

# GENERAL AND DENTAL NUTRITION

Lamar Institute of  
Technology

DHYG 1207

Course Syllabus

Revised Spring 2018

Taught by:  
Deborah Brown, RDH, MS  
[dwbrown@lit.edu](mailto:dwbrown@lit.edu)  
(409) 880-8867



## TABLE OF CONTENTS

<b>COURSE DESCRIPTION .....</b>	<b>5</b>
<b>COURSE GOALS .....</b>	<b>5</b>
<b>CREDIT HOURS: .....</b>	<b>5</b>
<b>CLASSROOM: .....</b>	<b>5</b>
<b>CLASS MEETING TIME: .....</b>	<b>5</b>
<b>COURSE POLICIES .....</b>	<b>5</b>
<b>REQUIRED TEXTS.....</b>	<b>7</b>
<b>REFERENCE MATERIALS .....</b>	<b>7</b>
<b>COURSE REQUIREMENTSCOURSE REQUIREMENTS .....</b>	<b>7</b>
<b>EVALUATION CRITERIA .....</b>	<b>8</b>

## LECTURE SCHEDULE

January		
Week 1	Introduction to course <i>Overview of Healthy Eating Habits</i> <b>Intro to <a href="http://www.choosemyplate.gov">www.choosemyplate.gov</a></b>	Chapter 1
Week 1	<i>Continued - Overview of Healthy Eating Habits</i>	Chapter 1
Week 2	<i>Concepts in Biochemistry</i>	Chapter 2
Week 2	<i>The Alimentary Canal / Aspects of Gingivitis and Periodontal Disease</i>	Chapter 3 Chapter 19
February		
Week 3	<b>EXAM 1</b>	<b>Chapters 1,2,3,19</b>
Week 3	<i>Carbohydrate: The Efficient Fuel</i>	Chapter 4
Week 4	<i>Carbohydrate: The Efficient Fuel Continued – Carbohydrates Nutritional Aspects of Dental Caries</i>	Chapter 4 Chapter 18
Week 4	<i>Continued - Nutritional Aspects of Dental Caries</i>	Chapter 18
Week 5	Protein: The Cellular Foundation	Chapter 5
Week 5	<i>Nutritional Aspects of Alterations in the Oral Cavity Portion Size Me</i>	Chapter 20 Video
Week 6	<b>EXAM 2</b>	<b>Chapters 4,5,18,20</b>
Week 6	Lipids: The Condensed Energy	Chapter 6
March		
Week 7	<i>Effects of Systemic Disease on Nutritional Status</i>	Chapter 17
Week 7	<i>Continued- Effects of Systemic Disease on Nutritional Status</i>	Chapter 17
Week 8	Use of the Energy Nutrients: Metabolism and Balance	Chapter 7
Week 9	<b>NO CLASS – Spring Break</b>	
Week 10	Vitamins Required for Calcified Structures: A, D, E, K, C	Chapter 8
Week 10	<i>Continued- Vitamins Required for Calcified Structures: A, D, E, K, C</i>	Chapter 8
Week 11	<b>EXAM 3</b>	<b>Chapters 6,7,8,17</b>
Week 11	<i>Nutritional Requirements Affecting Oral Health in Women</i>	Chapter 13
April		
Week 12	<i>Continued-Nutritional Requirements Affecting Oral Health in Women</i> Minerals Essential for Calcified Structures	Chapter 13 Chapter 9 <b>DUE: Personal</b>

		<b>Food Diary Assessment</b>
Week 12	<i>Continue Minerals Essential for Calcified Structures Nutrients Present in Calcified Structures</i>	Chapter 9 Chapter 10
Week 13	<i>Vitamins Required for Oral Soft Tissues and Salivary Glands</i>	Chapter 11
Week 13	<i>Continued-Vitamins Required for Oral Soft Tissues and Salivary Glands</i>	Chapter 11
Week 14	<b>EXAM 4</b>	<b>Chapters 9,10,11,13</b>
Week 14	<i>Nutritional Requirements During Growth &amp; Development</i>	Chapter 14
Week 15	<i>Continued- Nutritional Requirements During Growth &amp; Development Water and Minerals Required for Oral Soft Tissues and Salivary Glands</i>	Chapter 14 Chapter 12
Week 15	<i>Continue Water and Minerals Required for Oral Soft Tissues and Salivary Glands Nutritional Requirements for Older</i>	Chapter 12 Chapter 15
<b>May</b>		
Week 16	<i>Nutritional Assessment and Counseling for Dental Hygiene Patients</i>	Chapter 21 Video of Counseling
Week 16	<i>Continue Nutritional Assessment and Counseling for Dental Hygiene Patients</i>	Chapter 21
Finals Week	<b>EXAM 5</b>	<b>Chapters 12,14,15,21</b>

## COURSE DESCRIPTION

A study of general nutrition and nutritional biochemistry emphasizing the effect nutrition has on oral health.

