Designing and implementing a Big Sky Pathway requires collaboration at every level of the process. Based on your local community and the specific Career Pathway for which you wish to implement a Program of Study, you should assemble a team that includes academic and CTE Teachers, District or School CTE Advisors, Business and Industry Representatives, Postsecondary Partners and Faculty, Education Administrators, and even relevant local community leaders or recent program of study graduates.

### Career Cluster:
AFNR

### Career Pathway/POS:
Agriculture Technology, A.A.S.

| College: | MSU-Northern |
| High School: | Chinook HS |
| Phone: | 406.357.2236 |
| Date: | May 23, 2016 |

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Name/Affiliation</th>
<th>Role/Responsibility</th>
<th>Signature/Email Address</th>
</tr>
</thead>
</table>
| CTE Teacher | Robin Allen | Ensure that the Ag. Tech. curriculum is accurately listed in the POS, ensure that the Ag. Tech. curriculum aligns with the high school graduation requirements and AFNR standards. | Signature: Robin L. Allen (May 25, 2016)  
Email: allenr@chinookschools.org |
| Secondary Counselor | Fay Friede | Ensure that the POS curriculum assures that students meet requirements for a diploma from high school, ensure that the high school curriculum is accurately listed in this POS. | Signature: Fay Friede (May 25, 2016)  
Email: friedef@chinookschools.org |
| Secondary Principal or Superintendent | Matt Molyneaux | Provide leadership and supervision with high school personnel in the POS process, ensure the POS meets high school graduation and diploma requirements and aligns with postsecondary. | Signature: Matt Molyneaux (May 25, 2016)  
Email: molyneauxm@chinookschools.org |
| Postsecondary Academic Advisor | Bill Danley | Provide leadership and supervision with high school Ag. instructors in this POS process, ensure the POS aligns with high school curriculum and meets MSUN's requirements for the Agriculture Technology A.A.S. degree program. | Signature: William H. Danley (Jun 13, 2016)  
Email: danley@msun.edu |
| Postsecondary Dean or Chair | Larry Strizich | Provide Career and Technical Education leadership to ensure the POS (Program of Study) meets guidelines according to Montana OPI and MUS (Montana University System) Big Sky Pathway guidelines. | Signature: Lawrence J. Strizich (Sep 12, 2016)  
Email: strizich@msun.edu |
<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Details</th>
<th>Signature</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSP Coordinator</td>
<td>Holly Haas</td>
<td>Plan and coordinate with secondary and postsecondary personnel in designing an academic Pathway including courses and experiences between the high school and MSUN’s Agriculture Technology, A.A.S. degree program.</td>
<td></td>
<td><a href="mailto:holly.haas@msun.edu">holly.haas@msun.edu</a></td>
</tr>
<tr>
<td>OPI Specialist</td>
<td>Renee Harris</td>
<td>Assure that this POS meets state Big Sky Pathway guidelines, ensures that POS is aligned with the AFNR standards, and provide POS leadership.</td>
<td>Renee Harris (Sep 28, 2016)</td>
<td><a href="mailto:rharris3@mt.gov">rharris3@mt.gov</a></td>
</tr>
<tr>
<td>OCHE</td>
<td>Amy Williams</td>
<td>Upload documents to BSP web site at: <a href="http://mus.edu/BigSkyPathways/clusters.asp">http://mus.edu/BigSkyPathways/clusters.asp</a></td>
<td>Amy Williams (Sep 28, 2016)</td>
<td><a href="mailto:amylwilliams12@montana.edu">amylwilliams12@montana.edu</a></td>
</tr>
</tbody>
</table>

### Pathway Checklist

<table>
<thead>
<tr>
<th>Element</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pathway includes all state and local graduation requirements preparing students for entry into a postsecondary program</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2. Pathway identifies the appropriate secondary CTE, academic, and recommended elective courses offered by the high school which will prepare the student for college-level courses without remediation</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3. Pathway outlines a non-duplicative sequence of courses from grades 9-12 and from secondary to postsecondary education</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4. Pathway leads to an industry-recognized postsecondary credential, degree or employment</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5. Curriculum between secondary and postsecondary institutions has aligned curriculum, using industry recognized standards or with input of local/regional business and industry (May use Gap Analysis). List National Standards or Local/Regional Business Here: AFNR</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6. Pathway includes dual enrollment, high school for college credit, and opportunities for industry-recognized credentials and work-based learning experiences when applicable</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7. The pathway utilizes the guidance of a web-based career counseling system, or information regarding the pathway is available on the institution’s website.</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
### Cluster Overview:
Careers in the Agriculture, Food and Natural Resources cluster involve the planning, implementation, production, management, processing, and/or marketing of agricultural commodities and services.

### Pathway Options:
- Food Products and Processing Systems
- Plant Systems
- Animal Systems
- Power, Structural & Technical Systems
- Natural Resources Systems
- Environmental Service Systems
- Agribusiness Systems

### Occupation Examples:
Agricultural Chemical Dealer, Aquaculturalist, Environmental Compliance-Assurance Manager, Farm Manager, Health and Safety Sanitarian, Meat Cutter-Meat Grader, Park Manager, Produce Buyer, Recycling Technician, Wildlife Manager, Botanist, Agricultural Educator, Ecologist, Environmental Engineer, Fish and Game Officer, Bank Loan Officer, Plant Pathologist, Veterinarian

For a complete listing, go to: [http://online.onetcenter.org/find/career?c=1&g=Go](http://online.onetcenter.org/find/career?c=1&g=Go)

### SUGGESTED HIGH SCHOOL COURSES

<table>
<thead>
<tr>
<th>Grade</th>
<th>Graduation Requirements</th>
<th>9th English 9, Math, Physical Science, PE 9, Career Class, Keyboarding I, II or Computer Applications</th>
<th>Recommended CTE Cluster Foundation Course(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th</td>
<td>Workforce/2-Year College Prep</td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
<td>Animal Science Plant/Range Science</td>
</tr>
<tr>
<td></td>
<td>Workforce/2-Year College Prep</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pathways Course: Metal Fabrication &amp; Ag Mechanics (Engines)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CTE and/or Electives</td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>Workforce/2-Year College Prep</td>
<td>English 10, Math, Biology, PE 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workforce/2-Year College Prep</td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pathways Course: Metal Fabrication &amp; Ag Mechanics (Engines)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CTE and/or Electives</td>
<td></td>
</tr>
<tr>
<td>11th</td>
<td>Workforce/2-Year College Prep</td>
<td>English 11, Advanced Algebra &amp; Statistics, American History</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workforce/2-Year College Prep</td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pathways Course: Plant/Range Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CTE and/or Electives</td>
<td></td>
</tr>
<tr>
<td>12th</td>
<td>Workforce/2-Year College Prep</td>
<td>English, Government</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workforce/2-Year College Prep</td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pathways Course: Ag Business</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CTE and/or Electives</td>
<td></td>
</tr>
</tbody>
</table>

### ADVANCED LEARNING OPPORTUNITIES
High School to College/Career Linkages

- **CTE START courses:**
- **Advanced Placement or IB courses:**
- **Dual Enrollment courses:**
- **Online courses:**

**Other:** Supervised Agricultural Experience (SAE) and participation in appropriate FFA activities support and reinforce classroom and laboratory learning and should be a requirement for all students.

