

For the most up to date version of this syllabus, please click on or copy/paste link below directly into browser:
<https://docs.google.com/document/d/1n06-S9JrobranLYgOaR6phSLSxTIGY-Td-9QnrNckEk/edit?usp=sharing>

NUTC200
FOUNDATIONS OF NUTRITION SCIENCE
Tufts University, Friedman School of Nutrition Science and Policy
FALL 2020
(September 8 - December 13, 2020)

Students are not required to attend classes, but must have access to a reliable computer and internet connection to download pre-recorded lectures and course materials. The online learning management system used for administering this course is called Canvas. Students will be able to access the course website through Canvas by 5pm (EDT) on Friday, September 4, 2020. An orientation to Canvas is provided under Dashboard (once you login via canvas.tufts.edu), and an orientation to the layout of the course itself will be provided under Modules.

Instructor:

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Office Hours: email (24/7) or online (Zoom, Skype or Webex) by appointment

Teaching Assistant (TA):

Thanit (Pao) Vinitchagoon, MS, RD

PhD Candidate, Nutrition Interventions, Communication, and Behavior Change

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TA Office hours: email (24/7) or online (Zoom or Skype) appointment

Tufts Credit: 3.0 semester hour units

Course Description:

To provide an understanding of basic nutrition science to students with a limited scientific background. Students will become familiar with: the principles of diet planning, government standards, and food labeling; the biological functions and food sources of each macro- and micronutrient; energy balance, weight management, and physical activity; the role of nutrition in chronic disease development; nutrition throughout the life cycle; food safety issues; and current nutrition-related controversies.

Course Objectives:

By the end of the course, students will be able to:

- Describe the components of a healthy diet, and critically evaluate the quality of their own diet.
 - Identify the major functions and food sources of each macronutrient (carbohydrate, protein, lipids) and micronutrient (vitamins and minerals).
 - Explain the role of diet in maintaining health and preventing chronic disease.
 - Summarize the nutrients of concern during human growth and development, and throughout the aging process.
 - Assess the quality of nutrition information presented in the media.
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Textbook and Software:

STUDENTS ARE STRONGLY ENCOURAGED TO PURCHASE THE REQUIRED TEXTBOOK AND SOFTWARE AT LEAST 2 WEEKS BEFORE THE CLASS STARTS.

All versions of the required text and software are available for purchase directly from the publisher at www.cengagebrain.com. Do NOT purchase their MindTap product. The print version of the text is also available on other websites.

REQUIRED TEXT:

Understanding Nutrition (Wadsworth Cengage, 15th edition, 2019), by Eleanor Noss Whitney and Sharon Rady Rolfes. Available in either hardcover (ISBN 9781337392693), looseleaf (ISBN 9781337556316) and e-book format (ISBN 9781337677516). The 14th or 13th editions of this text are also acceptable (**used copies of these earlier editions are more widely available and less expensive!**).

When ordering the print version of the text, keep in mind that it may take up to 2 weeks for shipping. (In the event that your textbook does not arrive by the start of class, please note that Chapters 1-3 of the 15th edition will be available online via Canvas under Modules>Course Orientation>Textbook Chapters).

REQUIRED SOFTWARE:

1.) Diet and Wellness Plus (web-based software program from CengageBrain) will be used for analyzing your 3-day diet record. The program is available in an online version to which you will have instant access (do NOT purchase the printed card with an access code). You may purchase either the [2-semester instant access \(ISBN 9781285856209\)](#) or a [1-semester access FOR LESS MONEY \(ISBN 9781285856216\)](#). **Earlier versions of this software are unacceptable for this course.**

IMPORTANT NOTES ABOUT DIET AND WELLNESS PLUS:

- Please consider cost-sharing your access to this web-based software program with your fellow students. Each copy allows up to 10 student profiles. Feel free to post your request to share on Cafe McKay, the general class discussion forum on the Canvas course site. Instructions for sharing can also be found on Cafe McKay.
- **DO NOT** purchase a used access code for this software unless you know when it expires.
- **You do NOT need to enter a course number or course key to use this software.**
- Students must have access to Diet and Wellness Plus in time to complete Part 1 of the Diet Record assignment, which is due at the end of Week 3.

INTERNATIONAL STUDENTS ONLY may order the software from the publisher's international service desk by calling **1-800-354-9706, x55560**. Note: This info is for students who are taking the course from outside of N. America, or those who have not purchased these items prior to their leaving the U.S. Alternately, you can ask another student who has already purchased this product to share. Post your request to share, or find someone willing to share on Cafe McKay, the general class discussion forum on the Canvas course site.

