

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/1b8mzPMpQJx6OxdU3icRS5iSufnrai4bA3NW04601nI/edit?usp=sharing>

**NUTR 202**  
**PRINCIPLES OF NUTRITION SCIENCE**  
Tufts University, Friedman School of Nutrition Science and Policy  
**FALL 2021**  
*(September 8 - December 23, 2021)*

---

\* We will use a modified Hyflex format this semester. This format is intended to allow everyone access to the course materials and interactive activities, regardless of the changing circumstances that any or all of us may experience throughout the semester.

Students who are able to come to campus will be expected to attend each **Friday lecture** session in person. Students who are unable to attend in person will have the option of either attending the on-campus lecture remotely and synchronously via Zoom, or viewing a pre-recorded online version of the lecture asynchronously.

Students are also highly encouraged to attend each **Tuesday Q&A** (open discussion) session. These sessions will be held remotely and synchronously via Zoom, and attendance is optional. They will not be recorded.

---

**Instructor:**

Diane L. McKay, PhD, FACN

Email: [diane.mckay@tufts.edu](mailto:diane.mckay@tufts.edu)

Phone or text: (781) 608-7183

**Instructor Office Hours:** email, text (24/7) or online (Zoom) by appointment

**Teaching Assistant (TA):**

Afnan Alghanmi, MS

PhD Candidate, Food and Nutrition Policy and Programs

Email: [afnan.alghanmi@tufts.edu](mailto:afnan.alghanmi@tufts.edu)

**TA Office Hours:** email (24/7) or online (Zoom) by appointment

---

**Class meeting time:** Tuesdays and Fridays, 1:30-3:00 pm (\*see note above)

**Location:** Jaharis 156, Boston campus

**Bring an electronic device** (smartphone, laptop, or tablet) to each in-person class\*\*

---

**Tufts Graduate Credit:** 3.0 Semester hour units (SHU)

**Prerequisite:** One semester of college level biology, chemistry or physiology (preferred).

**Course Description and Goals:**

This course presents the scientific principles of human nutrition. During the course of the semester students will learn the components of a healthy diet, and their health implications; understand the major nutritional problems that affect individuals and populations from conception and throughout the life cycle; and understand the scientific basis for nutritional recommendations brought before the scientific and lay communities.

**Course Objectives/Outcomes:**

By the end of this course, students will:

- Summarize the dietary recommendations of the major groups/organizations in the United States that recommend what to include in a healthy diet.
- Categorize the accepted name(s) of each macronutrient (carbohydrate, protein, lipids, water) and micronutrient (vitamins and minerals); their common food sources; recommended intake; major functions and biochemical role in the body; and their mode of absorption, transport, and excretion through the body.
- Explain the adverse health effects associated with a toxicity or deficiency of each nutrient, and any potential major public health problems.
- Discriminate between sound and questionable nutrition information and sources.
- Critically evaluate the quality of their own diet.

**Course Content Warning:**

This course is about learning the science behind health and well-being as it relates to nutrition and food intake. For some students the content may evoke feelings of distress. If this should occur, and it is impacting your learning experience, please contact the instructor and do what you need to take care of yourself. Tufts Counseling and Mental Health Services are available at: <https://students.tufts.edu/health-and-wellness/counseling-and-mental-health>

---

**Textbook and Software:**

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

The print, rental, and e-book versions of the text are available on many websites (new and used). The software is available for purchase directly from the publisher at [www.cengagebrain.com](http://www.cengagebrain.com).

**REQUIRED TEXT:**

**Wardlaw's Perspectives in Nutrition**-McGraw-Hill, 11th (2019) or 12th edition (2021), by Byrd-Bredbenner et al. Consider sharing a copy!

Available in hardcover (ISBN 9781259709982), looseleaf (ISBN 9781260163933) and e-text formats (ISBN 9781260501100). The 10th and 9th editions of this text are also acceptable, but nothing earlier.

When ordering a print version of the text, keep in mind that it may take some time for shipping. In the event that your textbook does not arrive by the start of class, please note the first three chapters will be made available on the Canvas course site.