### POSTSECONDARY PROGRAM OF STUDY

<table>
<thead>
<tr>
<th>Math</th>
<th>English</th>
<th>Major</th>
<th>Other</th>
</tr>
</thead>
</table>

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Agriculture, Food & Natural Resources, page 1 of 3  
September 2011
### MONTANA POSTSECONDARY OPPORTUNITIES

**Montana University System Degree and Program Inventory:** [http://www.homepage.montana.edu/~mus/drginv/](http://www.homepage.montana.edu/~mus/drginv/)

**Your Guide to Montana's Certificate and Associate Degree Programs:** [http://mus.edu/twoyear/YourGuide.html](http://mus.edu/twoyear/YourGuide.html)

#### Colleges of Technology:
- BLCOT—Billings
- GFCOT—Great Falls
- HCOT—Helena
- TECHCOT—Butte
- UMCOT—Missoula
- GCP—Bozeman

#### Community Colleges:
- DCC—Glendive
- FVCC—Kalispell
- MCC—Miles City

#### Tribal Colleges:
- BFCC—Browning
- CDKC—Lame Deer
- FBCC—Harlem
- FPCC—Poplar
- LBHC—Crow Agency
- SCC—Box Elder
- SKC—Pablo

#### Four Year Colleges/Universities:
- MSU—Bozeman
- MSUB—Billings
- MSUN—Havre
- TECH—Butte
- UM—Missoula
- UMW—Dillon

### MILITARY
- Requires diploma or GED
- 17 with parental consent; 18 without
- Air Force, Air Guard, Army, Coast Guard, Marines, and Navy
- For more information: [http://todaysmilitary.com](http://todaysmilitary.com)

### PROFESSIONAL CERTIFICATE
- Requires diploma or GED
- Less than 30 credits; little/no general ed credits
- Complete in one year or less
- Agri-Mechanics Machinery/Technology — MSUN

### APPRENTICESHIP
- Requires diploma or GED
- Must be at least 18
- Minimum 2,000 hours of supervised experience
- Farm Equipment Mechanics
- See the MT Dept of Labor website for more information: [http://wsd.dli.mt.gov/apprenticeship/default.asp](http://wsd.dli.mt.gov/apprenticeship/default.asp)

### CERTIFICATE OF APPLIED SCIENCE
- Requires diploma or GED
- 30-45 credits; limited general education credits
- Complete in one year or less
- Agri-Business Technology — MCC
- Agri-Mechanics Machinery/Technology — DCC
- Livestock Technology — DCC
- Natural Resource Management — FVCC

### ASSOCIATE’S OF APPLIED SCIENCE DEGREE
- Requires diploma or GED
- 60-72 credits; includes 15-25 general ed credits
- Complete in two years *(if prepared academically in math and English)*
- Agri-Business Technology — DCC
- Agri-Business Technology—Equitation — DCC
- Agricultural Science/Technology — MSUN
- Agri-Mechanics Machinery/Technology — MSUN, DCC
- Equine Studies — UMW, MCC
- Natural Horsemanship — UMW
- Natural Resource Management — FVCC, BFCC

### BACCALAUREATE DEGREE
- Requires 4-year college prep for admission
- 128 credits (approximately)
- Complete in four years
- Agriculture Business — MSU
- Agriculture Education — MSU
- Animal Science — MSU
- Biotechnology — MSU
- Environmental Horticulture — MSU
- Environmental Sciences — MSU
- Land Rehabilitation — MSU
- Land Resource Sciences — MSU
- Natural Resources & Rangeland Technology — MSU
- Plant Science — MSU
- Sustainable Food & Bio-energy Systems — MSU
- Earth Sciences — MSU
- Biological Sciences — MSU
- Biology — UM
- Environmental Studies — UM

---

<table>
<thead>
<tr>
<th>— Semester 1</th>
<th>— Semester 2</th>
<th>— Semester 1</th>
<th>— Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 150 Intro to Ag Computing</td>
<td>WRIT 101 College Writing 1</td>
<td>AGBE 125 Intro to Farm Management</td>
<td>Advisor Approved Electives (6 credits)</td>
</tr>
<tr>
<td>AGBE 105 Ag. Marketing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGSC 102 Agricultural Plant Science</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANSC 100 Intro to Animal Science</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT 100 Intro to Technology</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Courses:**
- Semester 1: AG 150, WRIT 101, AGBE 125
- Semester 2: M 111, WRIT 101, AGBE 125

---

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGSC 218 Crop Production</td>
<td></td>
</tr>
<tr>
<td>AGSC 230 Agricultural Pest Management</td>
<td></td>
</tr>
<tr>
<td>NRSM 260 Rangeland Management</td>
<td></td>
</tr>
</tbody>
</table>

**Tribal Colleges:**
- BFCC—Browning
- CDKC—Lame Deer
- FBCC—Harlem
- FPCC—Poplar
- LBHC—Crow Agency
- SCC—Box Elder
- SKC—Pablo

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC 202 Livestock Feeding &amp; Nutrition</td>
<td></td>
</tr>
<tr>
<td>ANSC 203 Livestock Feeding &amp; Nutrition Lab</td>
<td></td>
</tr>
<tr>
<td>ENSC 245 Soils</td>
<td></td>
</tr>
</tbody>
</table>

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**College of Agriculture, Food, & Natural Resources:**

- Montana University System
- Degree and Program Inventory
- Your Guide to Montana’s Certificate and Associate Degree Programs

---

**September 2011**
<table>
<thead>
<tr>
<th>Degree and Program Inventory above may not be all inclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry — UM</td>
</tr>
<tr>
<td>Resource Conservation — UM</td>
</tr>
<tr>
<td>Wildland Restoration — UM</td>
</tr>
<tr>
<td>Wildlife Biology — UM</td>
</tr>
<tr>
<td>Environmental Engineering — TECH</td>
</tr>
<tr>
<td>Mining Engineering — TECH</td>
</tr>
<tr>
<td>Geological Engineering — TECH</td>
</tr>
<tr>
<td>Environmental Science — UMW, SKC</td>
</tr>
<tr>
<td>Earth Science — UMW</td>
</tr>
<tr>
<td>Environmental Science &amp; Forestry — SKC</td>
</tr>
</tbody>
</table>
### C. CLUSTER (FOUNDATION) KNOWLEDGE AND SKILLS

The following Cluster (Foundation) Knowledge and Skill statements apply to all careers in the Agriculture, Food and Natural Resources Cluster. Persons preparing for careers in the Agriculture, Food and Natural Resources Cluster should be able to demonstrate these skills in addition to those found on the Essential Knowledge and Skills Chart.

