Tufts UNIVERSITY | Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy

NUTR/NUTC 202: Principles of Nutrition Science
Tufts University | Summer 2024

This course is 100% online and asynchronous. Students are not required to attend classes, nor are they all required to be present at the same time for lectures. However they must have access to a reliable computer and internet connection to access the pre-recorded lectures and course materials. The online learning management system used for administering this course is Canvas. Students will be able to access the course website through Canvas by no later than 5pm (EDT) on Friday, May 17, 2024. An orientation to Canvas is provided under Dashboard (once you login via canvas.tufts.edu). An orientation to the layout of the course itself will be provided on the Canvas course site under Modules.

Welcome to NUTR/NUTC 202!

We are delighted to have you join us, and very much look forward to working with you this semester. My name is Diane McKay, and I will be your instructor. Feel free to call me Diane, Dr. McKay, or Professor McKay, whichever you are most comfortable with. In this course we cover the science of nutrition and how the individual nutrients present in what we eat and drink affect our bodies over time and influence our risk for chronic diseases like heart disease, cancer, and Type 2 diabetes. I have been teaching this course either in-person or online for over 15 years now, and I still love it. I will do my best to help you come up to speed and fill in your knowledge gaps related to nutrition science and, at the same time, help you feel more confident as a "nutrition expert" after we part.

In this course we truly believe that the diversity of student experiences and perspectives is essential to the deepening of knowledge. 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 always 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.

As a student, there may be times when personal stressors or difficulties interfere with your academic performance or well-being. There are confidential resources available at Tufts that can assist you in managing these challenges. If you feel like your performance in class is being impacted by your experiences outside of class, please don't hesitate to connect with me. In addition, through Tufts' Counseling and Mental Health Service (CMHS) students can access mental health support 24/7, and they can provide information on additional resources. To make an appointment, call 617-627-3360. Please visit the CMHS website: http://go.tufts.edu/Counseling to learn more about their services and resources.

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. As noted above, Tufts Counseling and Mental Health Services are available to you 24/7.

Important Information:

Class Meetings: No set meeting times. Course is 100% online and asynchronous

Location: Online, asynchronous.

Semester Hour Units: 3 SHU credit

Prerequisites: None. No prior background or coursework in science required.

Instructor: Diane L. McKay, PhD, FACN
Email: diane.mckay@tufts.edu
Phone or text: (781) 608-7183
Zoom link: provided upon request

Teaching Assistant (TA):

Riho Adachi, MPH, RD
PhD Candidate, Nutrition Interventions, Communications, and Behavior Change
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Course Communications:

We appreciate hearing questions from students. Because the class does not meet in person, and there are no set times for office hours, you are welcome to email questions directly to either or both of us, or send one or both of us an email to set up a time to connect via Zoom. Feel free to use "Cafe McKay," the general class discussion forum on Canvas, to post questions about course-related issues that you think might also be of interest to your fellow classmates. Be sure to check this discussion board frequently as the answers to your questions may have already been posted there by your peers or the instructor. If you cannot find your answer on "Cafe McKay," or if you prefer privacy, you are always welcome to contact us directly via your preferred mode of communication. We encourage you not to wait until the last minute if your question is urgent as we may not be readily available to respond. We will do our best to get back to you as soon as we are able. All communications from us, including periodic course announcements, will be sent to your Tufts email address so please check it at least once daily.

Office Hours:

We are always available to connect with you via email, text (24/7), or online (Zoom) at a mutually convenient time. You can connect with us either individually, in pairs, or even small groups. Students come to our office hours for all kinds of reasons, including:

- Ask questions or for more information about course material (we LOVE to talk about nutrition!)
- Share ideas about projects and assignments
- Get advice about completing assignments
- Talk about other issues related to the class (e.g., “How can I improve participation?”)
- Talk about issues affecting your performance in class (e.g., “My family member is sick and I am stressed out, is there anything we can do about this?” Or “I am juggling work and school and am wondering about advice to make sure I complete the class.”)
- Discuss disability accommodations (make sure you do this early in the semester)
- Ask questions about the major or minor
- Just say hi!

Course Summary:

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 Learning Objectives:

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

1. Summarize the dietary recommendations of the major groups/organizations in the United States that recommend what to include in a healthy diet.
2. 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.
3. Explain the adverse health effects associated with a toxicity or deficiency of each nutrient, and any potential major public health problems.
4. Discriminate between sound and questionable nutrition information and sources.
5. Critically evaluate the quality of their own diet.