**\*\* Two hard copies of the 10th edition are available in Hirsch Library.\*\***

### **REQUIRED SOFTWARE (2 programs):**

**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 access code).

Here is the link to purchase the [6 month instant access option for ~\\$30 \(ISBN 9781285856216\)](#) directly through Cengage. This is the best price available.

If you prefer to have access for a longer period of time, a 12-month instant access option is also available on that page for ~\$56. **Earlier versions of this software are unacceptable for this course.**

### **IMPORTANT NOTES ABOUT DIET AND WELLNESS PLUS:**

- Please consider cost-sharing the login access for this software 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.
- You will find instructions on how to share this software on Cafe McKay, and in an Announcement posted on the Home page of the Canvas course site. **If sharing, please note only one person at a time should access the software in order to prevent errors.**
- **You do NOT need to enter a course number or course key to use this software.**
- 
- **DO NOT** purchase a used version of this software unless you know when it expires.
- 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 2.

**FOR STUDENTS TAKING THE COURSE FROM OUTSIDE OF THE U.S.** visit <https://www.cengage.com/purchase-abroad> to purchase your Cengage course materials. 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.

2.) **\*\*Poll Everywhere (in-class response system)**

Poll Everywhere is a classroom response system that your instructor will use to ask questions during lectures and see the classroom's responses in real-time. It is **FREE** to Tufts students. Please follow the instructions below prior to the first class and **bring a web-enabled device to every class** so you can participate.

**Setting up your Poll Everywhere Account**

**Use your Tufts credentials to log into Poll Everywhere.** When you go to <http://www.polleverywhere.com> click "Login" and enter your tufts email address. You will then see a pop-up directing you to click a link to login with your Tufts credentials. After logging in you'll be taken to the Poll Everywhere site.

**Using Poll Everywhere in class**

Poll Everywhere can be accessed from any web-browser or from the Poll Everywhere mobile app (iOS and Android). For the best experience use the mobile app on your smartphone or tablet. For more information see the getting started guide:

<http://tuftsedtech.screenstepslive.com/s/19028/m/73482/1/812155-student-getting-started-guide>

**IMPORTANT NOTES ABOUT USING POLL EVERYWHERE:**

- **Always log in to Poll Everywhere before you participate.** If you do not log in your participation will not be associated with your name, and you will not get credit.
- In the classroom, **always connect your device to the "Tufts\_Secure" wireless network** for a fast and secure connection. For more information visit: <https://it.tufts.edu/securewireless>.
- If you run into any problems with Poll Everywhere please contact [edtech@tufts.edu](mailto:edtech@tufts.edu).

---

**Assignments, Exams and Grade Evaluation:**

**Grade Evaluation:**

Assignment	Weight
Reflective Journal Entries (1 per chapter)	15%
Graded Discussions (6)	15%
Weekly Quizzes (13)	15%
Midterm Exam	15%
Final Exam	15%

Diet Record Project (Parts 1-5)	25%
---------------------------------	-----

**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)

**Assignments, Exams and Activities:**

Assignments for this course include required readings, online and/or in-person lectures, weekly quizzes, weekly journal entries, 6 online discussions, a 5 part dietary assessment project, and 2 exams (midterm and final). Detailed instructions for each of these assignments will be provided on the course website in Canvas, the Tufts learning management system.

**There are NO opportunities for extra credit work 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.** 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).

**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.**

Required readings, online lectures, and supplemental materials

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

Weekly reflection journal entries

For each chapter/lecture students will be asked to reflect upon the information presented with a **reflection journal entry**. The purpose of this assignment is to help students incorporate, retain, and use the concepts and information they are presented with throughout this course. Reflection involves rigorous cognitive processing that makes it more likely that students will be able to absorb, remember, and master what they're learning.

In each reflection journal entry we are looking for well-composed, substantive statements that are honest and demonstrate your engagement with the materials. **Each reflection should address the following three (3) items:**

1. How does this information relate to you and your life? How does it fit into your prior experiences and knowledge? How does this fit with what you already know and or have experienced?
2. What are you struggling with, or what concepts/issues are you trying to reconcile in your own mind? What are you still wondering about?
3. Pick an issue that was raised in this chapter/lecture and explain how it connects to your own academic, or professional life. Why does it matter to you as a member of a community, society, or as a global citizen?

