Instructor License with an Instrument Rating during FAA certification evaluations. | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       |
| 3. Participate and gain the ability to interact positively in team/group activities valuing the diversity and applying the principles of crew resource management. | X       |         | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       |         |         |         |         |         |         |
| 4. Gain a working knowledge of regulatory and legal issues involved in the aviation industry.         | X       |         |         | X       | X       |         |         |         |         |         |         |         |         |         |         |         |         |         |
| 5. Apply the principles of effective decision making in the classroom and the aircraft.               | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       | X       |         |         |         |         |         |         |
| 6. Achieve the ability to communicate effectively in both written and spoken form.                    | X       | X       | X       |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| 7. Demonstrate an attitude of safety awareness.                                                       | X       | X       | X       | X       | X       | X       |         |         |         |         |         |         |         |         |         |         |         |
| 8. Gain a knowledge of management and operations in the aviation industry.                            | X       |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
### ASTE Department Learning Objectives

<table>
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<tr>
<th>Required Classes</th>
<th>AV 3120</th>
<th>AV 3140</th>
<th>AV 3720</th>
<th>AV 4280</th>
<th>AV 4490</th>
<th>AV 4660</th>
<th>AV 5400</th>
<th>AV 5410</th>
<th>AV 5420</th>
<th>MATH 1050</th>
<th>MATH 1060</th>
<th>MATH 1100</th>
<th>MGT 3110</th>
<th>PHYS 1800</th>
<th>PSC 2000</th>
<th>PSC 3250</th>
<th>TEE 2300</th>
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<tr>
<td>1. Understand the fundamentals of aerodynamics, aircraft systems and weather.</td>
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<td>2. Demonstrate proficient flight skills and knowledge to acquire a Private, Commercial and Flight Instructor License with an Instrument Rating during FAA certification evaluations.</td>
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<td>3. Participate and gain the ability to interact positively in team/group activities valuing diversity and applying the principles of teamwork and crew resource management.</td>
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<td>4. Gain a working knowledge of regulatory and legal issues involved in the aviation industry.</td>
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<td>5. Apply the principles of effective decision making in the classroom and the aircraft.</td>
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<td>6. Achieve the ability to communicate effectively in both written and spoken form.</td>
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<td>7. Demonstrate an attitude of safety awareness.</td>
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<td>8. Gain a knowledge of management and operations in the aviation industry.</td>
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Appendix 5B

Course Descriptions
Aviation Technology Professional Pilot Course Descriptions

AV 1100 The Aviation Profession: Covers attributes of aviation professional, career planning, and certification process.

AV 1130 Flight Principles: Basic flight theory and physics of flight. Aircraft control systems related to flight. Ground handling and servicing of aircraft.

AV 2170 Aircraft Systems: Theory and operation of aerospace environmental systems, communication, navigation and guidance systems, fuel and propellant systems, fire detection, and warning.


AV 2330 Private Pilot Ground School: Instructions in principles of flight, aircraft and engine operation, weather, navigation, radio aids to navigation, radio communications, and federal air regulations. Preparation for FAA Private Pilot written exam.

AV 2350 Private Pilot Certification: FAA approved flight training program meeting all requirements for, and in the issuance of, the Private Pilot Airplane License. Prerequisite: AV 2330 (may be taken concurrently).

AV 2430 Aircraft Electrical Systems and Components: Aircraft electrical power generating systems. Theory of generation, alternators, regulation, and control systems with laboratory application of principles and systems studied. Prerequisite: ETE 2300.

AV 2510 Intermediate Flight: FAA approved flight training program that fulfills the cross country requirements for commercial and instrument ratings. Prerequisite: AV 2350.

AV 2520 Instrument Pilot Ground School: Ground school approved by FAA under Part 141 of the Federal Aviation Regulations. Designed to prepare students to pass the FAA oral and written examinations required for becoming instrument rated pilots. Prerequisite: AV 2330.

AV 2540 Instrument Pilot Certification I: FAA approved flight training program introducing requirements for issuance of the Instrument Pilot Airplane Rating. Prerequisites: AV 2350, 2510; and AV 2520 (may be taken concurrently).

AV 2550 Instrument Pilot Certification II: Continuation of AV 2540. Completes all requirements for issuance of the instrument pilot airplane rating. Prerequisite: AV 2540.

AV 2620 Commercial Pilot Ground School: Commercial flight operations including performance, cross country planning, advanced systems operations, complex airplanes, and flight maneuvers. Prerequisites: AV 2350, 2520, 2540, and 2550.
AV 2660 Commercial Pilot Certification: Flight instruction to meet FAA requirements and completion of tests for certification. Prerequisites: AV 2540, 2550; and AV 2620 (may be taken concurrently).

AV 2740 CFI Certification: FAA-approved flight training program meeting all requirements for the issuance of the Certified Flight Instructor Airplane Rating. Prerequisites: AV 2620, 2660; and AV 2720 (may be taken concurrently).

AV 2860 CFII Certification: FAA approved flight training program meeting all the requirements for, and issuance of, the Certified Flight Instructor, Airplane Instrument Rating. Prerequisites: AV 2620, 2660, 2720, and 2740.

AV 2880 Multi-Engine Certification: Flight training program designed to satisfy all requirements necessary to qualify a student for the FAA Multi-Engine Airplane Rating practical test. Prerequisite: AV 2660.

AV 3010 National Airspace, Air Traffic Control, and Airport Administration: Study of air traffic control system, airspace usage, and facilities. Airport planning, development, and management and their importance to the achievement of a successful airport operation. Management of publicly owned and operated airports, ranging in size from general aviation to the large air carrier hubs. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 3120 Aviation Law: Law as it affects aviation industry. Rights and responsibilities of individual organizations and the aviation community. Regulation and liability pertaining to design, manufacturing, operation, and maintenance of aircraft. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 3140 Advanced Avionics Systems and Flight Simulation: Advanced instrument simulation training. Prerequisites: AV 1100, 2540, and a grade of C- or better in MATH 1050

AV 3720 CFI and CFII Ground School: Designed to prepare students to pass the FAA oral and written examinations required for becoming certified flight and instrument instructors. Combines Certified Flight Instructor and Certified Flight Instructor-Instrument into one course. Prerequisites: AV 2620, 2660.

AV 4280 Airline Management: Study of airline operations and their organizational structure. Examines functions of airline dispatcher, operations specialists, managers, and cockpit flight crew. Discussion of advanced flight planning, aircraft performance and loading considerations, and impact of weather on flight operations and routing priorities. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050

AV 4490 Human Factors in Aviation Safety: Examines major causative agent in aircraft accidents: the human being. Emphasizes psychological and physiological factors enhancing accident probability. Includes detailed analysis of ergonomics (human engineering) and its influence on safety. Prerequisites: AV 1100 and a grade of C- or better in MATH 1050
AV 4660 CI Flight Senior Project: Students select, plan, and execute an approved senior project. Writing and speaking skills emphasized through technical reports and presentations. Prerequisites: AV 1100, 5400, and a grade of C- or better in MATH 1050

AV 5400 Regional Jet Ground School I: Introduction to a typical commercial jet aircraft in use by Regional Airlines. Course includes the following: Aircraft Systems, Standard Operating Procedures, and Flight Planning and Performance. Introduction to Airline Flight Operations in preparation for entry-level pilot positions with a regional airline. Prerequisites: AV 1100, 2550, a grade of C- or better in MATH 1050

AV 5410 Regional Jet Ground School II: Continuation of AV 5400. Prerequisites: AV 1100, 5400, and a grade of C- or better in MATH 1050

AV 5420 Advanced Regional Jet Simulation: Flight training introduction to a typical commercial jet aircraft simulator in use by regional airlines. Intended for Professional Pilot aviation students actively pursuing a career in the airline industry. Prerequisites: AV 1100, 5410, and a grade of C- or better in MATH 1050


Math 1060 Trigonometry: Trigonometric functions, equations, identities, and applications. Graphing calculator required.

Math 1100 Calculus Techniques: Techniques of elementary calculus, differentiation, integration, elementary optimization, and introduction to partial derivatives. Applications in business, social science, and natural resources. Graphing calculator required.

MGT 3110 Managing Organizations and People: Overview of the role of management, and an introduction to leadership theory and practice. Includes defining of mission and goals, organizing work, and managing human performance.

PHYS 1800 Physics of Technology: Overview of the classical physics on which industrial technology is based. Elements of kinematics, forces, energy, momentum, thermodynamics, electric and magnetic fields, waves, and optics. Required laboratory.

PSC 2000 Atmosphere and Weather: Survey of the processes governing the behavior of the atmosphere and the phenomenon of weather. Basic physical principles of radiation, energy, evaporation, and heat transport are introduced and connected to atmospheric circulation and weather.

PSC 3250 Aviation Weather: Discussion, observation, and analysis of weather important for pilots and those associated with air travel.

TEE 2300 Electronic Fundamentals: Study and application of DC and AC concepts, semiconductors, digital electronics, and microcomputers.
College of Agriculture and Applied Sciences
School of Applied Sciences, Technology and Education (ASTE)
Utah State University

Assessment Plans

For the Undergraduate Programs in Teacher Preparation:
Agricultural Education (AGED)
Family and Consumer Sciences Education (FCSE)
&
Technology and Engineering Education (TEE)

Fall 2013
I. Description

The School of Applied Sciences, Technology and Education prepares teachers in the following career and technical education (CTE) programs: Agricultural Education, Family and Consumer Science Education, and Technology and Engineering Education. The commonalities for the degree programs are below. Additionally, each program has completed an assessment plan specific to their content area.

In order to obtain a secondary teaching license for grades 6-12, students in each of the majors must complete the 35-credit Secondary Teacher Education Program (STEP), which includes one semester of student teaching in a public school. The Utah State University School of Teacher Education and Leadership (TEAL) in the Emma Eccles Jones College of Education and Human Services collaboratively administer the education component of the program. Students must apply to the School of TEAL the semester before taking STEP courses. This is usually the fall of their junior year. Students learn subject content through the School of Applied Sciences, Technology, and Education and spend the last year or two studying education techniques through the STEP program.

II. Degrees and Emphasis Offered

Agricultural Education — Bachelor of Science
Family and Consumer Sciences Education — Bachelor of Science
Technology and Engineering Education — Bachelor of Science
  Technology and Engineering Education Emphasis
  Trade and Technical Education Emphasis

III. Learning Objectives & Outcomes

School of Teacher Education and Leadership: Secondary Education Learning Outcomes
The goal of this program is to provide students with the professional knowledge and teaching skills to complement the content knowledge acquired in general education and in teaching majors and minors. Successful completion of this program enables students to be recommended for secondary teacher licensure (grades 6-12) in Utah.

• Students will maintain a minimum accumulative GPA of 2.75 and a grade of “C” or better in all courses that constitute the Professional Education Framework (coursework from content major and minor departments as well as the secondary education coursework).
• Students will participate in on-campus teaching simulations as well as 60 hours of clinical experiences in middle and high school settings preceding student teaching.
• Students will successfully complete a comprehensive professional portfolio demonstrating their understanding of the ten standards based on their course work and clinical experiences at Level 1 and 2, before entering student teaching (Level 3).
• Students will successfully meet the requirements of secondary student teaching and for the professional seminar that accompanies this experience.
Council for the Accreditation of Educational Programs (CAEP)
Utah State University’s Secondary Teacher Education Program (STEP) is accredited through the Teacher Education Accreditation Council (TEAC) who is functioning under the Council for the Accreditation of Educational Programs (CAEP).

TEAC goals and principles: http://www.teac.org/accreditation/goals-principles/

CAEP 2013 Standards for Accreditation of Educator Preparation:
http://www.caepsite.org/standards.html

Secondary Education Learning Outcomes
The evaluation of the Secondary Teacher Education Program (STEP) is based on measures of student performance. The performances that are measured in the STEP program are derived from the Teacher Education Accreditation Council (TEAC) and the Utah Pre-Service Teacher Learning Outcomes:

Outcome 1: Learner Development
The teacher:
   a. Creates developmentally appropriate and challenging learning experiences based on students’ strengths, interests, and needs.
   b. Collaborates with families, colleagues, and other professionals to promote student growth and development.

Outcome 2: Learning Differences
The teacher:
   a. Adapts instruction to address each student’s learning strengths and needs.
   b. Delivers instruction that provides for different ways of demonstrating learning.
   c. Provides instruction that takes into account the experiences and knowledge of learners.

Outcome 3: Learning Environments
The teacher:
   a. Uses a variety of effective classroom management strategies to maintain a positive learning environment.
   b. Constructs learning experiences that require students to be actively engaged in learning.

Outcome 4: Content Knowledge
The teacher:
   a. Communicates accurate information and concepts.
   b. Adapts instruction to address students’ common misconceptions about subject matter.
   c. Designs instruction based on approved content standards and research.
   d. Provides multiple representations and explanations of concepts.
   e. Selects instructional resources that contain accurate content.

Outcome 5: Assessment
The teacher:
a. Uses pre-assessments, and formative and summative assessments, in a variety of formats that match learning objectives.
b. Teaches students to identify the elements of quality work. Uses data to assess student learning to plan for differentiated instruction.
c. Documents student progress and provides specific feedback to students and other stakeholders in a variety of ways.

Outcome 6: Instructional Planning
The teacher:
   a. Plans instruction based on state core.
   b. Aligns instruction and assessment with learning goals.
   c. Designs instruction at an appropriate level of cognitive complexity for the learning goal.

Outcome 7: Instructional Strategies
The teacher:
   a. Uses a variety of instructional strategies that elicit and build upon students’ prior knowledge and experiences.
   b. Constructs learning experiences that require students to use multiple forms of communication.
   c. Systematically includes a variety of perspectives and sources to inform instruction.
   d. Uses technologies appropriate for the learning goal.

Outcome 8: Reflection and Continuous Growth
The teacher:
   a. Participates in professional development.
   b. Recognizes and reflects upon own biases in order to become a more effective teacher of all students.
   c. Reflects on instructional effectiveness to improve subsequent teaching practice.
   d. Accepts and uses feedback from multiple sources.

Outcome 9: Leadership and Collaboration
The teacher:
   a. Participates as a team member in decision-making processes.
   b. Collaborates with school professionals to meet the needs of learners.

Outcome 10: Professional and Ethical Behavior
The teacher:
   a. Adheres to and upholds laws, rules, policies, and directives.
   b. Maintains professional behavior and appearance.

IV. Plan for Measuring the Achievement of Objectives

Students majoring in AGED, FCSE and TEE apply to be admitted to the Secondary Teacher Education Program (STEP) administered by the Emma Eccles Jones College of Education and Human Services.
All education graduates from the School of Applied Sciences, Technology and Education must satisfy requirements for the university core curriculum and meet the following three minimum requirements: (1) accumulative grade point average must be 2.75 or higher in all courses required for the major; (2) courses required for the major may be repeated one time to improve a grade; (3) courses required for the major may not be taken for pass-fail credit.

Upon completion of the degree, students are eligible for initial licensure in Utah and other states across the nation.

Assessment of student performance in the Secondary Teacher Education Program (STEP) is based on the Utah Effective Teaching Standards:

- Learner Development
- Learning Differences
- Learning Environments
- Instructional Practice
- Assessment
- Instructional Planning
- Instructional Strategies
- Reflection and Continuous Growth
- Leadership and Collaboration
- Professional and Ethical Behavior

Three unique performance assessments were developed from the conceptual framework of the ten standards. These assignments allow ongoing evaluation of student performance and progress as well as data for the assessment of the program. The three assessments are described below.

**Portfolio**

Students who enter the secondary education program begin developing a professional portfolio, which is an integral tool in the assessment of their professional performance as a teacher. Students select materials from the professional education courses, courses in their major/minor, clinical experiences, as well as other experiences they have had working with youth to demonstrate successful performance of knowledge skills, and attitudes reflected in the 10 standards of teaching in the conceptual framework. In every secondary education course, the relationship between course work, the conceptual framework, and the portfolio is explained. Students are taught how to analyze the materials they select and how to write a rationale explaining why the artifact fits the standard(s) indicated by the student. While students are introduced to the portfolio during their Level 1 coursework, the portfolio is completed and assessed in the SCED 4210 Cognition and Assessment course. Students must complete the portfolio before entering student teaching. The reviews of the portfolios allow faculty to identify areas of the program, which are successfully preparing students to perform as teachers.

**Student Teaching and the Student Teaching Performance Report (STPR)**

Family and Consumer Sciences Education students complete a capstone experience in student teaching. Students spend a minimum of 14 weeks in the student teaching site under the supervision of a qualified Family and Consumer Sciences Education instructor. The supervision is completed
during minimum of two supervisory visits. During the visits, each student teacher is provided feedback on his or her teaching using the Student Teaching Performance Report (STPR) developed by the Office of Field Experience and School of Teacher Education and Leadership.

The Student Teaching Performance Report (STPR) uses the same INTASC standards as the professional portfolio. The form identifies tasks for each principle that delineates the knowledge, skills, and dispositions that constitutes successful performance. The student teacher, mentor teacher, and university supervisor as a summative evaluation of that student’s performance complete the evaluation form. Placing a mark on a line, which represents a continuum from successful completion of the task to unsuccessful performance, indicates the level of performance.

Performance Surveys of First Year Teachers
While the previous three sources of data are compiled as students complete the secondary education program, the performance surveys of first year teachers are designed to gather data about the students’ performance after the first year of teaching. Surveys are sent to the graduates of the secondary education program and their principals at the end of their first year of teaching. The surveys provide data as to how well beginning teachers perform in relation to the ten standards that make up the secondary education program. Information obtained from the surveys provides information for the evaluation of the secondary education program.

NOTE: Graduating seniors must demonstrate proficiency in the content associated with the body of knowledge of their program by applying skills learned to a capstone student teaching experience. An evidenced-based assessment completed by graduate seniors is a professional portfolio that showcases accomplishments from student teaching and other learning experiences completed while at Utah State University.