Text, Software, and Materials:

The print version of the text is available on many websites. The required diet analysis software is available for purchase directly from the publisher at www.cengagebrain.com. Do NOT purchase their MindTap product. To curtail costs, consider renting or sharing with a classmate.

REQUIRED TEXT:

Wardlaw's Perspectives in Nutrition (McGraw-Hill, 11th or 12th edition), by Byrd-Bredbenner et al. The 12th edition is available in hardcover (ISBN13: 9781260695595), looseleaf (ISBN13: 9781260788594) and e-text formats (ISBN13: 9781266636509). The 10th edition of this text is 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, the first three chapters will be made available on the Canvas course site.

REQUIRED SOFTWARE:

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. Here is the link to purchase the **6 month instant access option for ~$35 (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 same page for ~$64. 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 detailed instructions on how to share this software on Cafe McKay, the general discussion forum, 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.

Access to course materials on Canvas:
The online learning management system used for administering this course is called Canvas. Login to canvas.tufts.edu using your Tufts username and password, then click on the tile labeled, NUTR-0202. There you will find all course materials (other than the required textbook and software listed above), including supplemental readings, assignment instructions and self-assessment quizzes. Unless otherwise noted, all assignments should be submitted through the NUTC- or NUTR-0202 course site on Canvas.

How to be Successful in this Course:

Ideally, we want students to complete all required readings (both in the textbook and on the Canvas course site) and watch the pre-recorded online lectures in their entirety. The pre-recorded lectures are closed-captioned and transcripts are available directly below each lecture. Supplemental readings, although not required, are highly recommended. Many students refer to select supplemental readings when composing their reflection journal assignments. Lecture outlines and learning objectives are provided for each chapter in order to organize the weekly materials and enhance your learning experience. You will find the lecture outlines and the learning objectives particularly helpful when preparing for the weekly quizzes. Think of the learning objectives as THE answers to the quiz questions. Students who put in the effort to write out a brief explanation of each learning objective as they go along tend to do well in this course and, in the process, create their own study guide to refer to throughout the semester.

Assignments and Grading:

Assignments for this course include required weekly readings, online lectures, self-assessment quizzes and written digests; four reflection journal entries; six online discussion forums; a five-part diet project; and one final project. The detailed instructions and grading criteria (rubrics) for each of these assignments can be found by logging on to the NUTC- or NUTR-0202 course site in Canvas (**canvas.tufts.edu**) and clicking on the tab labeled "Modules." Because there are so many different ways for students to demonstrate and apply their knowledge in this class, there are no opportunities to earn extra credit.

Reflection journal entries

Students must complete and submit a total of four (4) reflections at specified intervals throughout the semester. The purpose of this assignment is to help students incorporate, retain, and apply the concepts and information they are presented with throughout this course. Your reflections do not need to be summaries, nor do they need to include all of the elements covered within the specified period of time. Instead, you are encouraged to pull out specific issues/topics presented throughout the semester that resonate with you on some level, and use them as the basis for your reflections. In each reflection we are looking for well-composed, substantive statements that are honest and demonstrate your engagement with the course materials. Each reflection should address the following three (3) items as distinct sections:

1. **Real Life Connections to Self**- Consider one of the following: How is the course material relevant to you as a consumer? 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. **Real Life Connections to Others**-Pick an issue or topic that was raised in the course materials, and explain how it relates to the nutritional health of a specific group, population, or community (based on their age, sex, race, ethnicity, income, education, environment, etc.). How might you apply what you have learned in this course to address this issue and/or affect change in this group?
3. **Wonderments** - What concepts/issues related to the course materials are you trying to reconcile in your own mind? What are you still wondering about?

Please refer to the **Reflection Journal Grading Rubric** for details on expectations and grading. Each reflection journal entry is worth 2% of your final grade.

