

Revised: Fall 2016

DNH 150 Nutrition

Prerequisites:

BIO 141/142, DNH 111, DNH 115, DNH 120, DNH 141, DNH 142, DNH 145, DNH 146,
DNH 216

Course Description:

Studies nutrition as it relates to dentistry and general health. Emphasizes the principles of nutrition as applied to the clinical practice of dental hygiene.

Semester Credits: 2 Lecture Hours: 2

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Course Outcomes

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

1. To provide a basic foundation in the science of nutrition and the role of nutrition in the prevention and control of dental disease.
2. Demonstrate a knowledge of basic nutrition principles by:
 - a. Discussing the chemistry, functions, requirements, food sources and deficiency disorders associated with each major nutrient.
 - b. Recognizing intra-orally the effects of nutrients, diet and eating patterns on oral health.
 - c. Distinguishing between nutritional requirements for each stage of the life cycle.
3. To recognize the influence of cultural, socioeconomic and psychological factors on the dietary patterns and habits of clients.
4. To examine the nutritional needs of clients during specific stages of growth and development, such as: infancy and childhood, adolescence and old age.
5. To assess the nutritional needs of special clients, such as the orally, physically, and mentally handicapped, the diabetic, the pregnant, and the post-operative client.
6. Demonstrate the skills needed to plan, implement and evaluate nutrition education/analysis sessions with clients, including:
 - a. an adequate diet recall, and assessment of overall dietary adequacy
 - b. recognition of behavioral factors affecting food choices
 - c. discussion of diet and dental diseases/caries risk assessment
 - d. recommendations for dietary improvements
7. To increase awareness of the anticipated changes in food production, and need for research in seeking answers to nutritional needs for the future.

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Textbook:

Whitney, Eleanor and Sizer, Fancis, Nutrition – Concepts and Controversies, (14th edition), Wadsworth Publishing, 2016. ISBN – 9781305627994

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Topical Description:

UNIT 1: FOOD CHOICES AND HUMAN HEALTH, NUTRITION STANDARDS AND GUIDELINES, THE REMARKABLE BODY, AND CARBOHYDRATES – WEEKS 1-3

- A. The Diet and Health Connection
- B. Healthy People 2010: Nutrition for the Nation
- C. The Human Body and Its Food
- D. The Science of Nutrition
- E. Nutrient Recommendations
- F. Dietary Guidelines for Americans
- G. Diet Planning with the USDA Food Guide
- H. The Body's Cells
- I. Body Fluids and the Cardiovascular System
- J. Hormonal and Nervous Systems
- K. The Immune System
- L. The Digestive System
- M. Excretory System
- N. A Close Look at Carbohydrates
- O. The Need for Carbohydrates
- P. From Carbohydrates to Glucose
- Q. Refined, Enriched, and Whole-Grain Foods
- R. The Body's Use of Glucose
- S. Diabetes
- T. Management of Diabetes
- U. Hypoglycemia

UNIT 2: THE LIPIDS: FATS, OILS, PHOSPHOLIPIDS, AND STEROLS, THE PROTEINS AND AMINO ACIDS, AND THE VITAMINS – WEEKS 3-6

- A. Introducing the Lipids
- B. Usefulness of Fats in the Body
- C. Usefulness of Fats in Food
- D. Triglycerides: Fatty Acids and Glycerol
- E. Saturated Versus Unsaturated Fatty Acids
- F. Phospholipids and Sterols
- G. Digestion and Absorption of Fats

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- H. Transport of Fats
- I. Storage and Usage of Body Fats
- J. Dietary Fat, Cholesterol and Health
- K. Essential Polyunsaturated Fatty Acids
- L. Processing on Unsaturated Fats
- M. The Structure of Proteins
- N. Variety of Proteins
- O. Denaturation of Proteins
- P. Digestion and Absorption of Dietary Protein
- Q. Roles of Body Proteins
- R. Amino Acids to Glucose
- S. Food Protein: Need and Quality
- T. Nitrogen Balance
- U. Protein Deficiency and Excess
- V. Definition and Classification of Vitamins
- W. Fat Soluble Vitamins: Vitamins A, D, E, K; Roles and Consequences of Deficiency
- X. Water Soluble Vitamins: Vitamins B and C; Roles and Consequences of Deficiency

