

FOOD SCIENCE AND DIETETICS 2

FOOD SCIENCE 2 (new name)

Would you like to be the next person who creates a new food product? Would you like to see your new product sold in the marketplace? Food Science is your answer! Conduct laboratory experiments to measure, record, and analyze data. Topics covered include professionalism, safety and sanitation, the scientific method, chemistry, organic chemistry, microcomponents, and the processing, preservation, and packaging of food products. Integration of the Family and Consumer Sciences co-curricular student organization, Family, Career and Community Leaders of America (FCCLA), greatly enhances this course.

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| CIP Code: | 190501 |
| Course Code: | 5758 |
| 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: | 11-12 |
| Recommended Class Size: | 24 |
| Prerequisite: | Food Science 1 |
| Textbook Information: | http://www.mysctextbooks.com/ |

Employment Opportunities

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| 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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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. PROFESSIONAL DEVELOPMENT IN FOOD SCIENCE

2B1. Recommend professional practices that lead to success in food science.

1. Identify personal characteristics that are needed to be successful in the workplace.
2. Discuss diversity in the workplace.
3. Model behaviors that promote professionalism.
4. Examine organizations that offer professional development in food science.
5. Determine educational requirements for selected careers in food science.
6. Develop a career portfolio that focuses on food science related careers.

C. SANITATION AND SAFETY

2C1. Explain safe and sanitary measures used to test food products in a laboratory setting.

1. Assess food science lab safety and sanitation procedures.
2. Demonstrate safety and sanitation procedures when testing food products.
3. Inspect and report food laboratory for unsafe workers and working conditions.
4. Assess the safety of the food supply used in the food lab.
5. Examine the principles and application of the Hazard Analysis and Critical Control Point (HACCP).
6. Validate the need for the involvement of governmental agencies in establishing safe and sanitary food regulations throughout the world.

D. THE SCIENTIFIC METHOD

2D1. Implement the scientific method, including the processes and skills of scientific inquiry, to develop understanding of science content.

1. Describe the steps in the scientific method.
2. Predict outside influences that affect the scientific method.
3. Design an original experiment using the scientific method.
4. Test an experiment using the scientific method.
5. Justify the collected data.
6. Generate/Prepare a conclusion.

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E. CHEMISTRY

2E1. Identify chemistry concepts in food preparation.

1. Cite factors that alter the functional properties of water and how it affects its pH.
2. Explain the phase changes that occur with the addition or removal of energy.
3. Demonstrate how various temperatures affect rates of chemical and physical reactions.
4. Analyze the effects of heat transference with conduction, convection, and radiation.
5. Compare the advantages and disadvantages of food radiation.
6. Design a showcase that identifies pure substances and mixtures.

F. ORGANIC CHEMISTRY

2F1. Determine how the elements are affected by chemical reactions.

1. Summarize organic chemistry.
2. List chemical reactions that affect elements.
3. Compare the advantages and disadvantages of chemical reactions in food preparation.
4. Identify how different chemical reactions affect the nutritional value of food.
5. Assess the chemical reactions that occur in different cooking methods.
6. Test foods that incorporate different processes that change organic molecules when variances are applied.

G. MICROCOMPONENTS

2G1. Evaluate the function of microcomponents in food preparation and preservation.

1. List the microcomponents and the roles of each.
2. Explain functions of analogs and reasons for their use.
3. Experiment with phytochemicals and how processing affects them.
4. Test for the presence of vitamins and minerals in food products.
5. Evaluate common food additives and how they affect food products.
6. Compare the advantages and disadvantages of using microcomponents in food preparation and preservation.

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H. FOOD PRODUCTS: PROCESSING, PRESERVATION, & PACKAGING

2H1. Select processing, preservation, and packaging methods for food products.

1. Summarize the components of processing, preservation, and packaging in food products.
2. Categorize the various methods used in processing, preserving, and packaging food.
3. Experiment with different processing, preservation, and packaging methods by incorporating HACCP guidelines.
4. Compare the results of processing, preservation, and packaging methods.
5. Determine the best processing, preservation, and packaging method for selected food products.
6. Create a food product that could be sold for consumption.