#### Cluster Topic

<table>
<thead>
<tr>
<th>AGC01</th>
<th>ACADEMIC FOUNDATIONS: Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.</th>
<th>All Classes</th>
<th>ANSC100, 202, 262 AGSC102, 218 NRSM260</th>
</tr>
</thead>
</table>

No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

#### Cluster Topic

<table>
<thead>
<tr>
<th>AGC02</th>
<th>COMMUNICATIONS: Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.</th>
<th>All Classes</th>
<th>ANSC100, 262 AGSC102, 218 NRSM 260, SPCH 142, WRIT 108</th>
</tr>
</thead>
</table>

**AGC02.01** Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology to communicate technical information within AFNR.

**AGC02.01.01** Write clearly to communicate written ideas, results and questions to all types of people.

Sample Indicators
- Write with effective language to produce written communications for journals, newsletters, or other informative articles.

**AGC02.01.02** Model the use of strategies and techniques for enhancing the clarity and effectiveness of oral communication in order to engage in dialogue with members of an example career field.

Sample Indicators
- Monitor different kinds of behavior in order to improve communication.
- Prepare presentations to explain to both large groups and individuals issues of concern to the industry.
- Discuss aspects of the industry competently to an audience of both professionals and people not involved in the industry.

**AGC02.02** Employ the use of technical information effectively to maintain and communicate records and reporting procedures commonly used in the AFNR cluster.

**AGC02.02.01** Document work and processes using technical communication methods and protocols.

Sample Indicators
- Record technical information.
- Compose technical reports.
- Communicate documentation to others.

**AGC02.02.02**

#### Cluster Topic

<table>
<thead>
<tr>
<th>AGC03</th>
<th>PROBLEM-SOLVING AND CRITICAL THINKING: Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.</th>
<th>All Classes</th>
<th>AG150, AGBE105, 125, AGSC102, 218, 230, NRSM 260, ENSC 245</th>
</tr>
</thead>
</table>

**AGC03.01** Access and utilize suitable resources to identify and study public policies, issues and regulations impacting AFNR management.
### AGC03.01.01
**Review regulations and major laws to evaluate their impact on AFNR management.**

**Sample Indicators**
- Describe the major impacts of AFNR legislation.
- Describe the major regulations impacting the management of an individual resource.
- Identify situations that violate regulations.

**Course Notes**
- AG150, AGBE105, 125, AGSC102, 218, 230, NRSM 260, ENSC 245

### AGC03.01.02
**Read appropriate written material to stay abreast of current issues impacting AFNR management.**

**Sample Indicators**
- Identity significant issues that impact work assignment.

**Course Notes**
- AG150, AGBE105, 125, AGSC102, 218, 230, NRSM 260, ENSC 245

### AGC03.01.03
**Gather public input for AFNR management decision-making.**

**Sample Indicators**
- Conduct a local survey of public perceptions and desires concerning AFNR issues.

**Course Notes**
- AG150, AGBE105, 125, AGSC102, 218, 230, NRSM 260, ENSC 245

### AGC03.01.04
**Use critical thinking skills to identify, organize alternatives, and evaluate public policy issues related to AFNR.**

**Sample Indicators**
- Identify alternatives to an issue's potential solution.
- Evaluate alternatives for strengths and weaknesses.
- Recommend a solution based on research and analysis.

**Course Notes**
- AG150, AGBE105, 125, AGSC102, 218, 230, NRSM 260, ENSC 245

### Cluster Topic AGC04
**INFORMATION TECHNOLOGY APPLICATIONS:** Use information technology tools specific to the career cluster to access, manage, integrate, and create information.

### AGC04.01
**Access, manage, integrate and create information using information technology tools specific to AFNR in order to facilitate people, machines, and logistics.**

**Sample Indicators**
- Use Geographic Information System/Global Positioning System (GIS/GPS) applications.
- Create maps.
- Locate people or things.
- Identify best route for travel.

**Course Notes**
- AG150, AGBE105, 125, AGSC102, 218, 230, NRSM 260, ENSC 245

### Cluster Topic AGC05
**SYSTEMS:** Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.

### AGC05.01
**Examine and summarize roles within teams, work units, departments, organizations, interorganizational systems, and the larger environment to understand the nature and scope of AFNR organizations and the AFNR industry.**

**Sample Indicators**
- Examine company performance and goals within AFNR organizations and the AFNR industry.
- Explain the role and major functions of AFNR organizations to better utilize AFNR guidelines.
- Explain major guidelines used by AFNR organizations to manage and improve performance.
- Examine economic, social and technological changes to spotlight their impact on AFNR organizations and the industry.
- Explain technological changes to reveal their impact on information technology and transportation.

