Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for NTRN 1

INTRODUCTION TO NUTRITION SCIENCE

Effective: Fall 2020

I. CATALOG DESCRIPTION:
NTRN 1 — INTRODUCTION TO NUTRITION SCIENCE — 3.00 units

Scientific concepts of nutrition related to the function of nutrients, sources and recommended intakes. Nutritional assessment and the role of nutrition in the maintenance of health.

3.00 Units Lecture

Strongly Recommended
CHEM 30A - Intro and Applied Chemistry I
with a minimum grade of C

MATH 110 - Elementary Algebra
with a minimum grade of C

Grading Methods:
Letter Grade

Discipline:
- Nutritional Science/ Dietetics

	MIN
Lecture Hours:	54.00
Expected Outside of Class Hours:	108.00
Total Hours:	162.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. CHEM30A
1. Define concentration units of solutions and use these definitions in problem solving—molarity, osmolarity, and percent;
2. Describe properties of solutions, including osmotic pressure and processes such as osmosis and dialysis and their application to biological systems;
3. Describe buffer solutions in terms of their composition and function, especially ones in biological systems;
4. Describe factors affecting the rates of reactions;
5. Collect and analyze scientific data;

B. MATH110

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Analyze and evaluate the credibility of nutrition information.
B. Utilize the information presented on a nutrition facts label to assess the quality of a food item and to make informed choices regarding food products.
C. Analyze and critically assess the reliability and credibility of nutrition information and dietary advice, services and products.
D. Evaluate the efficacy and safety of nutrition trends and controversies based on established nutrition science.
E. Apply established standards/tools/guidelines to make informed decisions regarding food choices/diet.
F. Describe the roles of nutrients in the body and analyze assigned nutrient intake compared to standard recommendations and make suggestions for improvement/maintenance of intake.
G. Describe the characteristics, functions and sources of the energy nutrients: carbohydrates, lipids and proteins.
H. Describe the characteristics, functions and sources of the non-energy nutrients: vitamins, minerals and water.
I. Describe the characteristics, functions and sources of non-nutrients, including phytochemicals and antioxidants.
J. Describe the process of digestion, absorption and metabolism, including substrates, location and outcome.
K. Evaluate diet in terms of nutrients required and food sources.
L. Describe the relationship between food systems, nutrient intake (macro and micronutrient) and health status for individuals and populations.

M. Describe the role of energy balance and its role in body weight and composition.
N. Explain the role of nutrition in the prevention of chronic diseases, such as cardiovascular disease, Type 2 diabetes, hypertension and cancer.
O. Identify the importance and content of good nutrition throughout the lifespan including: pregnancy, lactation, infancy, childhood, adolescence, and older adulthood.
P. Describe the connection between conventional vs. sustainable agricultural practices and the effects on environment.
Q. Prevent food-borne illness through proper handling and preparation of food items.
R. Define food insecurity and the populations at risk for malnutrition, chronic disease and public policy efforts to reduce hunger in the US and globally.

V. CONTENT:

A. Food choices and human health
    1. The role of nutrition in the prevention of disease
    2. Chemical elements in foods
    3. The role of scientific research
    4. Basics of research design, including descriptions, advantages/disadvantages and contributions to science of nutrition of:
        a. Case studies/ clinical research
        b. Intervention studies
        c. Epidemiological studies
        d. Experimental studies
    5. Foodways; cultural preferences and social connections that effect food choices
B. Nutrition standards and guidelines
    1. Nutrient recommendations
    2. Planning and assessing diets with current nutrition tools
        a. Adequacy, Balance, Calorie Control, Moderation, Variety
        b. Nutrient Density
        c. Dietary Guidelines for Americans, 2005
        d. USDA Food Guide
        e. Dietary Reference Intakes (DRI)
            1. Recommended Dietary Allowances (RDA)
            2. Adequate Intakes (AI)
            3. Estimated Average Requirements (EAR)
            4. Tolerable Upper Level Intakes (UL)
            5. Acceptable Macronutrient Distribution Ranges (AMDR)
            6. My Pyramid
        f. Food Labels
            1. Requirements of the Nutrition Education and Labeling Act
            2. The Nutrition Facts Panel
            3. Nutrient claims permitted on labels
            4. Health claims permitted on labels and degree of evidence required
        g. Exchange system
        h. Diet planning using a variety of standards and guidelines
C. Nutrient characteristics, functions, sources, deficiencies and excesses:
    1. Carbohydrates
    2. Fats
    3. Proteins
    4. Vitamins
    5. Minerals
    6. Water
D. Biology and physiology of the digestive system
    1. Structures and functions of gastrointestinal tract
    2. Process of digestion including foods, substrates, location, and outcome
    3. Role of enzymes in digestion
    4. Absorption of nutrients
    5. Overview of metabolism of carbohydrates, fats, (and minimally proteins) in energy production.