Figure 1. Excerpt from Final Evaluation Student Teaching Performance Report (STPR).

| 1. CONTENT PEDAGOGY: The pre-service teacher uses the central concepts, tools of inquiry, and structures of the disciplines he or she teaches and can create learning experiences that make these aspects of subject matter meaningful to students. |
|-------------------------------|-------------------------------------------------------------------------------------------------|
| Content knowledge            | Explains concepts accurately and clearly                                                                                       | Explains lessons in shallow, confusing, or inaccurate terms |
| Choices of content           | Uses appropriate content materials and tools of inquiry   | Shows lack of knowledge of the subject; uses inappropriate materials |
| Student experiences          | Engages students in meaningful learning experiences where they can construct their own knowledge using a wide array of tasks and materials | Delivers knowledge with no opportunities for student involvement |

Comments:

Note. The university supervisor and mentor teacher fill out the final evaluation form (STPR) using an online reporting system.
During the student teaching experience, the university supervisor provides feedback to each student based on the INTASC standards and overall strengths and weaknesses of observed performance. The comment form is completed a minimum of three times and submitted to the Office of Field Experience in the School of Teacher Education and Leadership.
College of Agriculture and Applied Sciences

School of Applied Sciences, Technology and Education (ASTE)

Utah State University

Assessment Plan

For the Undergraduate Program in
Agriculture Education

Fall 2013
I. Program Description

The Bachelor of Science (BS) program in Agricultural Education prepares students to become school based agricultural education teachers and FFA advisors in high schools and technical education centers. The Agricultural Education program is designed to teach and develop the needed background in agricultural concepts and technologies for teaching school-based agricultural education as well as careers in Agricultural literacy programs; industry training; extension; commodity and special interest group educational consultants; post-secondary teaching. Students receive high-quality training at USU and job placement for agriculture teachers is extremely high across the state and the nation. Teachers in agricultural education are in high demand across the state and the nation due to a nationwide agriculture teacher shortage. Students in this major are qualified to teach many different subject areas, including agricultural economics, agricultural mechanization, animal science, plant science, natural resources and others. USU’s agricultural education students earn a more than 90% pass rate on the Praxis exam (required of all teachers) and 100% job placement for all students seeking employment after they graduate.

The program works closely with the College of Agriculture and Applied Sciences and the School of Teacher Education and Leadership to ensure students receive a broad, well-rounded education and meet the state teacher licensure requirements.

Students in the agricultural education program may select a minor in other programs across the college, but this is not required as the agricultural education degree program is considered a composite degree program.

II. Degrees and Emphasis Options

Students who successfully complete the 120 credit hours required for the Agricultural Education degree are awarded a Bachelor of Science in Agricultural Education.

III. Program Mission

Agricultural education is a systematic program of instruction available to students desiring to learn about the science, business and technology of plant and animal production and/or about the environmental and natural resources systems (The Council, 2013). The mission of the Agricultural Education Program at Utah State University is to prepare graduates to educate youth grades 6-12 about agricultural careers and assist them in making a lifetime of informed choices in the global agriculture, food, fiber and natural resource system. Education is delivered through an integrated educational delivery model of classroom/laboratory instruction, supervised agricultural education programs (work-based learning) and student leadership development (National FFA Organization). This mission coincides with the national mission for agricultural education as cited by the National FFA Organization. This mission is consistent with the framework for national, state, and local programs that prepare students for leadership development, personal growth and career success. Agricultural education envisions a world where all people value and understand the vital role of agriculture, food, fiber and natural resource systems in advance personal and global well being (The Council, 2013).
IV. Alignment of Program Mission with Department Mission

The agricultural education program reinforces the mission statement for the School of Applied Sciences, Technology, and Education by using a multidisciplinary systems science approach for the application of agriculture concepts through science, math, communications, leadership, management and technology and scientific inquiry. Specifically, the agricultural education program provides students learning experiences in a variety of content areas (agricultural economics; agricultural mechanization; animal, dairy and veterinary sciences; plant and soil science and natural resources). Graduates of the program are prepared to be secondary educators in agricultural education.

V. Program Goals

The goal of the Agricultural Education Program is to graduate students who are prepared to teach junior high, and senior high students the knowledge and content associated with the field of agriculture, food, fiber and natural resource systems. Students are also prepared to pursue careers in Agricultural literacy programs; industry training; extension; commodity and special interest group educational consultants; post-secondary teaching.

VI. Program Learning Objectives

The Agricultural Education (AGED) Program is designed to facilitate learning experiences that require students to meet the program objectives outlined by the School of Applied Sciences, Technology and Education, Secondary Teacher Education Program (STEP), and the national expectations of teachers of agricultural education (both professional practice standards and content-related standards). Students who complete the agricultural education program at Utah State University should be able to:

1. Implement a contemporary agricultural education program based on the National Agriculture, Food and Natural Resources Career Cluster Content Standards and the Utah Standards and Objectives for Agricultural Education.
2. Demonstrate an understanding of the complete program of agricultural education including classroom and laboratory instruction, FFA, and SAE.
3. Summarize the foundations, philosophy, and history of school-based agricultural education programs.
4. Demonstrate competence in technical agriculture areas including animal systems, plant systems, natural resource systems, agricultural business systems, agricultural leadership and communications and agriculture mechanical systems.
5. Employ and teach inquiry-based lessons and laboratory experiences to solve technical agriculture problems.
6. Create a safe learning environment in the classroom and laboratory.
7. Display professional habits including involvement in professional associations related to agricultural education, lifelong learning and collegiality.
8. Demonstrate the ability to manage, schedule, maintain and operate laboratories for an agricultural education program.
9. Utilize a wide range of contemporary instructional strategies and teaching methods to meet a variety of student abilities, age levels and cultural differences.

10. Demonstrate the ability to plan curriculum with organized units, lessons and daily activities.

11. Demonstrate the ability to assess, monitor, and evaluate student achievement using summative and formative evaluation techniques.

12. Explore the diversity of career opportunities in agricultural education through early field experience, clinical experience and student teaching.

13. Demonstrate teaching competence in a student teaching placement under the direction of a mentor teacher and assessment by professors in agricultural education.

14. Demonstrate the ability to effectively manage the FFA and SAE components of agricultural education.

Agricultural Education Professional Practice Standards/Outcomes

**National Standards for Teachers of Agricultural Education**

The National Standards for Teachers of Agricultural Education are currently being created by a national committee of University Teacher Educators.

Currently, the American Association for Agricultural Education (AAAE) has prepared a document entitled National Standards for Teacher Education in Agriculture that guides the vision for the Agricultural Education Program at Utah State University. This document may be found at [http://www.aaaeonline.org/files/ncatestds.pdf](http://www.aaaeonline.org/files/ncatestds.pdf).

Agricultural Education Initial Licensure/Certification Requirements

*Utah State Office of Education*

In addition to general education requirements students in the Agricultural Education program complete courses in professional and pedagogical studies in the Agricultural Education program as well as in the School of Teacher Education and Leadership. Students complete technical content courses including agricultural economics; agricultural mechanization; animal, dairy and veterinary sciences; plant and soil science; and natural resources. Further, students have the opportunity to select a minimum of 11 credits of additional technical agriculture concentration/elective courses to provide them a breadth of agricultural knowledge.

<table>
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<tr>
<th>PROFESSIONAL AND PEDAGOGICAL STUDIES</th>
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<tr>
<td>SCED 3100 - Motivation and Classroom Management</td>
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<td>SCED 3210 - Educational and Multicultural Foundations (DSS/CI)</td>
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<td>SCED 4200 - Language, Literacy and Learning in the Content Areas (CI)</td>
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<tr>
<td>SCED 4210 - Assessment and Curriculum Design</td>
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<td>Course Code</td>
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</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>ASTE 2710</td>
<td>Orientation to Agricultural Education</td>
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<tr>
<td>ASTE 3100</td>
<td>Personal Leadership in Agriculture</td>
</tr>
<tr>
<td>ASTE 3240</td>
<td>Teaching in Laboratory Settings (CI)</td>
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<tr>
<td>ASTE 3300</td>
<td>Clinical Experience I in Agricultural Education</td>
</tr>
<tr>
<td>ASTE 3620</td>
<td>Managing the FFA and SAE Programs</td>
</tr>
<tr>
<td>ASTE 4150</td>
<td>Methods of Teaching Agriculture</td>
</tr>
<tr>
<td>ASTE 4300</td>
<td>Clinical Experience II in Agricultural Education</td>
</tr>
<tr>
<td>ASTE 5500</td>
<td>Agricultural Education Secondary Curriculum Seminar</td>
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<td>ASTE 5630</td>
<td>Agricultural Education Student Teaching in Secondary Schools</td>
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**TECHNICAL AGRICULTURE CONTENT STUDIES**

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<td>BIOL 1610</td>
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<td>CHEM 1110</td>
<td>General Chemistry I (BPS)</td>
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<td>ADVS 1110</td>
<td>Introduction to Animal Science</td>
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<td>ADVS 4560</td>
<td>Principles of Animal Genetics (QI)</td>
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<td>ASTE 3030</td>
<td>Metal Welding Processes and Technology in Agriculture</td>
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<tr>
<td>ASTE 3080</td>
<td>Compact Power Units for Agriculture and Turfgrass Applications</td>
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<td>ASTE 4100</td>
<td>Agricultural Structures and Environment (QI)</td>
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<td>PSC 4050</td>
<td>Greenhouse Management and Crop Production</td>
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<tr>
<td>PSC 3000</td>
<td>Fundamentals of Soil Science or</td>
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<tr>
<td>PSC 4000</td>
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<td>ASTE 2830</td>
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<td>APEC 3012</td>
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<td>ASTE 5260</td>
<td>Environmental Impacts of Agricultural Systems (CI) or</td>
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<tr>
<td>ENVS 2340</td>
<td>Natural Resources and Society (BSS) or</td>
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<tr>
<td>WILD 2200</td>
<td>Ecology of our Changing World (BLS) or</td>
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<tr>
<td>WILD 4000</td>
<td>Principles of Rangeland Management</td>
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</tr>
</tbody>
</table>

Directed Electives in technical agriculture 11
VII. Course Map (See Appendix 6A)

VII. Course List with Descriptions (See Appendix 6B)

IX. Strengths, Weaknesses and Recommendations

Strengths
The Agricultural Education Program provides students comprehensive course offerings that develop students’ knowledge, skills and abilities in the specific content areas associated with the global agriculture industry. Specifically, students complete a high quality, industry-based, hands-on education related to agriculture. The program offers multiple laboratory-based learning experiences that facilitate application of content to real world, professional experiences. Further, students are exposed to a variety of experiential learning opportunities through early field experiences, professional student organizations (Collegiate FFA and Alpha Tau Alpha), as well as multiple guest lectures from the Utah State FFA, Utah State Office of Education, and Utah Agriculture in the Classroom and Utah 4-H.

The program faculty members are committed to demonstrating excellence in teaching, which has been evidenced by multiple teaching awards received by program faculty.

A comprehensive and high-quality advising program is available for students majoring in Agricultural Education. The professional advisor for the program has been recognized for excellence in advising. Students are provided frequent opportunities for advising, which has assisted in maintaining and increasing student enrollment in the program.

Weaknesses and Recommendations
- **Need for focused recruitment:** With an ongoing shortage of qualified agriculture teachers nationwide, a focused recruitment effort and budget are needed to grow the program and meet the demand for agriculture teachers. Specific recruitment efforts should focus on both male and female students.
- **Need for national/global competence:** Students in agricultural education must be nationally and globally competent in current agriculture issues. Experiential opportunities for study away (national/intermountain west) or study abroad should be explored.
- **Need for an advisory committee** specific to the agricultural education program, representative of all stakeholder groups.

X. Plan for Measuring the Achievement of Degree and Program Objectives

The Bachelor of Science (BS) program in Agricultural Education prepares students to become school-based agricultural education teachers and FFA advisors in high schools and technical education centers. The Agricultural Education program is designed to teach and develop the needed background in agricultural concepts and technologies for teaching school based agricultural education. Students receive high-quality preparation at USU and job placement for agriculture teachers is extremely high across the state and the nation. Teachers in agricultural
education are in high demand across the state and the nation due to a nationwide agriculture teacher shortage. Students in this major are qualified to teach many different subject areas, including agricultural economics, agricultural mechanization, animal science, plant science, natural resources and others. Students majoring in AGED apply to be admitted to the Secondary Teacher Education Program (STEP) administered by the Emma Eccles Jones College of Education and Human Services.

The AGED degree prepares graduates to be licensed to teach secondary agricultural education (grades 6-12). Job opportunities are available for our graduates across the nation (including vacancies in Utah and the Intermountain West). Upon completion of the degree, students are eligible for initial licensure in Utah and other states across the nation.

In addition to the following, objectives are measured based on the standards listed on pg. 82.

Exit Interviews
All graduates of the Agricultural Education program will complete an exit interview during the ASTE 5500 – Student Teaching Seminar.

Agricultural Education faculty members meet before the seminar and prepare specific items of inquiry for all students as they have completed student teaching.

University-wide questions should be gathered from the appropriate USU assessment program(s).

Agricultural Education faculty members meet soon after the conclusion of the seminar to plan and update the Agricultural Education program accordingly.

XI. Outreach Efforts

Membership & Leadership in Professional Associations
The faculty serving the Agricultural Education Program are members of various professional organizations associated with agricultural education and career and technical education. A few of the organizations that faculty have membership and have served in leadership roles are:

- American Association for Agricultural Education (AAAE)
- National Association of Agricultural Educators (NAAE)
- Utah Association of Agricultural Educators (Utah Affiliate of NAAE)
- Association of Career and Technical Education (ACTE)
- Utah Association of Career and Technical Education (Utah Affiliate of ACTE)
- Association for Career and Technical Education Research (ACTER)

American Association for Agricultural Education
Faculty members serving the Agricultural Education Program have served in elected and appointed positions within the professional organization. AAAE represents agricultural education teacher educators from across the nation.

Positions include:
- Regional Vice President
Development and Review of Agricultural Education Curriculum for the Utah State Office of Education

Curriculum Development
Faculty serving the Agricultural Education program have the opportunity to serve as program leaders for the development and review of state standards and curriculum for agricultural education. Standards and curriculum resources are disseminated on the Utah State Office of Education website designated for agricultural education resources: (http://www.schools.utah.gov/cte/ag_course.html)

FFA outreach
Faculty and students in the Agricultural Education program work with the Utah State FFA Association to deliver workshops to local high school agriculture students; plan, prepare and conduct FFA Career Development Events; assist with the Utah State FFA Convention; and volunteer with local FFA programs.

New Teacher Academy
Faculty in the Agricultural Education program work with the Utah State Office of Education to provide pedagogical instruction in Career and Technical Education to alternatively certified teachers in Utah. The goal of this program is to aid in the continuing education and professional development of industry professionals as they transition to teaching and pursue licensure requirements.

Utah Agriculture Teacher Induction Program
Faculty in the Agricultural Education program work with the Utah State Office of Education and the Utah Association of Agricultural Educators to provide in-service training and provide continuing education opportunities and support for all beginning and provisional teachers in Agricultural Education in Utah. The goal of this program is to aid in retention and teacher development by providing professional development opportunities in program and curriculum development, student and classroom management, FFA and SAEP implementation, and other program management activities. The agriculture teacher induction program and issues related to continuing licensure of beginning teachers, including mentoring and the development of professional portfolios will also be integral to the program.

XII. Interactions with Other Programs (within ASTE and externally)
Faculty in the agricultural education program participate and/or facilitate the following outreach efforts within ASTE and other programs campus wide.

- Agricultural education majors are required to take courses in agriculture content areas including Applied Sciences, Technology and Education (ASTE), Animal Dairy and
Veterinary Sciences (ADVS), Applied Economics (APEC), Plant, Soils and Climate (PSC) and Wildland Resources (WILD).

- Faculty develop collaborative research projects and scholarly activities with faculty in ASTE, Extension and other departments across campus.
- Faculty collaborate with the Utah State Office of Education to deliver instruction for the alternative route to licensure program for Career and Technical Education teachers in Utah.
- Faculty participate in various secondary student organization activities (specifically FFA).
Appendix 6A

Course Maps
# Course Map
## Agricultural Education

### Agricultural Education Program

#### Learning Outcomes

<p>| Implement a contemporary agricultural education program based on the National Agriculture, Food and Natural Resources Career Cluster Content Standards and the Utah Standards and Objectives for Agricultural Education. | X | X | X | X | X | X | X | X |
| Demonstrating an understanding of the complete program of agricultural education including classroom and laboratory instruction, FFA and SAE. | X | X | X | X | X | X | X | X |
| Summarizing the foundations, philosophy, and history of school-based agricultural education programs. | X | X | X | X | X | X | X | X |
| Demonstrating competence in technical agriculture areas including animal systems, plant systems, natural resource systems, agricultural business systems, agricultural leadership and communications and agriculture mechanical systems. | X | X | X | X | X | X | X | X |</p>
<table>
<thead>
<tr>
<th>Agricultural Education Program Learning Outcomes (continued)</th>
<th>Required Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employ and teach inquiry-based lessons and laboratory experiences to solve technical agriculture problems.</td>
<td>X X</td>
</tr>
<tr>
<td>Create a safe learning environment in the classroom and laboratory.</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Display professional habits including involvement in professional associations related to agricultural education, lifelong learning and collegiality.</td>
<td>X X X X X X X X X X</td>
</tr>
<tr>
<td>Demonstrate the ability to manage, schedule, maintain and operate laboratories for an agricultural education program.</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Utilize a wide range of contemporary instructional strategies and teaching methods to meet a variety of student abilities, age levels and cultural differences.</td>
<td>X X X X X X X X X X</td>
</tr>
<tr>
<td>Demonstrate the ability to plan curriculum with organized units, lessons and daily activities.</td>
<td>X X X X X X X X X X</td>
</tr>
</tbody>
</table>

