CVA Food Science Syllabus

Class Description

Food science integrates many branches of science and relies on the application of the rapid advances in technology to expand and improve the food supply. Students will evaluate the effects of processing, preparation, and storage on the quality, safety, wholesomeness, and nutritive value of foods. Building on information learned in Nutrition and Wellness and Chemistry, this course illustrates scientific principles in an applied context, exposing students to the wonders of the scientific world. Related careers will be explored.

This course has three sections: Food Science A is the first half of the class and includes Units 1-7. Food Science B is the second half of the class and includes Units 8-13. Food Science Y is the entire class and includes Units 1-13.

Click HERE for the Food Science Y Class Schedule which outlines the Units, Lessons, and Assessments for this course.

Click HERE for the Food Science State standards.

Class Outline

Unit 1: What is Food Science?
In this unit students will learn what food science is and explore how scientific discoveries and the work of food scientists and food chemists have shaped modern food products and processing methods. They will compare how food systems have evolved from early hunting and gathering to today's agricultural and marketing practices using charts, tables, and timelines. Students will also practice skills such as accurate measurement and learn the role of sensory evaluators. Finally, they will consider the benefits of studying food science and how to create a plan for pursuing a career in the field.

Unit 2: The Food Science Laboratory: Scientific Evaluation of Foods
In this unit students will explore the study of gastronomy and learn how the senses shape the overall flavor of food. They will examine how food scientists evaluate foods using scientific principles, sensory panels, and controlled taste tests, while also learning the purpose and safe use of common food science lab equipment. Students will develop and analyze their own sensory evaluations and practice effective communication and teamwork skills essential in the food science industry.

Unit 3: The Chemistry of Food and Food Preparation
In this unit students will learn how chemistry applies to food science by exploring the structure of atoms, common food elements, and how compounds form through ionic and covalent bonding. They will compare organic and inorganic compounds, classify food components, and examine both chemical and physical changes that occur during food preparation and preservation. Students will

also distinguish between homogeneous and heterogeneous mixtures and use the periodic table to recognize chemical symbols related to food.

Unit 4: Energy in food preparation and preservation
In this unit students will explore how different forms of heat energy affect food by learning the three methods of heat transfer - conduction, convection, and radiation - and identifying real-world examples of each. They will analyze how temperature influences chemical and physical reactions in foods, examine the effects of freezing and thawing, understand safe cooking temperatures, and learn how pressure-cooking changes food properties. Students will also study food safety guidelines, including the danger zone for foods.

Unit 5: Water and Acidity in Foods
In this unit students will learn why water and acidity are essential in food preparation and preservation, exploring how water behaves in its three states and how phase changes like freezing, melting, and evaporation affect foods. They will identify common water sources and contaminants, understand the importance of regulating water quality, and distinguish between water content and water availability in food. Students will also classify ingredients as acids, bases, or salts, use the pH scale to describe acidity, and examine how these components influence food safety, flavor, and texture.

Unit 6: The Role of Carbohydrates in Foods
In this unit students will learn why carbohydrates are important by exploring their functions, effects on the body, and key terms related to carbohydrate science. They will compare simple and complex carbohydrates, identify monosaccharides and disaccharides, and examine how glycemic index, low-carb diets, and carbohydrate loading impact health. Students will also compare grains, fruits, and vegetables and understand their nutritional benefits. In addition, they will study how starches, sugars, and polysaccharides contribute to food texture, thickening, and preservation, explore factors that influence crystal formation in candy making, and compare methods used to thicken sauces.

Unit 7: Lipids in Food: Their Impact and Importance
In this unit students will learn about different types of fats, their structures, and their roles in both the body and food preparation. They will compare saturated and unsaturated fats, understand cholesterol and its forms, and explore triglycerides, phospholipids, sterols, and stanols. Students will study how fats function in foods - including emulsification, texture, and stability - while examining the causes and effects of fat degradation and how to prevent it. By the end of the unit, they will understand how various fats affect health and how their properties influence cooking and food quality.

Unit 8: Proteins: The Building Blocks of Life
In this unit students will learn about the structure and functions of proteins, exploring how their chemical makeup, denaturation, and coagulation influence both nutrition and food preparation. They will compare proteins to other nutrients, examine complete proteins and protein complementation, and understand how conditions like PKU are managed through diet. Students will also study the role of gluten in baked goods, the cooking principles for eggs, meats, and dairy, and how enzymes work in foods. By the end of the unit, students will understand how proteins behave in foods through gels, denaturation, and enzymatic reactions.

Unit 9: Food Formulations
In this unit students will explore how food processing, preparation, and preservation impact the nutritional content of foods. They will compare vitamins, minerals, and phytochemicals, learn their functions, and identify their food sources. Students will also examine the differences between whole foods and enriched or fortified foods and understand how nutrient availability and bioavailability affect how the body uses nutrients. Finally, they will define functional foods, compare types found in the marketplace, and gain a deeper understanding of how nutrients change during cooking and storage.

Unit 10: Food Additives
In this unit students will learn how the Food and Drug Administration regulates food additives, explore the main functions of additives, and evaluate their potential benefits and risks. They will compare natural and artificial additives, identify examples of each, and understand what food analogs are and how they are used. Students will also examine substitutes for fat, sugar, and salt and their roles in food products. Finally, they will design and conduct a sensory evaluation comparing foods with and without additives or analogs, then compile and analyze their results to understand how additives influence flavor, texture, and overall quality.