## PRE-REQUISITE

DHYG 1301, 1431, 1304, & 1227.

## CO-REQUISITE

DHYG 1219, 1235, 1260, & 2301.

## COURSE GOALS

The student will;

1. Demonstrate knowledge of basic concepts in nutritional biochemistry,
2. Understand the concept of RDA's, nutrient density, choosemyplate.gov, and food labeling.
3. Demonstrate competency in utilizing a table of the nutrient value of common foods.
4. Identify and explain the six classes of nutrients.
5. Demonstrate the digestion, transport and absorption of nutrients in the human.
6. Recognize the nutritional variations during the life cycle and state their importance in the prevention of disease.
7. Apply dental nutrition concepts through the preparation and presentation of a nutrition counseling session for the management of diet related dental problems.

**CREDIT HOURS:** 2 semester hours

**CLASSROOM:** 103 MPC

**CLASS MEETING TIME:** 11:00 – 11:50 am Tuesday & Thursday

## INSTRUCTOR

Debbie Brown, RDH, MS, Associate Professor

Office: Rm 216 MPC

Phone: 409-880-8867

E-mail: [dwbrown@lit.edu](mailto:dwbrown@lit.edu)

Students should discuss questions by appointment or as the instructor is available.

## COURSE POLICIES

### 1. Attendance Policy

#### Absenteeism

In order to ensure the students in the dental hygiene program achieve the necessary didactic and clinical competencies outlined in the curriculum, it is necessary that the student complete all assigned lecture classes, clinical and laboratory hours. It is the responsibility of the student to attend class, clinic or lab. The instructor expects each student to be present at each session.

It is expected that students will appear to take their exams at the regularly scheduled examination time. Make-up examinations will be given **only** if the absence is due to illness (confirmed by a physicians' excuse), a death in the immediate family, or at the discretion of the instructor.

If students are unable to attend lecture class, clinic or lab, it is **mandatory that you call the appropriate instructor**

**prior to the scheduled class, clinic or lab time.** The student is responsible for all material missed at the time of absence. Extenuating circumstances will be taken into account. Extenuating circumstances might include but are not limited to: funeral of immediate family member, maternity, hospitalization, etc. If the student has surgery, a debilitating injury, or an extended illness, a doctor's release will be required before returning to clinic.

**a. Fall/Spring Semesters:**

Dental hygiene students will be allowed **two excused absences** in any lecture, clinic or lab. Absences must be accompanied by a written excuse on the next class day. In the event that a student misses class, clinic or lab beyond the allowed absences, the following policy will be enforced:

2 absences = verbal warning

Beginning with the 3 absence, **2 points** will be deducted from the final course grade for each absence thereafter.

**Tardiness**

Tardiness is disruptive to the instructor and the students in the classroom. It is expected that students will arrive on time for class, clinic or lab, and remain until dismissed by the instructor. If tardiness becomes an issue, the following policy will be enforced:

Tardy 1 time = verbal warning

Tardy 2 times is considered an absence.

**Students should plan on attending classes, labs and clinic sessions as assigned throughout the semester. Family outings, vacations and personal business should be scheduled when school is not in session and will not be considered excuses for missing assignments, examinations, classes, labs or clinic time.**

**If students are unable to attend lecture class, clinic or lab, it is mandatory that you call the appropriate instructor prior to the scheduled class, clinic or lab time. The student is responsible for all material missed at the time of absence. Extenuating circumstances will be taken into account. Extenuating circumstances might include but are not limited to: funeral of immediate family member, maternity, hospitalization, etc.**

**2. Disabilities Statement.** The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities.

If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building. You may also visit the online resource at <http://www.lit.edu/depts/stuserv/special/defaults.aspx>.

**3. Student Code of Conduct Statement**

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at [www.lit.edu](http://www.lit.edu) or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.

