COURSE SYLLABUS

BIO 1023 - INTRODUCTORY NUTRITION

MEETING TIMES: SECTION NUMBER: LOCATION:

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INSTRUCTOR INFORMATION

NAME:
OFFICE LOCATION:
PHONE:
OFFICE HOURS:
E-MAIL ADDRESS:

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BIOLOGY COURSE GRADING CRITERIA:

You may select one of the levels of performance indicated below:

A (4.0 GPA) 90 - 100% average on all assignments and exams
B (3.0 GPA) 80 - 89% average on all assignments and exams
C (2.0 GPA) 70 - 79% average on all assignments and exams
D (1.0 GPA) 60 - 69% average on all assignments and exams
F 0 - 59% average on all assignments and exams

For grades of AW, W, and I refer to the college catalog for information and how they might affect eligibility for financial aid, etc.

Your selected level of performance should correspond to your program requirements or personal needs. Be sure to check with your advisor to be aware of any special requirements relative to GPA or minimum grades acceptable for specific courses. Levels of competency are established by the Biology faculty as Departmental policy.
RULES OF THE GAME:

College biology courses are some of the most challenging courses offered at Oklahoma City Community College. They require constant attention and hard work. The following instructions have been developed to help facilitate your success in these courses. They are not meant to be punitive; however, should you disregard them, you may be referred to the Dean of Science and Mathematics for withdrawal from the course.

Abuse of the Testing Center may result in loss of the privilege to use this resource. Academic dishonesty in the Testing Center, on-line, or during class may result in a failing grade for the entire course. DON"T CHEAT!!!!!!!!!!

SPELLING POLICY

You will be responsible for spelling correctly the following:

1. Words to be defined as stated in the objectives.

2. Terms to be used in identification as stated in objectives or supplemental materials.

3. Terms used in biological processes that are stated in the objectives or supplemental materials.

4. Scientific names.

Each term that is not spelled correctly will count off ¼ of a percentage point from your test score.

For example:

| Test score (before spelling errors) | = 96% |
| Spelling errors (4 ea. X .25%) | = -1% |
| Final test score | = 95% |

COURSE DESCRIPTION

Upon completion of this course, the student will be able to discuss the composition of nutrients and accessory factors required for human nutrition, relate their roles in human health and disease, and describe the application of basic nutritional principles to the planning of normal and special dietary regimens.
COURSE COMPETENCIES

The student will be able to:

1. Define nutrition and be able to differentiate between sound nutritional practices and those that are unhealthy or dangerous.

2. Discuss the importance of carbohydrates, lipids and proteins in nutrition by indicating their role in the body and also give sources of these nutrients.

3. Discuss the importance of minerals and vitamins in regulating body processes and describe how deficiencies or excess intake of these nutrients can alter normal body function.

4. Discuss the energy requirements of the body and relate this to weight control.

5. Explain the importance of oxygen and fluids in the body.

6. Describe basic chemical structure.

ACCOMMODATIONS FOR STUDENTS WITH SPECIAL NEEDS

Oklahoma City Community College complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Students with disabilities who seek academic accommodations must make their request by: Contacting the Office of Student Support Services located on the first floor of the main building near entry 12, or call 682-7520.

STUDENTS INTERESTED IN MEDICAL CAREERS:

“Students interested in medical careers: Some criminal convictions (misdemeanors or felonies) will prevent individuals from participating in medical careers. Often, background checks will be conducted prior to participation in clinical rotations and again prior to employment.”
COURSE OBJECTIVES

UNIT 1 – INTRODUCTION TO NUTRITION

(Chapter 1 – The Role of Nutrition in our Health)

1. Define nutrition.

2. Describe the importance of Healthy People 2010 and its relationship to nutrition.

3. Define nutrients.

4. Differentiate between essential and nonessential nutrients.

5. Define and differentiate between calorie, Calorie, and Kilocalorie.

6. List the six classes of nutrients and include their sources, common names, energy yields, and basic function in the body.