Assignments, Quizzes and Grade Evaluation:

| Assignment | Weight |
|---------------------------------|---------------|
| Reflective Journal Entries (19) | 15% |
| Diet Record Project (Parts 1-6) | 25% |
| Class Discussions (6) | 30% |
| Weekly Quizzes (14) | 30% |

Grading Scale:

A+ = 98.50 - 100

A = 92.50 - 98.49

A- = 90.00 - 92.49

B+ = 87.50 - 89.99

B = 82.50 - 87.49

B- = 80.00 - 82.49

(No credit for course if grade is below a B-, per Friedman School policy)

Introduction to Canvas

A comprehensive introduction to our Learning Management System, Canvas, is located here:

<https://canvas.tufts.edu/courses/169>. If your previous institutions did not use Canvas, or if you are not already familiar with this system, I highly recommend reading through this introduction before

logging in to the online course site.

Assignments, Exams and Activities Instructions:

Assignments for this course include required readings, online discussions, weekly quizzes and journal entries, and a 6-part dietary assessment project. Instructions for each of these assignments will be provided on the course website in Canvas, the Tufts learning management system for administering the course.

There are NO opportunities to earn extra credit in this course.

Assignment dues dates/times

Due dates for all assignments are listed in this syllabus under the section labeled Lecture & Assignment Schedule below, and on the course site in Canvas. Students are responsible for knowing these due dates, and adhering to them. All assignments, including quizzes, exams, and discussion forum postings, must be submitted on their specified due date no later than 11:59PM ET (Boston time) or your local time, whichever is latest. **Please inform the instructor if you are taking the course in a time zone other than the eastern coast of the U.S.**

Assignments submitted after the posted due date/time will be assessed a 5 point per day penalty effective immediately. To avoid a late penalty, you MUST email, text, or call the instructor at any time PRIOR to the posted due date/time to request an extension, and cc your TA.

Required readings, online lectures, and supplemental materials

Students are required to complete all **required readings** (in textbook and online) and watch/listen to each **online lecture**. Supplemental readings, although not required, are highly recommended. Lecture outlines and supplemental lecture slides are provided for each chapter to enhance your learning experience. All readings, lectures, outlines, and supplemental materials can be found on the Canvas course site under **Modules**.

Weekly reflection journal entries

After **each chapter/lecture** students will be asked to reflect upon the information presented with a 3-2-1 **journal entry**. This 3-2-1 journal entry requires you to write out the following for each assigned chapter: **3 things you learned that you can use in the real world, 2 questions you still have, and 1 thing you thought was most interesting (or challenged your previous beliefs)**. By the end of each week (Sundays!), you must submit a 3-2-1 journal entry for **each chapter** covered that week. For example, in Weeks 8, 9, 10, 11, and 12 you are assigned 2 chapters, so you must submit a total of two (2) separate 3-2-1 journal entries - one (1) for each chapter assigned that week. Each journal entry should be properly labeled by chapter and date. Each week's worth of journal entries is worth ~0.8% of your course grade. [Please review these examples before submitting your first journal entry.](#)

Online class discussions

Students **must participate** in all 6 **graded discussion forums**. For online class discussions, students will be expected to read all assigned background materials prior to their participation. **Each student will be expected to post thoughtful and substantive comments that address the specific questions posed by the instructor, incorporate facts from the text/lectures, and are directly relevant to the assigned topic.** Students will be graded on the quality of their initial and reply postings, demonstrated understanding of the assigned materials, and timeliness of each posting. Students are expected to participate actively, and in a timely fashion. Please refer to the [Discussion Forum Rubric](#) for details on these expectations, and how they relate to your grade. Each discussion forum is worth 5% of your course grade. **For each discussion, please try to submit your initial posting no later than Thursday or Friday of that week, and submit your reply to your classmates' postings by the deadline on the following Sunday.**

Diet record project

For the **diet record project**, students will be asked to *a)* observe and record their own dietary habits for 3 days, and all physical activities over one 24 hour period; *b)* enter the data they have collected into the required software program, Diet and Wellness Plus (version 10.0 or higher), generate a 3-day average report along with a 24 hour activity report; and *c)* provide a written assessment of their diet and physical activity based on the information generated in these reports that addresses specific questions posed by the instructor.

This assignment is divided into 6 parts, due at specified intervals corresponding with the materials presented throughout the course. Part 1 is due at the end of week 3 and will require students to record their own dietary intake for 3 days, and generate a 3-day average intake report using Diet and Wellness Plus. Parts 2-6 will require students to submit their answers to specific questions related to this report. Part 1 is worth 5% of your grade, Parts 2 and 3 are each worth 4%, Part 4 is worth 2%, and Parts 5 and 6 are each worth 5% of your course grade. Please refer to the [Grading Rubric](#) for this assignment, and to the specific grading criteria provided in the instructions for each part.