By the end of each week (Thursdays!), you must submit a reflection journal entry for **each chapter** covered that week. For example, in Week 6 you are assigned 2 chapters, so you must submit a total of two (2) separate journal entries - **one (1) for each chapter** assigned that week. Each journal entry should be properly labeled by chapter and date.

Please refer to the [Reflection Journal Grading Rubric](#) for details on expectations, and how each reflection will be graded. Each journal entry is worth ~1% of your course grade.

#### Weekly quizzes

Graded **weekly quizzes** are provided to enhance your learning experience, and prepare you for your exams by highlighting concepts/issues of importance. Each week, students must complete a quiz based on the materials presented in the assigned chapter(s). Each quiz will be open for one 7 day period only (Friday to Thursday at 11:59pm Eastern Time), and may be completed anytime within the specified period. Students can take each quiz up to 2 times during that week, and your final score will be the average of the 2 attempts. Students may opt to take the quiz only once if they are confident of their answers. **All quizzes are open-book and timed** (20 minutes per quiz).

**Feedback on the quiz questions will not be provided until after the due date.** That is, students will not know whether their answers were correct or incorrect until the week is over. Each quiz is worth 1% of your course grade. During Weeks 12 and 13 on Life Cycle Nutrition (I, II, and III) and Diet, Health and Disease, students must complete 2 quizzes, i.e., one double-length quiz, per week (one per assigned chapter/lecture).

#### Online class discussions

Students **must participate** in all 6 **graded discussion forums**. For each discussion, students will be expected to 1) read the assigned background materials prior to their participation, 2) compose and submit their INITIAL posting by 11:59pm ET on **Tuesday** of that week, and 3) compose and submit at least 2 reply postings by 11:59pm ET by the following **Thursday**. **Each student will be expected to post thoughtful, 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 general [Grading Rubric for Online Discussions](#) for details on these expectations, and how they relate to your grade for this assignment. Students may submit their postings only during the week in which a discussion forum is active. Each discussion forum is worth 2.5% of your course grade.

### 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 *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, and *c*) provide a written assessment of their diet based on the information generated in these reports that addresses specific questions posed by the instructor.

This assignment will be divided into 5 parts, due at specified intervals corresponding with the materials presented throughout the course. Part 1 is due at the end of week 2 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 2-5 will require students to submit their answers to specific questions related to this report. Each individual part is worth 5% of your total grade. Please refer to the general [Grading Rubric](#) for this assignment, and to the specific grading criteria provided in the instructions for each part.

### Midterm and final exams

Students must complete the **midterm exam** at the end of Week 6, and the **final exam** by the end of Week 14 (end of semester). Each exam will be based on the materials presented in the required readings and lectures. The midterm exam will cover all material presented in the course through the end of Week 6 and is worth 15% of your course grade. The final exam will cover all material presented after Week 6 and is also worth 15% of your course grade. Although **the final exam is NOT cumulative**, the material presented after the midterm exam does build upon and refer to the material presented prior to the midterm.

Both exams will be administered in an online format through Canvas. Each exam will be open during a specified period. Once you start an exam, you will have 2 hours to complete it.

Unlike the weekly quizzes, each exam will require you to write comprehensive answers demonstrating your knowledge of and ability to apply the materials presented in this course. While the exams are open book, your written answers must be in your own words. Please review the Tufts policies on plagiarism prior to taking each exam (links to these policies are provided under the **Academic Conduct** section below).

---

### **Timed Quizzes and Exams in Canvas - Technical Info:**

Please keep in mind that for each online quiz/exam you will need a good *internet connection* to access them. You should also plan accordingly by making sure you can access Canvas and the internet at the location you choose to take your quizzes/exams. Some offices and corporations have *firewalls* that might *block* a system like this. When you are on campus, always connect your wifi to the “Tufts-Secure” option.

