

Course Title:	Sustainable Agriculture
Grade(s):	11th/12th

Course Description
This course is designed to allow students to explore the principles of sustainable agriculture for all aspects of production, including animal, crop, and food production. Students will study a variety of topics surrounding sustainable food and farming, including vegetable production, community agriculture programs, CSA structures, farmers' markets, raising sheep and goats sustainably, composting, meat processing, hydroponic and aquaponic operations, urban farming, and how to develop a sustainable production for the region we are located in. Students will also learn about how locally produced food can safely enter our food system. Students will be exposed to a variety of local and sustainable practices used on different local operations, including but not limited to organic, conventional, and natural productions. Students will develop an understanding of local agriculture through field trips and guest speakers from the local and state community in order to share their production practices. Both the land and the large animal facility will be utilized as lab space.
Approved Curricular Materials/Textbook(s)

Unit Title	Unit Description (Include Unit Objectives)	Unit Pacing
Unit 1: Introduction to Sustainable Agriculture	In this unit, students will be introduced to the concept of sustainable/regenerative agriculture. Students will learn how agriculture can be part of the solution to help rebuild our agricultural systems to reshape the environment in a positive way. Students will: • Define the 3 legs of sustainability and how they each work together to build a successful and sustainable business. • Describe environmental and societal issues based on sustainability. • Define common terminology surrounding organic, conventional, and natural labels. • Identify various business models used in local agriculture (CSA, Farmers'	2 weeks

	Market, Food Coop, Direct to Consumer).	
Unit 2: Local Food Production	This unit explores how food is produced locally and the level of food insecurity that communities across the world experience. Additionally, students travel to local farms with CSA structures, organic and conventional growing operations to learn how to operate and feed local communities. Students will: • Identify crops grown seasonally and locally. • Learn about maple syrup production. • Demonstrate the process of maple syrup from tapping trees to boiling. • Communicate reasons that farms choose different growing methods.	2 weeks
Unit 3: Sustainable Plant Production	The focus of this unit is to allow students to learn and participate in various sustainable plant production practices. Students will learn about new technologies in both field crops and greenhouse production. They will learn about the advantages and challenges of each operation. Students will: • Identify and describe field cropping techniques (no till, plastic, cultivation). • Develop a microgreen production system. • Learn about the different hydroponic systems (NFT, Wick, Deep Water Culture). • Describe how aquaponics can recycle nutrients to grow plants sustainably. • Identify the benefits of using a high tunnel to extend the growing season.	3 weeks
Unit 4: Sustainable Animal Production	In this unit, students will learn how livestock production can aid in creating a sustainable food system. Students will be exposed to breed selection, rotational grazing methods, alternative feed sources for livestock, and composting. Additionally, they will learn about honey production. Students will: • Learn how heritage breeds and breed selection can allow for more efficient animal production. • Develop a pasture rotation program that can be used to allow for better animal health and pasture health. • Construct a fodder grass system in the greenhouse that is used for an	2 weeks

	alternative feed system for livestock and poultry. • Identify items that can be composted and should not be composted. • Describe how a composting system can be sped up through the understanding of microbes and decomposition. • Identify the step in honey collection and the equipment needed.	
Unit 5: Urban Agriculture	In this unit, students are introduced to the concept of urban agriculture and how methods are being incorporated to make agriculture more prevalent in urban locations. Students will: • Identify how a rooftop garden can be created. • Demonstrate how a container garden can easily be made. • Discuss how incorporating urban agriculture can help environmental impacts while also educating consumers about food choices.	2 weeks
Unit 6: Sustainable Energy	In this unit, students get to explore the new technologies that exist and continue to evolve within agriscience. Students will first evaluate the current resource use in the United States. Then students will be able to explore current and upcoming technologies, including drone use, GPS, GMOs, biofuels, and others. Students will: • Discuss what potential energy sources are used in the United States. • Describe what are the advantages and disadvantages of non-renewable energy. • Describe what are the advantages and disadvantages of renewable energy. • Define what a biofuel is. • Develop a project describing an energy source and the impact agriculture has on that source. • Compare fuel consumption costs for agricultural production. • Compare the energy content of two common fuels used for energy production. • Demonstrate their ability to use a drone and how drones are used in agriculture.	3 weeks

Unit 7: Ag Extension Property	In this hands-on unit, students will be using their skills learned throughout the semester, but also in other classes, such as equipment operation, to install plantings and put into production the agriscience extension property. Student will: • Develop a crop planning schedule & goals for the year. • Participate in field preparation (plowing, harrowing, plastic mulch laying). • Develop a program planting schedule to incorporate all student groups. • Seed and grow plants throughout the semester that will be used in the extension property.	3 weeks
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