Minnesota State-Approved Technical Skill Assessments

Pathway: Animal Systems

Cluster: Agriculture, Food, & Natural Resources

CLUSTER/ PATHWAY/ PROGRAM	CERTIFICATION / ASSESSMENT TITLE	TYPE	ISSUING ORGANIZATION	WEBSITE Please report broken web links	ELIGIBILITY REQUIREMENTS / PREREQUISITES	ADMINISTRATION ELIGIBILITY (Written, Oral, Practical, etc.)	PASSING SCORE	COST	COMMENTS
For use at SECONDARY	For use at SECONDARY	For use at SECONDARY	For use at SECONDARY						
Agriculture Education (Cluster)	Agriculture Science I (180)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Entry-level assessment that verifies student mastery of foundational knowledge for careers in animal science, plant science, horticulture, natural resources, or agricultural systems and technology.	Online	80% for certicate	$6 per exam	46 questions on assessment; Grades 9-12; contact Precisions Exams for further information on ordering & assessing.
Agriculture Education (Cluster)	Agriculture Science II (183)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Second - level assessment in a series that verifies student mastery of general knowledge and skills of the agriculture, food, and natural science career cluster.	Online	80% for certicate	$6 per exam	56 questions on assessment; Grades 19-12; contact Precisions Exams for further information on ordering & assessing.

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Agriculture Education (Cluster)	Agriculture Science III (185)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Third assessment in a series that verifies student mastery of general knowledge and skills of the agriculture, food, and natural science career cluster. The scientific method is introduced and applied through experimentation and research.	Online	80% for certicate	$6 per exam	46 questions on assessment; Grades 9-12; contact Precisions Exams for further information on ordering & assessing.

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Animal Science	Principles of Agricultural Science - Animal	End of Course (EoC) Academic Assessment	CASE (Curriculum for Agriculture Science Education)	http://case4learning.org/index.php/assessment-learning-reflections/philosophy-and-strategies	End of course exams for the Principles of Agricultural Science - Animal that are aligned to course lesson conceps in agricultural science - animals.	Online	National Cut Score	$15 per exam from 1-100 exams ordered; $10 over 100 exams ordered	Contact CASE directly to order assessments for your high school program; information is on their web site, http://case4learning.org/index.php/assessment-learning-reflections/philosophy-and-strategies
Animal Science	Animal Systems	Academic Assessment	NOCTI	www.nocti.org/BlueprintCategoryLinks.cfm?category=Agriculture,%20Food%20%26%20Natural%20Resources	Broad-based, introductory career exploration assessment in animal systems.	Online	Criterion-referenced Written Cut Score	$19 per post-test exam; $31 for pre-test & post-test exam	Contact NOCTI directly to order assessments for your high school program; information is on their web site (http://www.nocti.org).

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Animal Science	Small Animal Science and Technology	Academic Assessment	NOCTI	http://www.nocti.org/BlueprintCategoryLinks.cfm?category=Agriculture,%20Food%20%26%20Natural%20Resources	Job Ready assessment in animal systems that measures technical skills at the occupational level and include items which gauge factual and theoretical knowledge in animal systems.	Online or written	Criterion-Referenced Written Cut Score	$19 per post-test exam; $31 for pre-test & post-test exam	Contact NOCTI directly to order assessments for your high school program; information is on their web site (http://www.nocti.org).
	NOCTI	NOCTI	TESTING AGREEMENT	Each institution/ consortium should have a Testing Coordinator who contacts NOCTI to obtain assessment exams, proctoring information, data management needs, and other important functions.	http://www.nocti.org/gettingstarted.cfm				

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Animal Science	Animal Science I (120)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Entry-level assessment that verifies student mastery of basic knowledge and skills in animal science.	Online	80%	$6 per exam	54 questions on assessment; Grades 9-12; contact Precisions Exams for further information on ordering & assessing.
Animal Science	Animal Science II (123)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Advanced secondary animal science courses that verifies student mastery of basic knowledge and skills in animal science.	Online	79%	$6 per exam	54 questions on assessment; Grades 9-12; contact Precisions Exams for further information on ordering & assessing.

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Animal Science	Equine Science A (127)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Introductory course that verifies student mastery of basic knowledge and skills in equine science.	Online	80%	$6 per exam	54 questions on assessment; Grades 9-12; contact Precisions Exams for further information on ordering & assessing.
Animal Science	Veterinary Assistant (124)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Introductory assessment in the veterinary profession - veterinary science and principles including anatomy, physiology, chemistry, animal health and disease, and animal laboratory procedures.	Online	80%	$6 per exam	49 questions on assessment; Grades11-12; contact Precisions Exams for further information on ordering & assessing.

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Animal Science	Veterinary Technician (125)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Advanced assessment in the veterinary profession for students who wish to further their education & training in the field.	Online	80%	$6 per exam	49 questions on assessment; Grades11-12; contact Precisions Exams for further information on ordering & assessing.
	Precision Exams	Precision Exams	Precision Exams Agreement	Each institution/ consortium should have a Testing Coordinator who contacts NOCTI to obtain assessment exams, proctoring information, data management needs, and other important functions. Click here for getting started: http://www.precisionexams.com/washington/exams.html					

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● For use at POSTSECONDARY	For use at POSTSECONDARY	For use at POSTSECONDARY							
Equine Science	Equine Science A (127)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Introductory course that verifies student mastery of basic knowledge and skills in equine science.	Online	70%	$6 per exam	54 questions on assessment; Grades 9-12; contact Precisions Exams for further information on ordering & assessing.
Animal Science	Veterinary Assistant (124)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Introductory assessment in the veterinary profession - veterinary science and principles including anatomy, physiology, chemistry, animal health and disease, and animal laboratory procedures.	Online	80%	$6 per exam	49 questions on assessment; Grades11-12; contact Precisions Exams for further information on ordering & assessing.

