

FOOD SCIENCE AND DIETETICS 1

FOOD SCIENCE 1 (new name)

How is root beer made? What makes your pizza taste so good? Will you get sick if you eat mold? These questions and more will be answered. Learn to apply the scientific method as you discover the science behind your favorite foods. Investigate principles of food production, processing, preservation, and packaging. Topics covered include introduction to food science, safety and sanitation, the scientific method, chemistry, organic chemistry, microcomponents, processing, preservation, and packaging. The course emphasizes hands-on lab activities and scientific inquiry. Integration of the Family and Consumer Sciences co-curricular student organization, Family, Career and Community Leaders of America (FCCLA), greatly enhances this course.

CIP Code:	190501
Course Code:	5757
Credit:	1 unit (120 hours), 2 units (240 hours), 3 units (360 hours)
National Certification:	Food Science Fundamentals http://aafcs.org/CredentialingCenter/PrePAC.asp
Recommended grades:	10-12
Recommended Class Size:	24
Prerequisite:	none
Textbook Information:	http://www.mysctextbooks.com/

Employment Opportunities

High School Education:	product packager, product grader, produce worker
Postsecondary Education:	flavor chemist, food application technologist, food safety, food inspector assistant, packaging manager, sales and service manager
Postgraduate Education:	food chemist, food microbiologist, food product consultant, food processing engineer, food sales representative, food scientist, food toxicologist, postsecondary instructor – nutrition, cellular biology, environmental chemistry and microbiology, physiology, psychology, agricultural research; product developer, quality control technician

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Standards Revision Committee

Secondary Teacher Representatives

Sophia Brown
Family and Consumer Sciences Teacher
C. E. Murray High School
Greeleyville, SC
slbrown@wcsd.k12.sc.us

Billie Chegin, BS
FCS Instructor
W. J. Keenan High School
Columbia, SC
bsouthard@richlandone.org

Sheri Felder, MEd, MS
Life Science Instructor
Eau Claire High School
Columbia, SC
sheri.felder@richlandone.org

Postsecondary Representatives:

Michael Carmel, CEC, CCE
Culinary Arts
Culinary Institute of Charleston
North Charleston, SC
Michael.carmel@tridenttech.edu

LaToya Johnson, B.S, M.Ed
FCS Instructor
S.C. State University
Orangeburg, SC
ljohn1@scsu.edu

Field Review:

Lorna G. Williams
Family and Consumer Science Teacher
Pickens High School
Pickens, SC
lornawilliams@pickens.k12.sc.us

Anna Turner MS CFCS-HNFS, (Retired)
Family and Consumer Sciences
Tri-Cities Christian Schools
Kingsport, TN and
Bob Jones Academy
Greenville, SC
Annasturner76@gmail.com

South Carolina Department of Education Representatives:

Juanita Bowens-Seabrook, PhD, RD, SNS
Education Associate
Office of Health and Nutrition
Columbia, SC
JBowens@ed.sc.gov

Dana Depew, MEd
Education Associate
Office of Career and Technology Ed.
Columbia, SC
Ddepew@ed.sc.gov

Eleanor R. A. Glover Gladney, PhD
Education Associate
Office of Career and Technology Ed.
Columbia, SC
eglover@ed.sc.gov

LaCrystal Jackson
Education Associate
Office of Adult Education
Columbia, SC
Ljackson@ed.sc.gov

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PROGRAM LEARNING OUTCOMES: WORKPLACE READINESS SKILLS

PERSONAL QUALITIES AND PEOPLE SKILLS

1. **Positive Work Ethic:** Comes to work every day on time, is willing to take direction, and is motivated to accomplish the task at hand
2. **Integrity:** Abides by workplace policies and laws and demonstrates honesty and reliability
3. **Teamwork:** Contributes to the success of the team, assists others, and requests help when needed
4. **Self-Representation:** Dresses appropriately, has a positive attitude, and uses language and manners suitable for the workplace
5. **Diversity Awareness:** Works well with all customers and coworkers
6. **Conflict Resolution:** Negotiates diplomatic solutions to interpersonal and workplace issues
7. **Creativity and Resourcefulness:** Contributes new ideas and works with initiative