Technical Competence
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<tr>
<th>Agricultural Education Program Learning Outcomes (continued)</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td>Demonstrate the ability to assess, monitor, and evaluate student achievement using summative and formative evaluation techniques.</td>
<td>X X X X</td>
</tr>
<tr>
<td>Explore the diversity of career opportunities in agricultural education through early field experience, clinical experience and student teaching.</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Demonstrate teaching competence in a student teaching placement under the direction of a mentor teacher and assessment by professors in agricultural education.</td>
<td>X X X X</td>
</tr>
<tr>
<td>Demonstrate the ability to effectively manage the FFA and SAE components of agricultural education.</td>
<td>X X X</td>
</tr>
<tr>
<td><strong>Secondary Education Program</strong></td>
<td><strong>Required Classes</strong></td>
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<td><strong>Learning Outcomes</strong></td>
<td><strong>SCED 3100</strong>&lt;br&gt;SCED 3210&lt;br&gt;SCED 4200&lt;br&gt;SCED 4210&lt;br&gt;SPED 4000&lt;br&gt;ASTE 3100&lt;br&gt;ASTE 2710&lt;br&gt;ASTE 3240&lt;br&gt;ASTE 3300&lt;br&gt;ASTE 3620&lt;br&gt;ASTE 4150&lt;br&gt;ASTE 4300&lt;br&gt;ASTE 5500&lt;br&gt;ASTE 5630&lt;br&gt;Technical Agriculture Courses</td>
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<tr>
<td>Learner Development: Creates developmentally appropriate and challenging learning experiences based on students’ strengths, interests and needs.</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td>Learner Development: Collaborates with families, colleagues, and other professionals to promote student growth and development.</td>
<td>X X X</td>
</tr>
<tr>
<td>Learning Differences: Adapts instruction to address each student’s learning strengths and needs.</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td>Learning Differences: Delivers instruction that provides for different ways of demonstrating learning.</td>
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</tr>
<tr>
<td>Learning Differences: Provides instruction that takes into account the experiences and knowledge of learners.</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Learning Environments: Uses a variety of effective classroom management strategies to maintain a positive learning environment.</td>
<td>X X X X</td>
</tr>
<tr>
<td>Learning Environments: Constructs learning experiences that require students to be actively engaged in learning.</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td>Content Knowledge: Communicates accurate information and concepts.</td>
<td>X X X X X X X X</td>
</tr>
</tbody>
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98
<table>
<thead>
<tr>
<th>Secondary Education Program Learning Outcomes (continued)</th>
<th>Required Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Knowledge: Adapts instruction to address students’ common misconceptions about subject matter.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Content Knowledge: Designs instruction based on approved content standards and research.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Content Knowledge: Provides multiple representations and explanations of concepts.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Content Knowledge: Selects instructional resources that contain accurate content.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Assessment: Uses pre-assessments, and formative and summative assessments, in a variety of formats that match learning objectives.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Assessment: Teaches students to identify the elements of quality work. Uses data to assess student learning to plan for differentiated instruction.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Assessment: Documents student progress and provides specific feedback to students and other stakeholders in a variety of ways.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Instructional Planning: Plans instruction based on state core.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Instructional Planning: Aligns instruction and assessment with learning goals.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4200</td>
</tr>
<tr>
<td>Secondary Education Program Learning Outcomes (continued)</td>
<td>Required Classes</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
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</tr>
<tr>
<td>Instructional Planning: Designs instruction at an appropriate level of cognitive complexity for the learning goal.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Instructional Strategies: Uses a variety of instructional strategies that elicit and build upon students’ prior knowledge and experiences.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Instructional Strategies: Constructs learning experiences that require students to use multiple forms of communication.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Instructional Strategies: Systematically includes a variety of perspectives and sources to inform instruction.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Instructional Strategies: Uses technologies appropriate for the learning goal.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Reflection and Continuous Growth: Participates in professional development.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Reflection and Continuous Growth: Recognizes and reflects upon own biases in order to become a more effective teacher of all students.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Reflection and Continuous Growth: Reflects on instructional effectiveness to improve subsequent teaching practice.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Reflection and Continuous Growth: Accepts and uses feedback from multiple sources.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SPED 4000 SCED 4200 ASTE 2710 ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 5500 ASTE 5630</td>
</tr>
<tr>
<td>Secondary Education Program Learning Outcomes (continued)</td>
<td>Required Classes</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Leadership and Collaboration: Participates as a team member in decision-making processes.</td>
<td>SCED 3100 SCED 3210 SCED 4200 SCED 4210 SCED 4000 SCED 4210 SCED 3100 ASTE 2710</td>
</tr>
<tr>
<td>Leadership and Collaboration: Collaborates with school professionals to meet the needs of learners.</td>
<td>ASTE 3100 ASTE 3240 ASTE 3300 ASTE 3620 ASTE 4150 ASTE 4300</td>
</tr>
<tr>
<td>Professional and Ethical Behavior: Adheres to and upholds laws, rules, policies, and directives.</td>
<td>ASTE 4300 ASTE 5500 ASTE 5630 ASTE 5630</td>
</tr>
<tr>
<td>Professional and Ethical Behavior: Maintains professional behavior and appearance.</td>
<td>ASTE 5500 ASTE 5630 ASTE 5630 ASTE 5630 ASTE 5630 ASTE 5630 ASTE 5630</td>
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</tbody>
</table>

Technical Agriculture Courses
Appendix 6B

Course Descriptions
Course List with Descriptions
Required Courses for a Bachelor of Science (BS) in Agricultural Education

Professional and Pedagogical Studies: Secondary and Special Education

SCED 3100. Motivation and Classroom Management: Designed to lead pre-service secondary school teachers to address two questions: (1) What diverse traits, talents, attitudes, and experiences do pre-adolescent and adolescent students bring to the middle school, junior high school, and high school environment? and (2) In light of these diverse traits, talents, attitudes, and experiences, how should teachers work with students to build cooperative classroom communities where students are motivated to engage in productive learning activities?. (F, Sp). 3 credits.

SCED 3210. Educational and Multicultural Foundations (DSS/CI): Provides pre-service teachers with the opportunity to critically examine the political, economic, and educational policies influencing students’ access to equitable educational experiences. Examines historical and philosophical foundations influencing the nature of multicultural education in our democratic society, how personal biases can influence instructional practices, and development of multicultural curriculum relevant to specific content areas. (F, Sp). 3 credits.

SCED 4200. Language, Literacy and Learning in the Content Areas (CI): The purpose of this course is to examine how theories and research about language, learning and literacy inform the teaching practices required to motivate and enable secondary students to comprehend, interpret, analyze, evaluate, integrate and use domain-specific and cross-curricular concepts. (F, Sp). 3 credits.

SCED 4210. Assessment and Curriculum Design: Designed to lead the pre-service secondary teachers to address two questions: (1) How do teachers monitor student progress, evaluate and communicate their achievement, and interpret summative test results? (2) How do teachers design curriculum that meets student learning needs and incorporates effective, ongoing assessment? (F, Sp). 3 credits.

SPED 4000. Education of Exceptional Individuals: Characteristics of all types of exceptional children with emphasis on the educational and psychological implications of these conditions to the development of the child. (F, Sp, Summer). 2 credits.

Professional and Pedagogical Studies: Agricultural Education

ASTE 2710. Orientation to Agricultural Education. Students examine the framework of agricultural education, with a special emphasis on the nature of the programs, career opportunities, and the qualifications and preparation requirements of future agricultural educators. Students will spend 25-30 hours observing instruction in secondary classrooms. (2 cr) (F)
ASTE 3100. Leadership Applications in Agricultural.
Study of leadership styles and their applications in development of agricultural programs for youth and adults. Emphasizes leadership and communication principles for effective community resource management in rural environments. Experiences provided in leadership styles, program planning, and meeting organization. (3 cr) (Sp)

ASTE 3240 (CI). Teaching in Laboratory Settings.
Basic principles of teaching students in laboratory settings. Overview of major concepts, considerations, and practices used for developing and evaluating agriscience curricula. Prerequisite: ASTE 2710. (3 cr) (Sp)

ASTE 3300. Clinical Experience I in Agricultural Education.
In-school clinical observation experience. Students involved in observing management and assisting in teaching. Designed to provide familiarity with agricultural education classroom. (1 cr) (Sp)

ASTE 3620. Managing the FFA and SAE Programs.
Introduction to basic concerns, understandings, and practices needed to effectively advise an FFA chapter. Students learn appropriate philosophies and skills for operation of a comprehensive supervised agricultural experience program. (2 cr) (Sp)

ASTE 4150 (CI). Methods of Teaching Agriculture.
Introduction to basic practices of classroom teaching and program planning. Through participation in discussions, activities, and assignments, students refine their abilities to develop programs, diagnose the learner, prepare the instruction, and guide student learning. Prerequisites: ASTE 2710, 3240. (3 cr) (F)

ASTE 4300. Clinical Experience II in Agricultural Education.
Continued in-school observation of agricultural education teaching. Requires student participation in teaching, management, and program development in agricultural education. (1 cr) (F)

ASTE 5500. Agricultural Education Secondary Curriculum Seminar.
Cooperative examination of considerations and processes for teaching secondary students. Reflection on the practice of teaching. Preparation for entry into the teaching profession. (2 cr) (Sp)

ASTE 5600. Agricultural Education Student Teaching in Secondary Schools.
Students teach agriscience and technology courses in secondary and middle school settings under the guidance of clinical and Utah State University supervisors. (8 cr) (Sp)
Assessment Plan

For the Undergraduate Program in
Family and Consumer Sciences Education (FCSE)

Fall 2013
I. Program Description

The program trains students to become family and consumer science teachers in middle and high schools through a well-rounded curriculum in teaching content areas. Teachers in this area are in high demand across the state and the nation because they are qualified to teach many different subject areas, including clothing and textiles, nutrition and foods, interior design, child and human development, financial literacy, and more. USU’s family and consumer science education students boast 100% pass rate on the Praxis exam (required of all teachers) and 100% job placement after they graduate.

The department works closely with the Nutrition, Dietetics, and Foods Sciences Department, Interior Design Program, and Family, Consumer, and Human Development Department to ensure that students receive a broad and well-rounded education. This major also provides undergraduate preparation for the Utah Extension service.

Students in the family and consumer sciences education program do not need to have a minor because the program provides students with knowledge in several subject areas; therefore, expanding their career options.

II. Degrees and Emphasis Offered

Students who successfully complete the 120 credit hours required for the Family and Consumer Sciences Education degree are awarded a Bachelor of Science in Family and Consumer Sciences Education.

III. Program Mission

The mission of the Family and Consumer Sciences Education Program at Utah State University is to prepare graduates to educate individuals, families and communities (specifically youth grades 6-12). This mission coincides with the national mission for the profession and field of study envisioned by the National Association of State Administrators for Family and Consumer Sciences (NASAFACS, 2008-2018). This mission is consistent with the framework for national, state, and local programs that prepare students for family life, work life, and careers in Family and Consumer Sciences by providing opportunities to develop the knowledge, skills, attitudes and behaviors needed for:

- Strengthening the well-being of individuals and families across the life span.
- Becoming responsible citizens and leaders in family, community and work settings.
- Promoting optimal nutrition and wellness across the life span.
- Managing resources to meet the material needs of individuals and families.
- Balancing personal, home, family and work lives.
- Using critical and creative thinking skills to address problems in diverse family, community and work environments.
- Successful life management, employment and careers development.
- Functioning effectively as providers and consumers of goods and services.
• Appreciating human worth and accepting responsibility for one's actions and success in family and work life (NASAFACS, 2008-2018).

IV. Alignment of Program Mission with Department Mission

The family and consumer sciences education program reinforces the mission statement for the School of Applied Sciences, Technology and Education by using a multidisciplinary systems science approach for the resolution of family and applied science matters through the advancement of education and scientific inquiry. Specifically, the family and consumer sciences education program provides students learning experiences in a variety of content areas (foods and nutrition; child development and parenting; family relations; financial literacy; clothing and textiles, and housing and interior design). Graduates of the program are prepared to be secondary educators in family and consumer sciences.

V. Program Goals

The goal of the Family and Consumer Sciences Education Program is to graduate students who are prepared to teach middle, junior high and senior high students the knowledge and content associated with the field of family and consumer sciences (food science and human nutrition; personal and family financial resource management; textiles and clothing; housing and interiors; child development and parenting, and human development and family relations).

VI. Program Learning Objectives

The Family and Consumer Sciences Education (FCSE) Program is designed to facilitate learning experiences that require students to meet the learning objectives outlined by the School of Applied Sciences, Technology and Education, Secondary Teacher Education Program (STEP) and the national expectations of teachers of family and consumer sciences (both professional practice standards and content-related standards).

Professional Practice Standards/Outcomes

National Standards for Teachers of Family and Consumer Sciences (NATEFACS, 2004)
The National Standards for Teachers of Family and Consumer Sciences provides an overarching model of excellence for what a beginning teacher in family and consumer sciences (FCS) should know and be able to do. The National Association of Teacher Educators led FCS educators and other stakeholders from across the country to develop the Standards. The two-year, highly participatory process yielded an integrated set of standards with a high degree of national consensus, while allowing for variations in state preparation and licensure. These standards are unique to FCS teachers. In addition, the beginning FCS teacher has general education background that meets overall professional education standards (NATEFACS, 2004).

1. Career, Community, and Family Connections - Analyze family, community, and work interrelationships; investigate career paths; examine family and consumer sciences careers; and apply career decision making and transitioning processes.

2. Consumer Economics and Family Resources - Use resources responsibly to address the diverse needs and goals of individuals, families, and communities in family and consumer
sciences areas such as resource management, consumer economics, financial literacy, living environments, and textiles and apparel.

3. Family and Human Development - Apply principles of human development, interpersonal relationships, and family to strengthen individuals and families across the lifespan in contexts such as parenting, care giving, and the workplace.

4. Nutrition, Food and Wellness - Promote nutrition, food, and wellness practices that enhance individual and family well being across the lifespan and address related concerns in a global society.

5. Curriculum Development - Develop, justify and implement curricula that address perennial and evolving family, career and community issues; reflect the integrative nature of family and consumer sciences; and integrate core academic areas.

6. Instructional Strategies and Resources - Facilitate students’ critical thinking and problem solving in family and consumer sciences through varied instructional strategies and technologies and through responsible management of resources in schools, communities and the workplace.

7. Learning Environment - Create and implement a safe, supportive learning environment that shows sensitivity to diverse needs, values, and characteristics of students, families and communities.

8. Professionalism - Engage in ethical professional practice based on the history and philosophy of family and consumer sciences and career and technical education through civic engagement, advocacy and ongoing professional development.

9. Student and Program Assessment - Assess, evaluate, and improve student learning and programs in family and consumer sciences using appropriate criteria, standards and processes.

10. Student Organization Integration - Assess, evaluate, and improve student learning and programs in family and consumer sciences using appropriate criteria, standards and processes.

*Family and Consumer Sciences Initial Licensure/Certification Requirements*

*Utah State Office of Education*

<table>
<thead>
<tr>
<th>CONTENT FOCUS AREA</th>
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<td>Human Development Across the Lifespan</td>
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</tr>
<tr>
<td>Marriage, Family Relationships and Parenting</td>
<td>6</td>
</tr>
<tr>
<td>Teaching in Child Development Laboratories</td>
<td>3</td>
</tr>
<tr>
<td>The Consumer &amp; the Market, Family Resource Management, Family Finance, or Personal Finance</td>
<td>6</td>
</tr>
<tr>
<td>Intermediate Nutrition or Nutrition through the Life Cycle</td>
<td>3</td>
</tr>
</tbody>
</table>
VII. Course Map (See Appendix 7A)

VIII. Course List with Descriptions (See Appendix 7B)

IX. Strengths, Weaknesses and Recommendations

Strengths
The Family and Consumer Sciences Education Program provides students a comprehensive offering of courses that develops students’ knowledge, skills and abilities in the specific content areas associated with the field of family and consumer sciences. Specifically, students complete a high quality, industry-based, hands-on education related to clothing and textiles (from beginning clothing production skills to advance tailoring and textile science content). The program offers multiple laboratory-based learning experiences that facilitate application of content to real world, professional experiences.

The program faculty members are committed to demonstrating excellence in teaching, which has been evidenced by multiple teaching awards received by program faculty.

A comprehensive and high-quality advising program is available for students majoring in Family and Consumer Sciences Education. The professional advisor for the program has been recognized for excellence in advising. Students are provided frequent opportunities for advising, which has assisted in maintaining and increasing student enrollment in the program.

Weaknesses
- **Need for more faculty members:** With an increase number of students enrolled in the program, there is a need for more faculty members to facilitate multiple sections of courses required for completion of the degree program.
• **Laboratory Space:** Another result of increased enrollment in the coursework facilitated by the FCSE program, there is a need for more laboratory space for clothing and textiles and foods and nutrition.

• **Need for more clinical and student teaching sites:** Each student in the program is required to complete two clinical experiences (30 hours each) and a semester-long student teaching experience. With increased enrollment there is a need for more sites and supervisors to assist in the assessment of student performance in this area.

• **Need for Family, Career and Community Leaders of America (FCCLA) Course:** Graduates of the FCSE program are expected to become an FCCLA Adviser in their future professional practice. Currently, a course is not available to prepare students for this experience. Units are integrated into existing courses, but with the increased number of students enrolled in the methods courses there is less time to focus on FCCLA in order to complete the micro teaching experiences that are required.

**Recommendations**

- Add another tenure track faculty member in FCSE: With an increase number of students enrolled in the program, there is a need for more faculty members to facilitate multiple sections of courses required for completion of the degree program.
- Survey current Utah family and consumer sciences teachers to identify professionals that are willing to serve as a mentor teacher for FCSE students. After compiling a list of potential sites, work with the Utah State Office of Education to identify a comprehensive list of qualified mentor teachers.
- Develop the curriculum for a new course focusing on Family, Career and Community Leaders of America (FCCLA). Once the curriculum is developed, submit the necessary paperwork to have the course approved and offered to students by Spring 2015.

**X. Plan for Measuring the Achievement of Degree and Program Objectives**

The Bachelor of Science (BS) Degree in Family and Consumer Sciences Education (FCSE) is designed to prepare graduates to educate individuals, families and communities to manage with reason and creativity the challenges across the lifespan of living and working in a global society. The program is structured to provide students learning experiences that contribute to the development of their body of knowledge that can be used to facilitate formal and informal educational experiences for youth. The foundational disciplines that are addressed in the degree program include: family, consumer and human development; family and consumer sciences education; interior design; instructional technology; clothing and textiles, and nutrition and food sciences.

The FCSE degree prepares graduates to be certified to teach secondary family and consumer sciences (grades 6-12). Job opportunities are available for our graduates across the nation (including vacancies in Utah and the Intermountain West).

**Exit Interviews**

All graduates of the Family and Consumer Sciences Education program will complete an exit interview during the FCSE 5500 – Student Teaching Seminar.
Family and Consumer Sciences Education faculty should meet before the seminar and prepare specific items of inquiry for all students as they have completed student teaching.

University-wide questions should be gathered from the appropriate USU assessment program(s).

Family and Consumer Sciences Education faculty members should meet soon after the conclusion of the seminar to plan and update the Family and Consumer Sciences Education program accordingly.

**XI. Outreach Effort**

**Membership & Leadership in Professional Associations**

The faculty serving the Family and Consumer Sciences Education Program are members of various professional organizations associated with family and consumer sciences. A few of the organizations that faculty have membership and have served in leadership roles are:

- American Association of Family and Consumer Sciences (AAFCS)
- Utah Association of Family and Consumer Sciences (Utah Affiliate of AAFCS)
- Association of Career and Technical Education (ACTE)
- Utah Association of Career and Technical Education (Utah Affiliate of ACTE)
- National Association of Teacher Educators of Family and Consumer Sciences (NATEFACS)
- Family and Consumer Sciences Education Association (FCSEA)
- Family, Career and Community Leaders of America (FCCLA)
- Utah Family, Career and Community Leaders of America

As a part of membership in professional associations, faculty in family and consumer sciences education author peer reviewed journal articles; present at state, national and international conferences and volunteer for service through these organizations.