Weekly quizzes

Graded **weekly quizzes** are provided to enhance your learning experience, and assess your comprehension. Each week, students must complete a quiz based on the materials presented in the assigned chapter(s). Quizzes are open-book, but they must be completed without any assistance from other students, instructors, TAs, etc. All of your work **MUST** be your own. Students will have only one (1) opportunity to take each quiz. Once you start a quiz, you must complete it within the next 60 minutes. **Each quiz is worth ~2% of your course grade. Each quiz will be open for one 7 day period only (Monday to Sunday), and may be completed anytime within the specified period.**

Timed Quizzes in Canvas:

Technical issues do happen, sometimes in the middle of quizzes. Please know that we are aware of this, and will make every effort to work with you (and tech support) to resolve the issue. Technical issues may include your computer crashing, internet access issues, or Canvas going down. If you experience technical issues during your timed quiz, the timer will continue to run in Canvas and

your work will be saved. Try to go back into Canvas and back into the quiz as soon as you can. The time will continue to count down, but Canvas will have saved your answers up to the point you lost access (Note: You do need to SAVE your answers in Canvas for them to actually be saved in case of a crash). Resume your quiz, but be sure to send an email to canvas@tufts.edu after the quiz to document what happened and when. If you continue to have difficulty, shut down your computer, restart your browser, and log back into Canvas again. If you still have difficulty, email technical support and "cc" your instructor.

Technical Support:

Online course support is provided by Friedman support staff and/or IT Support. *Please do not contact faculty or TAs for technical support.*

- **Telephone:** (617) 627-3376
- **Email:** canvas@tufts.edu
- **Hours:** 24 hours a day, seven days a week.

When reporting a problem, please include:

- The name and number of your online course (e.g. "NUTC 200 Online")
- Your operating system and browser
- A detailed description of the problem

This information will expedite the troubleshooting process. If you are sending a support request via email, please use your Tufts email address.

Many problems with Canvas are a result of using an unsupported browser. Please make sure you are using an up-to-date version of Firefox, Safari, Chrome, Edge, or Internet Explorer.

Class Policies and Expectations:

Students will have only one (1) opportunity to complete each assignment and quiz.

Students who are unable to complete an assignment on time for any reason should notify the instructor by email (preferred), text message or phone call **prior to the deadline**, with a brief explanation for why the extension is needed.

Instructors and other university personnel may request that students submit written assignments to plagiarism prevention resources, websites, or other authoritative databanks, such as (but not limited to) "turnitin.com," or a similar site. These services compare student-produced documents with web content, newspapers, journals & magazines, books, student essays, and other data to determine the originality of student work.

Students are expected to complete all assignments on their own, i.e., without assistance from other students, faculty, etc., unless otherwise noted. All outside documents used in the preparation

of students' work must be properly referenced. (References to the textbook are not required).

Academic Conduct:

Each student is responsible for upholding the highest standards of academic integrity, as specified in the Friedman School's Policies and Procedures manual (<http://nutrition.tufts.edu/student/documents>) and Tufts University policies (<http://students.tufts.edu/student-affairs/student-life-policies/academic-integrity-policy>). It is the responsibility of each student to understand and comply with these standards, as violations will be sanctioned by penalties ranging from failure on an assignment and the course to dismissal from the school.

Communication Policy:

All communications will be sent to your Tufts email address - please check it at least once a day. Please use "Cafe McKay," the online class discussion forum on Canvas, to post questions to your fellow students, or the instructor, about course-related issues that might also be of interest to your classmates. Students should check this discussion board frequently to seek out information for themselves before contacting the instructor. The answers to your questions may have already been posted by your peers, or the instructor. If you cannot find your answer on "Cafe McKay," or prefer privacy, feel free to contact the instructor or TA via email. Please do not wait until the last minute if your question is urgent. Since students may not all be in the same time zone, you must give the instructor some time to respond to your question. Faculty will respond answer within 24 hours (please note my response time is often much sooner than this).

Accommodation of Disabilities:

Tufts University is committed to providing equal access and support to all students through the provision of reasonable accommodations so that each student may access their curricula and achieve their personal and academic potential. If you have a disability that requires reasonable accommodations, please contact the Friedman School Assistant Dean of Student Affairs at 617-636-6719 to make arrangements for determination of appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

Diversity Statement:

We believe that the diversity of student experiences and perspectives is essential to the deepening of knowledge in this course. We consider it part of our responsibility as instructors to address the learning needs of all of the students in this course. It is my intent that students from all diverse backgrounds and perspectives be well served by this course, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: race, color, ethnicity, culture, gender, age, disability, religious beliefs, political preference, sexual orientation, gender identity, socioeconomic status, citizenship, language, or national origin among other personal characteristics. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

Lecture & Assignment Schedule:

*This schedule is subject to modification at the instructor's discretion

| DATE | WEEK | TOPIC | ASSIGNMENT DUE DATES |
|---------------|--|---|---|
| Sept 8-13 | 1 | Nutrition Overview | Discussion #1 postings - Sept 13 Week 1 journal entry - Sept 13 Week 1 quiz - Sept 13 |
| Sept 14-20 | 2 | Planning a Healthy Diet | Discussion #2 postings - Sept 20 Week 2 journal entry - Sept 20 Week 2 quiz - Sept 20 |
| Sept 21-27 | 3 | Digestion | <u>Diet project, part I</u> - Sept 27 Week 3 journal entry - Sept 27 Week 3 quiz - Sept 27 |
| Sept 28-Oct 4 | 4 | Carbohydrates | Discussion #3 postings- Oct 4 Week 4 journal entry - Oct 4 Week 4 quiz - Oct 4 |
| Oct 5-11 | 5 | Lipids | <u>Diet project, part II</u> - Oct 11 Week 5 journal entry - Oct 11 Week 5 quiz - Oct 11 |
| Oct 12-18 | 6 | Proteins | <u>Diet project, part III</u> - Oct 18 Week 6 journal entry - Oct 18 Week 6 quiz - Oct 18 |
| Oct 19-25 | 7 | Energy Metabolism/ Alcohol | Week 7 journal entry - Oct 25 Week 7 quiz - Oct 25 |
| Oct 26-Nov 1 | 8 | Energy Balance/ Weight Management | Discussion #4 postings - Nov 1 Week 8 journal entries (2) - Nov 1 Week 8 quiz - Nov 1 |
| Nov 2-8 | 9 | Vitamins | <u>Diet project, part IV</u> - Nov 8 Week 9 journal entries (2) - Nov 8 Week 9 quiz - Nov 8 |
| Nov 9-15 | 10 | Minerals/ Water | <u>Diet project, part V</u> - Nov 15 Week 10 journal entries (2) - Nov 15 Week 10 quiz - Nov 15 |
| Nov 16-22 | 11 (*see note under Week 11 below) | Nutrition for Fitness & Sports Lifecycle Nutrition, Part I | Discussion #5 postings - Nov 22 Week 11 journal entries (2) - Nov 22 Week 11 quiz (Ch 14 only) - Nov 22 |
| Nov 23-29 | 12 | Lifecycle Nutrition, Parts II and III | Week 12 journal entries (2) - Nov 29 Week 12 quiz (Ch 15, 16, 17) - Nov 29 |

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|--------------|----|---------------|--|
| Nov 30-Dec 6 | 13 | Diet & Health | Discussion #6 postings - Dec 6 Week 13 journal entry - Dec 6 Week 13 quiz - Dec 6 |
| Dec 7-13 | 14 | Food Safety | <u>Diet project, part VI</u> - Dec 13 Week 14 journal entry - Dec 13 Week 14 quiz - Dec 13 |

Readings, Activities & Discussions

For the most up to date information regarding assigned readings, instructions, and due dates please check the **Canvas** course site. Click on the link labeled **Modules** to access the readings, online lectures, and assignments for each week.

IMPORTANT ASSIGNMENT NOTE: 3-Day Diet Record, Part 1 (Due end of Week 3)

- You may begin collecting your own diet and activity data for the Diet Record Project as soon as you have access to the course site on Canvas. Instructions for Part 1, due at the end of Week 3, can be found under the Modules link on the Canvas course site.
- Students must have access to the required software, Diet and Wellness Plus, in order to complete Part 1 of this assignment, due at the end of Week 3.
- You may begin working on Parts 2-6 as soon as you have completed Part 1.

Week 1 Lecture: Nutrition Overview: Food Choices and Health

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Describe the major reasons people make food choices.
- Define the term “nutrient” and be able to list the six major nutrients.
- Identify the energy-providing nutrients.
- List the types of nutrition research study designs, and recognize their basic differences.
- Define *Dietary Reference Intakes* (DRI) and the 4 parts of the DRI including: *Estimated Average Requirements* (EAR), *Recommended Dietary Allowances* (RDA), *Adequate Intakes* (AI), and *Tolerable Upper Intake Levels* (UL).
- Define the *Estimated Energy Requirement* (EER).
- Define *Acceptable Macronutrient Distribution Ranges* (AMDR).
- Describe the 4 parts of a nutrition assessment for individuals (ABCD).
- List the major national nutrition surveys used to assess the nutritional status of the U.S. population.
- Identify the major chronic diseases that are linked to diet.
- Identify accurate sources of nutrition information.
- List the 8 red flags that identify nutrition misinformation.

Required readings:

- Whitney & Rolfes, Chapter 1 - An Overview of Nutrition; Highlight 1

- “Quackery: 25 Ways to Spot It”
- DRI Definitions (handout)
- Critical Health Applications of the DRIs

Supplementary readings and links:

- Please refer to the Canvas course site.