UNIT 3: WATER AND MINERALS, ENERGY BALANCE AND HEALTHY BODY WEIGHT, NUTRIENTS' PHYSICAL ACTIVITY AND THE BODY'S RESPONSE – WEEKS 6-8

- A. Why is Water the Most Indispensable Nutrient?
- B. The Body's Water Balance
- C. Safety and Sources of Drinking Water
- D. Body Fluids and Minerals
- E. The Major Minerals: Roles in the Body, Deficiencies and Toxicities
- F. The Trace Minerals: Roles in the Body, Deficiencies and Toxicities
- G. The Problems of Too Little or Too Much Body Fat
- H. Risks from Central Obesity
- I. The Body's Energy Balance
- J. Energy In and Energy Out
- K. Estimating Energy Requirements
- L. Body Weight Versus Body Fatness
- M. Body Mass Index
- N. Measures of Body Composition and Fat Distribution
- O. Hunger and Appetite
- P. Inside and Outside the Body Causes of Obesity

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- Q. How the Body Gains and Loses Weight
- R. Achieving and Maintaining a Healthy Body Weight
- S. Eating Disorders
- T. Benefits of Fitness
- U. Physical Activity Guidelines
- V. The Essentials of Fitness
- W. The Active Body's Use of Fuels
- X. Vitamins and Minerals – Keys to performance
- Y. Fluids and Temperature Regulation in Physical Activity

UNIT 4: DIET AND HEALTH, ORAL MANIFESTATIONS OF NUTRIENT DEFICIENCIES, LIFE STYLE NUTRITION-MOTHER AND INFANT, CHILD AND TEEN, OLDER ADULT – WEEKS 8-10

- A. Nutrition and Immunity
- B. The Concept of Risk Factors
- C. Cardiovascular Diseases
- D. Nutrition and Hypertension
- E. Nutrition and Cancer
- F. Dental Caries: Primary Factors to Consider
- G. Periodontal Diseases: Systemic and Behavioral Risk Factors
- H. Nutritional Guidance: Determining the Need and Developing a Plan
- I. Pregnancy: The Impact of Nutrition on the Future
- J. Increased Need for Nutrients During Pregnancy
- K. Weight Loss After Pregnancy
- L. Teen Pregnancy
- M. Alcohol and Pregnancy
- N. Lactation
- O. Feeding the Infant
- P. Feeding a Healthy Young Child
- Q. Mealtimes and Snacking
- R. Nutrient Deficiencies and Brain Impairment
- S. Food Allergy, Intolerance, and Aversion
- T. Nutrition in Adolescence
- U. Eating Patterns and Nutrient Intakes
- V. The Later Years
- W. Energy and Activity
- X. Protein Needs; Carbohydrates and Fiber; Fats and Arthritis; Vitamin Needs, Water and the Minerals
- Y. Food Choices of Older Adults

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Unit Objectives:

Unit One – Objectives

1. Describe the roles of nutrients in the body.
2. Discuss the ways that nutrition affects health.
3. List several personal life choices that affect health.
4. List the most vital nutrient, the three energy-yielding nutrients, and the two helper nutrients.
5. Describe ways that food conveys emotional satisfaction and hormonal stimuli.
6. Discuss the roles of the phytochemicals.
7. Describe the research process.
8. Explain the expression of cultural traditions and social values through food choices.
9. List four proposed U.S. nutrition-related health objectives.
10. List the foods that form the basis of a nutritious diet.
11. List, define and give examples of the five characteristics of a healthy diet.
12. Define Recommended Dietary Allowances and Dietary Reference Intakes.
13. Discuss the standards used on food labels.
14. Describe activities that are recommended for implementing nutrition recommendations.
15. Discuss how foods are grouped in the Daily Food Guide.
16. Describe how the Food Guide Pyramid provides guidance to achieving adequacy, balance, moderation, and variety.
17. List the drawbacks of the Food Guide Pyramid.
18. Describe how the Exchange System facilitates calorie control.
19. Discuss the importance of serving sizes in nutrition.
20. Describe the mechanical and chemical digestive processes in order of their occurrence in the body.
21. Discuss the processes of absorption, transportation, and storage of nutrients.
22. Distinguish among the various carbohydrates found in foods and in the human body.
23. Describe the body's use of glucose to provide energy or to make glycogen and fat.
24. Discuss diabetes, hypoglycemia, and lactose intolerance and their relationships to carbohydrate intake.
25. Discuss the roles of fiber-rich foods in the maintenance of the body's health and identify foods rich in fiber.