**Course Notes**
- AG150, AGBE105, 125, AGSC102, 218, 230, NRSM 260, ENSC 245
<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC05.02</th>
<th>Identify how key organizational systems affect organizational performance and the quality of products and services to demonstrate an understanding of how AFNR systems are managed and improved.</th>
<th>HS</th>
<th>MSUN</th>
<th>Course Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGC05.02.01</td>
<td>Manage and improve organizational systems to better serve customers.</td>
<td>Develop and manage plans and budgets to accomplish organizational goals and objectives.</td>
<td>Ag Bus</td>
<td>AG125, NRSM260</td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Evaluate customer needs to manage relationships with both internal and external customers.</td>
<td>Develop plans to improve organizational performance including customer satisfaction and service/operations performance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td></td>
<td>Develop plans to maintain compliance with organizational policies and government laws and regulations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGC05.02.02</td>
<td>Summarize the components and maintenance requirements of each agricultural, natural resource, and environmental system.</td>
<td></td>
<td>AG125, NRSM260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Develop management plans to improve the agricultural and natural resource systems.</td>
<td>Determine goals and objectives for each system to manage organizational activities more effectively.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td></td>
<td>Prepare and operate systems and technical tools to access, manage, integrate, evaluate and create information.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGC05.02.03</td>
<td>Research geographical data to recognize the types of systems used in various geographical areas.</td>
<td></td>
<td>ENSC245, NRSM260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Evaluate the effects of implementing practices to advance a system.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td></td>
<td>Explore multi-area trends to explain how systems differ across geographical areas.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster Topic</td>
<td>AGC06</td>
<td>SAFETY, HEALTH AND ENVIRONMENTAL: Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGC06.01</td>
<td>Maintain safe and healthful working conditions and environment that adhere to employee rights and responsibilities and employer obligations in order to promote well-being in the AFNR workplace.</td>
<td></td>
<td>OSHA</td>
<td>AGSC218, ANSC262, AGSC230, ENSC245</td>
<td></td>
</tr>
<tr>
<td>AGC06.01.01</td>
<td>Assess workplace conditions with regard to safety and health.</td>
<td>Identify those who are susceptible to risk of injury/illness at work.</td>
<td></td>
<td>AGSC 230</td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Describe ways to positively impact occupational safety and health.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGC06.01.02</td>
<td>Demonstrate application of rules and laws designed to promote safety and health.</td>
<td>Identify the responsibilities of employers related to occupational safety and health.</td>
<td></td>
<td>AGSC 230</td>
<td></td>
</tr>
<tr>
<td>Sample Indicators</td>
<td></td>
<td>Explain the role of government agencies in providing a safe workplace.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGC006.01.03</td>
<td>Apply safety/health precautions to participation in natural resource projects.</td>
<td></td>
<td>AGSC 230</td>
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<tr>
<td>Sample Indicators</td>
<td>Wear personal protective equipment.</td>
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<tr>
<td>AGC006.01.04</td>
<td>Demonstrate recognized first aid knowledge and procedures to show how they are used by natural resource industries.</td>
<td></td>
<td>AGSC 218, ANSC262, AGSC230, ENSC245</td>
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<tr>
<td>Sample Indicators</td>
<td>Complete recognized industry-level first aid training program.</td>
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<tr>
<td>AGC006.01.05</td>
<td>Identify health/safety policies and procedures for natural resource occupations.</td>
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<tr>
<td>Sample Indicators</td>
<td>Participate in safety meetings.</td>
<td></td>
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<tr>
<td>Sample Indicators</td>
<td>Describe the health and safety policies and procedures relevant to the worksite and assignment.</td>
<td></td>
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<tr>
<td>AGC06.02</td>
<td>Assess and control types and sources of workplace hazards common to the AFNR industry in order to demonstrate a working understanding of key health and safety concerns.</td>
<td>OSHA</td>
<td>AGSC 218, ANSC262, AGSC230, ENSC 245</td>
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<tr>
<td>AGC06.02.01</td>
<td>Demonstrate methods to correct common hazards.</td>
<td></td>
<td>AGSC 218, ANSC262, AGSC230, ENSC 245</td>
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<tr>
<td>Sample Indicators</td>
<td>Identify and describe common hazards in the workplace.</td>
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<tr>
<td></td>
<td>Identify and describe major sources of information about hazards in the workplace (e.g., MSDS, work procedures, exposure control plans, training materials, labels, and signage).</td>
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<td></td>
<td>Identify sources of combustible/flammable materials, fire and emergencies to establish a fire safe environment.</td>
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<td></td>
<td>Interpret safety signs and symbols.</td>
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<tr>
<td>AGC06.02.02</td>
<td>Demonstrate application of personal and group health and safety practices.</td>
<td>AGSC 218, AGSC 230, ANSC262, AGSC230, ENSC 245</td>
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<tr>
<td>Sample Indicators</td>
<td>Identify procedures necessary for maintaining a safe work area.</td>
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<td></td>
<td>Identify methods to correct common hazards.</td>
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<td></td>
<td>Identify methods for disposing of hazardous materials.</td>
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<td></td>
<td>Demonstrate principals of safe physical movement to avoid slips, trips, and spills.</td>
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<td></td>
<td>Inspect and use protective equipment (PPE).</td>
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<tr>
<td>AGC06.03</td>
<td>Examine and summarize importance of health, safety, and environmental management systems in AFNR organizations to express their importance to organizational performance and regulatory compliance.</td>
<td>AGSC 230</td>
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<tr>
<td>AGC06.03.01</td>
<td>Examine required regulations to maintain/improve safety, health and environmental management systems.</td>
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<tr>
<td>Sample Indicators</td>
<td>Study appropriate resources to identify the major regulatory areas (e.g., personal protective equipment) and government laws and regulations.</td>
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<td></td>
<td>Examine the major system components to realize benefits of health, safety and environmental management systems in AFNR organizations.</td>
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<td></td>
<td>Measure or estimate benefits to explain how government agencies promote compliance and improved health, safety and environmental performance to AFNR organizations.</td>
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<td></td>
<td>Examine logistics, distribution and transportation organizations to explain how AFNR organizations promote improved health, safety and environmental performance.</td>
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<tr>
<td>AGC06.03.02</td>
<td>Develop a plan to maintain and improve health, safety and environmental compliance and performance.</td>
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<tr>
<td>Sample Indicators</td>
<td>Make a personal commitment to safety, health and environmental policies and procedures.</td>
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<td></td>
<td>Develop plans to improve health, safety and environmental performance.</td>
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<td></td>
<td>Educate and orient other workers.</td>
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<tr>
<td>AGC06.03.03</td>
<td>State the importance of safety, health and environmental responsibilities in the workplace to provide operating guidelines.</td>
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<tr>
<td>Sample Indicators</td>
<td>Establish a set of safety, health and environmental principles to ensure a high level of performance.</td>
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<td></td>
<td>Develop a pollution/waste prevention plan to contribute to the total productivity improvement.</td>
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<tr>
<td>AGC06.03.04</td>
<td>Examine health risks associated with a particular skill to better form personnel safety guidelines.</td>
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<tr>
<td>Sample Indicators</td>
<td>Define what level of possible contamination or injury is considered a risk in order to set safety priorities.</td>
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<td>Assess mental and physical stresses to determine all aspects necessary to perform well and what health risks are associated with both the mental and physical aspects.</td>
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<tr>
<td>AGC06.03.05</td>
<td>Develop response plans to handle emergencies.</td>
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<tr>
<td>Sample Indicators</td>
<td>Identify various emergency response plan requirements for a facility.</td>
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<td></td>
<td>Develop an emergency response plan for natural disasters.</td>
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<tr>
<td>AGC06.03.06</td>
<td>Identify hazards and acquire first aid skills to promote environmental safety.</td>
<td>AGSC218,230, ANSC262, AGSC230, ENSC245</td>
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<tr>
<td>Sample Indicators</td>
<td>Identify general workplace safety hazards.</td>
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</tbody>
</table>
### Career Clusters Knowledge and Skills

<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC07</th>
<th>LEADERSHIP AND TEAMWORK:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.</strong></td>
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<td></td>
<td>AGSC218, ANSC262, AGSC230, NRSM 260</td>
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<tr>
<td>AGC07.01</td>
<td></td>
<td><strong>Demonstrate workplace ethics specific to AFNR occupations in order to reflect effective stewardship of resources.</strong></td>
</tr>
<tr>
<td>AGC08</td>
<td></td>
<td><strong>ETHICS AND LEGAL RESPONSIBILITIES: Know and understand the importance of professional ethics and legal responsibilities.</strong></td>
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<td>AGSC218, ANSC262, AGSC230, NRSM 260</td>
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<tr>
<td>AGC09</td>
<td></td>
<td><strong>EMPLOYABILITY AND CAREER DEVELOPMENT: Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.</strong></td>
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<td></td>
<td></td>
<td>AGSC218, ANSC262, AGSC230, NRSM 260</td>
</tr>
</tbody>
</table>

### Course Notes

- **AG100 as Elective**
- **Sample Indicators**
  - AGC09.01.01: Locate appropriate information on organizational policies in handbooks and manuals.
  - AGC09.01.02: Discuss how specific organizational policies and rules influence a specific work situation.
  - AGC09.02.01: Locate and identify specific organizational policy, rule or procedure to assist with a given situation.