Assignments:

- Online Lecture - An Overview of Nutrition
- Discussion 1 postings (Nutrition Information and Misinformation)
- Week 1 journal entry
- Week 1 quiz

Week 2 Lecture: Planning a Healthy Diet

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- List and define the six principles of diet-planning (ABCDMV).
- Explain the purpose of the *Dietary Guideline for Americans* and *MyPyramid/MyPlate*
- Summarize each of the *Dietary Guidelines for Americans*.
- Describe the components of the recent/current USDA Food Guide Graphics (*MyPyramid*, *MyPlate*), and know what the different colors, varying bandwidths, and triangular shapes represent.
- Define *nutrient density* and identify foods that are considered to be nutrient dense.
- Define *energy density* and identify foods that are considered to be energy dense.
- List the information that is required on a food label.
- Identify the information that is required on a Nutrition Facts Panel.
- Define *Daily Value* (DV) and how it is used on food labels.
- Recognize and give examples of *nutrient claims*, *health claims*, and *structure/function claims* allowed on food labels.

Required readings:

- Whitney & Rolfes, Chapter 2, Planning a Healthy Diet (skip Highlight 2).
- Dietary Guidelines for Americans (handout)
- Current USDA Food Guide Graphic - MyPlate
- “Guidance on How to Understand and Use the Nutrition Facts Panel on Food Labels” (Please refer to the Canvas course site for all links)

Supplementary readings and links:

- Please refer to the Canvas course site.

Assignments:

- Online Lecture - Planning a Healthy Diet
- Discussion 2 postings (Food Guide Graphics)

- Week 2 journal entry
- Week 2 quiz

Activity (optional):

- Watch: "Wartime Nutrition" video (see Canvas for link)

Week 3 Lecture: Digestion, Absorption, & Transport

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- List the parts of the gastrointestinal (digestive) tract in order from the mouth to the colon.
- List the organs that assist digestion, but are not part of the digestive tract. Describe the function of each.
- Compare the terms *mechanical digestion* and *chemical digestion*, and point out where these processes occur along the digestive tract.
- List the secretions that break down carbohydrates during digestion.
- List the secretions that break down fats during digestion.
- List the secretions that break down proteins during digestion.
- Describe the 4 ways in which nutrients can be absorbed into the cells lining the GI tract following their digestion.
- Explain the role of the circulatory (blood) system vs. the lymphatic system in the transport of nutrients around the body following their absorption.
- Identify the 4 major hormones that control digestion and absorption.
- Describe the common digestive tract problems in humans.

Required readings:

- Whitney & Rolfes, Chapter 3, Digestion, Absorption, and Transport; Highlight 3
- Transport of Nutrients (handout)

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lecture - Digestion & Absorption
- Diet project, part 1
- Week 3 journal entry
- Week 3 quiz

Activity:

- Watch: Digestion video/animation (see Canvas for link)

Week 4 Lecture: Carbohydrates

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Explain the difference between simple vs. complex carbohydrates, and identify the major food sources of each.
- Define *mono-*, *di-*, and *polysaccharides*, and give examples of each.
- Identify the 2 different types of dietary fiber, describe their effects in the body, and list the major food sources of each.
- Describe how sugars and starches are broken down in the digestive tract.
- Explain how the digestion of fiber differs from other carbohydrates.
- Define *lactose intolerance*.
- List the major functions of glucose in the body.
- Describe how the hormones insulin and glucagon maintain blood glucose at a constant level in the body.
- Explain the terms *glycemic response* and *glycemic index*.
- Identify the major sources of added sugars in the diet.
- Describe the health consequences of a diet high in added sugars.
- Discuss the health benefits of a diet rich in starch and fibers.

Required readings:

- Whitney & Rolfes, Chapter 4, The Carbohydrates: Sugars, Starches, and Fibers; Highlight 4
- Characteristics of Fiber (handout)
- Glycemic Index and Glycemic Load of Selected Foods (handout)

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lecture - Carbohydrates
- Discussion 3 postings (Prebiotics & Probiotics)
- Week 3 journal entry
- Week 3 quiz

Activity:

- Watch: Insulin video/animation (see Canvas for link)

Week 5 Lecture: Lipids

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- List the 3 major types of lipids found in foods and in the body.
- Describe the general structure of a triglyceride.
- Define *monounsaturated*, *polyunsaturated*, and *saturated fatty acid*. Identify major food sources of each.

- Define *trans fatty acid*, and identify common food sources.
- Identify the essential fatty acids and their role in the formation of eicosanoids.
- Identify major food sources of the omega 3 and omega 6 fatty acids.
- Describe how and where dietary lipids are digested and absorbed.
- Discuss the role of the lipoproteins (*chylomicrons*, *LDL*, and *HDL*) in transporting lipids throughout the body.
- List the major functions of fat in the body.
- Discuss the role of fat in the development of heart disease, cancer, and obesity.
- Explain the effects of the different fatty acids on blood cholesterol levels, i.e., HDL and LDL, and the health implications of raising and lowering these levels.
- Describe the major food sources of fat in the Mediterranean diet, and why this dietary pattern is considered heart healthy.