**National Coalition for Family and Consumer Sciences Education**

A faculty serving the Family and Consumer Sciences Education Program has served as an appointed member and Chair of the National Coalition for Family and Consumer Sciences Education. The Coalition represents a national infrastructure of professionals serving youth, teachers, state agency supervisors, teacher educators, researchers and others. Professional associations represented are:

- American Association of Family and Consumer Sciences
- Association for Career and Technical Education
- Family, Career and Community Leaders of America
- Family and Consumer Sciences Education Association

**Development and Review of Family and Consumer Sciences Curriculum for the Utah State Office of Education**
Faculty serving the Family and Consumer Sciences Education program have the opportunity to serve as program leaders for the development and review of state standards and curriculum for family and consumer sciences. Standards and curriculum resources are disseminated on the Utah State Office of Education website designated for family and consumer sciences resources: [http://www.schools.utah.gov/cte/facs.html](http://www.schools.utah.gov/cte/facs.html)

**XII. Interactions with Other Programs** (within ASTE and externally)

The faculty serving the family and consumer sciences education program participate and/or facilitate the following outreach efforts:

- Develop collaborative research projects and scholarly activities with faculty in Nutrition, Dietetics and Food Science, Extension Sustainability, and other departments across campus.
- Students majoring in family and consumer sciences education take courses from other departments including: Family, Consumer and Human Development (FCHD); Nutrition, Dietetics and Food Science (NDFS); Interior Design (ID); Secondary Education (SCED), and Special Education (SPED).
- Faculty collaborate with the Utah State Office of Education on the revision and development of standards and curriculum for secondary family and consumer sciences programs.
- Faculty participate in various secondary student organization planning and programming meetings and activities (specifically FCCLA).
Appendix 7A

Course Maps
<table>
<thead>
<tr>
<th>National Standards for Teachers of Family and Consumer Sciences</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td><strong>Career, Community, and Family Connections</strong> - Analyze family, community, and work interrelationships; investigate career paths; examine family and consumer sciences careers; and apply career decision-making and transitioning processes.</td>
<td>FCHD 1500 FCHD 2100 FCHD 2400 FCHD 3350 FCHD 3550 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660</td>
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<tr>
<td><strong>Consumer Economics and Family Resources</strong> - Use resources responsibly to address the diverse needs and goals of individuals, families, and communities in family and consumer sciences areas such as resource management, consumer economics, financial literacy, living environments, and textiles and apparel.</td>
<td>FCHD 1500 FCHD 2100 FCHD 2400 FCHD 3350 FCHD 3550 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660</td>
</tr>
<tr>
<td><strong>Family and Human Development</strong> - Apply principles of human development, interpersonal relationships, and family to strengthen individuals and families across the lifespan in contexts such as parenting, caregiving, and the workplace.</td>
<td>FCHD 1500 FCHD 2100 FCHD 2400 FCHD 3350 FCHD 3550 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660</td>
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<tr>
<td><strong>Nutrition, Food, and Wellness</strong> - Promote nutrition, food, and wellness practices that enhance individual and family well-being across the lifespan and address related concerns in a global society.</td>
<td>FCHD 1500 FCHD 2100 FCHD 2400 FCHD 3350 FCHD 3550 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660 FCHD 2400 FCHD 2660</td>
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<td><strong>Curriculum Development</strong> - Develop, justify, and implement curricula that address perennial and evolving family, career, and community issues; reflect the integrative nature of family and consumer sciences; and integrate core academic areas.</td>
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<tr>
<td>Instructional Strategies and Resources -</td>
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<tr>
<td>Facilitate students’ critical thinking and problem solving in family and consumer sciences through varied instructional strategies and technologies and through responsible management of resources in schools, communities, and the workplace.</td>
<td>x</td>
</tr>
<tr>
<td>Learning Environment - Create and implement a safe, supportive learning environment that shows sensitivity to diverse needs, values, and characteristics of students, families, and communities.</td>
<td>x</td>
</tr>
<tr>
<td>Professionalism - Engage in ethical professional practice based on the history and philosophy of family and consumer sciences and career and technical education through civic engagement, advocacy, and ongoing professional development.</td>
<td>x</td>
</tr>
<tr>
<td>Student and Program Assessment - Assess, evaluate, and improve student learning and programs in family and consumer sciences using appropriate criteria, standards, and processes.</td>
<td>x</td>
</tr>
<tr>
<td>Student Organization Integration - Assess, evaluate, and improve student learning and programs in family and consumer sciences using appropriate criteria, standards, and processes.</td>
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### National Standards for Teachers of Family and Consumer Sciences (cont.)

#### Required Classes

<table>
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<tr>
<th>Required Classes</th>
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<th>FCSE 5630</th>
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<th>NDFS 1260</th>
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<th>NDFS 3070</th>
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<th>SCED 3210</th>
<th>SCED 4200</th>
<th>SCED 4210</th>
<th>SPED 4000</th>
</tr>
</thead>
</table>

#### Career, Community, and Family Connections - Analyze family, community, and work interrelationships; investigate career paths; examine family and consumer sciences careers; and apply career decision-making and transitioning processes.

#### Consumer Economics and Family Resources - Use resources responsibly to address the diverse needs and goals of individuals, families, and communities in family and consumer sciences areas such as resource management, consumer economics, financial literacy, living environments, and textiles and apparel.

#### Family and Human Development - Apply principles of human development, interpersonal relationships, and family to strengthen individuals and families across the lifespan in contexts such as parenting, care giving, and the workplace.

#### Nutrition, Food, and Wellness - Promote nutrition, food, and wellness practices that enhance individual and family well-being across the lifespan and address related concerns in a global society.

#### Curriculum Development - Develop, justify, and implement curricula that address perennial and evolving family, career, and community issues; reflect the integrative nature of family and consumer sciences; and integrate core academic areas.

#### Instructional Strategies and Resources - Facilitate students’ critical thinking and problem solving in family and consumer sciences through varied instructional strategies and technologies and
through responsible management of resources in schools, communities, and the workplace.

<table>
<thead>
<tr>
<th>Learning Environment - Create and implement a safe, supportive learning environment that shows sensitivity to diverse needs, values, and characteristics of students, families, and communities.</th>
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<td>Professionalism - Engage in ethical professional practice based on the history and philosophy of family and consumer sciences and career and technical education through civic engagement, advocacy, and ongoing professional development.</td>
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<td>Student and Program Assessment - Assess, evaluate, and improve student learning and programs in family and consumer sciences using appropriate criteria, standards, and processes.</td>
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<td>Student Organization Integration - Assess, evaluate, and improve student learning and programs in family and consumer sciences using appropriate criteria, standards, and processes.</td>
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## Family and Consumer Sciences Initial Licensure/Certification Requirements (USOE)

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<td>Learner Development: Creates developmentally appropriate and challenging learning experiences based on students’ strengths, interests, and needs.</td>
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<td>Learner Development: Collaborates with families, colleagues, and other professionals to promote student growth and development.</td>
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<td>Learning Differences: Adapts instruction to address each student’s learning strengths and needs.</td>
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<td>Learning Differences: Delivers instruction that provides for different ways of demonstrating learning.</td>
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<td>Learning Differences: Provides instruction that takes into account the experiences and knowledge of learners.</td>
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<td>Learning Environments: Uses a variety of effective classroom management strategies to maintain a positive learning environment.</td>
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<td>Learning Environments: Constructs learning experiences that require students to be actively engaged in learning.</td>
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<td>Content Knowledge: Communicates accurate information and concepts.</td>
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<td>Content Knowledge: Adapts instruction to address students’ common misconceptions about subject matter.</td>
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<td>Content Knowledge: Designs instruction based on approved content standards and research.</td>
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<td>Content Knowledge: Provides multiple representations and explanations of concepts.</td>
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<td>Content Knowledge: Selects instructional resources that contain accurate content.</td>
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<td>Assessment: Uses pre-assessments, and formative and summative assessments, in a variety of formats that match learning objectives.</td>
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<td>Assessment: Teaches students to identify the elements of quality work. Uses data to assess student learning to plan for differentiated instruction.</td>
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<td>Assessment: Documents student progress and provides specific feedback to students and other stakeholders in a variety of ways.</td>
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<td>Instructional Planning: Aligns instruction and assessment with learning goals.</td>
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<td>Instructional Planning: Designs instruction at an appropriate level of cognitive complexity for the learning goal.</td>
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<td>Instructional Strategies: Uses a variety of instructional strategies that elicit and build upon students’ prior knowledge and experiences.</td>
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<td>Instructional Strategies: Constructs learning experiences that require students to use multiple forms of communication.</td>
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<td>Instructional Strategies: Systematically includes a variety of perspectives and sources to inform instruction.</td>
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<td>Instructional Strategies: Uses technologies appropriate for the learning goal.</td>
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<td>Reflection and Continuous Growth: Participates in professional development.</td>
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<td>Reflection and Continuous Growth: Recognizes and reflects upon own biases in order to become a more effective teacher of all students.</td>
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<td>Reflection and Continuous Growth: Reflects on instructional effectiveness to improve subsequent teaching practice.</td>
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<tr>
<td>Reflection and Continuous Growth: Accepts and uses feedback from multiple sources.</td>
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### Secondary Education Program Learning Outcomes

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<th>Required Classes</th>
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<tbody>
<tr>
<td>SCED 3100</td>
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</table>

#### Leadership and Collaboration: Participates as a team member in decision-making processes.
- SCED 3100: X
- SCED 3210: X
- SCED 4200: X
- SCED 4210: X
- SPED 4000: X
- FCSE 2510: X
- FCSE 3300: X
- FCSE 3400: X
- FCSE 4300: X
- FCSE 4400: X
- FCSE 5500: X
- FCSE 5630: X

#### Leadership and Collaboration: Collaborates with school professionals to meet the needs of learners.
- SCED 3100: X
- SCED 3210: X
- SCED 4200: X
- SCED 4210: X
- SPED 4000: X
- FCSE 2510: X
- FCSE 3300: X
- FCSE 3400: X
- FCSE 4300: X
- FCSE 4400: X
- FCSE 5500: X
- FCSE 5630: X

#### Professional and Ethical Behavior: Adheres to and upholds laws, rules, policies, and directives.
- SCED 3100: X
- SCED 3210: X
- SCED 4200: X
- SCED 4210: X
- SPED 4000: X
- FCSE 2510: X
- FCSE 3300: X
- FCSE 3400: X
- FCSE 4300: X
- FCSE 4400: X
- FCSE 5500: X
- FCSE 5630: X

#### Professional and Ethical Behavior: Maintains professional behavior and appearance.
- SCED 3100: X
- SCED 3210: X
- SCED 4200: X
- SCED 4210: X
- SPED 4000: X
- FCSE 2510: X
- FCSE 3300: X
- FCSE 3400: X
- FCSE 4300: X
- FCSE 4400: X
- FCSE 5500: X
- FCSE 5630: X
Family and Consumer Sciences Education Required Courses

Family, Consumer and Human Development

FCHD 1500 Human Development Across the Lifespan (BSS): Overview of human development across the lifespan, from conception to death. (F, Sp). 3 credits.

FCHD 2100 Family Resource Management: Explores the significance of values, goals, planning, and decision-making strategies in the development, management, and allocation of human, economic, and environmental resources. (F, Sp). 3 credits.

FCHD 2400 Marriage and Family Relationships (BSS): Overview of couple and family relationships, including marriage, child bearing and rearing, intergenerational relationships, and alternative family forms. (F, Sp). 3 credits.

FCHD 2660 Parenting and Child Guidance (HR): Review of parenting styles and child guidance philosophies with emphasis on principles and techniques. Child abuse will also be reviewed. (F, Sp). 3 credits.

FCHD 3350 Family Finance (DSS): Overview of financial topics including financial goals, record keeping, budgeting, saving, insurance, taxes, use of credit, credit reports, mortgages, investments, retirement, fraud and financial planning. (F, Sp, Summer). 3 credits.

FCHD 4550 Preschool Methods and Curriculum: Use of materials, equipment, and activities in planning and implementing curricula for preschool children. (F, Sp). 3 credits.

Family and Consumer Sciences Education

FCSE 2040 Clothing Production Principles: Intermediate-level clothing construction techniques, pattern alteration and fitting, and use of sewing machine and serger. Previous sewing experience recommended. (F, Sp). 3 credits.

FCSE 2510 Orientation to Family and Consumer Sciences Education: Overview of the integrated Family and Consumer Sciences Education system. Students learn how family and human development, nutrition, finance, clothing production, and consumerism is planned, implemented, and evaluated through FCSE programs in the public schools. (F, Sp). 3 credits.

FCSE 3030 Textile Science (DSC/QI): Study of fibers, yarns, fabric constructions, and finishes related to suitability for desired end uses. Use of mathematics and descriptive statistics for reporting and interpreting data collected from lab experiments. Lectures and laboratory. (F, Sp, Summer). 4 credits.

FCSE 3040 Advanced Clothing Production: Flat pattern design and tailoring techniques. (F). 3 credits.
FCSE 3080 Dress and Humanity (DHA): Explores relationship of dress and humanity. Collaborative group assignments, discussions of history related to dress, cultures as related to dress, and the influence dress has in today’s society. (F, Sp, Summer). 3 credits.

FCSE 3300 Family and Consumer Sciences Education Clinical Experience 1: Provides on-site experience for students to model a secondary family and consumer sciences education teacher. Students are expected to learn teaching and classroom management principles. (Sp). 1 credit.

FCSE 3400 Family and Consumer Sciences Education Methods 1: Methods of successfully planning and maintaining family and consumer sciences work education programs in secondary schools. History and philosophy of applied technology education. (Sp). 3 credits.

FCSE 3790 Housing and Interior Design Teaching Methods: Online course mirroring Utah’s state standards for housing and interior design. Students review housing and interior design content, and then generate teaching strategies appropriate for teaching that content at the high school level. (F, Sp). 3 credits.

FCSE 4250 Internship in Family and Consumer Sciences Education: Mid management level experience in a position approved by the department. One credit earned for each 60 hours of experience. (F, Sp, Summer). 1-12 credits.

FCSE 4300 Family and Consumer Sciences Education Clinical Experience 2: Provides on-site experience for students to model a secondary family and consumer sciences education teacher. Students expected to learn teaching and classroom management principles. (F). 1 credit.

FCSE 4400 Family and Consumer Sciences Education Methods 2: Development of competency in curriculum planning, and skill and sensitivity in the use of various teaching-learning strategies and resources. Includes assessment for vocational education. (F). 3 credits.

FCSE 5500 Student Teaching Seminar: Taken during student teaching in secondary schools to complement school experience. Focuses upon problems arising during student teaching. Includes teaching plans, procedures, adaptive classroom practices, and evaluation. (F, Sp). 2 credits.

FCSE 5630 Student Teaching in Secondary Schools: After assignment to a cooperating family and consumer sciences educator, students are given professional responsibilities associated with teaching. (F, Sp). 10 credits.

Interior Design

ID 1750 Design in Everyday Living (BCA): Investigation of the basic elements and principles of design related to everyday living experiences and the practical application of relevant theory. (F, Sp). 3 credits.
Instructional Technology and Learning Sciences

ITLS 4015 Technology Tools and Integration for Teachers: Integrated experience for pre-service teachers to apply instructional design principles in their instruction. Hands-on experience using a wide variety of technological tools with integration in practical learning environments. Application of technology as both process and product. (F, Sp). 1-3 credits.

Nutrition, Dietetics and Food Science

NDFS 1020 Science and Application of Human Nutrition (BLS): Role of dietary choices in providing nutrients and their relationship to the social, mental, and physical well-being of people. How to evaluate nutritional status with personal data using computer diet analysis program. (F, Sp, Summer). 3 credits.

NDFS 1260 Food Literacy: Challenges students to take reasoned and justified action in the home, community, and world related to food from the ground up. (F, Sp). 3 credits.


NDFS 3070 Science of Food Preparation: Science principles underlying modern food theory and practice. Relation of physical and chemical properties of food components and their systems to food preparation. (Sp). 3 credits.

Secondary and Special Education

SCED 3100 Motivation and Classroom Management: Designed to lead pre-service secondary school teachers to address two questions: (1) What diverse traits, talents, attitudes, and experiences do pre-adolescent and adolescent students bring to the middle school, junior high school, and high school environment? and (2) In light of these diverse traits, talents, attitudes, and experiences, how should teachers work with students to build cooperative classroom communities where students are motivated to engage in productive learning activities?. (F, Sp). 3 credits.

SCED 3210 Educational and Multicultural Foundations (DSS/CI): Provides pre-service teachers with the opportunity to critically examine the political, economic, and educational policies influencing students’ access to equitable educational experiences. Examines historical and philosophical foundations influencing the nature of multicultural education in our democratic society, how personal biases can influence instructional practices, and development of multicultural curriculum relevant to specific content areas. (F, Sp). 3 credits.

SCED 4200 Language, Literacy and Learning in the Content Areas (CI): The purpose of this course is to examine how theories and research about language, learning and literacy inform the teaching practices required to motivate and enable secondary students to comprehend,
interpret, analyze, evaluate, integrate and use domain-specific and cross-curricular concepts. (F, Sp). 3 credits.

**SCED 4210 Assessment and Curriculum Design:** Designed to lead the pre-service secondary teachers to address two questions: (1) How do teachers monitor student progress, evaluate and communicate their achievement, and interpret summative test results? (2) How do teachers design curriculum that meets student learning needs and incorporates effective, ongoing assessment? (F, Sp). 3 credits.

**SPED 4000 Education of Exceptional Individuals:** Characteristics of all types of exceptional children with emphasis on the educational and psychological implications of these conditions to the development of the child. (F, Sp, Summer). 2 credits.
Assessment Plan

For the Undergraduate Program in Technology and Engineering Education (TEE)

Fall 2013
I. Program Description

An undergraduate degree in Technology and Engineering Education (TEE) at Utah State University (USU) prepares students to become qualified instructors who can teach in grades 6-12 the necessary knowledge and skills needed in the promotion of technological literacy. The ever-increasing rate of technological development and the impacts of globalization have created a demand for individuals who are technologically literate, innovative and capable of working in teams.

Students have the option to emphasize their studies in Technology and Engineering Education or Trade and Technical Education.

A Technology and Engineering Education emphasis is designed to prepare students for careers in teaching at the middle school and high school levels. The courses in this option consist of communication, manufacturing, energy, power and transportation classes.

A Trade and Technical Education emphasis is designed to prepare students for teaching Career and Technical Education (CTE) courses at the high school and post-high school levels. The courses in this major consist of classes within a declared expertise of building trades, automotive technology, electricity and electronics, computer-aided drafting, nursing or culinary arts.

Students are exposed to extensive practical classroom experience through role-playing, video-laboratory activities, clinical experiences and student teaching.

To keep potential and current students informed and up-to-date, the program keeps a current website (www.tee.usu.edu). In addition, students enrolled in the program are kept informed though a listserv maintained by the program’s advisor.

II. Degrees and Emphasis Options Offered

Those earning a Bachelor of Science (B.S.) Degree in Technology and Engineering Education become eligible for teacher licensure (grades 6-12) in Utah. Students have the option to emphasize their studies in Technology and Engineering Education or Trade and Technical Education.

III. Program Mission

The mission of the undergraduate Technology and Engineering Education program at Utah State University (USU) is to prepare qualified secondary education (grades 6-12) technology and engineering education teachers who can provide their students with the technological literacy required to live and work in today’s 21st Century global society. Graduates of the program are expected to lead their profession, develop a passion for life-long learning and advance technological literacy in the community and schools.
IV. Alignment of Program Mission with Departmental Mission

The mission of the School of Applied Sciences, Technology and Education (ASTE) is to apply the Land Grant University philosophy to teaching & learning, discovery, research and outreach. The School uses proven educational processes which include formal and informal instruction, experiential learning, leadership, and personal development at an undergraduate, graduate and community-based level.