---

Apply general workplace safety precautions/procedures.

- Acquire and maintain first aid certification.
- Acquire and maintain cardiopulmonary resuscitation (CPR) certification.
- Respond to medical emergencies.
- Explain purpose of pollution control systems.
- Describe procedures to comply with environmental regulations.
- Maintain environmental health and safety facilities.
- Handle chemicals and safety equipment appropriately.
- Explain ergonomic procedures.
- Assess workplace safety.
- Assess a safety-training plan.
- Observe all regulatory and safety standards.

- **HS**
- **MSUN**
- **Course Notes**
### Career Clusters Knowledge and Skills

<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC09.02.02</th>
<th>HS</th>
<th>MSUN</th>
<th>Course Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Indicators</td>
<td>Match personal interest and aptitudes to selected careers.</td>
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<tr>
<td></td>
<td>Identify personal interests and aptitudes.</td>
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<td></td>
<td>Identify job requirements and characteristics of selected careers.</td>
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<td></td>
<td>Compare personal interests and aptitudes with job requirements and characteristics of career selected.</td>
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<td></td>
<td>Modify career goals based on results of personal interests and aptitudes with career requirements and characteristics.</td>
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</tbody>
</table>

**Sample Indicators**

**Cluster Topic**

**TECHNICAL SKILLS:** Use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.

<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC10</th>
<th>HS</th>
<th>MSUN</th>
<th>Course Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGC10.01.01</strong></td>
<td>Use technological systems to accomplish objectives in transportation.</td>
<td></td>
<td></td>
<td>AG 105, AG 150, AGSC230, ANSC262, NRSM260</td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Evaluate transportation needs to explain the role and function of critical transportation-related technological systems.</td>
<td></td>
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<td></td>
<td>Measure and manage the reliability and performance of technological systems to establish use and maintenance guidelines.</td>
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<td></td>
<td>Manage major health, safety and environmental risks to minimize their potential impact on technological systems.</td>
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</tbody>
</table>

**Sample Indicators**

**AGC10.01.02** Select and improve utilization of technological systems to improve production and products.

<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC10.01.03</th>
<th>HS</th>
<th>MSUN</th>
<th>Course Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Indicators</td>
<td>Identify technical skills needed to run an industry efficiently.</td>
<td></td>
<td></td>
<td>Ag 150, AGSC218, AGSC230, ANSC 202,262, NRSM260</td>
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<tr>
<td></td>
<td>Identify types of skills needed to succeed in a desired industry.</td>
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<td></td>
<td>Explore methods available to develop technical skills.</td>
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<tr>
<td></td>
<td>Correctly operate the tools associated with a specific skill.</td>
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</table>

**Sample Indicators**

**AGC10.01.04** Establish criteria to identify areas that have special needs for technical skills.

<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC10.02</th>
<th>HS</th>
<th>MSUN</th>
<th>Course Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AGC10.02.01</strong></td>
<td>Use tools, equipment, machinery and technology to work in areas related to AFNR.</td>
<td></td>
<td></td>
<td>Ag Mech, Metal Fab, Construction</td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Select the appropriate tool to perform a given task.</td>
<td></td>
<td></td>
<td>AGSC218,230, ANSC 202,262, ENSC245</td>
</tr>
<tr>
<td></td>
<td>Select tools and equipment.</td>
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<td></td>
<td>Identify standard tools, equipment, and safety procedures.</td>
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<td></td>
<td>Follow operating instructions.</td>
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<tr>
<td></td>
<td>Set up/Adjust tools and equipment.</td>
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<td></td>
<td>Maintain tools.</td>
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<tr>
<td></td>
<td>Store tools.</td>
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</table>

**Sample Indicators**

**AGC10.02.02** Maintain the working order of natural resources and tools for efficient work use.

<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC10.02.03</th>
<th>HS</th>
<th>MSUN</th>
<th>Course Notes</th>
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</thead>
<tbody>
<tr>
<td>Sample Indicators</td>
<td>Demonstrate how to check tool condition before use.</td>
<td></td>
<td></td>
<td>AGSC218,230, ANSC 202,262, ENSC245</td>
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<td></td>
<td>Describe the characteristics of a tool in need of maintenance.</td>
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<td></td>
<td>Demonstrate how to replace tool parts and components as needed.</td>
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</table>

**Sample Indicators**

**AGC10.02.03** Wear protective equipment and handle natural resource tools and equipment with skill to demonstrate safe use of tools and equipment.

<table>
<thead>
<tr>
<th>Cluster Topic</th>
<th>AGC10.02.03</th>
<th>HS</th>
<th>MSUN</th>
<th>Course Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Indicators</td>
<td>Wear appropriate personal protective equipment (PPE).</td>
<td></td>
<td></td>
<td>AGSC 218 &amp; 230, ANSC 202,262</td>
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<td></td>
<td>Demonstrate proper spacing distance from others when using tools.</td>
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<td></td>
<td>Check tools for safety before using.</td>
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<td>Store tools with appropriate safety precautions.</td>
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<td>Demonstrate the proper usage of a tool or piece of equipment.</td>
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<td></td>
<td>Describe regulations for the use of tools and equipment.</td>
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<tr>
<td>Career Clusters Knowledge and Skills</td>
<td>HS</td>
<td>MSUN</td>
<td>Course Notes</td>
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<tr>
<td>AGC10.02.04 Use tools and technology devices to assist in expanding human capacity for natural resource tasks.</td>
<td></td>
<td>ANSC 202,262, ENSC 245, NRSM 260</td>
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<tr>
<td><strong>Sample Indicators</strong></td>
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<tr>
<td>Use appropriate tools to assist in lifting and moving.</td>
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<td>Demonstrate use of knots, ropes, lines and attachments.</td>
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<tr>
<td>Use geo-spatial and mapping techniques (GIS/GPS).</td>
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<tr>
<td>AGC10.03 Compare and contrast issues affecting the AFNR industry including biotechnology, employment, safety, environmental and animal welfare to demonstrate an understanding of the trends and issues important to careers in this industry.</td>
<td></td>
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<td>AGBE105, 125, AG150</td>
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<tr>
<td>AGC10.03.01 Select solutions for different environmental issues.</td>
<td></td>
<td></td>
<td>AGBE105, 125, AG150</td>
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<tr>
<td><strong>Sample Indicators</strong></td>
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<tr>
<td>Identify issues affecting the industry.</td>
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<tr>
<td>Research history and policies related to the issue.</td>
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<td>Identify conflicting points of view.</td>
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<td>Determine effects of the issue on the industry.</td>
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<td>Determine potential resolutions to the issue.</td>
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<tr>
<td>AGC10.03.02 Analyze solutions for different environmental issues.</td>
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<td>AGBE105, 125, AG150</td>
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<tr>
<td>AGC10.03.03 Present solutions for different environmental issues.</td>
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<td></td>
<td>AGBE105, 125, AG150</td>
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<tr>
<td>AGC10.03.04 Learn economic principles in order to apply them to natural resource systems (i.e., supply, demand and profit).</td>
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<td>AGBE105, 125, AG150</td>
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<tr>
<td>AGC10.04 Envision emerging technology and globalization and project its influence on widespread markets to demonstrate an understanding of technologies and trends that will impact the AFNR industry.</td>
<td></td>
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<td>AGBE105, 125, AG150</td>
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<tr>
<td>AGC10.04.01 Examine new technologies to project their impact in the global market of technology.</td>
<td></td>
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<td>AGBE105, 125, AG150</td>
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<tr>
<td><strong>Sample Indicators</strong></td>
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<tr>
<td>Convert drawings from US Standard to metric.</td>
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<td>Identify ways that global regulations impact system designs.</td>
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<tr>
<td>Identify and discuss use of new technologies (such as lasers and robotics) and their impact on agricultural systems.</td>
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<td>Discuss the importance of new communication systems and how they impact ag systems.</td>
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<tr>
<td>AGC10.04.02 Discuss the relationship between the advancement of technology and the need for continuing education/ career development.</td>
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<td>AGBE105, 125, AG150</td>
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<tr>
<td><strong>Sample Indicators</strong></td>
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<tr>
<td>Research and discuss emerging technologies and the skills they require.</td>
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<td>Discuss history of systems over the last century and discuss how emerging technology and career training will be essential to meet market demands.</td>
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</table>

