



**Agriculture  
Technology**

CIP 01.0000

# **PROGRAM OF STUDY**

**CURRICULUM MAPPING  
WITH  
CERTIFICATION OUTCOMES**

Mon Valley Career & Technology Center prepares all students to attain their fullest potential for employment, to be life long learners, and to be productive and responsible members of an ever-changing society.

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### **Objective:**

This document has been prepared to project student learning outcomes in a linear fashion over the approved 3-year program of study.

### **Overview:**

This document provides a Pennsylvania Department of Education and Mon Valley CTC Occupational Advisory Committee approved list of tasks and learning objectives that are broken out into a linear form for a better understanding of learning outcomes over a three-year period within each program. It also serves as curriculum map as students work towards completing knowledge and skill-based tasks in pursuit of industry credentials. The end goal within each program is to work towards completing all tasks at proficient and advanced levels, earning multiple (stackable) industry credentials, and successfully complete the NOCTI exam. Student's progression and completion of task(s) and industry certification(s) may vary.

### **Navigation:**

**Unit / Task #** - This column indicates the Pennsylvania Department of Education or Mon Valley CTC local unit or task numbers given to each task within a given duty area.

**Task Description** – This column explains what knowledge-based or skill-based task that a student is working on for completion.

**Level / Marking Period** – This column indicates the learning level and timeframe at which the specific task(s) will be introduced to the student(s). Note that some tasks may be taught and completed individually while others may be taught in groups. ( i.e. 1.1 would signify a first year student being introduced to this task(s) in the first marking period, 2.3 would signify a second year student being introduced to this task(s) in third marking period, etc.)

### **Industry Certification:**

Students successfully progressing through the curriculum and tasks have opportunity to test for industry credentials. Industry credentials are listed on the right side of the document at the appropriate time within the curriculum that a student would be fully prepared to test for that certification.



**Agriculture Technology**

**Classification of Industrial Programs 01.0000**

<b>Unit / Task #</b>	<b>Task Description</b>	<b>Level / Marking Period</b>
101	Identify and follow all general safety, laboratory safety and field-site safety practices and procedures.	1.1, 2.1, 3.1
102	Identify and follow all OSHA safety standards	1.1, 2.1, 3.1
103	Identify and follow procedures written in the Safety Data Sheet (SDS) information system.	1.1, 2.1, 3.1
104	Operate agriculture and horticulture equipment.	1.1, 2.1, 3.1
105	Select the proper protective clothing and equipment.	1.1, 2.1, 3.1
501	Discuss the historical significance of agriculture to US and global economic strength.	1.1
504	Use computers to enter, access or retrieve data.	1.1, 2.1, 3.1
604	Evaluate a sites suitability for various agricultural purposes.	1.1
801	Use hand tools and power tools.	1.1, 2.1, 3.1
802	Use various gauges and testers used in agricultural power equipment.	1.1, 2.1, 3.1
803	Use air operated equipment.	1.1, 2.1, 3.1
804	Use electrical powered shop equipment.	1.1, 2.1, 3.1
805	Use fasteners to join parts.	1.1, 2.1, 3.1
806	Use measurement devices.	1.1, 2.1, 3.1
1001	Read blueprints and schematics.	1.1, 2.1, 3.1
1002	Create a technical drawing.	1.1, 2.1, 3.1



1405	Operate woodworking equipment/machinery, as needed in the agricultural sector.	1.1, 2.1, 3.1
1702	Demonstrate safe animal handling techniques for production, laboratory, and/or recreation.	1.1, 2.1, 3.1
1701	Compare and contrast cultural and societal uses and contributions of animals locally and globally.	1.2
1703	Identify products and uses of major livestock and companion animal species in Pennsylvania.	1.2
1704	Identify the basic anatomy of animals.	1.2
1705	Describe the functions of the animal body systems and system components.	1.2
1711	Evaluate the equipment and facilities used in modern animal agricultural production.	1.2, 2.2, 3.2
1801	Name and describe the functions of the skeletal system	1.2
1802	Name and describe the functions of the muscular system	1.2
1803	Name and describe the functions of the respiratory system	1.2
1804	Name and describe the functions of the circulatory system	1.2
1805	Name and describe the functions of the digestive systems (ruminant and non-ruminant)	1.2
2001	Describe the characteristics of the beef industry including breeds and types of operations	1.2
2004	Finishing the end of a rope, quick--release knot, bowline, double half hitch and tomfool knot	1.2
2005	Build a rope halter for cattle or sheep and build a temporary halter	1.2
2008	Identify common grooming tools	1.2
2009	Explain the different types of poultry production and the two main types of poultry products	1.2
2010	Identify and explain different types of poultry	1.2
2011	Describe feeding practices for poultry and the housing types used in commercial operations	1.2
2014	Summarize trends in poultry and egg consumption, and how these products are marketed	1.2
2017	List the use of rabbits by breed	1.2
2019	Describe the general characteristics of bison, deer and elk and their respective industries	1.2