7. Calculate the percent intake of each of the energy yielding nutrients in a typical diet.

8. Define DRI’s. Discuss the various standards utilized for DRI’s (ie; EAR’s, RDA’s, AI’s, EER’s, UL’s).

9. Differentiate between malnutrition, undernutrition, and overnutrition.

10. Discuss the assessment of nutritional status by professionals.

11. Differentiate between primary, secondary, and subclinical nutrient deficiencies.

12. Identify where one can obtain reliable nutrition information.

13. Discuss the steps of the scientific method. Be able to define the following terms: hypothesis, experiment, theory, observational study, double-blind, correlation, control group, experimental group, peer review, and placebo. Be able to explain how the scientific method relates to the field of nutrition.

14. Describe how to evaluate nutritional claims and advice.

(Chapter 2 – Designing a Healthful Diet)

1. Discuss the different parts of a food label and what each part represents. Discuss why some products must have labels.

2. Evaluate various nutrient claims on food labels.
3. Briefly discuss the nine key recommendations outlined in the Dietary Guidelines as set by the USDA.

4. Discuss the anatomy of the USDA’s “My Pyramid.” Include guidelines and food groups.

5. List three limitations of “MyPyramid.”

6. Give a brief overview of the “5-a-Day” diet, the “DASH” diet, and the Exchange System.

UNIT 2 – DIGESTION, BASIC CHEMISTRY, and CARBOHYDRATES

(Chapter 3 – The Human Body, Are We Really What We Eat?)

1. List and describe various stimulants that cause eating.

2. Be able to identify from diagrams the organs used in digestion and absorption and the functions of each organ including secretions and products and associated sphincters.

3. Describe what an enzyme is and how it works.

4. Relate the role of nerves and hormones in the regulation of digestion and absorption.

5. Discuss the different types of absorption including the physiology, the portal system, and the lymphatic system.

6. Discuss the cause and treatment of ulcers, heartburn, GERD, constipation, irritable bowel syndrome, diarrhea, belching, flatulence, Celiac disease, Crohn disease, and ulcerative colitis.

7. Define probiotics. Discuss the importance of bacteria in the digestive process.

8. Added vocabulary and concepts:
   
   - bolus
   - peristalsis
   - coenzyme

(Appendix C – Chemistry Review)

1. Define atom. Discuss atomic structure and atomic mass.

2. Define molecule. Discuss ionic, hydrogen, and covalent bonds.
3. Describe hydrolysis and condensation reactions.

4. Discuss acids, bases, and the pH scale.

5. Added vocabulary and concepts:
   - oxidized
   - reduced
   - organic molecules
   - inorganic molecules

(Chapter 4 – Carbohydrates)

1. Relate the major carbohydrates: monosaccharide, disaccharide, and polysaccharide in terms of their basic chemical structures and food sources.

2. Relate dietary fibers in terms of their basic structures (water soluble vs. water insoluble), food sources, and digestion in the human body. Describe the benefits of proper fiber intake.

3. Name the enzymes, hormones, substrates, and products of carbohydrate digestion. Identify where these processes occur.

4. Discuss hormonal control of blood glucose levels.

5. Differentiate between glycemic index and glycemic load. Explain the importance of both in proper nutrition.

6. List the functions of carbohydrates in the body.

7. List guidelines for carbohydrate and fiber intake.

8. Compare and contrast sugar substitutes in the diet.

9. Discuss the cause and treatment of dental caries, lactose intolerance, diabetes, and hypoglycemia.

10. Discuss man's transition in diets as this country has progressed from an agricultural economy to a technological economy.

11. Added Vocabulary and Concepts

<table>
<thead>
<tr>
<th>Monosaccharides</th>
<th>Fructose</th>
<th>Sucrose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disaccharides</td>
<td>Ribose</td>
<td>Lactose</td>
</tr>
<tr>
<td>Polysaccharides</td>
<td>Glycogen</td>
<td>Alpha bonds</td>
</tr>
<tr>
<td>Starches or fibers</td>
<td>Maltose</td>
<td>Beta bonds</td>
</tr>
</tbody>
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UNIT 3 – LIPIDS and PROTEINS

(Chapter 5 - Lipids)

1. Correlate the major lipid groups (triglycerides, sterols, and phospholipids) in terms of their basic structures, food sources, and function.