**D. PATHWAY KNOWLEDGE AND SKILLS**

The following knowledge and skill statements apply to all careers in the General Agriculture Pathway.

**Pathway Topic**

**ANIMAL SYSTEMS**

**AGPC01**

**AGPC01.01** Produce and/or manage animals in domesticated and/or natural environments using an application of knowledge regarding anatomy and physiology to enhance animal production.

**Sample Indicator**

Describe functional differences in animal structures and body systems.

| Animal Science |
| ANSC | ANSC100, ANSC262 |

**AGPC01.01.01** Explain basic functions of animal anatomy and physiology using classification systems.

**Sample Indicator**

Classify animals according to anatomy and physiology.

| ANSC | ANSC100, ANSC262 |

**AGPC01.01.02** State how body structures interact and affect animal health.

**Sample Indicator**

Identify selected animal parts from a diagram or on a real animal.

Identify ways that an animal’s health can be affected by anatomy/physiology problems.
| AGPC01.01.03 | Analyze a subject animal to determine the nature of its health status. | ANSC |
| Sample Indicator | Identify symptoms of diseases, illnesses, parasites, and other health-related problems. | |
| | Diagnose animal ailments. | |
| | Implement disease prevention and health improvement program. | |
| | Identify and implement treatment options. | |

**AGPC01.02** Recognize and interpret animal behaviors and execute protocols for safe handling to facilitate safety for both animals and humans.

**AGPC01.02.01** Develop a safety plan for working with a specific animal.

**Sample Indicator**

- Explain factors which serve to stimulate or discourage given types of animal behavior.
- Recognize the normality curve of animal behavior.
- Perform safe handling procedures when working with animals.
- Identify strengths and weaknesses of an animal safety handling plan.
- Operate animal facilities to insure safety of animals.

**AGPC01.03** Provide proper nutrition using accepted protocols and processes to maintain animal performance.

**AGPC01.03.01** Examine animal developmental stages.

**Sample Indicator**

- Identify the different phases of an animal’s life cycle.
- Select diets which provide the appropriate quantity of nutrients for each animal developmental stage.

**AGPC01.03.02** Explain why nutrient requirements are different throughout an animal’s life cycle.

**AGPC01.03.03** Analyze feedstuffs and the animal nutrient requirement and determine if the ration is adequate.

**Sample Indicator**

- Identify the differences between good and poor quality feedstuffs.
- Create a balanced ration for a given animal.

**AGPC01.03.04** Assess whether the nutritional requirements of a given animal are being met by recording performance and comparing feed variations.

**Sample Indicator**

- Use different types of feedstuffs (e.g., roughage, concentrates) to create a feed ration containing the appropriate amounts of required nutrients.
- Use different forms of feedstuffs (e.g., pellets, cracked, rolled, ground) to create a diet that meets the needs of a specific animal.

**AGPC01.04** Analyze and summarize factors that influence an animal’s reproductive cycle to demonstrate an understanding of the species response.

**AGPC01.04.01** Analyze the reproductive cycle based upon differences between male and female reproductive systems.

**Sample Indicator**

- Identify the parts of male and female reproductive tracts on example animals.
- Analyze the reproductive cycle of a given animal.
- Evaluate animal readiness for breeding.

**AGPC01.04.02** Compare and contrast differences in reproductive cycles from species to species.

**Sample Indicator**

- Discuss the pros and cons of breeding through natural cover and artificial insemination.
- Discuss the implications of genetic variation.
- Describe techniques of artificial insemination.
- Identify reproduction management practices (e.g., male to female ratios, age and weight for breeding, fertility and soundness for breeding, heat synchronization, flushing).

**AGPC01.04.03** Evaluate the breeding soundness of an animal.

**Sample Indicator**

- Describe the procedure for determining an animal’s breeding readiness.
- Identify and prevent problems associated with reproduction.
- Select animals based on breeding soundness.
### Career Clusters Knowledge and Skills

<table>
<thead>
<tr>
<th>Career Cluster</th>
<th>Course Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGPC01.05</td>
<td>Evaluate environmental factors affecting animal performance and implement procedures for enhancing performance to demonstrate an effective application of principles to optimize performance.</td>
</tr>
<tr>
<td>AGPC01.05.01</td>
<td>Recognize optimum performance for a given animal species.</td>
</tr>
<tr>
<td>AGPC01.05.02</td>
<td>Create a program to develop an animal to its highest potential performance.</td>
</tr>
<tr>
<td>AGPC01.05.03</td>
<td>Assess an animal to determine if it has reached its optimum performance level.</td>
</tr>
<tr>
<td>AGPC01.05.04</td>
<td>Develop efficient procedures to produce consistently high-quality animals, well-suited for their intended purpose.</td>
</tr>
</tbody>
</table>

#### Sample Indicators
- Identify good performance for a given animal species.
- Identify reasons why some animals perform better than others.
- Identify factors that can be manipulated to control a given animal’s performance.
- Generate ways to increase an animal’s performance.
- Make appropriate changes in an animal’s environment in order to achieve optimum performance.
- Use appropriate tools in manipulating animal performance.
- Identify a given species’ desirable production numbers (e.g., birth weight, rate of gain, age of maturity, age of sexual maturity).
- Evaluate desired traits (e.g., production) of animals.
- Evaluate the role that economics plays in animal production.
- Design facilities appropriate for the production of a given species of animal.
- Make decisions on using new techniques and methods in the production facility so that both profit and animal safety are maximized.