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26. List the chief functions and food sources of carbohydrate rich vitamins and describe any major deficiency and toxicity symptoms associated with each.
27. Describe the best method of planning a diet that is both rich in vitamins and consistent with the Dietary Guidelines.

Unit Two-Objectives

1. List the classification of lipids and give an example of each.
2. Define in writing the difference between saturated and unsaturated fatty acids.
3. Describe the major roles of fats in the body and in the diet.
4. Identify an essential fatty acid.
5. Describe three ways to avoid the spoilage problem with unsaturated oils.
6. Describe the body's use of triglycerides.
 - a. separation
 - b. emulsification
 - c. digestion and absorption
 - d. formation of lipoproteins
 - e. transport within the body
 - f. storage of fat
 - g. use of fat for energy
7. Define the role of lipoproteins in the absorption of fats.
8. Discuss the function of cholesterol in the diet.
9. Differentiate between HDL and LDL.
10. Give examples of foods in each food group which are low/high in fat.
11. Discuss the evidence which indicates that dietary fats may be related to heart disease.
12. Applying your knowledge of chemistry, state the chemical components of proteins.
13. Define the following: essential amino acid, complete protein, non essential amino acid, complementary protein, and incomplete protein.
14. Explain what is meant by "protein-sparing action".
15. Identify and discuss the roles of protein.
16. Describe the body's handling of protein to obtain maximum efficiency.
17. Identify the RDA for protein.
18. List examples of protein foods, including those containing complete proteins.
19. List the precautions a vegetarian must take in order to meet their protein needs.
20. Describe the signs and symptoms of the deficiency diseases related to inadequate protein in the diet.
21. Identify the general characteristics of fat-soluble vitamins.
22. Explain the major body functions of Vitamin A.



23. Explain the deficiency signs and symptoms associated with insufficient Vitamin A in the diet.
24. List the oral signs of Vitamin A deficiency.
25. Identify the toxicity symptoms associated with excess intakes of Vitamin A.
26. Explain how the Vitamin A in plants differs from the sources of Vitamin A in plant foods.
27. Identify food sources of Vitamin A in its active form and food sources of provitamin A.
28. Explain the major body functions of Vitamin D.
29. Describe the symptoms and signs of rickets and osteomalacia.
30. Identify both early and later symptoms and signs of Vitamin D toxicity.
31. List the oral symptoms of Vitamin D deficiency.
32. Identify sources of Vitamin D.
33. Explain the major body function of Vitamin E.
34. Identify some functions exploited by the media which are not directly controlled by Vitamin E.
35. Identify the probable sign of Vitamin E deficiency.
36. Describe those symptoms and signs which are currently thought to be associated with Vitamin E toxicity.
37. Explain the major body function of Vitamin K.
38. List the whole body and oral symptoms associated with Vitamin K deficiency.
39. Explain why Vitamin K deficiency is more prone to infants and adults on certain medications.
40. Identify sources of Vitamin K.
41. Identify the general characteristics of water-soluble vitamins.
42. Define co-enzyme.
43. Explain the role of the B vitamins in the catabolism of glucose.
44. Explain the major body functions of each of the B vitamins.
45. Describe the deficiency symptoms associated with each of the B vitamins.
46. List the oral signs of deficiencies associated with each of the B vitamins.
47. List the best food sources of all the B vitamins.
48. Explain why anemia is associated with a folacin deficiency, a B12 deficiency, or lack of the intrinsic factor.
49. List the ways to prevent losses of vitamin B in food handling.
50. Describe how the body handles excess intakes of the B vitamins.
51. Name the two active forms of Vitamin C.
52. Describe the metabolic roles of Vitamin C.
53. List the symptoms of scurvy.
54. State the oral signs of Vitamin C deficiency.
55. Identify those foods which are good sources of Vitamin C.
56. List the ways to protect Vitamin C in food handling.