Required readings:

- Whitney & Rolfes, Chapter 5, The Lipids: Triglycerides, Phospholipids, and Sterols; Highlight 5
- The Mediterranean Diet Pyramid (Oldways Preservation Trust)

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lecture - Lipids
- [Diet project, part II](#)
- Week 5 journal entry
- Week 5 quiz

Week 6 Lecture: Proteins

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Describe how the chemical make up of proteins differs from that of carbohydrates and fats.
- Explain why some, but not all amino acids, are essential, and state the consequences should an essential amino acid be lacking from the diet.
- Describe how and where proteins are digested.
- Describe the fate of amino acids once they are digested and absorbed.
- Define *deamination* and *transamination*.
- List the major functions of protein in the body.
- Define *protein quality* and give examples of foods containing high-quality proteins vs. low quality proteins.
- Describe how the plant-based foods in a vegetarian diet can be combined to make complementary (complete) proteins.
- Summarize the health advantages and nutritional risks of a vegan diet.
- Identify the 2 major forms of protein malnutrition.

- Discuss reasons why consuming too much protein is not recommended.

Required readings:

- Whitney & Rolfes, Chapter 6, Proteins: Amino Acids AND Highlight 2 (but skip Highlight 6)
- Vegetarian Diet Pyramid (Oldways Preservation Trust)

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lecture - Proteins
- [Diet project, part III](#)
- Week 6 journal entry
- Week 6 quiz

Week 7 Lecture: Energy Metabolism and Alcohol

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Define *anabolic* and *catabolic reactions*, and give an example of each
- Define ATP, and describe its 3 major functions in the body.
- Besides ATP, list the other 2 compounds produced in cells after food is completely metabolized.
- Identify the 3 major metabolic pathways through which the macronutrients are converted into energy.
- Identify where energy metabolism occurs in the cell.
- Examine the general differences in the breakdown of carbohydrates, fats, and proteins to usable energy components (ATP).
- Define *ketosis* and describe the conditions in which it occurs.
- Describe the consequences of consuming an excessive amount of any macronutrient (in excess of the body's energy/calorie needs)
- Explain, in general terms, what happens to the metabolic pathways during feasting, fasting, and prolonged fasting (starvation).
- Define *moderate alcohol consumption* for both men and women
- Define *one drink* when referring to an alcoholic beverage
- Discuss several factors that affect the body's ability to metabolize alcohol
- List the potential health benefits associated with moderate consumption
- List the detrimental effects of alcohol when consumed in excess
- Define *MEOS*, *cirrhosis*, *Wernicke-Korsakoff Syndrome*

Required readings:

- Whitney & Rolfes, Chapter 7, Metabolism: Transformations and Interactions;

Highlight 7

- Overview of Energy Metabolism (handout)

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lectures - Energy Metabolism AND Alcohol
- Week 7 journal entry
- Week 7 quiz

Week 8 Lectures: Energy Balance and Weight Management

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Define *energy balance*, and discuss how changes in energy balance affect body weight
- Describe the major components of "energy in" vs. "energy out."
- State the relative contributions of the 3 major components of energy expenditure (basal metabolism, physical activity, thermic effect of food), and identify the most variable of these components.
- List several factors that can affect BMR.
- List the variables required to calculate your estimated energy (calorie) requirements or EER.
- Define *body composition*, and list the 3 major components that make up a person's body weight
- Define *BMI*, and describe the equation used to determine BMI
- Summarize how BMI is used to define *underweight*, *healthy weight*, *overweight*, and *obesity*.
- Explain the health risks of too little and too much body fat, with an emphasis on *central obesity* and its associated health risks.
- List the common methods used to assess body fat (body composition).
- Describe the 3 factors that contribute to the *female athlete triad*.
- Compare and contrast the major characteristics of *anorexia nervosa*, *bulimia nervosa*, and *binge eating disorder*.

- Describe the prevalence of overweight and obesity among American adults.
- Describe how fat cells develop, and the role of LPL in fat storage.
- Discuss how genetics, environment, and the regulation of hunger and satiety contribute to the development of overweight and obesity.
- List the health risks associated with fad diets, weight loss products, prescription drugs and surgical interventions in treating obesity.
- Discuss the role of diet, physical activity, and behavior change as keys to managing body weight.
- Summarize the characteristics of a sound eating plan for weight management.

Required readings:

- Whitney & Rolfes, Chapters 8, 9; Highlights 8, 9
- Eating Attitudes Self-Test (handout)
- Exploring Eating Habits (handout)

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lectures - Energy Balance AND Weight Management
- Discussion 4 postings (Weighing in on Popular Diets)
- Week 8 journal entries (2)
- Week 8 quiz

Activity:

- Watch: The Obesity Epidemic video (see Canvas for link)

Week 9 Lectures: Vitamins**Lecture Learning Objectives:**

By the end of this lecture, students should be able to:

- Summarize the general differences between macronutrients (carbohydrates, lipids, proteins) and micronutrients (vitamins and minerals)
- List the fat-soluble and water-soluble vitamins, and describe how solubility affects the absorption, transport, storage, and excretion of each type.
- List the B vitamins, and identify the major functions of each vitamin in the body. (For each of these objectives, exclude pantothenic acid and biotin)
- List the major food sources of each of the B vitamins.
- Identify the major deficiency disease associated with each B vitamin
- List the major uses of vitamin C in the body
- Identify the signs and symptoms of vitamin C deficiency and toxicity
- List the major food sources of vitamin C