**4. Technical Requirements (for Blackboard)**

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at: [https://help.blackboard.com/en-us/Learn/9.1\\_2014\\_04/Student/015\\_Browser\\_Support/015\\_Browser\\_Support\\_Policy](https://help.blackboard.com/en-us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy). A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

**5. Examination Policy.** Students are expected to complete examinations as scheduled. Make-up examinations will be given only if the absence is due to illness (confirmed by a physician's excuse), a death in the immediate family or at the discretion of the instructor. All make-up examinations must be taken within one week following the original exam date. All examinations must be returned to the instructor to be kept on file. Students may have access to the examinations by appointment during the instructor's office hours. Exams may be reviewed up to two weeks following the exam date.

**6. Late Work.** Assignments will not be accepted if turned in late. Please refer to the student handbook for a comprehensive listing of the program policies. Faculty has the authority to modify the above policies if unusual circumstances mandate a change.

**7. Electronic equipment/cell phones.** Cell phones should be turned off during class time. No texting from cell phones, smart watches or computers will be allowed during the posted hours for class.

**8. Leaving Class during Lecture.** You should be prepared to remain in class for the entire class period. Any personal business should be taken care of prior to or after class. If a medical problem exists or an emergency occurs please inform the instructor.

**9. Remediation.** Remediation is available by appointment with the instructor. Please advise the instructor if you feel you need remediation and every effort will be made to accommodate you.

## TEACHING METHODS

Lecture, class discussion, audiovisual, personal dietary assessment, reading assignments.

## REQUIRED TEXTS

Davis, J. & Stegeman, C. (2019) The Dental Hygienist's Guide to Nutritional Care, 5<sup>th</sup> edition, Elsevier Saunders: St. Louis, Missouri. ISBN: 978-0-323-49727-5.

## REFERENCE MATERIALS

Collene, A., Smith, A.M. & Wardlaw, G.M. (2015) Contemporary Nutrition, 10<sup>th</sup> edition, McGraw-Hill: New York, NY.

Nix, S. (2013) Williams' Basic Nutrition & Diet Therapy, 14<sup>th</sup> edition, Elsevier Mosby: St. Louis, Missouri.

Palmer, G.A. (2007) Diet and Nutrition in Oral Health, 2<sup>nd</sup> edition, Prentice Hall: Upper Saddle River.

<http://www.choosemyplate.gov/>

Sroda, R. (2010) Nutrition for a Healthy Mouth, 2<sup>nd</sup> edition, Lippincott Williams & Wilkins: Baltimore & Philadelphia.

## INSTRUCTIONAL AIDS

Nutrition, Diet and Dental Health: Methods. ADHA self-study course on nutrition and relationship to caries and periodontal disease.

## COURSE REQUIREMENTS

1. Requirements for this course include five tests, one Personal Food Diary Project, and class participation grade. The student must pass the course with a 75% or higher in order to receive credit for DHYG 1207.
2. **Personal Food Diary Project.** The purpose of the counseling project is to afford the dental hygiene student the opportunity to apply the learned nutritional principles on themselves before applying them to a patient. Complete instructions may be found in the course addendum.
  - A. **Documentation.** Each student must complete all clinical forms.
  - B. **Written Report.** The will provide a written summary using the information from [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov), Dietary Guidelines, nutrient intake and food group report. The student will compare food intake to the nutrients highlighted, bolded, and underlined on the dietary assessment form. For more detail see course addendum.
  - C. **Computer Usage.** Students must be familiar with current computer programs utilized in contemporary dental office settings. Therefore, students must utilize the on-line site of [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov) to complete the diet analysis. This site may be accessed on any computer with internet capabilities.

## **EVALUATION CRITERIA**

Student must earn a grade of "C" or better to progress in the curriculum.

Exams (5)	75%
Personal Food Diary Project	20%
Class Participation	5%

### Grade Scale

A	92 - 100
B	83 - 91
C	75 - 82
D	60 - 74
F	Below 60



## CONTENT OUTLINE

### Overview of Healthy Eating Habits

- a. Nutrients
  - 1. essential nutrients
  - 2. function
  - 3. energy value (Kcalorie)
- b. Energy Needs of the Body
  - 1. basal metabolism
  - 2. basal metabolic rate
  - 3. energy expenditure factors
- c. Food Choice Guidance
- d. Dietary Standards
- e. Food Labeling
  - 1. Daily Reference Values
  - 2. Reference Daily Intakes

### Concepts in Biochemistry

- a. Fundamentals of biochemistry
- b. Principles of biomolecules in nutrition

### The Alimentary Canal: Digestion and Absorption

- a. Functions of each digestive organ
- b. Chemical secretions necessary for digestion of nutrients
- c. Where the chemical secretions are secreted
- d. How digestion and absorption affect nutritional status