Weekly (online) quizzes

Graded quizzes are provided to enhance your learning experience, assess your comprehension, and highlight concepts and issues of importance. Each week, students are asked to complete a quiz based on the materials presented in the assigned readings and lectures during the prior week. Quizzes are open-book, but they must be completed without any assistance from other students, acquaintances, instructors, TAs, internet bots, etc. Once you start a quiz, you must complete it within the amount of time indicated. Each quiz will be open for one 7-day period only (Wednesday morning to Tuesday night), and may be completed anytime within that period. Each quiz can be taken up to 2 times prior to the due date, and the final score will be the average of the 2 attempts. You will not be able to see your responses to either attempt until after the due date. That is, students will not know whether their answers were correct or incorrect until after the week is over. Even then the correct answers will not be provided. This is intentional because it allows you to identify the relevant sections of the lectures/readings that you need to go back and review. If after reviewing the materials you are still unable to find the correct answer, reach out so we can give you some guidance – but not the answer. I may post general feedback on the most frequently missed questions to the general class discussion forum, Café McKay after the due date has passed. And, unlike

your other assignments, each quiz closes immediately after its due date. This means that if you need to take a quiz after the due date, and you have not requested an extension prior to that, you need to reach out to me so I can reopen it for you. Each individual quiz is worth 1% of your final grade.

> **Technical issues** do happen, sometimes in the middle of timed 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 timer will continue to count down, but Canvas will have saved your answers up to the point you lost access. Resume your quiz and hit Submit when you are done, 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.

Weekly digests - "In Your Own Words"
Each week you will be required to write comprehensive answers to 1-3 questions that demonstrate your knowledge of and ability to apply the materials presented that week. Your answers must be composed in terms that would be readily understood by the target audience specified in each question, and in your own words. Please review the policies regarding plagiarism under the section labeled **Academic Conduct** above. Each individual digest is worth 1-2% of your course grade.

Graded (online) discussions
In order to help deepen your understanding of select topics, students will be asked to participate in six (6) graded discussion forums approximately every other week. In each discussion forum, students will be expected to 1) read the assigned background materials prior to participating, 2) compose and submit an initial posting to the respective forum by 11:59pm ET on the Saturday after it opens, and 3) compose and submit at least 2 reply postings to your classmates' initial postings by 11:59pm ET on Tuesday, i.e., the end of that week. Please refer to the Course Overview section (starting on page 7-8 below) to see the respective due dates for the initial and reply postings for each forum. The expectation is that your postings will be thoughtful and substantive, address the specific questions posed by the instructor, incorporate facts from the text/lectures, and are directly relevant to the assigned topic. You are expected to participate actively in each discussion forum, and submit your postings on time, especially your initial postings, so your classmates will have something to reply to by the end of the week. Grading will be based on the quality of your postings, your ability to demonstrate your understanding of the assigned materials, and whether each posting is submitted on time. Please refer to the Discussion Forum Rubric for details on these expectations, and how they relate to your grade. Unless an extension is requested prior to each posting due date, students are only allowed to submit their postings during the week in which that discussion forum is active. Each discussion forum is worth 2.5% of your final grade.

Diet record project
Because this is a science-based course you will be asked to conduct an experiment. In this experiment you will record your observations, analyze the data you collect, and discuss your results (in writing).*****Specifically, students will be asked to *a*) observe and record their own dietary habits for 3 days, *b*) enter the data they have collected into the required software program, Diet and Wellness Plus, 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. Feel free to start recording your daily food/beverage intake for Part 1 as soon as possible, even sometime during Week 1. Parts 2-5 will require students to submit their answers to specific questions related to their Part 1 report. Each individual part is worth 5% of your final grade. Please refer to the general Grading Rubric for this assignment, and to the specific grading criteria provided in the instructions for each part.

*****Accommodations can be made for students who would prefer to track and/or analyze someone else's diet rather than their own. Please contact the instructor or a TA for details.

Final summation project

At the end of the course students will be given the opportunity to demonstrate their enduring understanding of the “major nutritional problems that affect individuals and populations from conception and throughout the lifecycle" For this project, you will be asked to apply your knowledge of nutrition science to illustrate the nutrition-related issues/consequences/implications of a real world scenario on human health. A list of scenarios and range of formats to choose from will be provided.This project is worth 10% of your final grade.