2. Know the essential fatty acids, their food sources, function and deficiency effects on the human body.

3. Know the major fatty acids in terms of their basic chemical structures and food sources.

4. Know the process and purpose of hydrogenation in food products. What is meant by the term "trans fat"?

5. Name the enzymes, substrates, and products of lipid digestion. Identify where these processes occur.

6. List the function of lipids in both the human body and in food products.

7. List guidelines for fat intake and how to identify hidden fat in foods.

8. Discuss available fat replacements.

9. Discuss the effect of fats on the development of cardiovascular disease.

10. Discuss how lipoproteins are carried in the bloodstream.

11. Discuss why a high fat diet worked for prehistoric man since grains were not available. When grains did become available, what was the dietary change and was it good or bad? This is a higher learning objective and will require you to go on the internet or to a library to come to a conclusion.

12. Additional Vocabulary and Concepts:

<table>
<thead>
<tr>
<th>Lipid</th>
<th>Sterols</th>
<th>Monounsaturated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatty Acid</td>
<td>Trans fat</td>
<td>Polyunsaturated</td>
</tr>
<tr>
<td>Phospholipids</td>
<td>Saturated fatty acid</td>
<td>Glycerol</td>
</tr>
</tbody>
</table>
1. Describe how amino acids make up proteins.

2. List and distinguish between essential (indispensable) and nonessential (dispensable) amino acids.

3. Briefly discuss the process of protein synthesis.

4. Differentiate between high quality (complete) and low quality (incomplete) proteins.

5. Name the enzymes, substrates, and products of protein digestion. Identify where these processes occur.

6. List the functions of protein in the human body.

7. Discuss nitrogen balance.

8. Calculate, when healthy weight is given, the RDA for protein in adults.

9. Discuss the harms of excess protein in the diet.

10. Discuss the different types of vegetarianism and the reasons for vegetarianism.

11. Discuss the cause and treatment of kwashiorkor and marasmus.

12. Additional Vocabulary and Concepts

- Essential amino acids
- Nonessential amino acids
- Transamination
- Deamination
- Urea
- PKU
- Complete proteins
- Incomplete proteins
- Complementary proteins
- Mutual Supplementation
- Polypeptides
- Protein synthesis
- Pepsin
- Zymogen
- Gastrin
- Trypsin
- Chymotrypsin
- pH
- Kwashiorkor
- Marasmus
- Vegetarian diet pyramid
UNIT 4 – CELL STRUCTURE, METABOLISM, AND THE NUTRIENTS THAT SUPPORT METABOLISM

(Appendix D – Cell Structure)

1. Briefly discuss the anatomy and physiology of the cell including the nucleus, nuclear membrane, chromosomes, mitochondria, ribosomes, endoplasmic reticulum, and cell membrane.

   (Chapter 7 – Metabolism: From Food to Life)

1. Define metabolism, catabolism, and anabolism.

2. Explain the role of enzymes, cofactors, and coenzymes during chemical reactions.

3. BRIEFLY describe in correct order the three stages by which energy is extracted from glucose.

4. BRIEFLY describe the process of gluconeogenesis.

5. Discuss the effects of feeding and fasting on metabolism.

6. Added Vocabulary and Concepts:

   Anabolic          ADP
   Catabolic         Pyruvate
   Pathway           Coenzyme
   Acetic Acid       Glycolysis
   ATP               Gluconeogenesis
   Lactate Production
   Aerobic Pathway
   Acetyl-CoA
   Citric Acid Cycle
   Electron Transport chain
   Lipolysis
   Ketogenesis
   Lipogenesis
   Protein Metabolism
   Glycogen Storage
(Chapter 8 – Nutrients Involved in Energy Metabolism)

1. Review the differences between vitamins and minerals.

2. Describe how coenzymes enhance the activities of enzymes.

3. Describe the major food sources, functions, deficiency symptoms, and toxicity symptoms of the B-vitamins.

4. Describe the major food sources, functions, deficiency symptoms, and toxicity symptoms of choline.

5. Describe the major food sources, functions, deficiency symptoms, toxicity symptoms, and chemical symbols of iodine, chromium, magnesium, and sulfur.