- Identify the roles of vitamin A in the body, and describe the effects of vitamin A deficiency and toxicity.
- List the major food sources of vitamin A (preformed) and beta-carotene.
- Describe the uses of vitamin D in the body, and the effects of deficiency and toxicity of this vitamin.
- Identify the major food and non-food sources of vitamin D.
- Identify the role of vitamin E in the body and the effects of vitamin E deficiency and toxicity.
- List the major food sources of vitamin E.
- Identify the major role of vitamin K in the body, and the effects of vitamin K deficiency and

toxicity. List food and non-food sources of vitamin K.

- List food and non-food sources of vitamin K.
- Define the term *antioxidant*, and name the vitamins that act as antioxidants in the body.

Required readings:

- Whitney & Rolfes, Chapters 10, 11; Highlights 10, 11
- Factors That Destroy Vitamins (handout)
- Food Processing and Nutrient Density (short reading)

Supplementary reading:

- Please refer to the Canvas course site

Assignments:

- Online lectures - Fat-Soluble Vitamins AND Water-Soluble Vitamins (Parts I & II)
- Diet project, part IV
- Week 9 journal entries (2)
- Week 9 quiz

Activity:

Make a chart or flashcards to use as a study tool. Your chart/flash cards should contain the following information for **each** of the vitamins (except pantothenic acid and biotin):

- Major function(s) in the body, i.e., what does it do
- Reliable food sources, i.e., where can you get it
- Deficiency symptoms/conditions, i.e., what happens if you get too little
- Toxicity symptoms/conditions, i.e., what happens if you get too much

Week 10 Lectures: Minerals and Water

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- List the major functions of water in the body.
- Describe water balance, and list the body's major water sources (water in) and routes of water loss (water out)

- Describe the general difference between minerals and vitamins
- Describe the general difference between the major minerals and trace minerals
- Describe the role of calcium in the body and the factors that enhance or limit its absorption
- List the hormones needed to maintain blood calcium levels
- Identify food sources of calcium, and describe the effects of calcium deficiency.
- Identify the risk factors for the development of *osteoporosis* and the roles of physical activity and calcium intake.
- Identify the major roles of phosphorus in the body, and food sources in the diet
- Identify the role of magnesium in the body, and major food sources
- Define *electrolyte*, and list the 3 major electrolyte minerals

- Identify the role of sodium in the body, the effects of excessive intake, and major food sources
- Identify the role of potassium in the body, the effects of inadequate intake, and major food sources.
- Describe the DASH diet, and specify who might benefit from such a diet.
- Identify the major role of chloride during digestion.

- Identify the major functions of iron in the body
- Compare the availability of iron from plant vs. animal sources
- Describe the role of zinc in the body, major food sources, and consequences of a zinc deficiency
- Describe the effects of insufficient and excess iodine intake.
- Describe the use of chromium in the body and its relationship to diabetes.
- Describe the use of selenium in the body and the role of selenium in cancer protection.
- Explain the use of fluoride in the body and its role in dental caries prevention.
- List major phytochemicals that might protect the body from cancer and heart disease

Required readings:

- Whitney & Rolfes, Chapters 12 and 13; Highlight 12 (skip 13)

Supplementary reading:

- Please refer to the Canvas course site

Assignments:

- Online lectures - Major Minerals, Trace Minerals, AND Water
- Diet project, part V
- Week 10 journal entries (2)
- Week 10 quiz

Activities:

- Watch: Salt Matters - Preserving Choice, Protecting Health video (see Canvas for link)

Make a chart or flashcards to use as a study tool. Your chart/flash cards should contain the following information for each of the major minerals (except chloride), plus the trace minerals iron and zinc:

- Major function(s) in the body, i.e., what does it do
- Reliable food sources, i.e., where can you get it
- Deficiency symptoms/conditions, i.e., what happens if you get too little
- Toxicity symptoms/conditions, i.e., what happens if you get too much

Week 11 Lecture: Nutrition and Physical Activity (please see NOTE* below regarding the Week 11 assignments)

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- List the benefits of engaging in regular physical activity
- Explain the components of fitness and the progressive overload principle.
- Describe the use of glucose and glycogen as body fuels during exercise.
- Describe a diet to minimize glucose depletion during exercise, and define the term *carbohydrate loading*.
- Describe the role of body fat during prolonged exercise
- Compare the protein needs of an athlete vs. a sedentary person.
- List the micronutrients of concern for highly active people
- Discuss some reasons why female endurance athletes may be vulnerable to iron deficiency.
- Discuss the hydration schedule for physical activity and the need for electrolyte replacement.
- Define *ergogenic aid*.