### Carbohydrates

- a. Introduction
- b. Classification
  - 1. Monosaccharides
    - a. glucose
    - b. fructose
    - c. galactose
  - 2. Disaccharides
    - a. sucrose
    - b. lactose
    - c. maltose
  - 3. Polysaccharides
    - a. starch
    - b. glycogen
    - c. dietary fiber
      - 1. soluble
      - 2. insoluble
      - 3. Relationship between dietary fiber and health
- c. Physiologic Role
- d. Requirements
- e. Sources
- f. Hyper and Hypo States
  - 1. Carbohydrate excess
  - 2. Carbohydrate deficiency
  - 3. Dental caries
  - 4. Obesity
- g. Sugar Substitutes
  - 1. sugar alcohols
  - 2. flavinoid sweeteners

3. saccharin
4. aspartame
5. acesulfame K
6. cyclamates
7. xyitol
8. stevia plant

### **Protein**

- a. Classification
  1. Essential
  2. Nonessential
  3. Conditionally essential
- b. Measures of Protein Quality
  1. Complete and incomplete
  2. Biologic Value
  3. Nitrogen Balance
- c. Physiologic Roles
- d. Requirements
- e. Digestion and Metabolism
- f. Sources
  1. Bioavailability
- g. Under-consumption and Health-Related Problems
  1. Marasmus
  2. Kwashikor
- h. Over-consumption and Health-Related Problems

### **Lipids**

- a. Overview
- b. Functions
- c. Types
  1. triglycerides
  2. other dietary lipids
    - a. phospholipids
    - b. sterols
    - c. essential fatty acids
    - d. other
- d. Digestion and absorption
- e. Metabolism and storage
- f. Current Patterns of Consumption
- g. Dietary Requirements
- h. Sources
- i. Role in health
  1. Obesity
  2. Fats and coronary Heart Disease
  3. Cancer
  4. Hyperlipidemia
- j. Fats and Oral Health
  1. Dental caries
  2. Parotid enlargement

### **Use of Energy Nutrients: Metabolism and Balance**

- a. Metabolism
  1. Catabolism
  2. Anabolism
- b. Krebs Cycle
- c. Carbohydrate Metabolism
- d. Protein Metabolism

- e. Lipid Metabolism
- f. Alcohol Metabolism
- g. Metabolic Interrelationships
- h. Metabolic energy
- i. Basal Metabolic Rate (BMR)
  - 1. Factors affecting BMR
- j. Total Energy Requirements
  - 1. Basal energy expenditure (BEE)
    - a. Factors affecting BEE
- k. Energy Balance
  - 1. Factors affecting energy balance

**Vitamins Required for Calcified Structures (A,D,E,K,C)**

- a. Vitamin A
  - 1. Functions
    - a. Visual purple
    - b. Relationship between vitamin A deficiency and cancer
    - c. Maintenance of epithelial cells and tissues
    - d. Promotion of bone remodeling
    - e. Activation of cell membranes
  - 2. Function in oral structures
    - a. Periodontium
    - b. Teeth
    - c. Salivary glands
    - d. Oral mucous membranes
    - e. Cleft lip and palate
  - 3. RDA
  - 4. Sources
  - 5. Therapy
  - 6. Toxicity
- b. Vitamin D
  - 1. Absorption, transport, and storage
  - 2. Metabolism
  - 3. Function
  - 4. RDA
  - 5. Sources
  - 6. Therapy
  - 7. Deficiency
- c. Vitamin E
  - 1. Absorption and metabolism
  - 2. Function
  - 3. Therapy
  - 4. RDA
  - 5. Sources
  - 6. Myths and facts
  - 7. Toxicity
- d. Vitamin K
  - 1. Absorption
  - 2. Function
  - 3. Deficiency
  - 4. Vitamin K and Periodontal disease
  - 5. Therapy
  - 6. RDA
  - 7. Sources
- e. Vitamin C
  - 1. Absorption, transport, and storage
  - 2. Metabolism