Weight of Each Assignment Towards Course Grade

Points will be awarded for each assignment, and an overall course score will be calculated from the weights given below:

Assignment	**Weight**
Reflection Journal Entries (4)	8%
Weekly Self-Assessment Quizzes (15)	15%
Weekly Digests -”In Your Own Words” (13)	27%
Graded Discussions (6)	15%
Diet Record Project (5 parts)	25%
Final Summation Project	10%

Grading Range:

There are many different ways for students to demonstrate their knowledge and ability to apply the materials in this course, and you have the opportunity to accumulate a specific number of points towards your final score with each assignment. Please be aware that when I assign your final grade, I do not round up your final score, nor do I grade on a curve. Your final score will be based on the actual number of points earned throughout the semester, and your final grade will be assigned according to ranges specified in the chart below. For example, if at the end of the semester your final score is 89.99, your course grade will be a B+, and not an A-. To prevent any unwelcome surprises at the end of the course, I advise students to check their total score in the Canvas gradebook frequently throughout the semester.

*A **passing grade in the course is B- or better**. Course grades will be based on the final scores below:*

Final Grade	**Final Score**
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

Instructions for Submission of Assignments and Exams:

Please submit each assignment no later than 11:59PM ET (Boston time) on the due date indicated in the Course Overview section (starts on the next page). The due date for each assignment can also be found on the course site in Canvas. If you find yourself needing additional time on any assignment, feel free to request an extension at least one minute prior to the deadline (see Late Policy below). **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. **If a student chooses to use AI to assist with any assignment they must adhere to the AI policy as outlined below under Academic Conduct.**

Late Policy:
Assignments should be submitted on time, but I understand that extenuating circumstances can arise that make this difficult. If you cannot meet a deadline, please ask for an extension in advance. If you need an extension for any reason, please notify me by email (preferred), text message, or phone at least one minute prior to the deadline. No explanation is needed, but we do ask that you let us know how much additional time you might need so we can adjust your assignment deadline settings in Canvas accordingly. Regardless of the circumstances I want to make sure you have the time and space you need to devote to each assignment. There is no limit to the number of extensions a student can request, and we are always willing to accommodate students who may need additional time to complete their assignments - as long as they reach out at least one minute prior to the deadline. If you experience an emergency and are unable to notify me prior to the deadline, please reach out as soon as you are able so we can discuss a plan. Assignments received after their deadlines without an extension will have scores reduced by 5 percentage points (half a letter grade) for each day they are late, or until I hear from you.

Academic Conduct:

You are responsible for upholding the highest standards of academic integrity, as specified in the Friedman School's Policies and Procedures Handbook located at this web page: https://nutrition.tufts.edu/about/policies-and-procedures, as well as Tufts University's policies (https://students.tufts.edu/community-standards/support-resources/academic-integrity-resources). This includes understanding and avoiding plagiarism, which is defined as the unacknowledged use of someone else's published or unpublished work. It is the responsibility of each student to understand and comply with academic integrity standards, as violations will be sanctioned by penalties ranging from failure on an assignment and the course to dismissal from the school

As part of this course, I will use Turnitin to help determine the originality of your work. Turnitin is an automated system which instructors can use to quickly and easily compare each student's assignment with billions of websites, as well as an enormous database of student papers that grows with each submission. When written assignments are submitted to Turnitin, the service will retain a copy of the submitted work in the Turnitin database for the sole purpose of detecting plagiarism in future submitted works. Students retain copyright on their original course work. For more information, see Turnitin.com

AI policy: In this course, you may **not** submit any work generated by an AI program as your own. This is a violation of Tufts Academic Integrity policies and subject to disciplinary action. However, you may use AI tools for your learning, just as you can collaborate with your peers for things such as brainstorming, getting feedback, revising, or editing your own work. Please note that the material generated by these programs may be inaccurate, incomplete, or otherwise problematic. Many of these AI tools retain the rights to use your information and the content shared with them in a variety of ways. Beware that use of AI may also stifle your own independent thinking and creativity. If you use AI in this course, please follow these guidelines:

- Cite all AI tools when used or referred to in assigned work. In an AI citation, provide (1) the prompt you used, (2) the name of the AI tool and, if available, the version, (3) the company that provides the tool, (3) the date you used it, and (4) the AI url. Note that the AI tool is NOT an author. See also "How to Cite Generative AI" from the MLA.
- Identify the way it contributed to your work. For example, you can include a statement that you asked an AI to "identify any grammatical or spelling errors" in your writing, or you used it to get started in thinking about topics for your assignment. Any statement directly generated by an AI system should be in quotes. If you have questions please reach out to the instructor!

