GROSSMONT COLLEGE

COURSE OUTLINE OF RECORD

Curriculum Committee Approval: 03/22/2022

GCCCD Governing Board Approval: 04/19/2022

NUTRITION255 - SCIENCE OF NUTRITION

1. Course Number Course Title Semester Units

NUTR 255 Science of Nutrition 3

Semester Hours: 3 hours lecture: 48-54 hours 96-108 outside-of-class hours 144-162 total hours

2. Course Prerequisites

A “C” grade or higher or “Pass” in BIO 120 and CHEM 115 or CHEM 120 or equivalent.

Corequisite

None

Recommended Preparation

None

3. Catalog Description

In this course, students will analyze the relationship between food and science through the study and integration of chemistry, biology, and nutrition. The metabolic pathways, functions, and sources of nutrients will be reviewed and correlated to the role they have in health promotion and disease prevention. Students will examine nutrition-related challenges and changes over the human lifecycle with an emphasis on individual nutrient needs. Students will apply the scientific method to evaluate current concepts, controversies, and recommendations related to nutrition and dietetics. Additional topics include weight maintenance, eating disorders, food labeling, food safety, and unique nutrient needs at various stages in the lifecycle.

4. Course Objectives

The student will:

a. Recognize the relationship between optimal nutrition and optimal health.

b. Identify food sources and physiological functions of essential nutrients for bone health, blood health, immunity, fluid and electrolyte balance, and energy metabolism.

c. Demonstrate knowledge of nutrient digestion, absorption, and metabolism

d. Design a healthy diet plan by using a variety of dietary planning guides (e.g., food guidance systems, Recommended Dietary Intakes, Dietary Guidelines for Americans, etc.)

e. Record their own dietary intake or utilize a case study to compare actual nutrient intake to recommended standards

f. Utilize a computer database to plan appropriate dietary improvements based on individual requirements.

g. Examine individualized lifecycle nutritional needs at various stages from conception through old age.

h. Critically evaluate current nutrition-related topics using evidence-based sources (e.g., nutrition-related health disparities, vegetarianism, weight control issues, global nutrition concerns, fad diets).

5. Instructional Facilities

Standard classroom

6. Special Materials Required of Student

Electronic storage media.

7. Course Content

1. Essential biological functions and structures related to nutrition, from the smallest units of cellular through organ systems, including cell organelles and the different types of cellular transport
2. The chemistry of nutrition, including atoms, types of bonds, electron charges, pH balance, and the chemistry of water and solvents (i.e., condensation and hydrolysis). .
3. Metabolic pathways related to nutrition (e.g., glycolysis, TCA cycle, electron transport chain, energy production for glucose oxidation, fatty acid oxidation, synthesis of ketone bodies, urea cycle, ethanol metabolism, etc.) Nutrient classifications and their food sources (protein, lipids, carbohydrate, vitamins, minerals, water, and alcohol) through understanding the biochemical structure, unique physiology, fuel value and effect on human health.
4. Major dietary guidelines and recommendations (e.g. Healthy People, Dietary Guidelines for Americans, Dietary Reference Intakes)
5. Nutrients involved in a strong immune system, blood health and bone health.
6. Other components of food which contribute to good health (i.e., phytochemicals, antioxidants), their food sources, and relationship to diseases like cancer and heart disease.
7. Eating patterns that promote obesity, metabolic syndrome, and eating disorders such as anorexia nervosa, bulimia nervosa, binge/compulsive eating, and pica.
8. Current and controversial developments of nutrition biotechnology, food safety, fat and sugar substitutes, food additives, and inequities within the healthcare system related to nutrition.
9. Nutritional needs across the life cycle from pregnancy through older age.
10. Nutritional concerns around the globe in malnutrition and food supply.

8. Method of Instruction

1. Lectures
2. Demonstrations.
3. Class discussions
4. Multimedia presentations
5. Group work (projects, discussions)

9. Methods of Evaluating Student Performance

a. Periodic quizzes and examinations and final examination including both objective and essay questions.

b. Written assignments on current issues in nutrition, for example, students will evaluate the evidence behind current controversies in nutrition biotechnology such as a GMOs

c. Personal dietary record and computer analysis which compares intake to individualized goals with discussion of a personal plan of appropriate changes and improvements. Students are evaluated on their ability to connect their personal diet to the scientific concepts learned in the course.

10. Outside Class Assignments

a. Reading of text and current periodicals.

b. Computer analysis of personal dietary intake.

c. Individual and/or group projects including reports and presentations on various nutrition topics. Example: Students will work in small groups outside of class to create a vitamin/mineral study chart that outlines the functions, food sources, and deficiency/toxicity consequences of each vitamin and mineral covered in class.

d. Weekly homework assignments related to various topics in nutrition. Example: Students will complete an assignment comparing global dietary food guidance systems to the food guidance system in the United States.

11. Representative Texts

1. Representative Texts:

Byrd-Bredbenner, Carol et al*. Wardlaw’s* *Perspectives in Nutrition*. New York, New York, McGraw Hill, 12th Edition, 2021.

1. Supplementary texts and workbooks:

None

Addendum: Student Learning Outcomes

Upon completion of this course, our students will be able to do the following:

a. Identify the six classes of nutrients by name, function, caloric energy in a gram, food source, range of caloric amount in total diet.

1. Understand human behavior that results in an imbalance in metabolism leading to obesity, diabetes, and heart disease.
2. Identify the basic principles for achieving and maintaining energy balance through healthy lifestyle practices.