

## COURSE PROFICIENCY OUTLINE

### NUTRITION & FOOD SCIENCE- 630

5 Credits

#### Purpose

Nutrition and Food Science is the study of producing, processing, preparing, evaluating, and using food. The field crosses many branches of science including: biology, botany, physiology, and bacteriology. Organic chemistry and physics, however, are most often used. Students will learn how physical laws affect food. They will discover the remarkable link between food science and people's health.

- I. Student Outcomes Science 5.1, 5.2, 5.3, 5.5, 5.6, 5.10      Technology 8.1B  
Career 9.1A, 9.2ABCDF
  - A. Students will demonstrate an understanding of the basic terminology, facts, concepts, and applications of Nutrition and Food Science in everyday experiences.
  - B. Students will demonstrate the ability to utilize Nutrition and Food Science concepts in fundamental problem-solving situations.
  - C. Students will recognize the inter-relationship between their role as a consumer and the impact that role has on the environment as it applies to Nutrition and Food Science.
  - D. Students will develop and improve competencies in basic science critical thinking skills, and investigative and decision-making skills.

#### II. Content

- A. Nutrition and Food Science
  - 1. Describe areas included in the field of Nutrition and Food Science.
  - 2. Explain the role of food science in preserving the environment.
  - 3. Explain contribution of food science to nutrition and food safety.
- B. Laboratory Equipment Safety, Measurement and Scientific Method
  - 1. Demonstrate proper use and techniques for working safely in a food science lab.
  - 2. Demonstrate how to make accurate and precise food laboratory measurements.
  - 3. Identify variables in a food science experiment and explain how they may affect the results.
- C. Sensory Evaluation of Food
  - 1. Describe sensory characteristics that affect food preferences.
  - 2. Explain the relationship between sensory characteristics and nutrition.
- D. Chemistry Fundamentals
  - 1. Define Matter.
  - 2. Distinguish between chemical and physical changes.
  - 3. Compare heterogeneous and homogeneous mixtures.
  - 4. Explain the function of water in food preparation.

5. Compare general qualities of acids and bases in foods.
  6. Explain what affects rates of chemical reaction in food.
- E. Energy
1. Measure heat energy.
  2. Define specific heat.
  3. Compare processes of heat transfer.
    - a. Conduction
    - b. Convection
    - c. Radiation
    - d. Induction
- F. The Science of Nutrition
1. Choose healthful foods according to the Food Guide Pyramid.
  2. Describe the processes of digestion and metabolism.
  3. Identify and describe essential nutrients in relation to body processes.
    - a. Water
    - b. Carbohydrates
    - c. Lipids
    - d. Protein
    - e. Vitamins and Minerals
  4. Relate the understanding of nutrition to physical well-being.
- G. The Chemistry of Food
1. Explain the function and impact of enzymes.
  2. Identify and describe solutions and colloidal dispersions.
  3. Describe the role of leavening agents in baked goods.
  4. Explain the biochemistry of milk.
  5. Evaluate the role of additives in food.
  6. Summarize information on bacterial fermentation of foods.
- H. The Microbiology of Food Processing
1. Describe steps to prevent the spread of food borne illnesses.
  2. Identify and analyze current food preservation technologies.

### III. Activities and Materials

- A. Text - Food Science: The Biochemistry of Food and Nutrition, Mehas/Rodgers.
- B. Classwork
1. Lectures and audio-visual materials, note taking, discussions, food laboratory experiences, demonstrations, report development, critical thinking activities, and regular tests and quizzes will be utilized.
  2. Basic skills such as reading, writing, math, listening, information processing and scientific learning will be stressed.
- C. Laboratory Activities
1. Studies developing scientific skills and science critical thinking skills.
  2. Studies of scientific principles and their applications related to the course content.
  3. Sensory evaluation of food products prepared in class.
  4. Studies involving scientific critical thinking skills.
  5. Food laboratory experiences related to material covered in class.

D. Assignments

1. Readings – text and other sources, outlining, and the organization of information.
2. Written answers to questions
3. Laboratory and other reports various techniques and methods.

IV. Requirements and Evaluation

- A. Students are expected to complete classwork and homework learning assignments and make-up work whenever missed.
- B. Students will be expected to demonstrate an acceptable level of proficiency in all of the goals and objectives of the course within the previously defined content and process areas.
- C. Students will be expected to maintain a notebook of all class materials.
- D. Students will be expected to participate in all food laboratory experiences including: food preparation and analysis of taste, texture, and appearance.
- E. Students are expected to have regular class attendance.
- F. Students will take a comprehensive final examination. This exam will count as 20% of the final grade.
- G. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.