3. Function
4. RDA
5. Sources
6. Therapy
7. Deficiency

### **Vitamins Required for Oral Soft Tissues and Salivary Glands**

- a. The B Vitamins
  1. Function
  2. Sources
  3. Requirements
  4. Deficiency
  5. Toxicity
  6. Effect on general and oral health
- b. Folic Acid
  1. Function
  2. Sources
  3. Requirements
  4. Deficiency
  5. Toxicity
  6. Effect on general and oral health
- c. Vitamin B<sub>12</sub> (Cobalamin)
  1. Function
  2. Sources
  3. Requirements
  4. Deficiency
  5. Toxicity
  6. Effect on general and oral health
- d. Vitamin B<sub>6</sub> (Pyridoxine)
  1. Function
  2. Sources
  3. Requirements
  4. Deficiency
  5. Toxicity
  6. Effect on general and oral health
- e. Vitamin B<sub>1</sub> (Thiamin)
  1. Function
  2. Sources
  3. Requirements
  4. Deficiency
  5. Toxicity
  6. Effect on general and oral health
- f. Vitamin B<sub>2</sub> (Riboflavin)
  1. Function
  2. Sources
  3. Requirements
  4. Deficiency
  5. Toxicity
  6. Effect on general and oral health
- g. Vitamin B<sub>3</sub> (Niacin)
  1. Function
  2. Sources
  3. Requirements
  4. Deficiency
  5. Toxicity
  6. Effect on general and oral health

- h. Pantothenic Acid
  - 1. Function
  - 2. Sources
  - 3. Requirements
  - 4. Deficiency
  - 5. Toxicity
  - 6. Effect on general and oral health
- i. Biotin
  - 1. Function
  - 2. Sources
  - 3. Requirements
  - 4. Deficiency
  - 5. Toxicity
  - 6. Effect on general and oral health
- j. Vitamin-like Substance and Other Claimed Nutrients

**Minerals Essential for Calcified Structures & Nutrients Present in Calcified Structures**

- a. Macrominerals
  - 1. Distribution
  - 2. Function
  - 3. Absorptions
  - 4. Storage
  - 5. Excretion
  - 6. Fluid & electrolyte balance
  - 7. Acid-base balance
  - 8. Dietary sources
  - 9. RDA
  - 10. Deficiency
  - 11. Toxicity
  - 12. Hypertension
  - 13. Effect on general and oral health
- b. Trace Minerals
  - 1. Activators of enzyme systems
  - 2. Function
  - 3. RDA
  - 4. Dietary sources
  - 5. Deficiency
  - 6. Toxicity
  - 7. Effect on general and oral health

**Water and Minerals Required for Oral Soft Tissues and Salivary Glands**

- a. Distribution
  - 1. Factors which affect distribution
- b. Functions
- c. Sources
- d. Requirements
- e. Regulation
  - 1. Disturbances in water balance
- f. Sodium
  - 1. Function
  - 2. Daily requirements
  - 3. Sources
  - 4. Deficiency
  - 5. Dietary restriction
- g. Acid-base balance
- h. Hypertension

### **Nutritional Requirements Affecting Oral Health in Women, During Growth & Development, in Older Adults**

- a. Terms
- b. Growth
- c. Newborns
  - 1. Requirements
  - 2. Feeding Practices
  - 3. Oral Problems in infants
- d. Toddler & Preschool Children
  - 1. Toddlers
  - 2. Preschool Children
  - 3. Oral Problems of Toddlers and Preschool Children
- e. Adolescents
  - 1. Requirements
  - 2. Influential Factors on Eating Habits
  - 3. Counseling
- f. Maturity in the Life Cycle
  - 1. Physiologic Factors Influencing Nutritional Needs and Status
  - 2. Physiologic Changes in the Oral Cavity
  - 3. Socioeconomic and Psychological Factors
  - 4. Other Factors
  - 5. Nutrient Requirements

### **Other Considerations Affecting Nutrient Intake**

- a. Food patterns
- b. Cultural Influences
- c. Working with patients of different cultures
- d. Factors affecting nutrient intake
  - 1. Budget
  - 2. Food preparation
  - 3. Food fads and misinformation

### **Effects of Systemic Disease on Nutritional Status**

- a. Effects of chronic disease
- b. Mental health problems
  - 1. anorexia
  - 2. bulimia
    - a. Symptoms
    - b. Medical complications
    - c. Oral manifestations
    - d. Nutritional requirements
- c. Gustatory and olfactory functions
- d. Xerostomia
- e. The anemias
  - 1. Iron deficient anemia
  - 2. Plummer-Vinson Syndrome
  - 3. Megablastic anemia
  - 4. Folic acid deficiency
  - 5. Thalassemia
  - 6. Aplastic anemia
- h. Gastrointestinal Problems
- i. Cardiovascular Conditions
- j. Cerebrovascular Accidents
- k. Skeletal System
- l. Metabolic Problems
- m. Neuromuscular Problems
- n. Neoplasia