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](mailto:canvas@tufts.edu) after the quiz/exam 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](mailto: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. "NUTR 202")
- 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 exam.

**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, no explanation required.**

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 (<https://nutrition.tufts.edu/about/policies-and-procedures>) 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.** Feel free to 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, Zoom, or in person.** 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 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 10-16	1	Introduction to Nutrition Basis of a Healthy Diet	Discussion O (ungraded) Week 1 journal entries (2) - Sept 16 Week 1 quizzes (2) - Sept 16
Sept 17-23	2	Digestion	<b>Discussion I, initial posting - Sept 21</b> Discussion I, reply postings - Sept 23 Diet project, part I - Sept 23 Week 2 journal entry - Sept 23 Week 2 quiz - Sept 23
Sept 24-30	3	Carbohydrates	Diet project, part II - Sept 30 Week 3 journal entry - Sept 30 Week 3 quiz - Sept 30
Oct 1-7	4	Lipids	<b>Discussion II, initial posting - Oct 5</b> Discussion II, reply postings - Oct 7 Week 4 journal entry - Oct 7 Week 4 quiz - Oct 7
Oct 8-14	5	Proteins	Diet project, part III - Oct 14 Week 5 journal entry - Oct 14 Week 5 quiz - Oct 14
Oct 15-21	6	Energy Metabolism Alcohol	Week 6 journal entries (2) - Oct 21 Week 6 quiz - Oct 21
	--	Midterm Exam	Midterm Exam Due: Oct 22
Oct 22-28	7	Energy Balance Weight Management	<b>Discussion III, initial posting - Oct 26</b> Discussion III, reply postings - Oct 28 Week 7 journal entry - Oct 28 Week 7 quiz - Oct 28
Oct 29-Nov 4	8	Fat soluble vitamins	<b>Discussion IV, initial posting - Nov 2</b> Discussion IV, reply postings - Nov 4 Week 8 journal entry - Nov 4 Week 8 quiz - Nov 4
Nov 5-11	9	Water-Soluble Vitamins	Week 9 journal entry - Nov 11 Week 9 quiz - Nov 11
Nov 12-18	10	Major Minerals/Water	<b>Discussion V, initial posting - Nov 16</b> Discussion V, reply postings - Nov 18

			Week 10 journal entry - Nov 18 Week 10 quiz - Nov 18
Nov 19-25	11	Trace Minerals	Diet project, part IV - Nov 25 Week 11 journal entry - Nov 25 Week 11 quiz - Nov 25
Nov 26-Dec 9	12	Lifecycle Nutrition I, II	Week 12 journal entries (2) - Dec 9 Week 12 quizzes (2) - Dec 9
Dec 10-16	13	Lifecycle Nutrition III Diet, Health, and Disease	<b>Discussion VI, initial posting - Dec 14</b> Discussion VI, reply postings - Dec 16 Week 13 journal entries (2) - Dec 16 Week 13 quizzes (2) - Dec 16
Dec 17-23	14	Final week	Final Exam Due: Dec 23 (students may take this exam as early as Dec 17) Diet project, part V - Dec 23

### **Readings, Learning Objectives, & Activities**

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 2)**

- 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 2, can be found under the Assignments 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 2.
- You may begin working on Parts 2-5 as soon as you have completed Part 1.

### **Week 1 Lecture: Nutrition Overview and Basis of a Healthy Diet**

#### **Lecture Learning Objectives:**

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

- Be able to define “nutrition” and “essential nutrients.”
- Identify the six major classes of nutrients and their basic chemical structures.
- Describe foods in terms of their energy values, including alcohol.
- Explain the role of national nutrition surveys (NHANES)
- Describe the typical American diet.
- Summarize the ABCDEFs of nutrition assessment, and their limitations.
- Explain the scientific method.
- Be able to identify the red flags of poor nutrition advice.
- Identify reliable sources of nutrition information.
- Identify the components of a healthful diet, i.e., the diet planning principles.