If you ever have a question about the expectations concerning a particular assignment or project in this course, be sure to ask me for clarification. Faculty are required to report suspected cases of academic integrity violations to the Dean of Academic Affairs and the Assistant Dean of Student Affairs. If I suspect that you have cheated or plagiarized in this class, I must report the situation to them.

Accommodations:

We will do our best to ensure each of you has the resources you need to succeed. 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.

Course Overview:

You will find the Canvas course site is organized by weekly modules. Under each module you will find the learning objectives for each lecture/chapter, a list of required and supplemental readings, detailed instructions for each assignment due that week, along with the link to submit each assignment.

Disclaimer: The schedule below is subject to modification at the instructor's discretion.

DATE	WEEK	TOPIC(S)	ASSIGNMENT DUE DATES
	0	Course Introduction	Pre-Course Survey - May 28
May 22-28	1	Nutrition Overview Basis of a Healthy Diet	Discussion O Postings - May 28 Week 1 Digest (2) - May 28 Week 1 Quizzes (2) - May 28
May 29-June 4	2	Digestion	**Discussion 1 Initial Posting (1) - Jun 1** Discussion 1 Reply Postings (2) - Jun 4 Diet Project, Part 1 - Jun 4 Week 2 Digest - Jun 4 Week 2 Quiz - Jun 4
June 5-11	3	Carbohydrates	Diet Project, Part 2 - Jun 11 Week 3 Digest - Jun 11 Week 3 Quiz - Jun 11 Reflection #1 - Jun 11
June 12-18	4	Lipids	**Discussion 2 Initial Posting (1) - Jun 15** Discussion 2 Reply Postings (2) - Jun 18 Week 4 Digest - Jun 18 Week 4 Quiz - Jun 18
June 19-25	5	Proteins	Diet Project, Part 3 - Jun 25 Week 5 Digest - Jun 25 Week 5 Quiz - Jun 25
June 26-July 2	6	Energy Metabolism Alcohol	Week 6 Digest - Jul 2 Week 6 Quiz - Jul 2 Reflection #2 - Jul 2
July 3-9	7	Energy Balance Weight Management	**Discussion 3 Initial Posting (1) - Jul 6** Discussion 3 Reply Postings (2) - Jul 9 Week 7 Digest - Jul 9 Week 7 Quiz - Jul 9
July 10-16	8	Fat-Soluble Vitamins	**Discussion 4 Initial Posting (1) - Jul 13** Discussion 4 Reply Postings (2) - Jul 16 Week 8 Digest - Jul 16 Week 8 Quiz - Jul 16
July 17-23	9	Water-Soluble Vitamins	Week 9 Digest - Jul 23 Week 9 Quiz - Jul 23

			Reflection #3 - Jul 25
July 24-30	10	Major Minerals/Water	**Discussion 5 Initial Posting (1) - Jul 27** Discussion 5 Reply Postings (2) - Jul 30 Week 10 Digest - Jul 30 Week 10 Quiz - Jul 30
Jul 31-Aug 6	11	Trace Minerals	**Final Summation Project Topic - Aug 6** Diet Project, Part 4 - Aug 6 Week 11 Digest - Aug 6 Week 11 Quiz - Aug 6
Aug 7-13	12	Life Cycle Nutrition I Life Cycle Nutrition II	Week 12 Digest - Aug 13 Week 12 Quizzes (2) - Aug 13 Reflection #4 - Aug 13
Aug 14-20	13	Life Cycle Nutrition III Diet & Health	**Discussion 6 Initial Posting (1) - Aug 17** Discussion 6 Reply Postings (2) - Aug 20 Week 13 Digest - Aug 20 Week 13 Quizzes (2) - Aug 20
Aug 21-25	14	Final Assignments	Diet Project, Part 5 - Aug 25 **Final Summation Project -Aug 25**

Topics, Assignments, and Learning Objectives for Each Class Session:

Week 0 - May 17-21
Course Topic(s): Course Introduction
Learning Objectives:
Upon completion of this class, students will be able to:

- Identify important course-related information in the syllabus
- Describe how the course is organized in Canvas

Required Reading

- Course syllabus
- Canvas course site, NUTC- or NUTR-0202

Assignments and Due Date:

- Pre-Course Survey – May 28

Week 1 - May 22-28
Course Topic(s): Nutrition Overview, Basis of a Healthy Diet

Nutrition Overview,

Learning Objectives:
Upon completion of this week, students will be able to:

- Define “nutrition” and “essential nutrients.”
- Describe the six major classes of nutrients, their basic chemical structures, and respective energy values.
- Explain the role of national nutrition surveys (NHANES)
- Discuss the ABCDEFs of nutrition assessment, and the limitations of each.
- Identify the red flags of poor nutrition advice, and differentiate sources of nutrition information.