Required readings:

- Whitney & Rolfes, Chapter 14; Highlight 14 **AND** Chapter 15* (see Note)
- Physical Activity Guidelines for Americans - Fact Sheet

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lecture - Nutrition for Fitness & Sports
- Discussion 5 postings (Topic: Phytochemicals & Functional Foods)
- Week 11 journal entries (2)
- Week 11 quiz (Ch 14 only)

***NOTE REGARDING YOUR WEEK 11 ASSIGNMENTS**

During Week 11, please also read Chapter 15 on Pregnancy and Lactation (see learning objectives below under Life Cycle Nutrition). The Week 11 Quiz will cover Chapter 14 only. Chapter 15 will be covered in the Week 12 Quiz, along with Chapters 16 and 17.

Week 12 Lectures: Life Cycle Nutrition

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Explain why a nutritionally adequate diet is important long before a pregnancy is established.
- List the stages of prenatal growth and development.
- Define *placenta*, *critical period*, *NTD*, and *spina bifida*.
- Explain the role of folate during the early stages of fetal development
- Describe the relationship between maternal weight gain during pregnancy and infant birthweight

- Discuss the increased nutrient needs of the mother during pregnancy including total calories and specific micronutrients required for blood production, cell growth, and bone development.
- Discuss the need for additional calories and fluids during lactation, and list the habits that are incompatible with lactation.
- Define *fetal alcohol syndrome*.
- Discuss how an infant's calorie needs differ from an adult's needs.
- Describe how to assess the growth and nutritional status of infants and children
- Discuss the 2 dietary practices that have the most significant effect on an infant's nutritional health, i.e., the milk an infant receives, and the age at which solid foods are introduced
- Describe the incidence of childhood obesity and role of heredity and environmental factors in the development of obesity in children
- Describe the nutritional needs of adolescents.
- Explain how a teenager's choice of soda over milk or soymilk may jeopardize their nutritional health.
- Discuss the role of childhood obesity in the early development of type 2 diabetes and cardiovascular disease.
- Discuss the importance of physical activity in the later years, and define *sarcopenia*.
- Summarize the nutrients of concern for aging adults, i.e., identify the nutrients for which there are different requirements in older adults
- Define *atrophic gastritis*
- Discuss the nutrition recommendations for vision changes that occur with aging.
- Discuss the role of nutrition in the prevention and treatment of arthritic conditions.
- Describe common diseases of the aging brain and the role of nutrition in brain function.
- Outline food-related factors that can predict malnutrition in older adults, i.e., *DETERMINE*.
- Identify the commonly used drugs that adversely react with nutrients, and explain the potential consequences of these interactions.

Required readings:

- Whitney & Rolfes, Chapters 15 , 16, 17; Highlight 15, 16, 17 (**Please see the Week 11 NOTE* above**)
- Effects of Nutrient Deficiencies During Pregnancy (handout)

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lectures - Pregnancy & Breastfeeding, Infancy through Adolescence, AND Aging and the Elderly
- Week 12 journal entries (2)
- Week 12 quiz (Ch 15, 16, 17)

Week 13 Lecture: Diet & Health

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Identify the important lifestyle factors (modifiable and non-modifiable) that promote health and disease
- Describe how certain chronic diseases are in themselves risk factors for other other chronic diseases, i.e., list the interrelationships among chronic diseases
- Describe the development, risk factors, and specific nutrition recommendations for each of the major chronic diseases discussed (CVD, hypertension, diabetes, and cancer)
- Describe how nutrition impacts the immune system
- Discuss the potential impact of adhering to the *Dietary Guidelines for Americans* and *MyPlate* on chronic disease risk.

Required readings:

- Whitney & Rolfes, Chapter 18; skip Highlight 18

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments

- Online lecture - Diet, Health & Disease
- Discussion 6 postings (Dietary Supplement Use)
- Week 13 journal entry
- Week 13 quiz

Week 14 Lecture: Consumer Concerns About Foods and Water (Food Safety)

Lecture Learning Objectives:

By the end of this lecture, students should be able to:

- Describe two ways in which foodborne microorganisms can cause illness in the body, and give examples of each, i.e., infection vs. intoxication
- List methods to prevent foodborne illness during food production and service.
- Define *HACCP*, *pasteurization*, and *food irradiation*
- Summarize the 4 components of food safety in the kitchen, i.e., *Fight Bac!*
- List environmental contaminants in the food supply, and natural toxicants found in foods
- Discuss potential advantages and disadvantages associated with organic foods.
- Discuss common additives in the food supply and their risks and benefits.
- Discuss the risks and benefits of genetically engineered foods.

Required reading:

- Whitney & Rolfes, Chapter 19; Highlight 19

Supplementary readings and links:

- Please refer to the Canvas course site

Assignments:

- Online lecture - Food Safety
- Diet project, part VI
- Week 14 journal entry
- Week 14 quiz

END OF COURSE (No final exam!)