Unit 11: Principles of Fermentation
In this unit students will define fermentation, identify common fermented foods, and learn the scientific principles behind the process. They will explore the purposes of fermentation, compare bacterial, yeast, and mold-based methods, and examine how factors like temperature and acidity affect microbial growth. Students will also study the connection between fermented foods, probiotics, and gut health. Finally, they will compare fermentation and pickling and learn how foods such as vinegar, cheese, yogurt, and chocolate are produced through specific fermentation processes.

Unit 12: Keeping the Food Supply Safe
In this unit students will learn about the three major types of food contaminants: physical, chemical, and biological. They will compare foodborne illness, spoilage, and sanitation, explore microorganisms that cause illness, and understand key terms such as toxin, pathogen, and parasite. Students will also examine food intoxications versus infections, learn safe food-handling practices, review the “Danger Zone” guidelines, and identify ways to prevent common spoilage. In addition, they will study the government agencies that regulate the food supply, how outbreaks are investigated, and how the food industry ensures safety. Finally, students will strengthen critical-thinking and problem-solving skills by analyzing real-world food safety challenges and practicing root-cause analysis.

Unit 13: Food Preservation
In this unit students will learn how foods fall along a continuum from unprocessed to heavily processed and explore how different levels of packaging help protect food quality and safety. They will compare various packaging materials, examine reduced-oxygen packaging, and understand how pH and water activity influence processed foods. Students will also study the history of food preservation and explore commercial methods such as thermal processing, curing, dehydration, and freeze-drying, along with techniques that extend the shelf life of fresh products. Finally, they will compare home and commercial preservation methods to understand how different approaches affect food safety, texture, and storage.

CVA Work Policy

- All classwork must be completed and submitted using the links in CTLS by the DUE DATE listed on the Class Schedule.
- Work should be completed in the order it is assigned on the Class Schedule.
- All work submitted on time will be graded within 48 hours.
- Assignments not submitted by the due date will be marked missing. Missing assignments are calculated as zeros in the coursework average. When students submit missing work, the assignment will be graded and calculated into the coursework average.

The CVA term ends prior to the end of the traditional school semester. The final date work will be accepted each term is posted on the CVA website (cobbvirtualacademy.org) and the Class Schedule.

Grading

Grades for this course are calculated based on category percentages as follows:

Category	Weight
Quizzes	20%
Assignments	40%
Test	30%
Final	10%

Academic Integrity

Academic integrity is the cornerstone of learning at CVA, and we take the integrity and authenticity of student work very seriously. When academic integrity is maintained, students will make decisions based on values that will prepare them to be productive, meaningful, and ethical citizens.

Students are required to abide by the CVA Academic Integrity Policy. Academic dishonesty in any form will not be tolerated. The CVA Academic Integrity Policy outlines the consequences if students fail to maintain academic integrity in their course. For additional information, the CVA Academic Integrity Policy is posted on the CVA website.

Academic Integrity Process

Consequences	1st	2nd	3rd	4th
Parent contact by teacher	✓	✓	✓	✓
Resubmit work for full credit	✓			
Resubmit work for half credit		✓		
Automatic zero			✓	✓
Parent contact by CVA administration			✓	✓
Notification by CVA administration to local school			✓	✓
Mandated proctored exam or coursework				✓
Other as designated by CVA or local school administration	✓	✓	✓	✓

General Information

- The Cobb Teaching and Learning System (CTLS) is the platform used to deliver Cobb Virtual Academy classes.
- Students must earn 100% on the Student Orientation Quiz located inside each CVA Digital Classroom before they begin their Student Coursework.
- All coursework must be submitted through CTLS.
- All CCSD students have access to Microsoft 365 applications and must submit assignments in the requested format.
- Students in all sections of this course will take an online final exam during the window of time published on the CVA website and the Class Schedule.

Technology Requirements

CTLS is geo-restricted to the United States.

- A modern PC or Mac Computer
    - Lightweight or mobile devices such as Chromebooks, iPads, Android tablets, or smartphones **may not** be compatible with many of our courses.
    - Windows or Mac based computer
- Access to Microsoft 365
- Internet access

CVA Expectations

Student

- Maintain consistent access to a computer and internet
- Login to the course daily and review the announcements
- Adhere to the deadlines listed on the Class Schedule
- Read and promptly respond to teacher communication
- Contact the teacher with questions
- Manage your time wisely

Teacher

- Welcome Phone Call in the first two weeks
- 24-hour turnaround on all communication
- 48-hour turnaround on grading for items submitted by the due date
- Provide relevant feedback on assignments
- Be accessible via email and phone or text during published hours
- Provide two or more live sessions per term

CTLS Parent Account

Cobb Virtual Academy teachers use CTLS Parent to communicate with students and parents. Students will automatically receive communication sent from CTLS Parent via their CCSD student email address and will be asked to provide a cell phone number to receive text communications. Directions for students to set up CTLS Parent are located in the CVA Orientation. Parents will receive communications according to their existing notification settings.

Student Support

A student's first source for support is their CVA teacher. However, additional support is available. The **CVA Learning Center** is staffed with facilitators and is available both **in person** and **virtually**.

Facilitators can assist students with getting started, class navigation, assignment instructions, submitting work, technical issues, and strategies for online success.

The in-person Learning Center is on the Cobb Horizon High School campus at 1765 The Exchange Atlanta, GA.

All CVA students are enrolled in the Student Support digital classroom which provides access to the Virtual Learning Center (VLC). Students use the CTLS chat feature to send a message to the Student Support Team during the hours it is open.

Live Sessions

Your teacher will post live session information to the Class Board.