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Animal Science	Veterinary Technician (125)	Academic Assessment	Precision Exams	https://www.precisionexams.com/?q=node/7	Advanced assessment in the veterinary profession for students who have an interest in this field.	Online	80%	$6 per exam	49 questions on assessment; Grades11-12; contact Precisions Exams for further information on ordering & assessing.
	Precision Exams	Precision Exams	Precision Exams Agreement	Each institution/ consortium should have a Testing Coordinator who contacts NOCTI to obtain assessment exams, proctoring information, data management needs, and other important functions. Click here for getting started: http://www.precisionexams.com/washington/exams.html					

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Pathway: Animal Systems

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Veterinary Technician	Veterinary Technician National Examination (VTNE)	Certification	American Association of Veterinary State Boards (AVSB)	https://www.aavsb.org/VTNE/	National examination to evaluate entry-level veterinary technicians' competency to practice and to be credentialed.	Online	Pass/Fail - the candidate's score is based on their responses to the 150 operational questions.	$300 for seat fee at Prometric Testing Center	3 hour exam which consists of 150 multiple choice operational questions & 20 multiple choice pilot questions derived from the test specifications.
Swine Herds Person	Certified Swine Manager	Certification	Pork Checkoff	http://www.pork.org/certified-swine-manager/	Certification that assures candidate hasthe knowledge & skill to embody pork industry's We Care ethical principles of producing safe food, promoting animal well-being, protecting public health, natural resources, and strong communities.	Online or written	80%	$75	Must pass an exam as well as submit an on-the-job skills assessment.

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Beef Cattle Program	Cattle A. I.	Certification	Genex Cooperative, Inc.	http://genex.crinet.com/page49/LearningCenter	Certification that assures candidate has the knowledge & skill for artificial insemination of beef cattle.				Learning Center offers multiple topics in this area.

Minnesota Common Core Competencies

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)

Cluster: Agriculture, Food and Natural Resources

PERFORMANCE INDICATOR	PERFORMANCE MEASURE	*KEY:* **Y**=Essential **N**=Not Essential **O**=Optional **COMMON CORE COMPETENCIES** - Consensus among work group -		COMMENTS
		Secondary	**Post secondary**	
TOPIC 1: ACADEMIC FOUNDATIONS: Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster and/or career pathway.				
INDICATOR 01.01 Complete required training, education, and certification to prepare for employment in a particular career field.	**MEASURE 01.01.01** Identify training, education and certification requirements for occupational choice.	**Y**	**Y**	
	MEASURE 01.01.02 Participate in career-related training and/or degree programs.	**Y**	**Y**	
	MEASURE 01.01.03 Pass certification tests to qualify for licensure and/or certification in chosen occupational area.	**N**	**O**	**Business/Industry:** WANT--those who have it will move to the top; positions will not be available without.
INDICATOR 01.02 Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities.	**MEASURE 01.02.01** Model behaviors that demonstrate active listening.	**Y**	**Y**	
	MEASURE 01.02.02 Adapt language for audience, purpose, situation. (i.e. diction/structure, style).	**Y**	**Y**	**Business/ Industry:** CDL certification is an expectation for employment.
	MEASURE 01.02.03 Organize oral and written information.	**Y**	**Y**	
	MEASURE 01.02.04 Compose a variety of written documents such as agendas, media, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.	**Y**	**Y**	
	MEASURE 01.02.05 Present formal and informal speeches including discussion, information requests, interpretation, and persuasive arguments.	**Y**	**Y**	

Minnesota Common Core Competencies

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
INDICATOR 01.03 Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities.	**MEASURE 01.03.01** Demonstrate knowledge of basic arithmetic operations such as addition, subtraction, multiplication, and division.	**Y**	**Y**	
	MEASURE 01.03.02 Demonstrate use of relational expressions such as equal to, not equal, greater than, less than, etc.	**Y**	**Y**	
	MEASURE 01.03.03 Convert whole numbers, decimals, and fractions.	**Y**	**Y**	
	MEASURE 01.03.04 Apply data and measurements to solve a problem.	**Y**	**Y**	
	MEASURE 01.03.05 Analyze Mathematical problem statements for missing and/or irrelevant data.	**Y**	**Y**	**Business/Industry:** Critical thinking to analyze
	MEASURE 01.03.06 Construct charts/tables/graphs from functions and data.	**Y**	**Y**	**Business/Industry:** Huge need
	MEASURE 01.03.07 Utilize charts and tables from functions and data.	**Y**	**Y**	**Business/Industry:** i.e. Chemical applications *i.e. Charts for market numbers/ best sellers*
	MEASURE 01.03.08 Analyze data when interpreting operational documents.	**Y**	**Y**	
INDICATOR 01.04 Demonstrate science knowledge and skills required to pursue the full range of post-secondary and career education opportunities.	**MEASURE 01.04.01** Apply scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.	**O**	**O**	**Business/Industry:** WANT--If they have skill, it is valued.