PROFESSIONAL KNOWLEDGE AND SKILLS

8. **Speaking and Listening:** Follows directions and communicates effectively (verbal and nonverbal) with customers and fellow employees
9. **Reading, Researching, and Writing:** Reads, researches and interprets workplace documents and writes clearly
10. **Critical Thinking and Problem Solving:** Analyzes and resolves problems that arise in completing assigned tasks
11. **Health and Safety:** Follows safety guidelines and manages personal health
12. **Organizations, Systems, and Climates:** Identifies "big picture" issues and his or her role in fulfilling the mission of the workplace
13. **Lifelong Learning:** Continually acquires new industry-related information and improves professional skills
14. **Job Acquisition and Advancement:** Prepares to apply for a job, seeks promotions, accepts feedback gracefully, and applies the feedback to foster professional growth
15. **Time, Task, and Resource Management:** Organizes and implements a productive plan of work
16. **Mathematics:** Uses mathematical reasoning to accomplish tasks
17. **Customer Service:** Identifies and addresses the needs of all customers, providing helpful, courteous, and knowledgeable service

TECHNOLOGY KNOWLEDGE AND SKILLS

18. **Job-Specific Technologies:** Selects and safely uses technological resources to accomplish work responsibilities in a productive manner
19. **Information Technology:** Uses computers, file management techniques, and software/programs effectively
20. **Internet Use and Security:** Uses the Internet appropriately for work

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A. ACADEMICS (FOR ALIGNMENTS)

B. INTRODUCTION TO FOOD SCIENCE

1B1. Explain how changes in society have impacted food science and related careers.

1. Identify major historical events that changed the role of food science in society.
2. Illustrate how historical events changed how food is prepared, packaged, and processed.
3. Identify new foods developed to solve consumer problems/issues.
4. Contrast techniques developed to prepare foods. (cryogenic, freeze drying)
5. Examine careers that developed as a result of changes in food science.
6. Analyze trends to determine future changes in food science.

C. SANITATION AND SAFETY

1C1. Explain safe and sanitary measures used to test food products in a laboratory setting.

1. Identify the three major types of food contaminants: biological, chemical and physical.
2. Differentiate between food-borne illness, food spoilage and food sanitation.
3. Identify microbial organisms that can cause food-borne illness to include toxins, pathogens, and parasites.
4. Examine procedures for safety and sanitation in a food science laboratory.
5. Compare and contrast government agencies in the United States and abroad that regulate food products. (OSHA, FDA, DHEC, WHO)
6. Model appropriate safe and sanitary behaviors in the food laboratory.

D. THE SCIENTIFIC METHOD

1D1. Explain the scientific method, including the processes and skills of scientific inquiry, to develop understanding of science content.

1. Define the scientific method.
2. Outline the steps in the scientific method.
3. Apply the scientific method in a designed experiment.
4. Analyze the collected data.
5. Evaluate the hypothesis.
6. Write a group conclusion.

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E. CHEMISTRY

1E1. Explore the basic chemistry of food science.

1. Define chemistry as it applies to food science.
2. Explain the nature of acids and bases.
3. List the properties of water and the relationship to acids and bases.
4. Identify sources and forms of energy.
5. Differentiate how heat is transferred in cooking and preservation processes.
6. Compose a list of the differences between pure substances and mixtures.

F. ORGANIC CHEMISTRY

1F1. Examine the elements of organic chemistry as it applies to food products.

1. Define organic chemistry.
2. Identify the macronutrients.
3. Compare and contrast the classes of organic compounds.
4. Examine food labels to determine specific organic molecules.
5. Explain the functions of organic molecules in preparation of food products.
6. Create a list of foods that incorporate the different processes that change organic molecules when variances are applied.

G. FOOD PRODUCTS: PROCESSING, PRESERVATION, & PACKAGING

1G1. Explain the processing, preservation, and packaging of food products.

1. Define processing, preservation, and packaging.
2. Identify methods used to process, preserve, and package food.
3. Develop a Hazard Analysis Critical Control Point (HACCP) plan to process, preserve, and package a selected food item.
4. Describe the relationship between processing, preservation, and packaging of food products.
5. Explain how to solve problems in the processing, preservation, and packaging of food items.
6. Recommend the appropriate method when processing, preserving, and packaging food.