57. Explain why megadoses of Vitamin C may be dangerous.
58. Give examples of situations which may require therapeutic doses of Vitamin C.

Unit Three – Objectives

1. Identify the seven major minerals in the body.
2. Identify the major roles of each of the seven major minerals.
3. Identify and describe the deficiency diseases associated with the major minerals.
4. List the food sources of calcium, phosphorus, potassium, sodium, chloride, sulfur, and magnesium.
5. Describe the roles of iron in the body.
6. Identify the best food sources of iron.
7. Explain why iron deficiencies are seen more often in females and children.
8. Describe the symptoms of iron-deficiency.
9. Describe the symptoms of excess iron, iodine, and fluoride intakes.
10. Identify the major body functions of iodine and zinc.
11. Describe the deficiency symptoms of iodine and zinc.
12. Identify the best food sources of iodine, zinc and fluoride.
13. Briefly describe the roles of copper, selenium, and chromium in the body.
14. Identify and discuss the functions of water in the body.
15. Identify four variables that affect the quality of water.
16. Discuss the effect of these variables in the body.
17. Identify the general characteristics of fat-soluble vitamins.
18. List and define the three components of the body's energy budget.
19. Identify and explain the factors that affect the basal metabolic rate.
20. Estimate your individual total energy expenditure.
21. Discuss the problems of too much or too little body fat.
22. Discuss the role of standard weight tables and BMI in defining obesity.
23. Evaluate the methods used to estimating body fatness.
24. Summarize the theories that attempt to explain the mystery of obesity.
25. Explain what happens during moderate weight loss versus rapid weight loss.
26. Summarize the recommended strategies to promote weight control and explain the roles surgery and pills play in this attempt.
27. Explain the benefits of and guidelines for regular physical activity.
28. Summarize how the body adjusts its fuel mix to respond to physical activity of varying intensity levels and duration.
29. Discuss the effects, if any, of a high-protein diet on athletic performance.
30. Describe the roles vitamins and minerals play in physical performance and indicate whether supplements are necessary to support the needs of active people.
31. List the risks of taking ergogenic aids and steroids.
32. Describe the best way to stay hydrated before and during exercise.



Unit Four – Objectives

1. Describe the role of nutrition in maintaining a healthy immune system.
2. Define atherosclerosis and identify the risk factors for cardiovascular disease.
3. Describe how hypertension develops and identify the risk factors associated with the disease.
4. Discuss strategies that can be used to reduce the risks of cardiovascular disease and hypertension.
5. Describe the process by which a cancer develops and explain what is known about the effects of food constituents on cancer development.
6. Describe how maternal nutrition before and during pregnancy affects both the development of the fetus and growth of the infant after birth.
7. Discuss maternal physiological adjustments that occur during pregnancy and explain how they influence energy and other nutrient requirements.
8. Explain why abstinence from smoking and drugs, avoiding dieting, and moderation in the use of caffeine are recommended during pregnancy.
9. Explain the effects of alcohol on the development of the fetus and describe fetal alcohol syndrome.
10. List the benefits of breastfeeding and indicate the changes a lactating woman needs to make in her diet to promote breastfeeding success.
11. Describe the circumstances when breastfeeding is not appropriate and explain healthy alternatives.
12. Plan a timetable for feeding foods to an infant from birth to 12 months of age.
13. Describe the nutrient needs of young children and appropriate feeding practices including issues of choking, portion sizes, and snacking.
14. Discuss nutrition-related concerns of children including the link between diet and behavior, the problem of lead, and the impact of television on nutrition.
15. Distinguish between food allergies, intolerances, and aversions.
16. Discuss the special nutrient needs and concerns of teenagers including the effect of diet on PMS and acne.
17. Describe special nutritional needs of older adults and the suspected connections between diet and disease.
18. Understand the multifaceted interactions between diet, nutrition and the synergistic bidirectional relationship between the two.
19. Relate dental caries and periodontal disease to nutritional factors.
20. Explain nutritional concerns with the following medically compromising conditions: diabetes, HIV, overweight and obesity, oral and pharyngeal cancer, osteoporosis.