Minnesota Common Core Competencies

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
INDICATOR 01.05 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.	**MEASURE 01.05.01** Examine new technologies to project their impact in the global market of technology.	**Y**	**Y**	*e.g., Convert drawings from US Standard to metric.* *e.g., Identify ways that global regulations impact system designs.* *e.g., Identify and discuss use of new technologies (such as lasers and robotics) and their impact on agricultural systems.* *e.g., Discuss the importance of new communication systems and how they impact ag systems.*
	MEASURE 01.05.02 Discuss the relationship between the advancement of technology and the need for continuing education/ career development.	**Y**	**Y**	*e.g., Research and discuss emerging technologies and the skills they require.* *e.g., Discuss history of systems over the last century and discuss how emerging technology and career training will be essential to meet market demands.*
TOPIC 2: COMMUNICATIONS - Communicate clearly and effectively with reason including technical terminology and information.				
INDICATOR 02.01 Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology to communicate technical information within AFNR.	**MEASURE 02.01.01** Write clearly to communicate written ideas, results and questions to all types of people.	**Y**	**Y**	*e.g., Write with effective language to produce written communications for journals, newsletters, or other informative articles.* *e.g., Explain aspects of the industry to people not involved in it, and discuss its components.*
	MEASURE 02.01.02 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.	**Y**	**Y**	*e.g., Monitor different kinds of behavior in order to improve communication.* *e.g., Prepare presentations to explain to both large groups and individuals issues of concern to the industry.* *e.g., Discuss aspects of the industry competently to an audience of both professionals and people not involved in the industry.*
INDICATOR 02.02 Employ the use of technical information effectively to maintain and communicate records and reporting procedures commonly used in the AFNR cluster.	**MEASURE 02.02.01** Document work and processes using technical communication methods and protocols.	**O**	**Y**	**Secondary/Postsecondary**: SAE Records--degree & preferably awards *e.g., Record technical information, compose technical reports, and communicate documentation to others*

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Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)

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		KEY: **Y**=Essential **N**=Not Essential **O**=Optional		
TOPIC 3: PROBLEM-SOLVING AND CRITICAL THINKING - Utilize critical thinking skills to make sense of problems and persevere in solving them. Employ valid, reliable research strategies. Demonstrate creativity and innovation.				
INDICATOR 03.01 Use critical thinking skills independently and in teams to solve problems and make decisions.	**MEASURE 03.01.01** Analyze elements of a problem to develop creative solutions.	**Y**	**Y**	
	MEASURE 03.01.02 Use problem-solving, critical thinking, and creativity skills to improve a situation or process.	**Y**	**Y**	*e.g., Ideas, proposals, and solutions*
	MEASURE 03.01.03 Generate new and creative ideas to solve problems.	**Y**	**Y**	
	MEASURE 03.01.04 Critically analyze information to determine value to the problem-solving task.	**Y**	**Y**	
INDICATOR 03.02 Identify, write and monitor workplace performance goals to guide progress in assigned areas of responsibility and accountability.	**MEASURE 03.02.01** Write realistic performance goals, objectives and action plans.	**Y**	**Y**	*e.g. SMART goals--short, moderate, & long term goals*
	MEASURE 03.02.02 Monitor performance goals and adjust as necessary.	**Y**	**Y**	
	MEASURE 03.02.03 Communicate goal achievement.	**Y**	**Y**	
INDICATOR 03.03 Conduct technical research to gather information necessary for decision-making.	**MEASURE 03.03.01** Gather information and data using a variety of resources.	**Y**	**Y**	
	MEASURE 03.03.02 Analyze and evaluate information and data for problem solving.	**Y**	**Y**	
TOPIC 4: TECHNOLOGY APPLICATIONS - Use technology to enhance productivity.				
INDICATOR 04.01 Access, manage, integrate and create information using information technology tools specific to AFNR in order to facilitate people, machines, and logistics.	**MEASURE 04.01.01** Use Geographic Information System/Global Positioning System (GIS/GPS) applications.	**O**	**Y**	*e.g., Create maps, locate people or things, and identify best route for travel.*
	MEASURE 04.01.02 Use business software systems	**O**	**Y**	*e.g. SAP - Agvance Accounting, QuickBooks, etc.*

Minnesota Common Core Competencies

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)

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		KEY: **Y**=Essential **N**=Not Essential **O**=Optional		
TOPIC 5: ORGANIZATIONAL AND GLOBAL SYSTEMS – Understand the environmental, social, and economic impacts of decisions within an organization. Understand global context of industries and careers.				
INDICATOR 05.01 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.	**MEASURE 05.01.01** Examine company performance and goals within AFNR organizations and the AFNR industry.	**Y**	**Y**	*e.g., Examine the role and major functions of AFNR organizations; examine how economic, social and technological changes impact AFNR organizations and the industry; and explain technological changes to reveal their impact.*
INDICATOR 05.02 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.	**MEASURE 05.02.01** Evaluate customer needs to manage relationships with both internal and external customers.	**Y**	**Y**	
	MEASURE 05.02.02 Develop and implement management plans and budgets to accomplish organizational goals and objectives.	**O**	**Y**	
	MEASURE 05.02.03 Implement plans to maintain compliance with organizational policies and government laws and regulations.	**N**	**Y**	**Business/Industry:** Critical! Government rules, laws, EPA, etc.
	MEASURE 05.02.04 Prepare and operate systems and technical tools to access, manage, integrate, evaluate and create information.	**N**	**Y**	
TOPIC 6: SAFETY, HEALTH, AND ENVIRONMENT – Understand the importance of safety, health, and environmental management systems and their importance to organizational performance and regulatory compliance.				
INDICATOR 06.01 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.	**MEASURE 06.01.01** Assess workplace conditions with regard to safety and health.	**Y**	**Y**	*e.g., Identify the types of risk of injury/illness at work.* *e.g., Identify those who are susceptible to risk of injury/illness at work.* *e.g., Describe ways to positively impact occupational safety and health.*
	MEASURE 06.01.02 Demonstrate application of rules and laws designed to promote safety and health.	**Y**	**Y**	*e.g., Identify key rights of employees related to occupational safety and health.* *e.g., Identify the responsibilities of employers related to occupational safety and health.* *e.g., Explain the role of government agencies in providing a safe workplace.*