### Pathway Topic

<table>
<thead>
<tr>
<th>Pathway Topic</th>
<th>AGRIBUSINESS SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGPG01.01</td>
<td>Employ leadership skills to accomplish goals and objectives in an AFNR business environment.</td>
</tr>
<tr>
<td>AGPG01.01.01</td>
<td>Develop a mission statement to guide business activities effectively.</td>
</tr>
<tr>
<td>AGPG01.01.02</td>
<td>Apply leadership skills to accomplish general business activities from production to public relations.</td>
</tr>
<tr>
<td>AGPG01.01.03</td>
<td>Apply management skills to accomplish general business activities from production to public relations.</td>
</tr>
</tbody>
</table>

#### Sample Indicators
- Identify planning approaches for preparing mission statement.
- Write a mission statement.
- Establish short- and long-term goals.
- Ask for feedback from stakeholders to test the impact of the mission statement.
- Disseminate mission statement to inform fellow employees and gain in-house support.
- Identify leadership styles.
- Conduct a business meeting using proper parliamentary procedures/consensus techniques.
- Work in teams to access a variety of expertise.
- Recognize and reward jobs well done.
- Identify management types.
- Identify organizational structures.
- Identify time management techniques.
- Make business agreements.
- Follow local, state, and federal regulations and appreciate the consequences of not following them.
- Recruit, train and evaluate human resources.
- Make business presentations.
<table>
<thead>
<tr>
<th>AGPG01.02</th>
<th>Practice good record keeping strategies and techniques to accomplish AFNR business objectives.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGPG01.02.01</td>
<td>Prepare all files as needed for effective record keeping practices.</td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Identify information management systems. Develop record keeping techniques and practices. Keep production and agribusiness records. Make records analysis.</td>
</tr>
<tr>
<td>AGPG01.03</td>
<td>Manage budget, credit, and optimal application of AFNR business assets using generally accepted accounting principles to promote business financial well-being.</td>
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<tr>
<td>AGPG01.03.01</td>
<td>Employ fundamental accounting principles in business bookkeeping and associated financial files.</td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Budget resources (e.g., capital, human, financial, time). Manage assets for optimum utilization. Manage risk of liabilities. Evaluate credit uses and options. Prepare and interpret financial statements (e.g., balance sheet, profit/loss statement, cash flow statement). Prepare tax forms (e.g., W-4, I9, Depreciation, 1099, Workers Compensation). Determine cost of doing business. Compare and examine advantages and disadvantages of banking procedures (e.g., bank reconciliation). Analyze investment options (e.g., buy, lease, finance, risk).</td>
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<tr>
<td>AGPG01.04</td>
<td>Assess and manage inventory using AFNR industry concepts and inventory control practices to ensure adequate inventory for business demand.</td>
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<tr>
<td>AGPG01.04.01</td>
<td>Monitor inventory levels to accomplish practical inventory control.</td>
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<tr>
<td>Sample Indicators</td>
<td>Maintain optimum inventory levels. Apply just-in-time concepts. Calculate costs of carrying inventory. Perform logistics management.</td>
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<tr>
<td>AGPG01.05</td>
<td>Appraise, select and employ technological resources to accomplish AFNR business objectives.</td>
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<tr>
<td>AGPG01.05.01</td>
<td>Use technology and information technology strategies for business improvement.</td>
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<tr>
<td>Sample Indicators</td>
<td>Utilize leading technology: e.g., Global Positioning System (GPS), Geographical Information System (GIS), Personal Data Application (PDA), cellular. Create and use documents using word processors, spreadsheets, databases and electronic mail. Conduct research using the Internet. Conduct oral/visual presentation using presentation software.</td>
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<tr>
<td>AGPG01.06</td>
<td>Use sales and marketing principles common to agribusiness systems to accomplish AFNR business objectives.</td>
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<tr>
<td>AGPG01.06.01</td>
<td>Conduct market research.</td>
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<tr>
<td>Sample Indicators</td>
<td>Evaluate methods of marketing products and services. Apply economic principles to marketing (e.g., supply and demand). Research products and service design(s).</td>
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<tr>
<td>AGPG01.06.02</td>
<td>Develop a marketing plan.</td>
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<tr>
<td>Sample Indicators</td>
<td>Identify and develop value-added products. Develop public relations campaigns. Develop sales goals and incentive programs.</td>
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<tr>
<td>AGPG01.06.03</td>
<td>Implement a marketing plan.</td>
</tr>
<tr>
<td>Sample Indicators</td>
<td>Promote products and services. Advertise products and services.</td>
</tr>
</tbody>
</table>
### Career Clusters Knowledge and Skills

| AGPG01.06.04 | Merchandise products and services. |
| Sample Indicators | Identify key components to organize a sale. |
| | Build and develop customer relationships. |
| | Conduct sales presentation. |
| | Provide post-sale service. |
| | Handle customer complaints. |
| | Locate prospective new customers. |
| | Test, troubleshoot, and replace heating and air-conditioning components (e.g., compressor, expansion valve, receiver dryer, pump, hoses). |
| | Evacuate and charge air conditioning systems. |

| AGPB01.01 | Produce and manage plants in both domesticated and natural environments using application of principles of anatomy and physiology to enhance plant production. |
| AGPB01.01.01 | Analyze nutritional requirements and environmental conditions. |
| Sample Indicators | Describe nutrient sources. |
| | Determine plant nutrient requirements for optimum growth. |
| | Identify function of plant nutrients in plants. |
| | Determine the environmental factors that influence and optimize plant growth. |
| | Apply nutrients to plants for economic growth. |
| | Describe nutrient application methods and appropriate practices. |

| AGPB01.01.02 | Evaluate nutritional requirements and environmental conditions. |
| Sample Indicators | Describe nutrient sources. |
| | Determine plant nutrient requirements for optimum growth. |
| | Identify function of plant nutrients in plants. |
| | Determine the environmental factors that influence and optimize plant growth. |
| | Apply nutrients to plants for economic growth. |
| | Describe nutrient application methods and appropriate practices. |

| AGPB01.01.03 | Develop a fertilization plan using the results of an analysis and evaluation of nutritional requirements and environmental conditions. |
| Sample Indicators | Describe nutrient sources. |
| | Determine plant nutrient requirements for optimum growth. |
| | Identify function of plant nutrients in plants. |
| | Determine the environmental factors that influence and optimize plant growth. |
| | Apply nutrients to plants for economic growth. |
| | Describe nutrient application methods and appropriate practices. |

| AGPB01.01.04 | Implement a fertilization plan using the results of an analysis and evaluation of nutritional requirements and environmental conditions. |
| Sample Indicators | Describe nutrient sources. |
| | Determine plant nutrient requirements for optimum growth. |
| | Identify function of plant nutrients in plants. |
| | Determine the environmental factors that influence and optimize plant growth. |
| | Apply nutrients to plants for economic growth. |
| | Describe nutrient application methods and appropriate practices. |

| AGPB01.01.05 | Evaluate soil/media nutrients using tests of appropriate materials and/or by examining data. |