The Technology and Engineering Education program is housed in the School of Applied Sciences, Technology and Education (ASTE) and aligns very well with this School and its other programs, especially those involved in training teachers in agriculture, and in family and consumer science.

V. Program Goals

The major goals of the Technology and Engineering program at USU are:

1. To prepare high quality technology and engineering education teachers who can successfully teach in secondary education programs here in Utah and throughout the U.S.
2. To provide students with the necessary knowledge and skills so that they can teach the content identified in the Standards for Technological Literacy: Content for the Study of Technology (see Appendix 8A).
3. To prepare professional teachers who can develop, implement and evaluate technology and engineering standards-based curricula and programs that promote technological literacy.
4. To prepare students who can effectively use a variety of instructional strategies and teaching methods that promote inquiry-based learning and problem-solving.
5. To prepare professional teachers who can effectively develop and manage technology and engineering education laboratories that promote student learning.
6. Describe the role of Technology and Engineering in the teaching of Science, Technology, Engineering and Mathematics (STEM).
7. To prepare students with a quest for life-long learning.

VI. Program Learning Objectives

After completing the program in Technology and Engineering Education at Utah State University, students will be able to:

1. Be capable of implementing a contemporary technology and engineering education program based on the Standards for Technological Literacy.
2. Possess a conceptual understanding of 1) the nature of history of technology and 2) the influence of technology on society and the environment.
3. Demonstrate competence with various technologies including design, communication, manufacturing, construction, transportation, energy, bio-related technology and computer technology.
4. Employ and teach problem solving methods (e.g., engineering design) to solve technical problems.
5. Demonstrate the ability to operate laboratory tools and equipment in an efficient and safe manner and teach accordingly.
6. Display professional habits including involvement in professional associations related to technology and engineering education, continuous learning and collegiality.
7. Demonstrate ability to manage, schedule, maintain and operate labs for technology and engineering education programs.
8. Be capable of using a wide range of contemporary instructional strategies and teaching methods to meet a variety of student abilities, age levels and cultural differences.
9. Demonstrate the ability to plan curriculum with organized units, lessons and daily activities.
10. Demonstrate the ability to assess, monitor and evaluate student achievement using formative and summative evaluation techniques.
11. Become familiar with the formal and informal aspects of a career in Technology and Engineering Education.
12. Explore the diversity of teaching opportunities in Technology and Engineering Education through internships, clinical experiences, and student teaching.
13. Demonstrate teaching competency in a student teaching placement under the direction of a mentoring teacher and assessment by professors in the area of TEE.

VII. Course Map (See Appendix 8B)

VIII. Course List with Descriptions (See Appendix 8C)

IX. Strengths, Weaknesses and Recommendations

An undergraduate degree in Technology and Engineering Education (TEE) at Utah State University (USU) prepares students to become qualified instructors who can teach in grades 6-12 the necessary knowledge and skills needed in the promotion of technological literacy. The ever-increasing rate of technological development and the impacts of globalization have created a demand for individuals who are technologically literate, innovative and capable of working in teams.

The field of Technology and Engineering Education is a high demand field and the program consistently has a 100% placement rate for those who choose teaching as a career. Secondary education school teaching opportunities exist in Utah, the Intermountain West, and the United States. The strengths, weaknesses and recommendations for the program are shown below.

Strengths

- Highly Qualified Faculty (i.e., Gary Stewardson and Edward Reeve). Notable characteristics of these faculty members include:
  - K-12 teaching experience in Technology and Engineering Education.
More than 25 years of research and teaching experience in technology and engineering education at the university level.

- Real-world industry experience.
- International Consultants in the areas of training and development, developing educational materials, and working with Government and Non-Government Agencies.
- Long-standing involvement in the Profession of Technology and Engineering Education. For example, Edward Reeve is currently on the International Technology and Engineering Educators (ITEEA) Board of Directors and he recently completed his three-year term as President of the Council on Technology and Engineering Teacher Education (CTETE). Gary Stewardson is currently chairing ITEEA’s program review committee for its national conference.

- Up-to date laboratories that promote technological literacy in the designed world. For example, notable new equipment in these labs include CNC machines, a 3D-printer and a laser- engraver.

- Small size classes that promote one-one interactions with the instructor.
- Approachable Faculty members who “care” about their students succeeding.
- Commitment to the Community through outreach activities. For example, currently the program supports an after school “Design Academy” (grades 6-12) that supports students learning how to build and compete in the area of VEX robotics.

- One-month summer Master’s Degree Program that brings teachers from around the region to the USU campus in the summer. Approximately 20 students enrolled in the Master’s degree program.

- A doctoral degree (PhD) in Education with a specialization in Curriculum and Instruction (C&I), emphasis in Technology and Engineering Education, is offered through the School of Teacher Education and Leadership in the College of Education and Human Services. Many of our doctoral graduates have become leaders in the field.

- Excellent working relationships with other colleges and departments on campus.

- Nationally Recognized Program.

- Recently updated TEE curriculum that reflects the current needs of the profession.

- Program area website.

- Working to develop more STEM into the undergraduate curriculum.

- Full-time graduate students who help the program through teaching, research, and service activities. Currently 4 full-time Doctoral Degree students and 1 Master’s Degree student.

**Weaknesses**

- Low Student Enrollments in undergraduate program
- At times, the two faculty member’s time can be spread quite thin because of other professional and university commitments (e.g., serving on graduate committees, university committees, etc.).

- Some tools and equipment are outdated (e.g., in the construction lab) and could be updated.

- Relationships with the State Technology and Engineering Education Specialist and the other schools in the state that offers the same degree program could be strengthened.
Faculty involvement in the state technology and engineering education association could be strengthened.

Better tracking data of graduates of the program is needed. Re-establish exit interview practice of graduates.

No-online TEE courses or off campus TEE courses offered.

An in-depth review is needed of the goals and objectives of each of the TEE courses offered in the program.

Recommendations

- Develop an active recruitment plan to get new undergraduates into the program (i.e., goal is to double student enrollment). Explore recruitment options with our branch campuses and USU Eastern.
- For low enrollment classes, team up with similar classes being taught in agriculture and/or family and consumer science.
- Hire another 1/2 of full-time faculty member in the program.
- Update outdated tools and equipment in the laboratories.
- Build stronger relationships with state organizations and BYU.
- Build a system to track program graduates.
- Conduct an in-depth program review.
- Form an advisory committee consisting of those constituents involved in Technology and Engineering Teacher education (e.g., state CTE director, or colleague from another university).

X. Plan for Measuring the Achievement of Degree and Program Objectives

The Bachelor of Science (BS) Degree in Technology and Engineering Education (TEE) is designed to develop the needed background knowledge and skills for the teaching of basic technology and engineering concepts at the secondary education level. The TEE undergraduate degree uses ITEEA’s Standards for Technological Literacy: Content for the Study of Technology (STL) as the basis for the content covered in the program’s courses. Additionally, measuring achievement of the degree and program objectives, as they relate to the Secondary Teacher Education Program, can be found on page 85.

Graduation and Employment

Graduates of the TEE program are in high demand across the region and in the U.S. The TEE program provide 100% placement to those seeking employment as a teacher. Those opting not to seek employment in education, typically work in industry in an area of expertise. Success can be measured by those gainfully employed in the profession, including those involved in local, state, and national professional activities. In addition, at the end of their student teaching experience, students complete an exit survey entitled “Technology and Engineering Education Program Evaluation” (see Appendix 8D) that evaluates their experiences and satisfaction with the TEE program. Data obtained in these survey helps to refine program goals and objectives as needed.
XI. Outreach efforts

Gary Stewardson

- Design Academy – After school group that supports students (grades 6-12) learning how to build and compete in the area of VEX robotics
- Provides in-service workshops for teachers and students to learn how to build competitive robots
- Provides presentations at the Technology Student Association’s (TSA) annual leadership workshop in the area VEX robotics and runs the TSA/VEX competitions
- Work with local manufacturing companies

Edward Reeve

- Conduct education training (e.g., teacher in-service, skill update workshops, etc.) for local and international organizations
- Involved in the teaching of on-line courses for the new CTE on-line Master’s Degree Program
- Work with international universities and government organizations in the development of STEM Education materials

XII. Interaction with Other Programs (within ASTE and externally)

School of Applied Sciences, Technology and Education (ASTE)

USU’s TEE program is now housed in the School of Applied Sciences, Technology and Education (ASTE) where similar type programs (i.e., agricultural education and family and consumer sciences education) are located. The TEE program is exploring how to merge similar type program classes (e.g., teaching methods) together. To date, the program has placed TEE students in a couple of agricultural education teaching methods courses and an agricultural related construction class. All of these placements have worked well.
Appendix 8A

Standards for Technological Literacy: Content for the Study of Technology
The Nature of Technology
Standard 1. Students will develop an understanding of the characteristics and scope of technology.
Standard 2. Students will develop an understanding of the core concepts of technology.
Standard 3. Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

Technology and Society
Standard 4. Students will develop an understanding of the cultural, social, economic, and political effects of technology.
Standard 5. Students will develop an understanding of the effects of technology on the environment.
Standard 6. Students will develop an understanding of the role of society in the development and use of technology.
Standard 7. Students will develop an understanding of the influence of technology on history.

Design
Standard 8. Students will develop an understanding of the attributes of design.
Standard 9. Students will develop an understanding of engineering design.
Standard 10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Abilities for a Technological World
Standard 11. Students will develop abilities to apply the design process.
Standard 12. Students will develop abilities to use and maintain technological products and systems.
Standard 13. Students will develop abilities to assess the impact of products and systems.

The Designed World
Standard 14. Students will develop an understanding of and be able to select and use medical technologies.
Standard 15. Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.
Standard 16. Students will develop an understanding of and be able to select and use energy and power technologies.
Standard 17. Students will develop an understanding of and be able to select and use information and communication technologies.
Standard 18. Students will develop an understanding of and be able to select and use transportation technologies.
Standard 19. Students will develop an understanding of and be able to select and use manufacturing technologies.
Standard 20. Students will develop an understanding of and be able to select and use construction technologies.

Appendix 8B

Course Maps
**ASTE Course Map**  
**Technology & Engineering Education**

<table>
<thead>
<tr>
<th>TEE Program Learning Objectives</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td>1. Be capable of implementing a contemporary technology and engineering education program based on the Standards for Technological Literacy.</td>
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<tr>
<td>2. Possess a conceptual understanding of: 1) the nature of history of technology and 2) the influence of technology on society and the environment.</td>
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<td>3. Demonstrate competence with various technologies including design, communication, manufacturing, construction, transportation, energy, bio-related technology and computer technology.</td>
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<td>4. Employ and teach problem solving methods (e.g., engineering design) to solve technical problems.</td>
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<tr>
<td>5. Demonstrate the ability to operate laboratory tools and equipment in an efficient and safe manner and teach accordingly.</td>
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<tr>
<td>6. Display professional habits including involvement in professional associations related to technology and engineering education, continuous learning, and collegiality.</td>
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<td>7. Demonstrate ability to manage, schedule, maintain, and operate labs for technology and engineering education programs.</td>
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<th>SCED 3210</th>
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<th>SCED 4210</th>
<th>SPED 4000</th>
<th>TEE 3200</th>
<th>TEE 3300</th>
<th>TEE 4300</th>
<th>TEE 4400</th>
<th>TEE 5500</th>
<th>TEE 5630</th>
<th>TEE 1200</th>
<th>TEE 3050</th>
<th>Communication ITLS 5215 or 5245 or 5265 or ART 2810</th>
<th>TEE 1030</th>
<th>SCED 3100</th>
<th>SCED 3210</th>
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<td>8.</td>
<td>Be able of using a wide range of contemporary instructional strategies and teaching methods to meet a variety of student abilities, age levels, and cultural differences.</td>
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<td>9.</td>
<td>Demonstrate the ability to plan curriculum with organized units, lessons, and daily activities.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>10.</td>
<td>Demonstrate the ability to assess, monitor, and evaluate student achievement using formative and summative evaluation techniques.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>11.</td>
<td>Become familiar with the formal and informal aspects of a career in Technology and Engineering Education.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>12.</td>
<td>Explore the diversity of teaching opportunities in Technology and Engineering Education through internships, clinical experiences, and student teaching.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>13.</td>
<td>Demonstrate teaching competency in a student teaching placement under the direction of a mentoring teacher and assessment by professors in the area of TEE.</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>14.</td>
<td>Design performance assessment systems based upon stated learning/program objectives.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tbody>
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140
## TEE Program Learning Objectives

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Required Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Be capable of implementing a contemporary technology and engineering education program based on the Standards for Technological Literacy.</td>
<td>X X X X X X X X X</td>
</tr>
<tr>
<td>2.</td>
<td>Possess a conceptual understanding of: 1) the nature of history of technology and 2) the influence of technology on society and the environment.</td>
<td>X X X X X X X X X</td>
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<tr>
<td>3.</td>
<td>Demonstrate competence with various technologies including design, communication, manufacturing, construction, transportation, energy, bio-related technology and computer technology.</td>
<td>X X X X X X X X X</td>
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<tr>
<td>4.</td>
<td>Employ and teach problem solving methods (e.g., engineering design) to solve technical problems.</td>
<td>X X X X X X X X X</td>
</tr>
<tr>
<td>5.</td>
<td>Demonstrate the ability to operate laboratory tools and equipment in an efficient and safe manner and teach accordingly.</td>
<td>X X X X X X X X X</td>
</tr>
<tr>
<td>6.</td>
<td>Display professional habits including involvement in professional associations related to technology and engineering education, continuous learning, and collegiality.</td>
<td>X X X X X X X X X</td>
</tr>
<tr>
<td>7.</td>
<td>Demonstrate ability to manage, schedule, maintain, and operate labs for technology and engineering education programs.</td>
<td>X X X X X X X X X</td>
</tr>
</tbody>
</table>
8. Be able to use a wide range of contemporary instructional strategies and teaching methods to meet a variety of student abilities, age levels, and cultural differences.  

9. Demonstrate the ability to plan curriculum with organized units, lessons, and daily activities.  

10. Demonstrate the ability to assess, monitor, and evaluate student achievement using formative and summative evaluation techniques.  

11. Become familiar with the formal and informal aspects of a career in Technology and Engineering Education.  

12. Explore the diversity of teaching opportunities in Technology and Engineering Education through internships, clinical experiences, and student teaching.  

13. Demonstrate teaching competency in a student teaching placement under the direction of a mentoring teacher and assessment by professors in the area of TEE.  

Appendix 8C

Course Descriptions
Required Courses for Technology & Engineering Education Majors

**Technology & Engineering Education**

**TEE 3200. Methods of Teaching Engineering and Technology Education I.** Classroom laboratory practicum for design, practice, and performance of technology education demonstrations and lab activities. **Prerequisite/Restriction:** TEE 1000. **Corequisite:** TEE 3300. (Sp) (3cr).

**TEE 3300. Clinical Experience I.** Field-based experiences in secondary schools. Students complete 30 hours of tutoring students and assist teachers with managerial, clerical, and other professional tasks. **Prerequisite/Restriction:** TEE 1000 and Admission into Teacher Education. **Corequisite:** TEE 3200. (Sp) (1cr).

**TEE 4300. Clinical Experience II.** Field-based experience, in which students complete 30 hours of teaching-related experiences in the classroom. **Prerequisite/Restriction:** TEE 3200, TEE 3300 and Admission to Teacher Education. **Corequisite:** TEE 4400. (F) (1cr).

**TEE 4400. Methods of Teaching Engineering and Technology Education II.** Techniques of teaching as applied to individual and group instruction. Students apply various methods in presenting lessons. **Prerequisite/Restriction:** TEE 3200, TEE 3300. **Corequisite:** TEE 4300. (F) (3cr).

**TEE 5500. Student Teaching Seminar.** Focuses on observations and problems arising during student teaching. Includes review of teaching plans, procedures, adaptive classroom practices, and evaluation. **Corequisite:** TEE 5630. (F) (2cr).

**TEE 5630. Student Teaching in Secondary Schools.** Candidates assigned to cooperating teachers in public secondary schools within their major and minor subjects. Students have professional responsibilities with teaching. **Corequisite:** TEE 5500. (F) (10cr).

**Communication Courses**

**TEE 1200. Computer-Aided Drafting and Design.** Provides students with ability to accurately produce basic engineering, 2-D, and pictorial drawings using traditional and computer-aided drafting techniques. Introduction to drafting fundamentals and equipment associated with the drafting industry, including drawings, reproductions, and computer-aided techniques. (F,Sp) (3cr).

**TEE 3050. Computer Systems and Networking.** Introduction to modern graphic and electronic communication systems. Emphasizes design, development, production, and dissemination of both electronic and graphic messages. Covers major concepts, including desktop publishing, and audio and video production techniques. (F) (3cr).
Choose one of the following:

**ITLS 5215. Digital Video Capture and Production I.** Fundamental theories and practice in design and development for camera and computer-based audio and video production, including recording, editing, and digitizing audio and video segments for education and training applications. To receive graduate-level credit, students must fulfill additional requirements. (F) (3cr).

**ITLS 5245. Interactive Multi-Media Production.** Covers fundamental programming concepts, in addition to fundamentals of the interactive multi-media environment. Students finishing this course will have at least one completed fully-functional project for their portfolios. To receive graduate-level credit, students must fulfill additional requirements. (Sp,Su) (3cr).

**ITLS 5265. Internet Development.** Teaches web publishing primarily using HTML (Hyper-Text Markup Language). Explores current web technologies and includes design, development, and evaluation. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su) (3cr).

**ART 2810. Photography I.** Black and white photography, including camera operation, exposure and development, and enlarging and printing of black and white negatives, with a concern for advancing technical controls, aesthetics, and darkroom experimentation. Introduction to electronic imaging. (F,Sp) (3cr).

**Manufacturing Courses**

**TEE 1030. Material Processing Systems.** Introduction to properties of industrial materials (metallic, polymeric, ceramic, and composite), processes used to produce standard stock and finished products, and the use of precision measuring instruments in manufacturing. (F,Sp) (3cr).

**TEE 2020. Computer-Integrated Manufacturing Systems.** Introduction to principles, operations, and applications of automated manufacturing systems, including: data acquisition and controls, CNC, CAD/CAM, and robotics. **Prerequisite/Restriction:** TEE 1030, TEE 1200. (Sp) (3cr).

**TEE 2030. Wood-Based Manufacturing Systems.** Focuses on the instructional strategy of establishing a manufacturing enterprise utilizing woodworking equipment and techniques. Topics include management; finance and marketing strategies; and the design of product, tooling, and production systems. **Prerequisite/Restriction:** TEE 1030. (F) (3cr).

Choose one of the following:

**ASTE 3030. Metal Welding Processes and Technology in Agriculture.** Selection of ferrous and nonferrous welding techniques in agricultural applications. Welding, cold- and hot-working metal in agricultural construction and maintenance. (F) (3cr).