Minnesota Common Core Competencies

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
INDICATOR 06.02 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.	**MEASURE 06.02.01** Demonstrate methods to correct common hazards.	**Y**	**Y**	*e.g., Identify and describe common hazards in the workplace.*
				e.g., 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).
				e.g., Identify sources of combustible/flammable materials, fire and emergencies to establish a fire safe environment.
				e.g., Interpret safety signs and symbols.
	MEASURE 06.02.02 Demonstrate application of personal and group health and safety practices.	**Y**	**Y**	*e.g., Identify procedures necessary for maintaining a safe work area.*
				e.g., Identify methods to correct common hazards.
				e.g., Identify methods for disposing of hazardous materials.
				e.g., Demonstrate principals of safe physical movement to avoid slips, trips, and spills.
				e.g., Inspect and use protective equipment (PPE).
INDICATOR 06.03 Examine and summarize importance of health, safety, and environmental management systems in AFNR organizations to express their importance to organizational performance and regulatory compliance.	**MEASURE 06.03.01** Examine required regulations to maintain/improve safety, health and environmental management systems.	**O**	**Y**	*e.g., Study appropriate resources to identify the major regulatory areas (e.g., personal protective equipment) and government laws and regulations.*
				e.g., Examine the major system components to realize benefits of health, safety and environmental management systems in AFNR organizations.
				e.g., Measure or estimate benefits to explain how government agencies promote compliance and improved health, safety and environmental performance to AFNR organizations.
				e.g., Examine logistics, distribution and transportation organizations to explain how AFNR organizations promote improved health, safety and environmental performance.
	MEASURE 06.03.02 Implement a plan to maintain and improve health, safety and environmental compliance and performance.	**N**	**Y**	*e.g., Make a personal commitment to safety, health and environmental policies and procedures.*
				e.g., Develop plans to improve health, safety and environmental performance.
				e.g., Educate and orient other workers.

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)
Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
	MEASURE 06.03.03 State the importance of safety, health and environmental responsibilities in the workplace to provide operating guidelines.	**N**	**Y**	*e.g., Establish a set of safety, health and environmental principles to ensure a high level of performance.* *e.g., Develop a pollution/waste prevention plan to contribute to the total productivity improvement.*
	MEASURE 06.03.04 Examine health risks associated with a particular skill to better form personnel safety guidelines.	**N**	**Y**	*e.g., Define what level of possible contamination or injury is considered a risk in order to set safety priorities.* *e.g., 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.*
	MEASURE 06.03.05 Implement response plans to handle emergencies.	**N**	**Y**	*e.g., Identify various emergency response plan requirements for a facility.* *e.g., Develop an emergency response plan for natural disasters.*
	MEASURE 06.03.06 Maintain environmental health and safety facilities.	**N**	**Y**	*e.g., Identify and apply general workplace safety hazards.* *e.g., Handle chemicals and safety equipment appropriately.* *e.g., Maintain environmental health and safety facilities.* *e.g., Observe all regulatory and safety standards.*
TOPIC 7: LEADERSHIP AND TEAMWORK - Use leadership in collaborating with others to accomplish productive organizational goals and objectives with an awareness of cultural/global competence.				
INDICATOR 07.01 Demonstrate leadership skills to accomplish organizational goals and objectives.	**MEASURE 07.01.01** Analyze the various roles of leaders within organizations	**Y**	**Y**	*e.g., Contribute ideas; share in building an organization; act as role models to employees by adhering to company policies, procedures, and standards; promote the organization's vision; and mentor others.*
	MEASURE 07.01.02 Exhibit personal and interpersonal skills appropriate to the workplace.	**Y**	**Y**	
	MEASURE 07.01.03 Analyze leadership and management styles.	**N**	**Y**	
	MEASURE 07.01.04 Understand the value of participation in civic and community leadership and teamwork opportunities to enhance skills.	**Y**	**Y**	