Required Readings

- Wardlaw, Chapter 1 - The Science of Nutrition
- Whitney & Rolfes, Highlight 1 - Nutrition Information and Misinformation
- “How to Spot Health Fraud” (FDA)

Basis of a Healthy Diet

Learning Objectives:

Upon completion of this week, students will be able to:

- Describe the components of a healthful diet, i.e., the diet planning principles (ABCDMV).
- Define nutrient density, and give examples of nutrient dense foods from each food group.
- Explain the four sets of dietary standards of the DRIs, how they are determined, and how/when each is applied.
- Compare DVs with DRIs, and explain how DVs are used on Nutrition Facts Panels.
- Interpret the nutrition information provided on food packaging labels.
- Distinguish between the three types of claims allowed on food labels and the conditions under which each is allowed.
- Summarize the purpose of the Dietary Guidelines for Americans (DGA).
- Describe the components of the current USDA Food Guide Graphic, and how this graphic relates to the DGA.

Required Readings

- Wardlaw, Chapter 2 - Tools of a Healthy Diet
- Whitney & Rolfes, Chapter 2 (pg 38-40 only)
- Critical Health Applications of the DRIs (NAM)
- Guidance on How to Understand and Use the Nutritional Facts Panel on Food Labels (FDA)
- 2020-2025 Dietary Guidelines for Americans - Executive Summary (USDA/DHHS)
- Current USDA Food Guide Graphic - MyPlate.gov > Eat Healthy (USDA)
- Culturally Appropriate Food Guides (Oldways Preservation Trust)
- Should the Dietary Guidelines Fight Systemic Racism? (Civil Eats, 2020)
- “Is American Dietetics a White Bread World?” (NY Times, 2020)
- “Our Idea of Healthy Eating Excludes Other Cultures and That’s a Problem” (SELF, 2018)
- Using What’s at Hand (serving size guide, Healthwise)

Assignments:

- Online lecture - An Overview of Nutrition
- Week 1, chapter 1 quiz (for practice, no credit)
- Discussion O - Nutrition Information: Fact or Fiction? (for practice, no credit)

- Online lecture - Basis of a Healthy Diet
- Week 1, chapter 2 quiz
- Week 1 digest (2 questions)

Week 2 - May 29-June 4
Course Topic(s): Digestion

Digestion

Learning Objectives:

Upon completion of this week, students will be able to:

- Outline the overall physiological processes of digestion and absorption, including the roles played by each organ within the gastrointestinal tract (mouth, stomach, small intestine, large intestine) and the accessory organs (salivary glands, liver, gallbladder, and pancreas).
- Identify the major enzyme classes and hormones that act in the digestion of the various nutrients, and indicate how they work.
- Compare the general differences between fat- vs. water-soluble nutrients during digestion, absorption, and transport, and outline each step in the process.
- Describe, in detail, the digestion of a meal containing all 3 macronutrients, i.e., carbohydrates, lipids, and protein.
- Summarize the major nutrition-related gastrointestinal health problems
- Discuss the relationship between gut microbes, prebiotics, and probiotics

Required Readings

- Wardlaw, Chapter 4 - Digestion & Absorption
- Transport of Nutrients (handout)
- Probiotics Come With Bold Health Claims, but the Science is Shaky (STAT, 2016)

Assignments:

- Online lecture - Carbohydrates
- Discussion 1 - Gut Microbes, Prebiotic, and Probiotics
- Week 2 Quiz
- Week 2 Digest
- Diet project, part 1

Week 3 - June 5-11
Course Topic(s): Carbohydrates

Carbohydrates

Learning Objectives:

Upon completion of this week, students will be able to:

- Differentiate between mono-, di-, oligo-, and polysaccharides and identify food sources of each.
- Summarize the digestion and absorption of the different types of carbohydrates.
- Describe the major functions of simple and complex carbohydrates in the body and their health effects.
- Discuss the role of dietary fiber in disease prevention, and the potential mechanisms involved.
- Explain the roles of the hormones insulin and glucagon in the regulation of blood glucose, i.e, glucose homeostasis.