**AV 4200. Composite Manufacturing Processes and Repair.** Composite manufacturing processes, composite materials survey, tooling design and fabrication, autoclave processes, vacuum bag techniques, filament winding processes, equipment requirements, materials cutting
and storage, and composite materials testing. **Prerequisite/Restriction:** Aviation technology majors only. AV 1100 and a grade of C- or better in MATH 1050. (F) (3cr).

**Energy, Power, Transportation Courses**

**TEE 1020. Energy Power, Transportation Systems Control Technology.** Exploration of the concepts and processes relating to the control and automation (both hard and programmable) of technical systems in the areas of energy and power, transportation, and agricultural and related biotechnologies. (Sp) (3cr).

Choose one of the following:

**ENGR 2210. Fundamental Electronics for Engineers.** Study and application of DC and AC concepts. Includes circuit fundamentals, theorems, laws, analysis, components, equipment, and measuring devices. Laboratory will include circuit design, construction and analysis of AC/DC circuits, and the use of measuring instruments, power supplies, and signal generators. Not available to students majoring in Electrical Engineering or Computer Engineering. **Prerequisite/Restriction:** MATH 1210 and MATH 1220. (F,Sp,Su) (3cr).

**TEE 2300. Electronic Fundamentals (Q1).** Study and application of DC and AC concepts, semiconductors, digital electronics, and microcomputers. **Prerequisite/Restriction:** MATH 1050. (Sp) (4cr).

**Construction Courses**

**TEE 1040. Construction and Estimating.** Overview of construction industry and its practices. Reviews four major parts of construction industry, including: (1) Inputs: materials; (2) Process: design and building of structures; (3) Outputs: sites, buildings, etc.; and (4) Feedback: effects of building systems. Provides prospective technology education teachers with opportunity to study and perform activities related to the field of construction and estimating. At completion of course, students should be able to demonstrate knowledge and skills required to implement a construction technology program. (Sp) (3cr).

**TEE 2220. Civil Engineering and Architecture.** Introduction to fields of civil engineering and architecture. Software applications used to solve problems and communicate solutions. Topics include: project planning, site planning, building design, and project documentation and presentation. **Prerequisite/Restriction:** TEE 1200, MATH 1050. (Sp) (3cr).

**Related Professional Courses**

**TEE 1000. Orientation to Technology and Engineering Education.** Introduction to the technology education teaching profession, including programs, facilities, goals, and opportunities. (F) (1cr).

**TEE 3440. Science, Technology, and Modern Society (DSC).** Designed to challenge students from all academic majors to develop an understanding of the dynamic interaction between science, technology, and society. Explores responsibility of humans for directing the utilization of technology as a creative enterprise. (F,Sp) (3cr).
**Prerequisite/Restriction:** One of the following within the last year or three consecutive semesters (including summer); ACT Math score of at least 27; SAT Math score of at least 620; AP Calculus AB score of at least 3; Grade of C- or better in MATH 1050 and MATH 1060; or satisfactory score on the Math Placement Exam. (F,Sp,Su) (4cr).

PHYS 1800. Physics of Technology (BPS). Overview of the classical physics on which industrial technology is based. Elements of kinematics, forces, energy, momentum, thermodynamics, electric and magnetic fields, waves, and optics. Required laboratory. 
**Prerequisite/Restriction:** MATH 1050 and MATH 1060. (4cr).

Choose one of the following:

**BIOL 1610. Biology I.** Principles of cell biology, energetics, and genetics; plant structure, function, and development. Three lectures and one lab. To receive University Studies Breadth Life Sciences (BLS) credit, students must complete both BIOL 1610 and either BIOL 1620 or BIOL 3300. The BIOL 1610 and BIOL 3300 option for BLS credit is available only to students majoring in Biological Engineering or Environmental Engineering. The BIOL 1610 and BIOL 3060 option for BLS credit is available only to students in the Bioinformatics Emphasis of the Computer Science Major. (F) (4cr).

**CHEM 1110. General Chemistry I (BPS).** For non-science majors. This course is designed for students whose major does not require the more mathematically intensive CHEM 1210 or CHEM 1220 courses. First of a two-semester sequence. Progression is made from the basic tenets of general chemistry through an introduction to organic chemistry, with topics being presented in order of practical importance and sophistication. 
**Prerequisite/Restriction:** Math ACT score of at least 23, or MATH 1050 or higher; or corequisite of MATH 1050. (F,Sp) (4cr).
Appendix 8D

Technology and Engineering Education Program Evaluation
At the end of your student teaching experience you will need to evaluate your experiences in the TEE program. Please answer the following question and we will discuss your responses during the final student teaching seminar. The TEE faculty are particularly interested in continuing to improve our program, so please be honest with your responses.

Please rate the following on a scale of: Poor = 1 – Excellent = 4

1. How well were you prepared to teach about technological literacy?
   - Poor
   - Average
   - Good
   - Excellent

2. How well were you prepared to teach the characteristics and scope of technology?
   - Poor
   - Average
   - Good
   - Excellent

3. How well were you prepared to teach to the core concepts of technology?
   - Poor
   - Average
   - Good
   - Excellent

4. How well were you prepared to teach about technology and its interdisciplinary nature?
   - Poor
   - Average
   - Good
   - Excellent

5. How well were you prepared to teach about technology’s societal, economic, and environmental impacts?
   - Poor
   - Average
   - Good
   - Excellent

6. How well were you prepared to teach about technology’s influence on history?
   - Poor
   - Average
   - Good
   - Excellent

7. How well were you prepared to teach about/using design?
   - Poor
   - Average
   - Good
   - Excellent

8. How well were you prepared to teach about/using engineering design?
   - Poor
   - Average
   - Good
   - Excellent

9. How well were you prepared to teach about/using research, troubleshooting, and innovation and invention strategies?
   - Poor
   - Average
   - Good
   - Excellent
10. How well were you prepared to teach about applying the design process?
   Poor  Average  Good   Excellent
   1        2       3          4

11. How well were you prepared to teach about the abilities required to use and maintain a technological product or system?
   Poor  Average  Good   Excellent
   1        2       3          4

12. How well were you prepared to teach about assessing the impacts of products and systems?
   Poor  Average  Good   Excellent
   1        2       3          4

13. How well were you prepared to teach about the selection and use of medical technologies?
   Poor  Average  Good   Excellent
   1        2       3          4

14. How well were you prepared to teach about the selection and use of Agricultural and related Biotechnologies?
   Poor  Average  Good   Excellent
   1        2       3          4

15. How well were you prepared to teach about the selection and use of Energy and Power technologies?
   Poor  Average  Good   Excellent
   1        2       3          4

16. How well were you prepared to teach about the selection and use of Information and Communication technologies?
   Poor  Average  Good   Excellent
   1        2       3          4

17. How well were you prepared to teach about the selection and use of Transportation technologies?
   Poor  Average  Good   Excellent
   1        2       3          4

18. How well were you prepared to teach about the selection and use of Manufacturing technologies?
   Poor  Average  Good   Excellent
   1        2       3          4

19. How well were you prepared to teach about the selection and use of Construction technologies?
   Poor  Average  Good   Excellent
   1        2       3          4
20. How well were you prepared to teach to use CAD, machines, and tools?
   
   Poor  Average  Good  Excellent
   1      2       3          4

Professional Sequence:

21. How well were you prepared to use standards for technological literacy (STL) to develop and evaluate curriculum and lessons?
   
   Poor  Average  Good  Excellent
   1      2       3          4

22. How well were you prepared to make informed decisions by identifying multiple resources to create meaningful lessons?
   
   Poor  Average  Good  Excellent
   1      2       3          4

23. How well were you prepared to develop appropriate content for technology lessons?
   
   Poor  Average  Good  Excellent
   1      2       3          4

24. How well were you prepared to design and deliver technology content using a number of different teaching strategies?
   
   Poor  Average  Good  Excellent
   1      2       3          4

25. How well were you prepared to design lessons and units of study which were sensitive to cultural diversity?
   
   Poor  Average  Good  Excellent
   1      2       3          4

26. How well were you prepared to design learning experiences for students of differing abilities and ages?
   
   Poor  Average  Good  Excellent
   1      2       3          4

27. How well were you prepared to plan for and evaluate student learning?
   
   Poor  Average  Good  Excellent
   1      2       3          4

28. How well were you prepared to use educational technology during the program?
   
   Poor  Average  Good  Excellent
   1      2       3          4
29. How well were you prepared to seek out and utilize professional development opportunities?

<table>
<thead>
<tr>
<th>Poor</th>
<th>Average</th>
<th>Good</th>
<th>Excellent</th>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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30. Overall, how would you rate the professional sequence in Technology Education?

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<thead>
<tr>
<th>Poor</th>
<th>Average</th>
<th>Good</th>
<th>Excellent</th>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>

Was the interaction with a large number of practicing teachers during the program helpful with your preparation? Explain.

What support do you wish you had gotten that would have helped you in your student teaching position?

What courses were most valuable to you as you prepared for student teaching?

What courses were least valuable in the program as you prepared for student teaching? How can we improve them?

What are your teaching goals for the next five years?
Assessment Plan

For the Graduate Program in Agricultural Systems Technology

Fall 2013
I. Program Description

The Master of Science program in Agricultural Systems Technology emphasizes the scholarship of teaching and learning within formal and non-formal settings. Coursework focuses on building knowledge and in-depth expertise in practitioner-based teaching, curriculum development, systems thinking, program planning, and evaluation techniques. It also requires proficiency in research methodology, statistical applications, and synthesis of information. Students in this research-oriented program will design, conduct, and disseminate the results of a research project using scientific writing and communication skills. All students completing this program are required to complete a thesis project.

The Master of Science program in Agricultural Systems Technology offers specializations in Agricultural Extension Education, in Family and Consumer Sciences Education and Extension (FCSEE), and in Secondary and Post-Secondary Agricultural Education.

- The purpose of the Agricultural Extension Education specialization is to provide a program for individuals interested in extension and outreach-oriented work at land-grant universities, federal and state agencies, non-profits, and other organizations. The curriculum for the program includes coursework related to managing people; planning, implementing, and evaluating programs to promote technology transfer (adult education); understanding research techniques relevant to agriculture; and the managing of fiscal affairs.

- The purpose of the Family and Consumer Sciences Education and Extension specialization is to expand academic preparation in an area of study such as family studies, housing, textiles and clothing, nutrition and food sciences, and management of personal resources. This specialization emphasizes teaching and curriculum/program development and/or Extension. Students are prepared for community professions including secondary teaching and urban or rural extension. Studies may lead to supervisory and administrative positions in business, technical schools, and applied technology colleges, or to consulting positions in mass media and industry. The master's degree does not result in a teaching license for public schools.

- The purpose of the Secondary and Postsecondary Agricultural Education specialization is to improve practitioner professional proficiency in teaching, curriculum development, program planning, and evaluation. This specialization provides teachers with opportunities to acquire additional knowledge in professional education and in agricultural science education while building awareness of the world’s food, fiber, and natural resource system. The master's degree does not result in a teaching license for public schools.

II. Degree and Emphasis Options

Students who successfully complete the 30 credit hours required for the AST Master of Science degree with the required thesis will earn a Master of Science in Agricultural Systems Technology with an emphasis in one of the three options outlined above (Agricultural Extension Education, Family and Consumer Sciences Education and Extension, or Secondary and Postsecondary Agricultural Education).
III. Program Mission Statement

The mission of the Master of Science in Agricultural Systems Technology is to prepare students for careers in extension, adult and community education, and school-based education.

IV. Alignment of Program Mission with Department Mission

The Master of Science in Agricultural Systems Technology reinforces the mission of the School of Applied Sciences, Technology and Education by challenging students to apply a multidisciplinary systems science approach for the resolution of family, agricultural and applied science matters through the advancement of education, technology transfer, scientific inquiry, and agricultural mechanization. Coursework, research, and professional development opportunities facilitate the career development of graduate students in ASTE while connecting to the department mission.

V. Program Goal

The goal of the Master of Science in Agricultural Systems Technology is to graduate students who are proficient in research methodology, statistical application and academic writing in a field of study or specialization, and the scholarship of teaching and learning in formal and non-formal settings.

VI. Program Learning Outcomes

After completing the program in School of Applied Sciences, Technology and Education at Utah State University, our students will be able to:

- Apply focused and comprehensive knowledge in an identified emphasis area (Agricultural Extension Education, Family and Consumer Sciences Education and Extension, or Agricultural Education) through classroom instruction, research, and other innovative educational experiences.
- Use original ideas and scholarly skills to contribute to the advancement of their field.
- Develop and practice professional skills so they can integrate and communicate effectively with the scholarly community in their discipline.
- Assume future leadership roles in disseminating and applying knowledge to address local and global societal needs.

VII. Course Map (See Appendix 9A)

VIII. Course List with Descriptions (See Appendix 9B)
IX. Strengths, Weaknesses and Recommendations

Strengths

Focus is placed on skill development, program planning, and evaluation techniques. The degree program emphasizes a wide range of teaching and learning skills and requires proficiency in research methodology and statistical applications.

The program integrates faculty expertise from a variety of disciplines including Agricultural Communications and Journalism, Agricultural Education, Agricultural Systems Technology, Family and Consumer Sciences Education, and Technology and Engineering Education.

Course delivery is varied to accommodate working professionals in the field who wish to retain full-time employment while pursuing a graduate degree. Fall and spring Semester Courses are broadcast to distance education sites in Utah or are online. Others, including summer courses, are offered in intensive workshop-type settings or as hybrid (online and workshop style) courses.

Weaknesses

- Need for money for graduate student assistantships and scholarships.
- Need for recruitment of new students to the program.
- Need for more faculty time dedicated to graduate studies.
- Need for additional research and internship opportunities for students.
- Need for development of scientific writing and communication skills for students.

Recommendations

- Increase the number of multidisciplinary research proposals that could provide funding for graduate student assistantships and scholarships.
- Develop a recruitment plan to facilitate strategic recruitment of Master of Science students.
- Identify strategies for multidisciplinary approach to course facilitation to avoid duplication of courses across programs in ASTE.
- Continue to develop collaborative partnerships across campus and with various agencies/organizations to identify possible research projects and internships for students.
- Develop a course or seminar that focuses on scientific writing and communication skills for graduate students.

X. Plan for Measuring the Achievement of Degree and Program Objectives

All graduates from the Master of Science in Agricultural Systems Technology must complete a total of 30 required credits. Of the 30 credits required, 12 credits are designated as Core to the program (ASTE 6160, FCSE 6180, FCSE 6140 and ASTE 6100); six credits of research and thesis (ASTE 6970) and the remaining 12 credits from the selected Education or Extension option. Students in Agricultural Systems Technology must satisfy requirements for the
university core curriculum and meet the following three minimum requirements: (1) accumulative grade point average must be 2.75 or higher in all courses required for the major; (2) courses required for the major may be repeated one time to improve a grade; (3) courses required for the major may not be taken for pass-fail credit.

**Thesis**

The Plan A option for a master’s degree requires preparation of a thesis. Six to 15 thesis credits are required. The semester(s) during which a student registers for thesis credit should correspond as closely as possible to the semester(s) in which the thesis work is done and faculty supervision is provided. The thesis for a Plan A master’s degree is to be a contribution to the field of knowledge based on the student’s own research, or a treatment and presentation of known subject matter from a new perspective. The student and major professor should decide upon a problem or subject for the thesis study by the end of the student’s second semester of graduate study.

The following checklist of requirements must be completed before the graduate student is awarded the Master of Science Degree in Agricultural Systems Technology (according to School of Graduate Studies):

- Supervisory Committee form is approved and up-to-date (end of second semester). (A revised Supervisory Committee form must be submitted to the School of Graduate Studies (SGS) if there are changes in the composition of the supervisory committee.)
- Program of Study (POS) form is approved by the end of the second semester. All courses listed on the form are completed and grades submitted. Any changes to the POS form are approved by the supervisory committee and an updated POS form is sent to SGS.
- Residency Requirement: at least 24 of the credits used to satisfy degree requirements are from Utah State University.
- Thesis proposal is signed by all committee members and submitted to the SGS.
- Coursework on the POS (including transfer credits) taken more than eight years prior to the defense is revalidated. (Revalidation of coursework requires a revalidation plan submitted by the major professor and approval by the dean of the SGS.)
- Appointment for Examination form is submitted to the SGS at least 15 working days before the final examination.
- Registered for at least three credit hours the semester of defense.
- Record of Exam Completion form is signed by the entire committee to the SGS.
- Information in Banner is current, graduation surveys completed, and the diploma fee paid.
- Electronic Thesis and Dissertation (ETD) Approval form (provided at the final defense) is signed and taken to the Merrill-Cazier Library with thesis.
- Incomplete grades for research credits are changed by the major professor.
- Thesis is completed and signed by all committee members, after which it is submitted to the assistant dean in the SGS for review. When satisfactory, the SGS dean will sign the thesis and it must be picked up from the SGS office, copied, and taken to the second floor of the Merrill-Cazier Library for binding. Binding fees will be paid to the library at that
time. Please note the university requires that one copy of the thesis will remain in the library.

- After the dean has signed the thesis, the student’s file will be reviewed for completion and processed for graduation.
- Binding Clearance form is returned to the SGS signaling completion of degree

**Thesis Defense**

After the graduate student receives approval from his or her supervisory committee, the student defends his/her Master’s thesis before an examination committee consisting of the major professor and a minimum of two other graduate faculty members. One graduate faculty member must be from outside the department. Upon completion of the student’s presentation of his or her research, committee members ask critical questions related to the research conducted and findings presented in the thesis. Based on the student’s performance, a pass or fail decision is made by the committee.