Minnesota Common Core Competencies

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
INDICATOR 07.02 Demonstrate positive working relationships and accomplish organizational goals.	**MEASURE 07.02.01** Work with others to develop and gain commitment to team goals.	**Y**	**Y**	
	MEASURE 07.02.02 Model leadership and teamwork qualities to aid in employee morale.	**Y**	**Y**	
	MEASURE 07.02.03 Identify and explain best practices for successful team functioning.	**Y**	**Y**	
INDICATOR 07.03 Use teamwork skills to achieve collective goals and use team members' talents effectively.	**MEASURE 07.03.01** Work with others to achieve objectives in a timely manner.	**Y**	**Y**	
	MEASURE 07.03.02 Promote the full involvement and use of team member's individual talents and skills.	**Y**	**Y**	
	MEASURE 07.03.03 Take responsibility for shared group and individual work tasks.	**Y**	**Y**	
	MEASURE 07.03.04 Assist team members in completing their work.	**Y**	**Y**	
	MEASURE 07.03.05 Adapt effectively to changes in projects and work activities.	**Y**	**Y**	
INDICATOR 07.04 Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.	**MEASURE 07.04.01** Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.	**Y**	**Y**	*e.g., Use positive interpersonal skills to work cooperatively with co-workers representing different cultures, genders and backgrounds.*
				e.g., Manage personal skills to accomplish assignments.
				e.g., Treat people with respect.
				e.g., Provide constructive praise and criticism.
				e.g., Demonstrate sensitivity to and value for diversity.
				e.g., Manage stress and control emotions.
INDICATOR 07.05 -Participate in meetings to accomplish work tasks.	**MEASURE 07.05.01** Participate in meetings to accomplish work tasks.	**Y**	**Y**	

Pathway: Animal Systems - Foundation Knowledge & Skills (Topics 1 -9)
Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
INDICATOR 07.06 Use mentoring skills to inspire and teach others.	**MEASURE 07.06.01** Use motivational techniques to enhance performance in others.	**Y**	**Y**	
	MEASURE 07.06.02 Provide guidance to enhance performance in others.	**N**	**Y**	
TOPIC 8: ETHICS AND LEGAL RESPONSIBILITIES –Know, understand, and model the importance of ethics, integrity, and legal responsibilities.				
INDICATOR 08.01 Demonstrate workplace ethics specific to AFNR occupations in order to reflect effective stewardship of resources.	**MEASURE 08.01.01** Demonstrate interest and concern for resource stewardship and ethics.	**O**	**Y**	
	MEASURE 08.01.02 Demonstrate interest and concern for resource	**O**	**Y**	**Business & Industry:** Nonnegotiable
	MEASURE 08.01.03 Exercise personal habits and actions to demonstrate workplace ethics.	**O**	**Y**	**Business & Industry:** Key to doing business right *e.g., Explain how personal workplace actions can affect the resource.*
TOPIC 9: CAREER DEVELOPMENT, EMPLOYABILITY, AND CITIZENSHIP –Attend to personal health and financial well-being. Know and understand the importance of employability skills. Plan education and career paths aligned to personal goals and employability goals. Act as a responsible and contributing citizen and employee.				
INDICATOR 09.01 Explain written organizational policies, rules and procedures common the AFNR workplaces to ensure employees perform job functions effectively.	**MEASURE 09.01.01** Locate appropriate information on organizational policies in handbooks and manuals.	**O**	**Y**	*e.g., Identify and select the appropriate documents of various organizational publications as reference for the situation.*
	MEASURE 09.01.02 Discuss how specific organizational policies and rules influence a specific work situation.	**O**	**Y**	*e.g., Locate, identify, and explain specific organizational policy, rule or procedure to assist with a given situation.*
INDICATOR 09.02 Select, research and examine critical aspects of career opportunities in one or more AFNR career pathways in order to gain an understanding of the breadth of occupations within this cluster.	**MEASURE 09.02.01** Locate and identify career opportunities that appeal to personal career goals.	**Y**	**Y**	*e.g., Locate and interpret career information; identify job requirements; identify educational and credentialing requirements for the career pathway(s).*
	MEASURE 09.02.02 Match personal interest and aptitudes to selected careers.	**Y**	**Y**	*e.g., Identify personal interests and aptitudes; identify job requirements and characteristics of selected careers; compare personal interests and aptitudes with job requirements and characteristics of career selected.*
TOPIC 10: TECHNICAL LITERACY – Apply technical knowledge and skills required to pursue careers in a specific career cluster and/or career pathway.				
See Separate Document for Topic 10: Technical Literacy - Animal Systems				

Minnesota Common Core Competencies

Pathway: Animal Systems - Technical Skills (Topic 10)

Cluster: Agriculture, Food and Natural Resources

PERFORMANCE INDICATOR	PERFORMANCE MEASURE	*KEY:* **Y**=Essential **N**=Not Essential **O**=Optional **COMMON CORE COMPETENCIES** - Consensus among work group - Secondary	Post secondary	COMMENTS
TOPIC 10: TECHNICAL LITERACY – Apply technical knowledge and skills required to pursue careers in a specific career cluster and/or career pathway.				
INDICATOR 10.01 Examine the components, historical development, global implications, and futue trends of the animal systems industry.	**MEASURE 10.01.01** Evaluate the development and implications of animal origin, domestication and distribution.	**Y**	**Y**	*Level 1: Define major components of the animal industry.*
		Y	**Y**	*Level 2: Outline the development of the animal industry and the resulting products, services and careers.*
		N	**O**	*Level 3: Predict adaptations of animals to production practices and environments.*
INDICATOR 10.02 Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.	**MEASURE 10.02.01** Classify animals according to hierarchical taxonomy and agricultural use.	**Y**	**O**	*Level 1: Explain the importance of the binomial system of nomenclature.* **Comment from Postsecondary:** Essential for Vet Tech only
		Y	**O**	*Level 2: Explain how animals are classified using Linnaeus's taxonomical classification system.* **Comment from Business/Industry:** Essential for Vet Tech only - need to know and explain
		Y	**N**	*Level 3: Classify animals according to the taxonomical classification system.*
		Y	**O**	*Level 1: Identify major animal species by common and scientific names.* **Comment from Postsecondary:** Essential for Vet Tech only
		Y	**Y**	*Level 2: Appraise and evaluate the economic value of animals for various applications in the agriculture industry.*
	MEASURE 10.02.02 Apply principles of comparative anatomy and physiology to uses within various animal systems.	**Y**	**Y**	*Level 1: Identify basic characteristics of animal cells, tissues, organs and body systems.* **Comment from Business/Industry for Levels 1-3:** May be too involved for many employees within animal industries. Focus on two-year degree is at mid-management level.