- Define nutrient density, and identify nutrient dense foods from each food group.
- Name and define the four sets of dietary standards of the DRIs.
- Describe how the DRIs are determined and how/when each is used.
- Compare the DV to DRI and explain how they are used on Nutrition Facts Panels.
- Interpret the nutrition information provided on food packaging labels.
- Describe the different types of claims allowed on food labels.
- Summarize the purpose of the Dietary Guidelines for Americans.
- Describe the components of the current USDA Food Guide Graphic.

**Required readings:**

- Wardlaw, Chapters 1 and 2
- **Please refer to the Canvas course site for complete list and links**

**Assignments:**

- Online lectures - Nutrition Overview AND Basis of a Healthy Diet
- Discussion “O” postings (for practice, no credit)
- Week 1 journal entries (2)
- Week 1 quizzes (Chapter 1 quiz is for practice, Chapter 2 quiz for credit)
- Begin working on Diet project, part I (due at end of Week 2)

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 2 Lecture: Digestion and Absorption**

**Lecture Learning Objectives:**

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

- Describe the overall physiological processes of digestion and absorption, including the roles played by the organs of the gastrointestinal tract and the related accessory organs: liver, gallbladder, and pancreas.
- Describe, in detail, the digestion of a meal containing all 3 macronutrients.
- Describe the differences between the digestion and absorption of the fat- vs. water-soluble nutrients, and be able to outline each step in the process.
- Identify the enzymes and hormones that act in the digestion of the various nutrients, and indicate how they work.
- Summarize the major nutrition-related gastrointestinal health problems and typical approaches to treatment.

**Required readings:**

- Wardlaw, Chapter 4
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Digestion and Absorption
- Discussion I postings

- Week 2 journal entry
- Week 2 quiz
- Diet project, part I

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 3 Lecture: Carbohydrates**

**Lecture Learning Objectives:**

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

- Describe the differences and similarities among mono-, di-, oligo-, and polysaccharides and identify food sources of each.
- Explain the functions of simple and complex carbohydrates.
- Describe the digestion and absorption of carbohydrates.
- Discuss the role of fiber in human nutrition.
- Discuss the problems that can occur with carbohydrate digestion and absorption.
- Know the recommended intake of dietary carbohydrate.
- Explain the roles of hormones in the regulation of blood glucose.

**Required readings:**

- Wardlaw, Chapter 5
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Carbohydrates
- Week 3 journal entry
- Week 3 quiz
- Diet project, Part II

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 4 Lecture: Lipids**

**Lecture Learning Objectives:**

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

- Describe the structure of saturated, monounsaturated, and polyunsaturated fatty acids and identify the fatty acids that are considered essential.
- Describe the structure of triglycerides and phospholipids and explain their biological significance.
- Summarize the role of cholesterol in human nutrition.
- Explain the effects of omega-3 and omega-6 fatty acids on cell function and health.
- Describe the functions of dietary fat and body fat.
- Explain the digestion and absorption of dietary fat, including the role of bile.

- Describe the transport of lipids in the blood and throughout the body, and the role of each lipoprotein.
- Identify food sources of dietary cholesterol, saturated fat, mono- and polyunsaturated fats.
- Discuss the origin and food sources of trans fatty acids and their effect on health.

**Required readings:**

- Wardlaw, Chapter 6
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Lipids
- Discussion II postings
- Week 4 journal entry
- Week 4 quiz

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 5 Lecture: Proteins**

**Lecture Learning Objectives:**

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

- Describe the chemical structure of amino acids and proteins.
- Identify the amino acids that are essential in the diet.
- Describe the special category of conditionally essential, or indispensable, amino acids.
- Summarize the process of protein synthesis.
- Describe deamination and transamination.
- Explain the difference between high-quality and lower-quality proteins, their specific food sources, and the concept of a limiting amino acid.
- Summarize protein digestion and absorption.
- Specify the physiological functions of protein.