**XI. Outreach Efforts**

The faculty serving the Master of Science in Agricultural Systems Technology participate in and/or facilitate the following outreach efforts:

- Teacher Professional Development Seminars
- Extension Field Days
- State, National, and International Presentations focusing on the various specialization areas offered through the degree program
- Service Projects that meet the needs of various secondary, community and adult education entities

**XII. Interactions with Other Programs** (within ASTE and externally)

The faculty serving the Master of Science in Agricultural Systems Technology participate and/or facilitate the following outreach efforts:

- Courses offered as a part of the Master of Science in Agricultural Systems Technology are integrated into other graduate programs offered in ASTE, and other departments across campus
- Faculty in ASTE serve as the outside member on graduate committees across the university
- Faculty from other departments serve as outside member on ASTE graduate student supervisory committees
- Multiple faculty collaborate with the Utah Department of Education on the revision of education standards, curriculum development, and other tasks as needed
- Multiple faculty collaborate on research and outreach efforts related to extension programming.
- Multiple faculty collaborate with the Utah Department of Agriculture on education, research, and outreach efforts.
Appendix 9A

Course Map
## AST Graduate Program Learning Outcomes

<table>
<thead>
<tr>
<th>A. Apply focused and comprehensive knowledge in an identified emphasis area (Agricultural Extension Education, Family and Consumer Sciences Education and Extension, or Agricultural Education) through classroom instruction, research, and other innovative educational experiences.</th>
<th>ASTE 6160</th>
<th>FCSE 6180</th>
<th>FCSE 6140</th>
<th>ASTE 6100</th>
<th>ASTE 6200</th>
<th>FCSE 6220</th>
<th>ASTE 6260</th>
<th>FCSE 6950</th>
<th>ASTE 7500</th>
<th>FCSE 6300</th>
<th>FCSE 6320</th>
<th>FCSE 6340</th>
<th>FCSE 6380</th>
<th>ASTE 6970</th>
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<tr>
<td>X</td>
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<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

| B. Use original ideas and scholarly skills to contribute to the advancement of their field. | X | X | X | | | | | X | | | | | |

| C. Develop and practice professional skills so they can integrate and communicate effectively with the scholarly community in their discipline. | X | X | X | X | X | X | X | X | X | X | X | X | X |

| D. Assume future leadership roles in disseminating and applying knowledge to address local and global societal needs. | | | | | | | | | X | X | | | |


Appendix 9B

Course Descriptions
Required Courses for a Master of Science (MS) in Agricultural Systems Technology

Agricultural Systems, Technology and Education

ASTE 6160 Foundations of Adult Education: Addresses the context and providers of adult education. In addition, adult learning theories and participation models are examined. (Sp). 3 credits.

ASTE 6100 Research Methods: Introduces techniques used in applied agricultural research, as well as in career and technical education research. Includes research design, data gathering, and statistical analysis and interpretation. (Summer). 3 credits.

ASTE 6200 Principles and Practices of Extension Education: History, philosophy, and organizational structure of U.S. and international extension organizations, including programming models, teaching strategies, and accountability. (Sp). 3 credits.

ASTE 6260 Environmental Impacts of Ag Systems: Investigation of relationship between agricultural practices and environmental quality, including control of agricultural nonpoint-source pollution. (F). 3 credits.

ASTE 6970 Research and Thesis: (F, Sp, Summer). 1-9 credits.

ASTE 7500 Diffusion of Innovations: Explores processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. Course content is applicable to persons who work closely with people in formal and informal educational settings. (Summer). 3 credits.

Family and Consumer Sciences Education

FCSE 6140 Evaluation and Ethics of Research in Education and Extension: Investigation and reporting of current issues related to career and technical education and extension education research. (F). 3 credits.

FCSE 6180 Administration and Program Planning: Application of research and theory of administration and program planning to define and clarify the role of leadership in extension and formal education situations. (F). 3 credits.

FCSE 6220 Volunteer Programs and Partnerships: Explores the use and management of volunteers and partnerships in the development and implementation of extension, non-formal, and outreach education programs. (Summer). 3 credits.

FCSE 6950 Graduate Internship: Designed for graduate students who wish to acquire or upgrade their experience in an occupational field related to their area of study. One credit earned for each 60 hours of experience. Repeatable for up to 6 credits. (F, Sp, Summer). 1-6 credits.
**FCSE 6300 Advanced Teaching Strategies:** Explores advanced application of teaching strategies and theory, as well as the creation of innovative classroom materials. (F). 3 credits.

**FCSE 6320 Classroom Management, Student Motivation, and Guidance:** Multiple-strategy approach for increasing teachers’ effectiveness and satisfaction in classroom management and discipline (Summer). 3 credits.

**FCSE 6340 Curriculum Development, Testing, and Evaluation:** Examines current trends in curriculum and program development related to specific educational outcomes. Includes curriculum development process. (Summer). 3 credits.

**FCSE 6380 Mentoring and Supervision:** Explores the role of supervision and mentoring in the success of teaching professionals. Reviews four components of professional practice. Examines techniques for observation and conferencing. Students reflect upon their own teaching/mentoring experiences and the impact upon professional practice. (Sp). 3 credits.
Assessment Plan

For the Graduate Program in
Career and Technical Education (CTE)

Fall 2013
I. Program Description

The Career and Technical Education (CTE) online professional degree program has been designed to meet the needs of practicing Career and Technical Education professionals in the areas of Agricultural Education; Business Education; Family and Consumer Sciences Education; Skilled and Technical Education; and Technology and Engineering Education. The School of Applied Sciences, Technology and Education (ASTE) currently offers undergraduate pre-service teacher preparation programs in these areas of CTE. This M.Ed. degree will provide a continuation of our focus upon CTE teachers and their professional development and utilize the faculty capacity to enhance secondary education in Utah. This degree does not require a thesis and can be completed in as little as two years. The program provides students with the flexibility to pursue specific CTE emphases: instructional technology, educational leadership, non-formal and adult education, and science, technology, engineering and mathematics (STEM).

II. Degrees and Emphasis Options Offered

The program offers a Masters of Education (M.Ed.) professional degree in Career and Technical Education, with emphases in: Educational Leadership, Non-formal and Adult Education, and, Science, Technology, Engineering, and Mathematics (STEM).

III. Program Mission

To meet the workforce demand of current professionals the mission of this program is to: Provide a professional masters level degree for Career and Technical Education educators and prospective educators to become more highly qualified and increase their earning potential.

IV. Alignment of Program Mission with Departmental Mission

The CTE M.Ed. program allows students to complete their degree online, addressing the land-grant philosophy to deliver quality programming not only in the state of Utah, but nationwide. Furthermore, this program directly “serves the public through learning, discovery and engagement” by giving current teachers and administrators tools they need to better educate the public in the areas of agriculture, family and consumer sciences, technology and engineering, and business.

V. Program Goals

In keeping with USU’s mission statement this master’s program will help advance the following Utah State University goals:

- Enhance the reputation of the University for learning, discovery and engagement by offering a unique program that will appeal to CTE professionals in Utah, the region and nationwide.
- Strengthen the recruitment, retention, graduation and placement of students by offering an online option to prospective students who cannot attend a traditional face-to-face
master’s program. The program will make graduates more marketable for future positions and allow for pay increases in already obtained positions.

- Build a socially and intellectually vibrant campus community, enhanced by the diversity of its faculty, staff, and students, by expanding our reach to both traditional and nontraditional students through the online delivery method of courses and allowing faculty to interact with students in a technology-driven manner. Our campus community extend its bounds nationwide with this program, as few are offered in the nation.
- Infuse new energy into graduate programs by developing a highly desired online program that allows a broader base of CTE professionals to enroll in a master’s program that requires students to create a culminating creative of integrative experience.

VI. Program Learning Objectives

1. Develop and deliver contemporary CTE curricula.
2. Modify instruction and model effective pedagogy to meet the needs of secondary (adolescent) and post-secondary (adult) learners.
3. Use advanced teaching methods and instructional strategies to enhance student learning.
4. Effectively assess and evaluate student learning.
5. Utilize effective management and student motivation techniques in the classroom.
6. Discuss current issues and trends in Career and Technical Education.
7. Use basic research methods to improve teaching and learning.
8. Develop academic writing skills.

VII. Course Map (See Appendix 10A)

VIII. Course List with Descriptions (See Appendix 10B)

IX. Strengths, Weaknesses and Recommendations

Strengths
The strength of this 100% online degree is its flexibility and its capacity to offer high-quality instruction to a clientele that may not have any other avenue to further their education. This degree serves student-centered demands of current CTE professionals by offering courses through a convenient delivery method and fulfills the land-grant mission by bringing education to individuals not only in the state of Utah, but nationwide. As this is a professional degree, no thesis is required; appealing to the practitioner who desires to improve themselves and their employment opportunities. Furthermore, this program addresses the land grant mission and directly “serves the public through learning, discovery and engagement” by giving current teachers and administrators tools they need to better educate the public in the areas of agriculture, family and consumer sciences, technology and engineering, and business.

Weaknesses
This new degree program was initiated August 1, 2013. While specific weaknesses have yet to be identified, the major potential weakness would be instructor training in online pedagogy and tools. As with any new program, low enrollment is a potential problem.
Recommendations

To address these weaknesses, it is recommended that all faculty teaching online courses in this degree program successfully complete training offered by the Center for Innovative Design and Instruction. It is also recommended that each online course be reviewed annually by the faculty engaged with the program to improve the quality of instruction. Student evaluations should be considered in this peer review.

To address enrollment, a marketing plan to recruit students is critical to the growth of the program. Specific approaches will be discussed in the Outreach section.

X. Plan for measuring the achievement of degree and program objectives

The achievements of this program will be measured by the number of students that successfully complete the M.Ed. degree. The total number of graduates should increase over time. The milestone for recruiting is 40-50 new students each year in anticipation that the program would serve 80 students annually. Attrition is expected, however a successful program will graduate 25-30 students annually after 2016.

XI. Outreach Efforts

Currently a website is maintained and updated by the Chair of the degree program. During the first year of the program, an exhibit will be created along with a marketing brochure that can be used at national and regional CTE meetings and at specific CTE discipline (agriculture, business, family and consumer sciences, and engineering technology) professional meetings within Utah and around the intermountain west. Other avenues will be explored for marketing with Regional Campuses and Distance Education efforts. Finally, direct advertisements should be placed on websites (or other publications) that are frequented by CTE teachers who may be interested an online M.Ed.

XII. Interaction with other programs: within ASTE and externally

This degree was created by restructuring a Plan C Master of Science degree into a professional degree program to attract those who may be interested in completing a Master’s degree without a thesis in the area of Career and Technical Education. This action also builds upon the individual CTE teacher preparation programs housed in the School of Applied Sciences, Technology & Education. In addition, students have the option to select an emphasis in the areas of Educational Leadership, Non-formal and Adult Education, and Science Technology, Engineering and Mathematics (STEM). These emphasis areas expose students to a variety of coursework and engage them with faculty outside of ASTE.
Appendix 10A

Course Maps
# ASTE Course Map

## CTE Program Requirements

### CTE M.Ed. Learning Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td>1. Develop and deliver contemporary CTE curricula.</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>2. Modify instruction and model pedagogy to meet the needs of adult learners.</td>
<td>X X X</td>
</tr>
<tr>
<td>3. Use advanced teaching methods and instructional strategies to enhance student learning.</td>
<td>X X</td>
</tr>
<tr>
<td>4. Effectively assess and evaluate student learning.</td>
<td>X</td>
</tr>
<tr>
<td>5. Utilize effective management and student motivation techniques in classroom.</td>
<td>X X</td>
</tr>
<tr>
<td>6. Discuss current issues and trends in Career and Technical Education.</td>
<td>X X</td>
</tr>
<tr>
<td>7. Use basic research methods to improve teaching and learning.</td>
<td>X</td>
</tr>
<tr>
<td>8. Develop academic writing skills.</td>
<td>X X X X X X</td>
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## CTE Educational Leadership Emphasis

<table>
<thead>
<tr>
<th>CTE M.Ed. Learning Objectives</th>
<th>Required Classes</th>
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<tbody>
<tr>
<td>1. Develop and deliver contemporary CTE curricula.</td>
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</tr>
<tr>
<td>2. Modify instruction and model pedagogy to meet the needs of adult learners.</td>
<td></td>
</tr>
<tr>
<td>3. Use advanced teaching methods and instructional strategies to enhance student learning.</td>
<td>X</td>
</tr>
<tr>
<td>4. Effectively assess and evaluate student learning.</td>
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</tr>
<tr>
<td>5. Utilize effective management and student motivation techniques in classroom.</td>
<td>X</td>
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<tr>
<td>6. Discuss current issues and trends in Career and Technical Education.</td>
<td>X X X</td>
</tr>
<tr>
<td>7. Use basic research methods to improve teaching and learning.</td>
<td>X X</td>
</tr>
<tr>
<td>8. Develop academic writing skills.</td>
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<thead>
<tr>
<th>ASTE 6380</th>
<th>TEAL 6740</th>
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</table>
CTE Nonformal and Adult Education Emphasis

<table>
<thead>
<tr>
<th>CTE M. Ed. Learning Objectives</th>
<th>Required Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASTE 6200</td>
</tr>
<tr>
<td>1. Develop and deliver contemporary CTE curricula.</td>
<td>X</td>
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<tr>
<td>2. Modify instruction and model pedagogy to meet the needs of adult learners.</td>
<td>X</td>
</tr>
<tr>
<td>3. Use advanced teaching methods and instructional strategies to enhance student learning.</td>
<td>X</td>
</tr>
<tr>
<td>4. Effectively assess and evaluate student learning.</td>
<td>X</td>
</tr>
<tr>
<td>5. Utilize effective management and student motivation techniques in classroom.</td>
<td>X</td>
</tr>
<tr>
<td>6. Discuss current issues and trends in Career and Technical Education.</td>
<td>X</td>
</tr>
<tr>
<td>7. Use basic research methods to improve teaching and learning.</td>
<td>X</td>
</tr>
<tr>
<td>8. Develop academic writing skills.</td>
<td>X</td>
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</tbody>
</table>
## CTE Science, Technology, Engineering, and Mathematics (STEM) Emphasis

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<th>CTE M.Ed. Learning Objectives</th>
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<td>1. Develop and deliver contemporary CTE curricula.</td>
<td>ASTE 6460</td>
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<tr>
<td>2. Modify instruction and model pedagogy to meet the needs of adult learners.</td>
<td>X</td>
</tr>
<tr>
<td>3. Use advanced teaching methods and instructional strategies to enhance student learning.</td>
<td>X</td>
</tr>
<tr>
<td>4. Effectively assess and evaluate student learning.</td>
<td>X</td>
</tr>
<tr>
<td>5. Utilize effective management and student motivation techniques in classroom.</td>
<td>X</td>
</tr>
<tr>
<td>6. Discuss current issues and trends in Career and Technical Education.</td>
<td>X</td>
</tr>
<tr>
<td>7. Use basic research methods to improve teaching and learning.</td>
<td>X</td>
</tr>
<tr>
<td>8. Develop academic writing skills.</td>
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Appendix 10B

Course Descriptions
Core Required Courses

ASTE/TEE 6090 Program Design (Sp odd): Study of contemporary program design and development in technology and engineering education and career and technical education. Reviews complete curriculum developmental process.

ASTE 6140 Reading and Applying Research (Sp even): Investigation and analysis of relevant educational research that informs applications in career and technical education and extension education environments.

ASTE/TEE 6150 Evaluation and Assessment (F odd): This course will provide an overview of the various methods used to measure and evaluate student achievement, within the cognitive, affective, and psychomotor domains. The course will review the principles of teaching and learning.

ASTE 6160 Foundations of Adult Education and Program Evaluation (Su odd): Addresses the context and providers of adult education. In addition, adult learning theories and participation models are examined.

ASTE 6300 Advanced Teaching Strategies (Su even): Explores advanced application of teaching strategies and theory, as well as the creation of innovative classroom materials.

Elective Courses

ASTE 6220 Volunteer Programs and Partnerships (Su even): Explores the use and management of volunteers and partnerships in the development and implementation of extension, nonformal, and outreach education programs.

ASTE 6380 Mentoring and Supervision (F odd): Explores the role of supervision and mentoring in the success of teaching professionals. Reviews four components of professional practice. Examines techniques for observation and conferencing. Students reflect upon their own teaching/mentoring experiences and the impact upon professional practice.

ASTE 6320 Classroom Management (F even): Multiple-strategy approach for increasing teachers’ effectiveness and satisfaction in classroom management and discipline.

ASTE 6350 Safety and Risk Management (Su Odd): Major concepts associated with the development, enactment, and execution of policy of experiential learning programs. Focus will be on the examination and development of policy. This course provides students with an understanding of safety concepts, principles, and practices as they relate to risk management for extension.

ASTE 6460 Integrating CTE Curriculum with STEM Content (Sp odd): Challenges students to make connections between and apply content knowledge in Science, Technology, Engineering, and Mathematics (STEM) to competencies in Career and Technical Education (CTE) to positively impact the workforce.
ASTE 6900 Graduate Independent Study (F, Sp, Su): Independent study in an area of Career and Technical Education. For approval of project and allowable credits, students should check with committee.

ASTE/TEE 6910 Experimental Laboratory (F even): Introduction to elements of a research report through selection and development of experimental study utilizing tools, equipment, materials, and processes for improving programs and teaching techniques.

ASTE 7500 Diffusion of Innovations (Sp even): Explores processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. Course content is applicable to persons who work closely with people in formal and informal educational settings.

Emphasis Option – Educational Leadership

ASTE 6380 – Mentoring and Supervision (F odd): Explores the role of supervision and mentoring in the success of teaching professionals. Reviews four components of professional practice. Examines techniques for observation and conferencing. Students reflect upon their own teaching/mentoring experiences and the impact upon professional practice.

TEAL 6090 Theories of Organizational Leadership in Education (F, Sp): Introduces prospective school administrators to theories of organizational behavior and practices of managing and leading people within the context of the school organization. Differentiated syllabi provided between master’s and doctoral versions.

TEAL 6500 School Finance (F, Sp): Focuses on generating, allocating, and managing revenues and resources for public schools. Emphasizes law and policy regarding Utah school finance.

TEAL 6740 School Law (F, Sp): Acquaints students with legal issues relating to public education. Considers rights and responsibilities of students, teachers, and educational practitioners. Relates these rights to school programs and operations as determined by state and federal laws and court decisions.

Emphasis Option – Nonformal and Adult Education

ASTE 6200 Principles and Practices of Extension Education (Sp odd): History, philosophy, and organizational structure of U.S. and international extension organizations, including programming models, teaching strategies, and accountability.

ASTE 6220 Volunteer Programs and Partnerships (Su even): Explores the use and management of volunteers and partnerships in the development and implementation of extension, nonformal, and outreach education programs.

ASTE 6350 Safety and Risk Management (Su odd): Major concepts associated with the development, enactment, and execution of policy of experiential learning programs. Focus will
be on the examination and development of policy. This course provides students with an understanding of safety concepts, principles, and practices as they relate to risk management for extension.

**ASTE 7500 Diffusion of Innovations** (Sp even): Explores processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. Course content is applicable to persons who work closely with people in formal and informal educational settings.

**EDUC 6010 Introduction to Program Evaluation** (broadcast – F): Alternative approaches and practical guidelines for conducting evaluation studies. Through case studies and simulations, addresses impact of social, political, and ethical issues on evaluation.

**Emphasis Option – Science, Technology, Engineering, and Mathematics (STEM)**

**ASTE 6460 Integrating CTE Curriculum with STEM Content** (Sp odd): Challenges students to make connections between and apply content knowledge in Science, Technology, Engineering, and Mathematics (STEM) to competencies in Career and Technical Education (CTE) to positively impact the workforce.

**ASTE/TEE 6910 Experimental Laboratory** (F even): Introduction to elements of a research report through selection and development of experimental study utilizing tools, equipment, materials, and processes for improving programs and teaching techniques.

**ITLS 6205 Computer Application Instruction and Training** (F, Sp, Su): Introduction to use of computer applications, with special emphasis on software used in instruction and training. To receive graduate-level credit, students must fulfill additional requirements.