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
		Y	**Y**	*Level 2: Compare and contrast animal cells, tissues, organs and body systems.*
		Y	**Y**	*Level 3: Explain how the components and systems of animal anatomy and physiology relate to the production and use of animals.*
		Y	**O**	*Level 1: Describe the functions of animal cell structures.* **Comment from Business/Industry:** Essential for Vet Tech only
		N	**O**	*Level 2: Describe the molecular makeup of animal cells and its importance in animal production and management.* **Comment from Secondary & Postsecondary:** Management Programs Only
		Y	**Y**	*Level 3: Describe the basic functions of animal cells in growth and reproduction.*
		N	**O**	*Level 1: Explain the application of the processes of meiosis and mitosis to animal growth, development, health and reproduction.* **Comment from Postsecondary:** Essential for Vet Tech only
		Y	**Y**	*Level 2: Describe the properties, locations, functions and types of animal tissues.*
		Y	**Y**	*Level 3: Explain the relationship of animal tissues to growth, performance and health.*
		Y	**Y**	*Level 1: Describe the properties, locations, functions and types of animal organs.*
		Y	**Y**	*Level 2: Compare and contrast organ types and functions among animal species.*
		Y	**Y**	*Level 3: Explain the impact of animal body systems on performance, health, growth and reproduction.*
INDICATOR 10.03 Provide for the proper health care of animals.	**MEASURE 10.03.01** Prescribe and implement a prevention and treatment program for animal diseases, parasites and other disorders.	**Y**	**Y**	*Level 1: Explain methods of determining animal health and disorders.*
		Y	**Y**	*Level 2: Perform simple health-check evaluations on animals.*
		N	**Y**	*Level 3: Perform diagnostic tests to detect health problems in animals.*

Minnesota Common Core Competencies

Pathway: Animal Systems - Technical Skills (Topic 10)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
		Y	**Y**	*Level 1: Identify common diseases, parasites and physiological disorders that affect animals.*
		N	**Y**	*Level 2: Recognize illnesss and disorders of animals based on symptoms and problems caused by diseases, parasites, and physiological disorders of animals.*
		N	**Y**	*Level 3: Treat common diseases, parasites and physiological disorders of animals.*
		Y	**Y**	*Level 1: Explain characteristics of causative agents and vectors of diseases and disorders in animals.*
		Y	**Y**	*Level 2: Evaluate preventive measures for controlling and limiting the spread of diseases, parasites and disorders among animals.*
		N	**Y**	*Level 3: Design and implement a health maintenance and disease and disorder prevention plan for animals in their natural and/or confined environments.*
		N	**Y**	*Level 1: Explain the clinical significance of common considerations in veterinary treatments, such as aseptic techniques.*
		N	**Y**	*Level 2: Recognize necessary preparations of animals, facilities and equipment for surgical and nonsurgical veterinary treatments and procedures.*
		N	**Y**	*Level 3: Perform nonsurgical treatments and procedures in animal health care.*
		Y	**Y**	*Level 1: Recognize zoonotic diseases.*
		Y	**Y**	*Level 2: Explain the health risk of zoonotic diseases to humans and their historical significance and future implications.*
		N	**Y**	*Level 3: Develop a plan for zoonotic disease prevention methods and procedures for the safe handling and treatment of animals.*
	MEASURE 10.03.02 Provide for the biosecurity of agricultural animals and production facilities.	**Y**	**Y**	*Level 1: Explain the importance of biosecurity to the animal industry.*
		Y	**Y**	*Level 2: Discuss procedures at the local, state and national levels to ensure biosecurity of the animal industry.*

Minnesota Common Core Competencies

Pathway: Animal Systems - Technical Skills (Topic 10)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
		N	**Y**	*Level 3: Develop a biosecurity plan for an animal production operation.*
INDICATOR 10.04 Apply principles of animal nutrition to ensure the proper growth, development, reproduction, and economic production of animals.	**MEASURE 10.04.01** Develop a biosecurity plan for an animal production operation.	**Y**	**Y**	*Level 1: Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.*
		Y	**Y**	*Level 2: Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition.*
		Y	**Y**	*Level 3: Select appropriate feedstuffs for animals based on factors such as economics, digestive system and nutritional needs.*
		Y	**Y**	*Level I: Explain the importance of a balanced ration for animals.*
		N	**Y**	*Level 2: Appraise the adequacy of feed rations using data from the analysis of feedstuffs, animal requirements and performance.*
		N	**Y**	*Level 3: Formulate animal feeds based on nutritional requirements, using feed ingredients for maximum nutrition and optimal economic production.*
	MEASURE 10.04.02 Understand and administer animal feed additives and growth promotants in animal production.	**Y**	**Y**	*Level 1: Explain the purpose and benefits of feed additives and growth promotants in animal production.*
		N	**Y**	*Level 2: Discuss how feed additives and growth promotants are administered and the precautions that should be taken.*
		N	**Y**	*Level 3: Administer feed additives and growth promotants.* **Comment from Postsecondary:** Water-based administration included.