**Required readings:**

- Wardlaw, Chapter 7
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Proteins
- Week 5 journal entry
- Week 5 quiz
- Diet project, Part III

**Supplementary readings and links:**

- Please refer to the Canvas course site

## **Week 6 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 where energy metabolism occurs in the cell.
- Identify the 3 major metabolic pathways through which the macronutrients are converted into energy.
- 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.
- Outline the metabolic consequences of consuming an excessive amount of any macronutrient (in excess of the body's energy/calorie needs)
- Describe the fate of each macronutrient during short-term and prolonged fasting (starvation).
- Define *moderate alcohol consumption* for both men and women
- Define *one drink* when referring to an alcoholic beverage
- Briefly describe the process of alcohol absorption and metabolism, including the role of the enzyme alcohol dehydrogenase and the microsomal ethanol oxidizing system (MEOS).
- List the potential health benefits associated with moderate alcohol consumption
- List the nutrients that are most likely to be deficient in a diet of a person who abuses alcohol.
- Define *Wernicke-Korsakoff Syndrome*
- Summarize the negative health effects of alcohol abuse, i.e., how alcohol damages body organs, such as the liver, heart, and brain.
- Define *fatty liver disease, cirrhosis*
- Describe the impact of alcohol consumption during pregnancy.

### **Required readings:**

- Wardlaw, Chapters 8, 9
- Please refer to the Canvas course site for complete list and links

### **Assignments:**

- Online lecture - Energy Metabolism **AND** Alcohol
- Week 6 journal entries (2)
- Week 6 quiz

### **Supplementary readings and links:**

- Please refer to the Canvas course site

**MIDTERM EXAM: Due October 22** - See instructions under **Modules** on **Canvas**

### **Week 7 Lecture: Energy Balance and Weight Control**

#### **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"
- Define & state the relative contributions of the 3 major components of energy expenditure (basal metabolism, physical activity, thermic effect of food)
- List several factors that can affect BMR.
- List the variables required to calculate your estimated energy requirements (EER).
- Define BMI, describe its limitations, and summarize how BMI is used to define underweight, healthy weight, overweight, and obesity.
- Describe the common methods used to assess body composition, i.e., proportion of fat mass to lean mass (muscle), and their limitations.
- Explain the health risks of too little and too much body fat, with an emphasis on central obesity and its associated health risks.
- Discuss 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:**

- Wardlaw, Chapter 10 (skip section on Eating Disorders)
- Please refer to the Canvas course site for complete list and links

#### **Assignments:**

- Online lecture - Energy Balance **AND** Weight Management
- Discussion III postings
- Week 7 journal entry
- Week 7 quiz

#### **Supplementary readings and links:**

- Please refer to the Canvas course site

### **Week 8 Lecture: Fat-Soluble 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 of vitamin.
- 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.
- Define the term *antioxidant*, and name the vitamins that act as antioxidants in the body.
- Identify the population group or groups at risk for fat-soluble vitamin deficiencies.

### **Required readings:**

- Wardlaw, Chapter 12
- Please refer to the Canvas course site for complete list and links

### **Assignments:**

- Online lecture - Fat-Soluble Vitamins
- Discussion IV postings
- Week 8 journal entry
- Week 8 quiz

### **Supplementary readings and links:**

- Please refer to the Canvas course site

## **Week 9 Lecture: Water-Soluble Vitamins**

### **Lecture Learning Objectives:**

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

- List the B vitamins, and identify the major functions of each vitamin in the body.
- List the major food sources of each of the B vitamins.
- Identify the major deficiency disease(s) associated with each B vitamin
- Describe the digestion and absorption of vitamin B12 from food
- 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
- Describe the population group or groups at risk for water-soluble vitamin deficiencies.

**Required readings:**

- Wardlaw, Chapter 13
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Water-Soluble Vitamins
- Week 9 journal entry
- Week 9 quiz

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 10 Lecture: Major Minerals and Water**

**Lecture Learning Objectives:**

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

- Describe the absorption, storage, and risks of toxicity of the major minerals.
- List the functions of each major mineral.
- Identify food sources and state the recommended intake of each of the major minerals.
- Describe the major mineral deficiency and toxicity conditions.
- Identify the population group or groups at risk for major mineral deficiencies.
- 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 in the intestines
- List the hormones needed to maintain blood calcium levels, and describe how calcium homeostasis is maintained
- 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*, list the 3 major electrolyte minerals, and describe their common functions
- 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 food components of the DASH diet, the minerals provided by each

- food component, and specify who might benefit from such a diet.
- Identify the major role of chloride during digestion.
  - Discuss the reasons why a protein-adequate diet can meet the body's need for sulfur
  - Describe the population group or groups at risk for major mineral deficiencies.
- 
- Summarize the key roles of water in the body.
  - Discuss the daily water needs of humans.
  - Define water balance and its components.