**Certification test for:  
OSHA - Agriculture**



2020	Discuss the management of bison, deer and elk and how this compares and contrasts with other production animals	1.2
2021	Discuss the game bird industry and the major game birds produced.	1.2
201	Control weeds, insects, and plant diseases.	1.3
202	Interpret horticulture product labels.	1.3
203	Calculate and mix quantities of horticultural products used in plant health care.	1.3
204	Define the concept of, "Plant Health Care," such as disease, nutrients etc.	1.3
301	Describe the process of photosynthesis, respiration, translocation, and transpiration.	1.3
303	Identify plant structures and explain their functions.	1.3
304	Identify conditions essential for seed germination.	1.3
305	Explain the environmental factors that affect the growth and development of a plant.	1.3
307	Identify plant nutrient requirements.	1.3
310	Describe techniques used to control environmental factors.	1.3
311	Describe how weather and climate impact growing conditions and plant selection.	1.3
401	Identify and describe soil characteristics.	1.3
402	Identify soil and/or plant nutrients.	1.3, 2.3, 3.3
403	Describe soil management techniques.	1.3, 2.3, 3.3
404	Conduct proper soil sampling techniques.	1.3, 2.3, 3.3
405	Test soil for pH, texture, macronutrients and soluble salts.	1.3, 2.3, 3.3
406	Interpret commercial soil test reports.	1.3, 2.3, 3.3
601	Define soil erosion and its causes.	1.3
602	Identify the various types of land uses.	1.3
701	Describe the historical development of agricultural technologies in power systems.	1.4
1104	List and describe the operation of various engine types.	1.4
1105	Use specialized tools for small engines.	1.4, 2.4, 3.4
1106	Use measuring and calibration devices.	1.4, 2.4, 3.4
1201	Review operating and service resources.	1.4, 2.4, 3.4
1202	Perform safety inspections.	1.4, 2.4, 3.4



603	Use surveying equipment for site evaluation.	2.1
901	Identify various types of metals.	2.1
902	Use welding and cutting equipment.	2.1
904	Repair sheet metal products.	2.1
905	Fabricate a metal product.	2.1
901	Identify various types of metals.	2.1
605	Describe and apply principles of landscape and hardscape	2.2
606	Describe the characteristics of lawn/turfgrass installation and maintenance.	2.2
607	Describe the characteristics and features of retaining walls and types of growing structures.	2.2
1706	Describe normal animal behavior by species, along with causes and potential results of abnormal behavior (social, sexual, reproductive, and ingestive).	2.2
1708	Explain the significance of the 6 classes of nutrients for animal growth, performance, maintenance and reproduction.	2.2
1709	Describe preventative animal health and treatment techniques.	2.2
1710	Investigate environmental, food, medicinal, public safety, and biosecurity issues related to animal health.	2.2
1712	Examine the impact of pests and diseases as variables in animal production.	2.2, 3.2
1713	Investigate emerging technologies within practical applications of animal science.	2.2, 3.2
1806	Describe the classes of nutrients needed by animals based on their digestive system	2.2
1807	Explain the classes of additives and nutrients needed and sometimes added to feed	2.2
1808	Differentiate between roughage and concentrated feedstuffs	2.2
2002	Describe the facilities, feeding techniques, health and safety measures used in the management of beef cattle	2.2
2006	Describe how to operate a chute, halter cattle and identify common restraint tools and equipment	2.2
2012	List parasites and diseases of poultry	2.2
2013	Describe the management of backyard poultry flocks	2.2
2015	Outline consumer concerns about poultry products	2.2
2016	Explain the classes of poultry, meat and eggs and judge the quality of these products	2.2