- o. AIDS

**Nutritional Aspects of Periodontal Disease**

- a. Physical effects of food on periodontal health
- b. Nutrient composition
- c. Food consistency
- d. Nutritional considerations for periodontal patients
- e. NUG
- f. Gingivitis
- g. Periodontitis
- h. Nutritional management
- i. Dietary recommendations
- j. Periodontal surgery
- k. Post operative care

**Nutritional Aspects of Alterations in the Oral Cavity**

- a. Conditions that interfere with food intake
- b. Xerostomia
- c. Root caries
- d. Dentition status
- e. Alveolar osteoporosis
- f. Glossitis

**Nutritional Assessment and Counseling for Dental Hygiene Patients**

- a. Diet counseling
- b. Evaluation of the Patient
- c. Assessment of Nutritional Status
- d. Formation of Nutrition Treatment Plan
- e. Facilitative Communication Skills
- f. General Principles for Caries Prevention
- g. Food Diaries
- h. Evaluation of Food Diaries

## Learner Objectives

### Overview of Healthy Eating Habits

1. Define the terms: nutrition, nutrients, metabolism, essential and non-essential nutrients.
2. Explain the energy value, kcal, of food.
3. List the general physiologic functions of the six nutrient classifications of foods.
4. Identify factors that influence food habits
5. Name the food groups on MyPlate.
6. Determine the amounts needed from each of the food groups on MyPlate for a well-balanced 2000 kilocalorie diet.
7. Identify significant nutrient contributions of each food group.
8. State the Dietary Guidelines for Americans and their purpose.
9. Identify dietary selections in each food group that significantly affect intake of calories, fats, salt, and sugar.
10. Assess dietary intake of a patient, using the Dietary Guidelines for Americans and MyPlate.
11. Diagram and explain a food label. Explain the requirements of both ingredient labeling and nutritional labeling.
12. Explain the term, Daily Value (DV), Daily Reference Value (DRV), and Reference Daily Intake (RDI). Compare the DV, DRV, and RDI to the RDA.

### Concepts in Biochemistry

1. Explain the role of biochemistry in dental hygiene and nutrition.
2. Compare and contrast the structure, function, and properties of the four major classes of biomolecules (carbohydrates, proteins, nucleic acids, and lipids).
3. Outline the structure, function, and property of monosaccharides, disaccharides, and polysaccharides.
4. Outline the structure, function, and property of amino acids and proteins.
5. Compare and contrast the roles of enzymes, coenzymes, and vitamins in nutrition.
6. Outline the structure, function, and property of fatty acids, triglycerides, and steroids.
7. Differentiate catabolism from anabolism. Explain connections between metabolic pathways in carbohydrate, protein, and lipid metabolism.

### The Alimentary Canal: Digestion and Absorption

1. Describe general functions of each digestive organ.
2. Identify chemical secretions necessary for digestion of energy-containing nutrients and in what parts of the gastrointestinal tract they are secreted.
3. Describe how digestion and absorption may affect nutritional status and oral health.

### Carbohydrate: The Efficient Fuel

1. Define carbohydrates and the three most common classifications of carbohydrates.
2. Differentiate among monosaccharides, disaccharides, and polysaccharides.
3. Describe the health benefits of fiber, including difference effects of soluble versus insoluble fiber.
4. Identify and describe the physiologic role of carbohydrates.
5. Identify sources of carbohydrates.
6. Discuss the complications that result from carbohydrate excess and deficiency.
7. Describe the role of carbohydrates in the caries process.
8. Discuss the sugar substitutes and their assets, limitations and applications.
9. Describe the relationship between carbohydrates and lactose intolerance.

### Protein: The Cellular Foundation

1. Describe the structure of an amino acid and the variations that exist.
2. Compare and contrast the terms essential and nonessential amino acids.
3. List the 9 essential amino acids and the 11 nonessential amino acids.
4. Discuss the measures of protein quality.
5. Explain the physiologic roles of protein.
6. Identify the protein requirements for adults. Given a body weight, calculate the protein requirement.
7. Identify the factors which may impact the protein requirement for an individual.
8. Identify protein sources within the basic food groups. Discuss the bioavailability of animal and plant sources of protein.



9. Identify protein sources for individuals with various dietary restrictions.
10. State the problems associated with protein deficiency and excess.
11. Describe the PEM diseases of Kwashiorkor and Marasmus. Identify symptoms typical of the disease.
12. Outline the dental problems associated with protein deficiency.