6. Discuss various disorders associated with inadequate B-vitamin intake.

UNIT 5 – FLUID AND ELECTROLYTE BALANCE AND ANTIOXIDANT FUNCTION

(Chapter 9 – Nutrients Involved in Fluid and Electrolyte Balance)

1. Differentiate between extracellular, intracellular, interstitial, and intravascular fluid.

2. List and briefly describe the functions of fluid in the body.

3. List and briefly describe the functions of electrolytes in the body.

4. Discuss movement of water through cell membranes (osmosis).

5. Describe the general guidelines for fluid intake.

6. Describe the major food sources, functions, deficiency symptoms, toxicity symptoms, and the chemical symbols of sodium, potassium, chloride, and phosphorus.

7. Discuss the following disorders as related to fluids and electrolytes: dehydration, heat stroke, water intoxication, hypertension, neuropsychiatric disorders, and muscle disorders.
(Chapter 10 – Nutrients Involved in Antioxidant Function)

1. Define free radicals and discuss how they can damage cells.

2. Describe how antioxidants protect cells from the oxidative damage caused by free radicals.


4. Describe the major food sources, functions, deficiency symptoms, toxicity symptoms, and the chemical symbols of selenium, copper, iron, zinc, and manganese.

5. Discuss the following disorders as related to oxidation: cancer, cardiovascular disease, and aging.

6. Added vocabulary and concepts:

provitamin oxidation free radical megadose rhodopsin cell differentiation xerophthalmia phytochemicals

UNIT 6 – BONE, BLOOD, AND IMMUNITY HEALTH

(Chapter 11 – Nutrients Involved in Bone Health)

1. Briefly describe the process of bone growth, modeling, and remodeling.

2. Describe three methods used to measure bone density.

3. Describe the major food sources, functions, deficiency symptoms, and toxicity symptoms as related to bone health of vitamins D and K.

4. Describe the major food sources, functions, deficiency symptoms, toxicity symptoms, and the chemical symbols as related to bone health of calcium, phosphorus, magnesium, and fluoride.

5. Define osteoporosis and discuss various risk factors that increase the likelihood of osteoporosis.
(Chapter 12 – Nutrients Involved in Blood Health and Immunity)

1. Discuss the functions of iron, zinc, and copper and their contributions to blood health.

2. Discuss the functions of Vitamins B\textsubscript{12}, K and folate and their contributions to blood health.

3. Discuss the following disorders as related to blood health: neural tube disease, vascular disease, and various anemias.

4. Discuss the functions of protein and omega fatty acids in the development of immune function.

5. Discuss the functions of vitamins A, C, and E and their contributions to immune health.

6. Discuss the functions of zinc, copper, and iron and their contributions to immune health.

7. Discuss the importance of phytochemicals and probiotics to immune function.

UNIT 7 – BODY WEIGHT AND PHYSICAL ACTIVITY

(Chapter 13 – Achieving and Maintaining a Healthful Body Weight)

1. Define what is meant by a healthful weight.

2. Discuss BMI… how is it measured, what is a healthy BMI, and what are the limitations of using BMI for estimating a healthy weight?

3. Identify desirable body fat compositions in men and women. Discuss various ways to measure body fat composition.

4. Identify and discuss the components of energy expenditure.

5. Discuss energy use in terms of basal metabolism, physical activity, and the thermic effect of food.

6. Discuss various genetic, physical, and psychological factors that affect body weight.

7. Calculate basal metabolic rate when given gender and weight.

8. Describe why and how reduced Kcal intake, increased physical activity, and behavior modification fit into any weight loss program.
9. Discuss briefly what should be taken into consideration when treating underweight individuals.

10. Define obesity and discuss its causes. Discuss various methods to treat obesity.

11. Know the following additional vocabulary and/or concepts:

- underweight
- overweight
- obesity
- morbid obesity
- Energy balance
- How to compute basal metabolism
- Lean body mass
- Thermic effect of food
- Body Mass Index
- Set point

(Chapter 14 – Nutrition and Physical Activity: Keys to Good Health)

1. Compare and contrast the concepts of physical activity, leisure-time physical activity, exercise, and physical fitness.

2. Describe the components of a sound fitness program.

3. List and describe the processes we use to break down fuels to support physical activity.

4. Discuss the nutritional needs that help support physical activity.

5. Define the term “ergonomic aids,” and discuss the potential benefits and risks of the aids that are currently on the market.