E. Malnutrition
    1. Undernutrition
    2. Deficiencies
    3. Toxicity
    4. Obesity
F. Energy balance and body composition
G. Nutrients, physical activity, and metabolism
    1. Components of fitness
    2. Benefits of physical activity
    3. Fueling the body
    4. Fluids and temperature regulation
H. Role of physical activity and nutrition in health promotion and disease risk reduction
    1. Cardiovascular diseases
    2. Hypertension
    3. Cancer
    4. Type 2 Diabetes
    5. High Cholesterol
    6. Obesity
    7. Osteoporosis
I. Nutritional needs throughout the lifecycle
    1. Pregnancy
    2. Fetal needs
    3. Infancy
    4. Child
    5. Adolescent
    6. Adult
    7. Older Adult
J. Food safety
    1. Microbes
    2. Preventing food borne illness
    3. Natural toxins in foods
    4. Contaminants
    5. Bioaccumulation
K. Food Technologies

1. Pasteurization
2. Irradiation
3. Genetically Modified Organisms

L. Hunger and the global environment
1. Food insecurity, hunger, and overview of U.S. Food programs
2. Conventional agriculture
3. Environmental degradation
4. Sustainable agriculture, and the "slow food" movement
5. Organic foods
6. Organic foods, the “slow food” revolution

VI. METHODS OF INSTRUCTION:
A. Read text and internet based materials
B. **Discussion** -
C. Media presentations
D. Research Projects
E. Diet analysis projects
F. **Lecture** -
G. Group projects and presentations

VII. TYPICAL ASSIGNMENTS:
A. Reading
1. Read the chapter on Carbohydrates: Sugar, Starch, Glycogen and Fiber
2. Read the Controversy about artificial sweeteners

B. Discussion
1. Should a person avoid carbohydrates to lose weight?
2. To what degree are sugar and artificial sweeteners “bad” for you?

C. Understanding the Nutrition Facts Label- strategies and calculations
D. Diet Analysis Project
1. keep a food diary
2. analyze nutrient intake using computer based tools
3. compare food intake to recommendations
4. compare and contrast food intake to nutrient recommendations
5. make recommendations for improving and/or maintaining diet

VIII. EVALUATION:
Methods/Frequency

A. Exams/Tests
2-3 per semester
B. Quizzes
5-10 per semester
C. Projects
1-2 per semester
D. Class Participation
Daily
E. Class Work
Daily
F. Home Work
Weekly

IX. TYPICAL TEXTS:
1. Smith, Anne, and Angela Collene. *Wardlaw's Contemporary Nutrition.* 11th ed., McGraw-Hill Education, 2018.
2. Sizer, Francis, and Ellie Whitney. *Nutrition Concepts and Controversies.* 14th ed., Wadsworth, Cengage Learning, 2017.
3. Stephenson, Tammy, and Wendy Schiff. *Human Nutrition Science for Healthy Living.* 1st ed., McGraw-Hill Education, 2016.

X. OTHER MATERIALS REQUIRED OF STUDENTS:
A. Internet access.