### **Lipids: The Condensed Energy**

1. Explain the justification for the descriptive term **Condensed energy** when referring to lipids.
2. Discuss the characteristics of a triglyceride lipid. Explain the effect of structure in solution.
3. Explain the term saturated, unsaturated, and polyunsaturated lipids. List sources of each and the impact on health.
4. Explain the terms trans and cis as related to the overall appearance of the fatty acid chain.
5. Identify the impact of the configuration on health.
6. What impact do Omega - 3 fatty acids have on the health of the individual when compared to Omega - 6 fatty acids?
7. Describe the appearance of true fats at room temperature. Identify factors that affect the consistency of fats.
8. List two compound lipid structures and their role in human physiology.
9. Discuss the lipoprotein, cholesterol. Identify the function, types, and physiology of cholesterol formation.
10. Identify and explain the physiologic role of lipids.
11. Discuss dietary fats and dental health.
12. Identify the requirements and sources for fat and fatty acids.
13. Identify the health concerns associated with over and under-consumption of fat.
14. List the advantages and disadvantages of fat replacers.

### **Utilization of The Energy Nutrients: Metabolism and Balance**

1. Calculate energy needs according to the patient's weight and activities.
2. Explain physiological sources of energy.
3. Explain Basal Metabolic Rate (BMR) and the factors that affect the BMR.
4. Discuss the calculations made to determine Total Energy Requirements.
5. Identify the factors that affect energy balance.

### **Vitamins Required for Calcified Structures**

1. Identify the four fat-soluble vitamins.
2. Compare the characteristics of water-soluble vitamins with those of fat-soluble vitamins.
3. Identify functions, deficiencies, surpluses, and toxicities, and oral symptoms for vitamins A, D, E, K, and C.
4. Select food sources for Vitamins A, D, E, K, and C.

### **Minerals Essential for Calcified Structures**

1. List the minerals found in collagen, bones, and teeth.
2. Describe how the body uses minerals to help maintain fluid and electrolyte balance and acid-base balance.
3. Describe the mineral regulation in the body.
4. Identify the dietary sources, RDA, and any toxicity that may result in the human diet.
5. Discuss the effect of the mineral deficiency or oversupply in the oral cavity and human body.

### **Nutrients Present in Calcified Structures**

1. Describe the physiological roles of specific minerals and how these apply to oral health, along with sources of copper, selenium, chromium, and manganese.
2. List ultratrace elements present in the body.
3. Identify reasons why large amounts of one mineral may cause nutritional deficiencies of another.

### **Vitamins Required for Oral Soft Tissues and Salivary Glands**

1. Describe the classification of the B complex vitamins.
2. Identify the function, and absorption for each of the B complex vitamins and vitamin-like compounds (thiamin, riboflavin, niacin, pantothenic acid, biotin, B<sub>6</sub>, and B<sub>12</sub>).
3. Identify the diagnosis of deficiency, and toxicity for each of the B complex vitamins.

4. Identify the food sources and Recommended Dietary Allowance for each of the B complex vitamins.

### **Fluids and Minerals Required For Oral Soft Tissues and Salivary Glands**

1. Describe the process of osmosis.
2. Discuss the electrolytes. Include the physiological role, requirements, sources, deficiency state, toxicity state, and regulation for each.
3. List normal fluid requirements and identify factors that may affect these requirements.
4. Discuss sodium, potassium, zinc, iodine and iron. Include the physiological role, requirements, sources, deficiency state, toxicity state, and regulation for each.
5. Identify oral signs and symptoms of fluid and electrolyte imbalances.
6. Discuss areas of nutritional concern with patients who have fluid and electrolyte imbalances.
7. Determine which diseases and medications may require patients to restrict sodium intake.

### **Nutritional Requirements Affecting Oral Health in Women**

1. Assess nutrients commonly supplemented during pregnancy and lactation.
2. Use recommended guidelines to assess food intake of pregnant and lactating women for adequate nutrients.
3. Implement nutrition and oral health considerations for patients who are pregnant or breastfeeding.
4. Describe each factor affecting fetal development.

### **Nutritional Requirements during Growth and Development and Eating Habits Affecting Oral Health**

1. Describe the major dietary life cycles and the nutritional requirements specific to each cycle.
2. Identify the nutritional requirements specific to the adolescent female.
3. Discuss ways to handle typical nutritional problems that occur in infants, young children, school-age children, and adolescents.
4. Apply dental aspects related to nutritional needs during infancy, early childhood, elementary school years and adolescence to patient care.