### Pathway Topic

| AGPB01 | PLANT SYSTEMS |
| AGPB01.01 | Produce and manage plants in both domesticated and natural environments using application of principles of anatomy and physiology to enhance plant production. |
| AGPB01.01.01 | Analyze nutritional requirements and environmental conditions. |
| Sample Indicators | Describe nutrient sources. |
| | Determine plant nutrient requirements for optimum growth. |
| | Identify function of plant nutrients in plants. |
| | Determine the environmental factors that influence and optimize plant growth. |
| | Apply nutrients to plants for economic growth. |
| | Describe nutrient application methods and appropriate practices. |

| AGPB01.01.02 | Evaluate nutritional requirements and environmental conditions. |
| Sample Indicators | Describe nutrient sources. |
| | Determine plant nutrient requirements for optimum growth. |
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| | Describe nutrient application methods and appropriate practices. |

| AGPB01.01.05 | Evaluate soil/media nutrients using tests of appropriate materials and/or by examining data. |

### Course Notes

<p>| AGSC 102, ENSC 245 | AGSC 218 | ENSC 245 |</p>
<table>
<thead>
<tr>
<th>Sample Indicators</th>
<th>AGPB01.01.06</th>
<th>AGPB01.01.07</th>
<th>AGPB01.01.08</th>
<th>AGPB01.01.09</th>
<th>AGPB01.01.10</th>
<th>AGPB01.02</th>
<th>AGPB01.02.01</th>
<th>AGPB01.02.02</th>
<th>AGPB01.03</th>
<th>AGPB01.03.01</th>
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</thead>
<tbody>
<tr>
<td>Collect and test soil/media and/or plant tissue.</td>
<td>Manage soil/media nutrients using tests of appropriate materials and/or by examining data.</td>
<td>Explain basic methods for reproducing and propagating plants.</td>
<td>Employ basic methods for reproducing and propagating plants.</td>
<td>Develop a plan for integrated pest management.</td>
<td>Implement a plan for integrated pest management.</td>
<td>Examine and explain basic plant anatomy and physiology using taxonomic and other classifications to build a working understanding of functional differences among plant structures.</td>
<td>Examine unique plant properties to identify/describe functional differences in plant structures including roots, stems, flowers, leaves and fruit.</td>
<td>Classify plants based on physiology for taxonomic or other classifications.</td>
<td>Examine and apply fundamentals of production and harvesting when producing plants to demonstrate plant management and production techniques.</td>
<td>Develop a production plan that applies the fundamentals of plant management.</td>
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<tr>
<td>Interpret tests of soil/media and/or plant tissue.</td>
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<td>Determine the role of genetics in plants.</td>
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<td>Identify soil slope, structure and type.</td>
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<td>Describe the components and functions of plant reproductive parts.</td>
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<td>Evaluate soil/media permeability and water-holding capacity.</td>
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<td>Identify and practice methods of asexual/sexual plant propagation.</td>
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<td>Determine the chemical properties of soil/media.</td>
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<td>Describe the principles of plant micro-propagation.</td>
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<td>Determine land use capability.</td>
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<td>Apply principles and practices of biotechnology to plant propagation.</td>
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<td>Determine the biological functions of microorganisms of soil/media.</td>
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<td>Environmental Science</td>
<td>ENSC 245</td>
<td>Environmental Science; Exp. Ag</td>
<td>AGSC 102</td>
<td>Environmental Science</td>
<td>AGSC 218 &amp; 230</td>
<td>Environmental Science; Exp. Ag, Environmental Science</td>
<td>AGSC 102, 218, NRSM 260</td>
<td>Environmental Science</td>
<td>AGSC 218, NRSM 260</td>
<td>Environmental Science</td>
</tr>
<tr>
<td>Career Clusters Knowledge and Skills</td>
<td>Sample Indicators</td>
<td>HS</td>
<td>MSUN</td>
<td>Course Notes</td>
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<td>Identify and select seeds and plants.</td>
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<td>Manipulate and evaluate environmental conditions (e.g., irrigation, mulch, shading) to foster plant germination, growth and development.</td>
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<td>Evaluate and demonstrate planting practices (e.g., population rate, germination/seed vigor, inoculation, seed and plant treatments).</td>
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<td>Evaluate and demonstrate transplanting practices.</td>
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<td>Prepare soil/media for planting.</td>
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<td>Control plant growth (e.g., pruning, pinching, disbudding, topping, detasseling, staking, cabling, shearing, shaping).</td>
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<td>Prepare plants and plant products for distribution.</td>
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<tr>
<td>AGPB01.03.02 Harvest crops using methods that apply fundamentals of plant management.</td>
<td></td>
<td>Environmental Science</td>
<td>AGSC 218</td>
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<tr>
<td>Sample Indicators</td>
<td>Determine crop maturity.</td>
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<td>Identify harvesting practices and equipment.</td>
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<td>Demonstrate common harvesting techniques.</td>
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<td>Calculate yield and loss.</td>
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<td>Identify options for crop storage.</td>
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<td>Maintain quality of plant products in storage.</td>
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<tr>
<td>Prepare plants and plant products for distribution.</td>
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<tr>
<td>AGPB01.03.03 Handle crops using methods that apply fundamentals of plant management.</td>
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<tr>
<td>AGPB01.03.04 Store crops using methods that apply fundamentals of plant management.</td>
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<tr>
<td>AGPB01.04 Exercise elements of design common to professionals in plant systems to enhance an environment for a variety of purposes (e.g., floral, forest, landscape, farm).</td>
<td></td>
<td>Environmental Science</td>
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<tr>
<td>AGPB01.04.01 Create a design using plants that demonstrates an application of basic design elements and principles.</td>
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<td>Environmental Science</td>
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<tr>
<td>Sample Indicators</td>
<td>Conduct a site evaluation for physical condition and design implications.</td>
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<tr>
<td>Apply elements of design (e.g., line, form, texture, color).</td>
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<tr>
<td>Incorporate principles of design (e.g., space, scale, proportion, order).</td>
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<tr>
<td>Use landscape design drawing tools including Computer Aided Design (CAD) and industry-specific software.</td>
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<tr>
<td>Select hard goods, supplies and tools used in design.</td>
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"MSUN Chinook Ag. Tech" History

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