Minnesota Common Core Competencies

Pathway: Animal Systems - Technical Skills (Topic 10)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
INDICATOR 10.05 Evaluate and select animals based on scientific principles of animal production. business.	**MEASURE 10.05.01** Evaluate the male and female reproductive systems in selecting animals.	**Y**	**Y**	*Level I: Explain the male and female reproductive organs of the major animal species.*
		Y	**Y**	*Level 2: Describe the functions of major organs in the male and female reproductive systems.*
	MEASURE 10.05.02 Evaluate animals for breeding readiness and soundness.	**Y**	**Y**	*Level 1: Explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female animals.*
		Y	**Y**	*Level 2: Summarize factors that lead to reproductive maturity.*
		Y	**Y**	*Level 3: Evaluate and select animals for reproductive readiness.*
		Y	**Y**	*Level 1: Discuss the importance of efficient and economic reproduction in animals.*
		Y	**Y**	*Level 2: Evaluate reproductive problems that occur in animals.*
		Y	**Y**	*Level 3: Explain treatment or culling of animals with reproductive problems.*
	MEASURE 10.05.03 Apply scientific principles in the selection and breeding of animals.	**Y**	**Y**	*Level 1: Explain genetic inheritance in agricultural animals.*
		Y	**Y**	*Level 2: Explain the advantages of using genetically superior animals in the production of animals and animal products.*
		Y	**O**	*Level 3: Select a breeding system based on the principles of genetics.* **Comment from Postsecondary:** Not essential for Poultry
		Y	**Y**	*Level 1: Define natural and artificial breeding methods.*
		Y	**Y**	*Level 2: Explain the processes of natural and artificial breeding methods.*
		Y	**Y**	*Level 3: Select animal breeding methods based on reproductive and economic efficiency.*

Pathway: Animal Systems - Technical Skills (Topic 10)
Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
		Y	**Y**	*Level 1: Explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock.*
		Y	**Y**	*Level 1: Explain the advantages of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer.*
		Y	**Y**	*Level 2: Explain the processes of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer.*
		Y	**Y**	*Level 1: Discuss the uses and advantages and disadvantages of natural breeding and artificial insemination.*
		Y	**Y**	*Level 2: Explain the materials, methods and processes of artificial insemination.*
INDICATOR 10.06 Preapre and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.	**MEASURE 10.06.01** Demonstrate safe animal handling and management techniques.	**Y**	**Y**	*Level 1: Discuss the dangers involved in working with animals.*
		Y	**Y**	*Level 2: Outline safety procedures for working with animals by species.*
		Y	**Y**	*Level 3: Interpret animal behaviors and execute protocols for safe handling of animals.*
		Y	**Y**	*Level 1: Explain the implications of animal welfare and animal rights for animal agriculture.*
		Y	**Y**	*Level 2: Explain programs that assure the welfare of animals and prevent abuse or mistreatment.*
		N	**Y**	*Level 3: Implement quality-assurance programs and procedures for animal production.* **Comment from Postsecondary:** HACCP - Food Safety - Quality management practice
	MEASURE 10.06.02 Implement procedures to ensure that animal products are safe.	**Y**	**Y**	*Level I: Identify animal production practices that could pose health risks or are considered to pose risks by some.*
		Y	**Y**	*Level 2: Discuss consumer concerns with animal production practices relative to human health.*

Minnesota Common Core Competencies

Pathway: Animal Systems - Technical Skills (Topic 10)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
		Y	**Y**	*Level 1: Describe how animal identification systems can track an animal's location, nutrition requirements, production progress and changes in health.*
		Y	**Y**	*Level 2: Explain why animal trace-back capability, using individual animal and farm identification systems, is important to producers and consumers.*
INDICATOR 10.07 Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.	**MEASURE 10.07.01** Design animal housing, equipment and handling facilities for the major systems of animal production.	**Y**	**Y**	*Level 1: Identify facilities needed to house and produce each animal species safely and efficiently.*
		N	**Y**	*Level 2: Critique designs for an animal facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility.*
		Y	**Y**	*Level 3: Evaluate an animal facility, focusing on animal requirements, efficiency, safety and ease of handling.*
		Y	**Y**	*Level 1: Identify equipment and handling facilities used in modern animal production.*
		Y	**Y**	*Level 2: Explain how modern equipment and handling facilities enhance the safe and economic production of animals.*
		Y	**Y**	*Level 3: Select equipment and implement animal handling procedures and improvements to enhance production efficiency.* **Comment from Secondary/Postsecondary:** Include air mitigation part of the facilities.
	MEASURE 10.07.02 Comply with government regulations and safety standards for facilities used in animal production.	**Y**	**Y**	*Level 1: List the general standards (e.g., environmental, zoning, construction) that must be met in facilities for animal production.*

Minnesota Common Core Competencies

Pathway: Animal Systems - Technical Skills (Topic 10)