### **Nutritional Requirements for Older Adults and Eating Habits Affecting Oral Health**

1. Discuss ways to handle typical nutritional problems occurring in older adults.
2. Examine dental considerations of nutritional needs that occur in older patients.
3. Identify nutrition education needs for older patients.
4. Discuss physiological changes altering an older individual's nutritional status.
5. Discuss differences in amounts of nutrients needed by older patients compared with younger patients.

### **Effects of Systemic Disease on Nutritional Status and Oral Health**

1. Discuss the various diseases, conditions, and treatments that commonly have oral signs and symptoms.
2. Distinguish between primary and secondary nutritional deficiencies.
3. Discuss disease states, conditions, and accompanying treatments likely to affect nutritional intake.
4. Critically assess the implications of a patient's systemic diseases or conditions for optimal oral health.
5. Describe the procedure to assess a patient's nutritional status.
6. Identify three major changes that occur in the oral cavity as a result of nutritional deficiencies.
7. Describe the role of nutritional deficiencies in cheilosis, angular stomatitis, glossitis, gingivitis, oral mucosa inflammation.
8. Describe the nutritional management of acute problems of the oral mucosa.
9. Identify the situations when vitamin supplementation is appropriate.

### **Nutritional Aspects of Dental Caries: Causes, Prevention, and Treatment**

1. Explain the role each of the following play in the caries process: tooth, saliva, food, and plaque biofilm.
2. Explain the relationship of sugar alcohols, starches, and sugars to dental caries.
3. Explain the relationship between the texture of food and dental caries.
4. Discuss the comparative cariogenicity of starch and sugar in humans.
5. Explain the significance of the Stephan Curve.
6. Know the instrument used to assess diet in relation to caries.
7. Know the groups of foods which are high caries risks.
8. Discuss the evidence for the relationship of caries to bacteria and carbohydrates.
9. List the bacteria that play a significant role in caries development.

10. Describe a diet which would be considered non-cariogenic.

#### **Nutritional Aspects of Gingivitis and Periodontal Disease**

1. Identify the means by which nutritional deficiencies can contribute to periodontal disease.
2. Discuss the conclusions about the local effects of the physical consistency of food on periodontal health.
3. Identify the etiology of ANUG and describe the recommended dietary prescription.
4. Identify and describe each step for giving nutritional guidance to a patient with chronic periodontitis.
5. Describe the goal for prescribing a diet before periodontal surgery.
6. List three benefits from good nutrition in regard to periodontal tissues.
7. Discuss the use of firm, fibrous foods to a) remove plaque, b) stimulate saliva, and c) provide for food removal or oral clearance.
8. Discuss the need for high protein food supplements before and after periodontal surgery.
9. Describe a recommended post-operative dietary management for office periodontal patients.

#### **Nutritional Aspects of Alterations in the Oral Cavity**

1. Describe the common signs and symptoms of xerostomia and glossitis.
2. Synthesize appropriate dietary and oral hygiene recommendations for a patient with orthodontics, xerostomia, root caries, dentin hypersensitivity, glossitis, temporomandibular disorder, or removable prosthetic appliances.
3. Identify dietary guidelines appropriate for a patient undergoing oral surgery and a patient with a new denture, before and after insertion.

#### **Nutritional Assessment and Education for Dental Patients**

1. Describe the two effects of nutrition on dentition.
2. Identify the food choices and eating habits which merit attention during a diet counseling session.
3. Explain Shaw's statement, "The frequency of eating, the amount of food retained in the mouth particularly on tooth surfaces, and the length of time that food residues are retained in critical areas are more important than the total amount of sugars consumed."
4. What the diet counselor should incorporate into the diet prescription whenever possible.
5. Discuss the basic prerequisite for accomplishing dietary change and the minimal requirements for a successful dietary counseling service.
6. Describe the type of patient that would most likely benefit from a diet counseling service.
7. List the communication techniques that will have a beneficial effect on effective communication.
8. Explain the first and basic goal in interviewing. Discuss the characteristics of the physical setting, diet interviewer, and the interview techniques that will result in a successful interview.
9. Explain the four rules that should be adopted when making dietary modifications.
10. Describe the instructions given to a patient keeping a 5 Day Food Intake Diary.
11. Summarize the guidelines and the dietary counseling for caries prevention and control.