**ITLS 6245 Interactive Multimedia Production** (Sp, Su): Covers fundamental programming concepts, in addition to fundamentals of the interactive multi-media environment. Students finishing this course will have at least one completed fully-functional project for their portfolios. To receive graduate-level credit, students must fulfill additional requirements.

**ITLS 6265 Internet Development** (F, Sp, Su): Teaches web publishing primarily using HTML (Hyper-Text Markup Language). Explores current web technologies and includes design, development, and evaluation. To receive graduate-level credit, students must fulfill additional requirements.

**ITLS 6540 Instructional Technology and Learning Science Foundations**: Detailed study of communication and learning theories as applied to the instructional design process. Examines principles and research upon which instructional design and instructional technology are based.
College of Agriculture and Applied Sciences

School of Applied Sciences, Technology and Education (ASTE)

Utah State University

Assessment Plan

For the Graduate Program in
Technology and Engineering Education (TEE)

Fall 2013
I. Program Description

The Technology and Engineering Education (TEE) graduate program is administratively housed in the School of Applied Sciences and Technology Education (ASTE) in the College of Agriculture and Applied Sciences.

The program area offers both the doctoral degree and master’s degree to students who want to advance their careers and expand their knowledge in the field of technology and engineering education, research, and current practices in pedagogy. The doctoral degree is a research degree and is primarily chosen by people who are seeking teaching/research positions in colleges and universities. The master’s degree program is primarily designed for professionals in the areas of Technology and Engineering Education, Career and Technical Education (CTE), and Science, Technology, Engineering, and Mathematics (STEM) fields who want to improve their knowledge and skills in such areas as curriculum development, research methods, current educational theory, and evaluation and assessment.

II. Degrees and Emphasis Options Offered

Doctor of Philosophy (Ph.D) Degree

A doctoral degree in Education with a specialization in Curriculum and Instruction (C&I), with an area of emphasis in technology and engineering education is offered through the School of Teacher Education and Leadership (TEAL- [http://www.teal.usu.edu](http://www.teal.usu.edu)) in the College of Education and Human Services. Shown in Appendix 11A in the Emphasis Area Program Requirements. This is a research degree and is primarily chosen by people who are seeking teaching/research positions in colleges and universities.

Master of Science (M.S.) Degree:

The Master of Science (M.S.) degree program is primarily designed for professionals in the areas of Technology and Engineering Education, Career and Technical Education (CTE), and Science, Technology, Engineering, and Mathematics (STEM) fields who want to improve their knowledge and skills in such areas as curriculum development, research methods, current educational theory, and evaluation and assessment.

In this program, students are required to complete a “professional core” of courses (15 credits) that are used to enhance their knowledge of current theory and practice in TEE, CTE, and STEM, and complete the specific requirements of either the Plan A or Plan B option (see below). In consultation with their advisor and/or graduate committee, students will select electives that help them achieve their educational objectives and fulfill the requirements of the graduate program. Shown in Appendix 11B is the MS Check Sheet for Plans A&B.

Current USU undergraduates may take Master Degree courses provided they meet USU requirements and they must complete a USU Split Form prior to enrolling in classes ([see: http://research.usu.edu/graduateschool/files/uploads/SplitForm.pdf](http://research.usu.edu/graduateschool/files/uploads/SplitForm.pdf)). The Split Form gives permission for students to register for graduate courses. To use the Split Form, students must be
within 30 semester credits of completing bachelor's requirements, have filed an Application for Graduation in the Graduation Office, have a 3.0 or higher GPA, and have applied for admission to the School of Graduate Studies.

Options

Plan A (30 credits): The Plan A “thesis” option requires students to complete a master thesis. This plan is especially beneficial to students preparing for advanced study (e.g., a doctoral degree). In this option, students are required to complete a statistics course and a minimum of three credits of Thesis Research (TEE 6970).

Plan B (33 Credits): The Plan B “project” option requires students to complete an in-depth “scholarly project” (e.g., a major program or curriculum revision or pilot-testing a new instructional strategy or teaching method.) In this option, students are required to complete the experimental lab course (TEE 6910) and the Master’s Project Course (TEE 6960).

III. Program Mission

The mission of the M.S. and Ph.D graduate programs in Technology and Engineering Education at Utah State University (USU) are to enhance the pedagogical and research skills of qualified individuals who are interested in furthering their education careers.

IV. Alignment of Program Mission with Departmental Mission

The mission of the School of Applied Sciences, Technology and Education (ASTE) is to apply the Land Grant University philosophy to teaching & learning, discovery, research, and outreach. The School uses proven educational processes which include formal and informal instruction, experiential learning, leadership, and personal development at an undergraduate, graduate, and community based level.

The Technology and Engineering Education program is housed in the School of Applied Sciences, Technology and Education (ASTE) and aligns very well with this School and its other programs, especially those involved in training teachers in agriculture, and in family and consumer science.

In addition, the TEE graduate program works closely with the School of Teacher Education and Leadership (TEAL) in the Emma Eccles Jones College of Education & Human Services who administer the doctoral program in Doctoral Program in Education with Specialization in Curriculum and Instruction. Our mission also aligns closely with the mission of the School of Teacher Education and Leadership and we support their program learning goals and objectives. The mission of TEAL at USU is to “research, teach, lead, and serve in partnership with other stakeholders in the educational process and continually evaluate our research, teaching, leadership, and service to ensure their relevance and effectiveness.”
V. Program Goals

The program goals of the Technology and Engineering graduate program align with the primary goals of USU’s School of Graduate Studies (see: http://rgs.usu.edu/graduateschool/htm/about/mission-and-goals). The specific goals of the TEE graduate program are as follows:

1. Graduate students will obtain focused and comprehensive knowledge in Technology and Engineering Education through classroom instruction, research, and other innovative educational experiences and venues.

2. Graduate students will be prepared to use original ideas and scholarly skills to contribute to the advancement of the field of Technology and Engineering Education.

3. Graduate students will have excellent opportunities to develop and practice professional skills so they can integrate and communicate effectively with the scholarly community in the field of Technology and Engineering Education.

4. Graduate students will be prepared to assume future leadership roles in disseminating and applying knowledge to address local and global educational societal needs.

VI. Program Learning Objectives

After completing the master’s and/or doctoral degree graduate program in Technology and Engineering Education at Utah State University, students will able to:

1. Develop and implement contemporary technology and engineering curricula used in Technology and Engineering Education and Career and Technical Education.

2. Be able to discuss and debate contemporary issues and trends occurring in the field of Technology and Engineering Education.

3. Be able to effectively develop and use evaluation and assessment instruments to measure student learning and program effectiveness.

4. Describe common administrative and organizational structures used in the managing of secondary education Technology and Engineering classroom and laboratories.

5. Describe basic techniques and methods used in conducting qualitative and quantitative research studies.

6. Describe a variety of inquiry-based learning strategies, including engineering design and the scientific method.

7. Demonstrate the ability to function effectively on teams.
8. Effectively communicate ideas, data through written and electronic means.

9. Recognize the need for, and an ability to engage in life-long learning.

10. Describe the foundational aspects of Technology and Engineering Education.

11. Develop grant proposals and manage grants.

12. Describe the various aspects of student learning in Technology and Engineering Education.

13. Conduct Research.

VII. Course Map (See Appendix 11C)

VIII. Course List (See Appendices 11A & 11B)

IX. Strengths, Weaknesses and Recommendations

A graduate degree in Technology and Engineering Education (TEE) at Utah State University (USU) prepares students to become better teachers and leaders in the field and has been designed for those who want to advance their careers and expand their knowledge in technology and engineering education and current practices in pedagogy. The doctoral degree is a research degree and is primarily chosen by people who are seeking teaching/research positions in colleges and universities. The master’s degree program is primarily designed for professionals in the areas of Technology and Engineering Education, Career and Technical Education (CTE), and Science, Technology, Engineering, and Mathematics (STEM) fields who want to improve their knowledge and skills in such areas as curriculum development, research methods, current educational theory, and evaluation and assessment.

The field of Technology and Engineering Education is a high demand field and the undergraduate program consistently has a 100% placement rate for those who choose teaching as a career. In the graduate program, we experience the same success, especially for those who complete the PhD.

Strengths

- Highly qualified faculty (i.e., Gary Stewardson and Edward Reeve) with diverse philosophical backgrounds. Notable characteristics of these faculty members include:
  - K-12 teaching experience in Technology and Engineering Education.
  - More than 25 years of research and teaching experience in technology and engineering education at the university level.
  - Real-world industry experience.
International Consultants in the areas of training and development, developing educational materials, and working with Government and Non-Government Agencies.

Long-standing involvement in the Profession of Technology and Engineering Education. For example, Edward Reeve is currently on the International Technology and Engineering Educators (ITEEA) Board of Directors and he recently completed his three-year term as President of the Council on Technology and Engineering Teacher Education (CTETE). Gary Stewardson is currently chairing ITEEA’s program review committee for its national conference.

- Up-to-date laboratories that promote technological literacy in the designed world. For example, notable new equipment in these labs include CNC machines, a 3D-printer, and a laser-engraver.
- Small size classes that promote one-one interactions with the instructor.
- Approachable Faculty members who “care” about their students succeeding.
- Commitment to the community through outreach activities. For example, currently the program supports an after school “high school design academy” that supports students learning how to build and compete in the area of VEX robotics.

- Face-to-Face Master’s Degree program that is offered in a unique one-month summer program of classes that allows students to complete the degree in three summers. This program brings teachers from around the region to the USU campus in the summer. Approximately 20 students enrolled in the Master’s degree program.
- A doctoral degree (PhD) in Education with a specialization in Curriculum and Instruction (C&I) is offered through the School of Teacher Education and Leadership (TEAL) in the College of Education and Human Services. This arrangement helps strengthen our degree and utilizes the expertise of the world-class faculty from TEAL. Students who complete the C&I doctoral program receive a degree with an area of emphasis in technology and engineering education. This emphasis area helps them to obtain research and teaching positions in respected universities around the country.
- Excellent working relationships with all colleges (e.g., engineering) and departments (e.g., engineering education) on campus. This relationship helps in collaborative program efforts, including serving on their graduate student committees.
- Nationally Recognized Program by our peers
- Recently updated TEE curriculum that reflects the current needs of the profession.
- Program area website.
- Full-time graduate students who help the program through teaching, research, and service activities. Currently 4 full-time Doctoral Degree students and 1 Master’s Degree student.

Weaknesses

- Low undergraduate student numbers. Better undergraduate student enrollments could improve the pipeline into our graduate programs.
- Low number of full-time Master’s degree students. At times, the two faculty member’s time can be spread quite thin because of other professional and university commitments (e.g., serving on graduate committees, university committees, etc.)
• Relationships with the State Technology and Engineering Education Specialist and the other school in the state (i.e., BYU) that offers the same degree could be strengthened.
• Faculty involvement in the state technology and engineering education association could be better strengthened.
• Better tracking data of graduates of the program is needed. Re-establish exit interview practice of graduates.
• No-online TEE courses or off-campus TEE courses offered.
• An in-depth review is needed of the goals and objectives of each of the TEE courses offered in the program.

Recommendations

• Develop an active recruitment plan to get new graduate students into the program.
• For low enrollment classes, team up with similar classes being taught in agriculture and/or family and consumer science.
• Hire another ½ of full-time faculty member in the program.
• Build relationships with state organizations and BYU.
• Build a system to track program graduates.
• Conduct an in-depth program review.

X. Plan for Measuring the Achievement of Degree and Program Objectives

The first measurement students entering the TEE graduate programs must meet are the requirements of the USU School of Graduate Studies. Admission to the TEE program follows the general USU requirements. In order to be admitted to a graduate degree program at Utah State University, students must meet these minimum requirements:

• Have the requisite degree for your intended program by the time you are matriculated
• 3.0 or higher GPA on your last 60 semester or 90 quarter credits
• Score at or above the 40th percentile on appropriate admissions test.

NOTE: The GRE is required for admittance into the doctoral degree program. For admittance into the master degree program, either the GRE or MAT can be used for admittance.
• Three satisfactory letters of recommendation

In addition, graduate students in the program must follow and meet USU and program area guidelines. Important guideline include the following:

• A 3.0 GPA is required for all graduate degrees.
• Students have up to 6 years to complete a master's degree and up to 8 years to complete a doctorate.
• For a master's degree, the minimum number of credits required ranges from 30-36; 24 of those credits must be from USU.
• For a PhD, 60 semester credits is the minimum with a master's degree in a related field; 90 credits are required without a Master’s Degree.
• Doctoral students must meet an academic residency requirement.
• Up to 12 semester graduate-level credits may be transferred to a USU graduate degree from an accredited university if approved by the student's supervisory committee and the graduate school. These transfer credits should have grades of “B” or higher, should not exceed the 8 year limit from degree completion, and should not have been used for another degree.
• A maximum of 12 semester graduate credit hours may be earned before matriculation. Matriculation occurs when you have completed all the admission requirements and have been officially accepted into USU’s graduate school and the TEE program. Credits taken beyond 12 semester credits cannot be used to fulfill degree requirements.

Almost all student who complete the master’s degree are practicing teachers, At the end of their program, typically during their final defense, they are asked to state how the degree has benefited in their career and they are asked if there are any suggestions to improve the program. Doctoral degree students are full-time students and the faculty works continually with them to make program improvements as needed.

XI. Outreach Efforts

• Gary Stewardson:
  - Design Academy – After school group that supports students (grades 6-12) learning how to build and compete in the area of VEX robotics.
  - Provides in-service workshops for teachers and students to learn how to build competitive robots.
  - Provides presentations at the Technology Student Association’s (TSA) annual leadership workshop in the area VEX robotics and runs the TSA/VEX competitions
  - Work with local manufacturing companies.

• Edward Reeve:
  - Conduct education training (e.g., teacher in-service, skill update workshops, etc.) for local and international organizations.
  - Involved in the teaching of on-line courses for the new CTE on-line Master’s Degree Program.
  - Work with international universities and government organizations in the development of STEM Education materials.
  - Visiting Professor, Thailand in the area of Educational Administration

XII. Interaction with Other Programs (within ASTE and externally)

School of Teacher Education and Leadership (TEAL)

The TEE doctoral program in Curriculum and Instruction is housed in the School of Teacher Education and Leadership (TEAL) in the Emma Eccles Jones College of Education & Human
Services and we work closely with them in managing the technology and engineering education emphasis area within the program, In addition, we adhere to their program goals, learning objectives and standards.

_School of Applied Sciences, Technology and Education (ASTE)_

USU’s TEE program is now housed in the School of Applied Sciences, Technology and Education (ASTE) where similar type programs (i.e., agricultural education and family and consumer sciences education) are located. The TEE graduate program is exploring how to merge similar type program classes together, including those with the new CTE Master’s Degree Program.
Appendix 11A

TEE PhD Program Requirements
Area of Emphasis (18 credits)

**Required Core**

TEE 7230    Foundation of Technology & Engineering Education 3  
EED 7460    Finance & Grant Writing 3  
EED 7010    The Role of Cognition in Engineering and Technology Ed. 3  
TEE 7400    Occupational Analysis and Curriculum Development 3

**Recommended Courses**

TEE 6090    Program Design 3  
TEE 6100    Contemporary Issues 3  
TEE 6150    Evaluation and Assessment 3  
TEE 6450    Administration and Organization 3  
TEE 6750    Research Methods and Design 3  
TEE 6440    Technology and Society  
TEE 6520    Explorations of Industry 3  
TEE 7040    Dynamics and Network Engineering for Technology and Ed. 3  
TEE 7400    Occupational Analysis and Curriculum Development 3  
EDD 7500    Internationalizing Institutions of Higher Education 3  
TEE 7600    Academic Issues and Politics in Higher Education 3  
TEE 7810    Research Seminar 1-3

**Focus Courses**

Students should identify an area of focus and select several courses based on this area. Recommended areas would be Engineering, Curriculum Content, Grant Writing, Instructional Technology, Business, or Agriculture
Appendix 11B
Program Check Sheet
# MS Program Check Sheet

## Master’s Degree Program Checklist

**NAME:** _____________________________   **A#:** _____________________________

**Plan A ____ (30 Credits Minimum)  Plan B ____ (33 Credits Minimum)**

### 1. Required Professional Courses (Required in Plans A & B)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Title</th>
<th>Credits</th>
<th>Grade</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEE 6090</td>
<td>Program Design</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEE 6100</td>
<td>Contemporary Issues</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEE 6150</td>
<td>Evaluation and Assessment</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>TEE 6450</td>
<td>Administration and Organization</td>
<td>3</td>
<td></td>
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</tr>
<tr>
<td>TEE 6750</td>
<td>Research Methods and Design</td>
<td>3</td>
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</tbody>
</table>

**Plan A**

- TEE 6970  Thesis Research  1-9
- STAT 5200 Experimental Design (Prerequisite: STAT 2000 or STAT 3000) 3

**Plan B**

- TEE 6910  Experimental Laboratory  3
- TEE 6969  Master’s Project  3-6

### Electives

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**Total Credits __________**
Appendix 11C

Course Maps
# ASTE Course Map
## Technology & Engineering Education

### TEE Program Learning Objectives

<table>
<thead>
<tr>
<th>TEE Program Learning Objectives</th>
<th>MS &amp; PhD Required Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TEE 6090</td>
</tr>
<tr>
<td>1. Develop and implement contemporary technology and engineering curricula used in Technology and Engineering Education and Career and Technical Education.</td>
<td>X</td>
</tr>
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<td>2. Be able to discuss and debate contemporary issues and trends occurring in the field of Technology and Engineering Education.</td>
<td>X</td>
</tr>
<tr>
<td>3. Be able to effectively develop and use evaluation and assessment instruments to measure student learning and program effectiveness.</td>
<td>X</td>
</tr>
<tr>
<td>4. Describe common administrative and organizational structures used in the managing of secondary education Technology and Engineering classroom and laboratories.</td>
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<tr>
<td>5. Describe basic techniques and methods used in conducting qualitative and quantitative research studies.</td>
<td>X</td>
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<tr>
<td>6. Describe a variety of inquiry-based learning strategies, including engineering design and the scientific method.</td>
<td>X</td>
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<tr>
<td>7. Demonstrate the ability to function effectively on teams.</td>
<td>X</td>
</tr>
<tr>
<td>8. Effectively communicate ideas, data through written and electronic means.</td>
<td>X</td>
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<tr>
<td>9. Recognize the need for, and an ability to engage in lifelong learning.</td>
<td>X</td>
</tr>
<tr>
<td>10. Describe the foundational aspects of Technology and Engineering Education.</td>
<td>X</td>
</tr>
<tr>
<td>11. Develop grant proposals and manage grants.</td>
<td>X</td>
</tr>
<tr>
<td>12. Describe the various aspects of student learning in Technology and Engineering Education.</td>
<td>X</td>
</tr>
<tr>
<td>13. Conduct Research.</td>
<td></td>
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</tbody>
</table>