2022	Outline biosecurity measures for game bird production, diet health and marketing of their products	2.2
205	Distinguish the components of an Integrated Pest Management program including the effects of chemicals and pesticides on the environment.	2.3
206	Identify various horticultural pests including their signs and symptoms.	2.3
207	Prepare for PA Pesticide Certification.	2.3
302	Identify plant cell structure, organization and function.	2.3
306	Distinguish between sexual and asexual plant reproduction.	2.3
308	Describe the nutrient cycles.	2.3
407	Describe criteria for selecting fertilizers and soil amendments.	2.3, 3.3
408	Describe factors influencing fertilizer application.	2.3, 3.3
409	Identify current issues regarding plant and soil management that impacts agronomic and horticultural practices.	2.3, 3.3
1401	Develop an itemized bill of materials and determine costs.	2.3
1402	Layout a structure foundation.	2.3
1403	Calculate, mix and finish concrete and masonry units.	2.3
1404	Select building materials.	2.3
1101	Select mechanical equipment appropriate to task.	2.4
1102	Measure power output of various equipment.	2.4
1103	Service and repair powertrain.	2.4, 3.4
1107	Troubleshoot an engine and return it to working order.	2.4, 3.4
1203	Operate and calibrate machines.	2.4, 3.4
1204	Perform disassembly and assembly procedures.	2.4, 3.4
1205	Operate machinery and power units.	2.4, 3.4
1206	Maintain, troubleshoot and repair.	2.4, 3.4
1406	Design a building for an application in agriculture using new technologies.	2.4, 3.4
1601	Identify environmental problems and use equipment and tools needed to measure the problems in livestock, crop handling, processing, nursery and landscaping, aquaculture, forestry and agribusiness industries.	2.4
1602	Use various map types and aerial photos for land use, soil, watershed, wildlife and natural resource management and conservation.	2.4
1603	Identify global positioning systems, remote sensing and collection equipment for various applications.	2.4



502	Maintain business and financial records.	3.1
503	Analyze financial institution to source credit for agricultural product distribution.	3.1
505	Prepare a technical report.	3.1
506	Use telephone communication techniques.	3.1
507	Analyze sales activities or agriculture business trends.	3.1
508	Use product knowledge to meet customer needs.	3.1
512	Access multi-media advertising services.	3.1
513	Develop a sales presentation.	3.1
514	Demonstrate goods or services.	3.1
515	Develop a logistics plan.	3.1
516	Provide customer service needs and training.	3.1
702	Identify the potential impact of global applications and emerging technologies towards sustainability.	3.1
1707	Predict genetic types using the punnet square method.	3.2
1901	Explain how genetics relates to improvement in animals and how animal characteristics are transmitted	3.2
1902	Explain sex determination in mammals and birds	3.2
1903	Discuss the use of biotechnology in animal science and how this compares to genetic engineering	3.2
1904	Explain the current role of biotechnology in animal science, the objections/concerns and what the future of agricultural biotechnology looks like	3.2
1905	Explain common breeding systems and their advantages and disadvantages in production agriculture	3.2
1906	Explain the importance of breeding management	3.2
1907	Compare and contrast crossbreeding and straightbreeding systems	3.2
2003	Evaluate beef animals for the selection of market and breeding animals and utilize appropriate terminology when doing so	3.2
2007	Develop a plan for training, preparing and showing production animals	3.2
2018	Outline a management program for production rabbits	3.2
2023	Discuss the management of fish and how this compares and contrasts with other production animals and wildlife	3.2
2024	Outline a management program for production fish	3.2



309	Classify plants and use appropriate binomial taxonomic terminology.	3.3
312	Outline the proper use of plant material in various segments of the horticulture industry.	3.3
313	Determine the impact of environmental factors on plant materials.	3.3
314	List the identifying characteristics of various plant categories including woody and herbaceous plants in the horticulture industry.	3.3
315	Identify 100 plants used in horticulture industry by horticultural reference/botanical reference. (70 need to be deciduous, evergreen, annuals, perennials and house plants)	3.3
1301	Identify the parts and functions of specific energy systems to include electrical power, solar power, wind power, mechanical power and chemical/carbon-based power systems.	3.4
1302	Identify the principles of power transmission, heat transfer, evaporation, fluid movement, conductivity, satellite transmission, conservation and regulations.	3.4
1407	Construct various switched electrical branch circuits.	3.4
1408	Troubleshoot electrical systems.	3.4
1501	Cut, assemble and pressure test components within various types of water supply systems.	3.4
1502	Calculate pump and pipe size based on water requirements, head and friction losses for water and irrigation systems.	3.4
1503	Identify the components in various agricultural irrigation systems.	3.4
1604	Identify and evaluate storage and waste disposal systems and procedures.	3.4
MVCTC	Task Remediation / NOCTI Review	3.4