Cluster: Agriculture, Food and Natural Resources

		KEY: **Y**=Essential	**N**=Not Essential	**O**=Optional
INDICATOR 10.08 Analyze environmental factors associated with animal production.	**MEASURE 10.08.01** Reduce the effects of animal production on the environment.	**Y**	**Y**	*Level 1: Evaluate the effects of animal agriculture on the environment.*
		Y	**Y**	*Level 2: Explain methods of reducing the effects of animal agriculture on the environment.*
	MEASURE 10.08.02 Evaluate the effects of environmental conditions on animals.	**Y**	**Y**	*Level 1: Identify optimal environmental conditions for animals.* **Comment from Postsecondary**: Not essential for Vet Tech
		Y	**Y**	*Level 2: Describe the effects of environmental conditions on animal populations and performance.* **Comment from Postsecondary**: Not essential for Vet Tech

Technical Skill Assessment Blueprint

Pathway: Animal Systems

Cluster: Agriculture, Food, and Natural Resources

An "assessment blueprint" is a document that indicates the knowledge and skills that will be covered in an assessment instrument and the percentage of the assessment that will be devoted to each area of knowledge and skills. The Minnesota assessment blueprints will be used to review the appropriateness of existing assessments by determining how closely those assessments match up to what the Animal Systems career pathway working groups have determined should be assessed. The assessment blueprints can also be used to guide the development of new assessments where suitable third-party assessments do not exist.

		SECONDARY % of Assessment ↓	POST-SECONDARY % of Assessment ↓	BUSINESS & INDUSTRY % of Assessment ↓
TOPIC 1	**ACADEMIC FOUNDATIONS -** Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary opportunities within the Animal Systems career pathway.	5%	5%	5%
TOPIC 2	**COMMUNICATION -** Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information.	10%	15%	15%
TOPIC 3	**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.	10%	15%	20%
TOPIC 4	**INFORMATION TECHNOLOGY APPLICATIONS -** Use information technology tools specific to Animal Systems occupations to access, manage, integrate, and create information.	5%	5%	5%
TOPIC 5	**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.	5%	5%	5%
TOPIC 6	**SAFETY, HEALTH AND ENVIRONMENTAL -** Understand the importance of health, safety, and environmental management systems in organization.	5%	10%	10%
TOPIC 7	**LEADERSHIP AND TEAMWORK -** Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.	15%	10%	15%
TOPIC 8	**ETHICS AND LEGAL RESPONSIBILITY -** Know and understand the importance of professional ethics and legal responsibilities.	5%	5%	5%
TOPIC 9	**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.	15%	5%	5%
TOPIC 10	**PATHWAY-SPECIFIC SKILLS -** Use of technical knowledge and skills required to pursue careers in the Animal Systems career pathway, including knowledge of design, operation, and maintenance of technological systems.	25%	25%	15%
		100%	100%	100%

Agriculture, Food & Natural Resources: Animal Systems

Career Pathway Plan of Study for ►Learners ►Parents ►Counselors ►Teachers/Faculty

This Career Pathway Plan of Study (based on the Animal Systems Pathway of the Agriculture, Food and Natural Resources Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals.
**This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.*

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Animal Systems Pathway	Occupations Relating to This Pathway
	Interest Inventory Administered and Plan of Study Initiated for all Learners							
	9	English/ Language Arts I	Geometry	Earth or Life or Physical Science	Government & Citizenship	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Local student organizations activities such as FFA activities are also important for personal growth and leadership development.	• Introduction to Agriculture, Food, & Natural Resources I	**Occupations Requiring Postsecondary Education** ►Animal Breeder ►Animal Inspector ►Animal Manager/Caretaker ►Animal Nutritionist ►Aquaculturalist ►Dairy Producer ►Embryo Technologist ►Equine Science/ Horse Husbandry ►Feed Sales Representative ►Livestock Producer ►Pet Shop Operator ►Taxidermist ►Veterinary Technician ►Vivarium Technician **Occupations Requiring Baccalaureate or Graduate Degree** ►Agriculture Educator ►Animal Scientist ►Education & Extension Specialist ►Meat Science Inspector ►USDA Inspector ►Veterinarian ►Wildlife Biologist
	10	English/ Language Arts II	Algebra II	Biology or Agriscience	U.S. History		• Introduction to Agriculture, Food, & Natural Resources II • Animal Science I	
	11	English/ Language Arts III	Statistics & Probability	Chemistry or Physics or Food Science	World History		• Animal Science II • Veterinary Technician	
	College Placement Assessments-Academic/Career Advisement Provided							
	12	English/ Language Arts IV	Math Elective	Science Elective (e.g. CTE Science Equivalent – Agriscience)	Economics (Ag Ed./ Bus. Ed./ Social Studies)		• Animal Science III • Internship in Plant Systems	
	Articulation/Dual Credit Transcripted-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.							
POSTSECONDARY	Year 1	Required Transfer Curriculum Goals Determined by Local College Program in College Year 1 and Year 2 - **Goal 1:** Communication; **Goal 2:** Critical Thinking/Problem-Solving; **Goal 3:** Natural Science; **Goal 4:** Mathematical/Logical Reasoning; **Goal 5:** History and the Social and Behavior Sciences; **Goal 6:** The Humanities and the Arts; **Goal 7:** Human Diversity; **Goal 8:** Global Perspective; **Goal 9:** Ethical and Civic Responsibility; **Goal 10:** People and the Environment				All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities such as PAS may also be important to include.	• Core Courses	
	Year 2						• Advanced Courses	
	Year 3	Continue Courses in Area of Specialization					• Continue Courses Required for Animal Science Major	
	Year 4	Continue Courses in the Area of Specialization.					• Complete Animal Science Major (4-Year Program)	