**Required readings:**

- Wardlaw, Chapter 14
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lectures - Major Minerals AND Water
- Discussion V postings
- Week 10 journal entry
- Week 10 quiz

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 11 Lecture: Trace Minerals**

**Lecture Learning Objectives:**

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

- Define trace mineral.
- List the primary functions and deficiency/toxicity issues for each trace mineral.
- Describe, in general, how trace minerals are absorbed, transported, and excreted.
- Identify foods that are concentrated sources of each trace mineral.
- Identify the population group or groups at risk for trace mineral deficiencies.
- 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
- Discuss the mucosal block theory
- Describe the role of copper in the body
- Identify and describe the potential consequences of trace mineral interactions (i.e., iron, zinc, copper)
- 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 and as an antioxidant.
- Explain the use of fluoride in the body and its role in dental caries prevention.

**Required readings:**

- Wardlaw, Chapter 15
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Trace Minerals
- Week 11 journal entry
- Week 11 quiz
- Diet project, Part V

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 12 Lecture: Lifecycle Nutrition I and II****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.
- Describe 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 effect of nutrition on pregnancy and its outcome.
- Summarize the nutrient needs of the mother during lactation
- Summarize the physiology of the letdown reflex.
- Outline the benefits of breastfeeding for both the infant and mother
- 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.
- Explain the consequences of under-nutrition or over-nutrition at different stages of growth and development.
- 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 and compare the nutrient needs of infants, children, and adolescents
- Describe the nutritional problems that may occur during the growing years (obesity in particular) and their potential impact on future health

**Required readings:**

- Wardlaw, Chapters 16, 17
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Pregnancy and Lactation **AND** Infancy Through Adolescence **AND** Aging and the Elderly
- Week 12 journal entries (one for each chapter)
- Week 12 quiz (40 questions, 40 minutes)

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 13 Lecture: Lifecycle Nutrition III and Diet, Health, & Disease****Lecture Learning Objectives:**

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

- Discuss the physical changes of the aging process and nutritional implications.
- Describe the role of physical activity during aging.
- Summarize the nutrients of concern for aging adults, i.e., identify the nutrients for which there are different requirements in older adults
- Outline food-related factors that can predict malnutrition in older adults.
- Identify the commonly used drugs that adversely react with nutrients, and explain the potential consequences of these interactions.
  
- Identify the important lifestyle factors (modifiable and non-modifiable) that promote health and disease
- Describe the development, risk factors, and specific nutrition recommendations for each of the major chronic diseases discussed (CVD, hypertension, diabetes, and cancer)
- Compare the two major forms of diabetes mellitus
- Define the role of nutrition in the metabolic syndrome
- Describe how nutrition impacts the immune system
- Discuss the potential impact of adhering to the *Dietary Guidelines for Americans* and the food guide graphics, *MyPyramid/MyPlate*, on chronic disease risk.

**Required readings:**

- Wardlaw, Chapter 18
- Whitney & Rolfes, Chapter 18
- Please refer to the Canvas course site for complete list and links

**Assignments:**

- Online lecture - Aging and the Elderly **AND** Diet, Health, and Disease
- Discussion VI postings

- Week 13 journal entries (one for each chapter)
- Week 13 quiz (40 questions, 40 minutes)

**Supplementary readings and links:**

- Please refer to the Canvas course site

**Week 14**

- **FINAL EXAM: Due December 23** - See instructions under **Modules** on Canvas
- **DIET RECORD PROJECT, PART V: Due December 23** - See Instructions under **Modules** on Canvas