Required readings:

- Wardlaw, Chapter 5 - Carbohydrates
- "The Nutrition Source: Fiber"(Harvard School of Public Health)
- "Types of Fiber and their Health Benefits" (WebMD)

Assignments:

- Online lecture - Carbohydrates
- Week 3 quiz
- Week 3 digest
- Diet project, part 2
- Reflection #1

Week 4 - June 12-18
Course Topic(s): Lipids

Lipids

Learning Objectives:

Upon completion of this week, students will be able to:

- Describe the structure, biological significance, and sources of each category of lipids, i.e, triglycerides, phospholipids, and sterols.
- Explain the differences between saturated, monounsaturated, and polyunsaturated fatty acids with regard to their respective chemical structures, predominant food sources, and health effects.
- Identify the two essential omega-3 and omega-6 fatty acids and summarize their respective health effects.
- Discuss the origins and food sources of trans fatty acids and their effect on health
- Summarize the digestion and absorption of dietary fat, including the role of bile.
- Explain the structure and role of each type of lipoprotein (i.e, chylomicrons, VLDL, LDL, and HDL) in lipid transport throughout the body.
- Describe the major functions of fat in the body.

Required readings:

- Wardlaw, Chapter 6 - Lipids
- "The Nutrition Source: Types of Fat" (Harvard School of Public Health)
- Omega-3 Fatty Acids Fact Sheet for Health Professionals (NIH ODS)
- Eat Smart: Fats (AHA)

Assignments:

- Online lecture - Lipids
- Discussion #2 - Dietary Fats and CVD Risk
- Week 4 quiz
- Week 4 digest

Week 5 - June 19-25
Course Topic(s): Proteins

Lecture 6: Proteins

Learning Objectives:

Upon completion of this week, students will be able to:

- Identify the structure of amino acids and describe how they form proteins in the body.
- Define essential and nonessential amino acids and the role of deamination and transamination in protein synthesis and metabolism.
- Compare complete and incomplete proteins and their respective food sources.
- Explain the concept of a limiting amino acid and how it relates to protein quality.
- Summarize the digestion and absorption of protein.
- Describe the major physiological functions of protein and their effects on health.

Required readings:

- Wardlaw, Chapter 7 - Protein
- "The Myth of the Indian Vegetarian Nation" (BBC, 2016)
- World Meat and Dairy Production (Our World in Data)

Assignments:

- Online lecture - Protein
- Week 5 quiz
- Week 5 digest
- Diet project, part 3

Week 6 - June 26-July 2
Course Topic(s): Energy Metabolism, Alcohol

Energy Metabolism

Learning Objectives:

Upon completion of this week, students will 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 i.e., types of work for which it is required.
- Besides ATP, list the other 2 compounds produced in cells after food is completely metabolized.
- Identify the three (3) major metabolic pathways through which the macronutrients are converted into energy, and where energy metabolism occurs in the cell.
- Examine the general differences between the metabolism of carbohydrates, fats, and proteins into usable energy (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)

- Compare the fate of each macronutrient in the body during feasting (consuming any macronutrient in excess of the body's energy/calorie needs), fasting (after nutrients from a meal are no longer available for energy) and prolonged fasting (after glycogen is depleted).

Required readings:

- Wardlaw, Chapter 9 - Energy Metabolism
- Energy Metabolism Overview (handout)

Alcohol

Learning Objectives:

Upon completion of this week, students will be able to:

- Define the term "*one drink"* when referring to an alcoholic beverage
- Define the term "*moderate alcohol consumption"* for both men and women
- 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, Chapter 8 - Alcohol
- Binge drinking dangerous for young adults (ScienceDaily, 2016)
- Bone mass suffers with binge drinking (ScienceDaily, 2018)

Assignments:

- Online lecture - Energy Metabolism
- Online lecture - Alcohol
- Week 6 quiz
- Week 6 digest
- Reflection #2

Week 7 - July 3-9
Course Topic(s): Energy Balance, Weight Management

Energy Balance & Weight Management

Learning Objectives:

Upon completion of this week, students will 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 or EER.
- Define BMI, describe its limitations, and summarize how BMI is used to define underweight, healthy weight, overweight, and obesity in public health settings.
- 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 adults in the U.S..

- Describe how fat cells develop, and the role of lipoprotein lipase (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 - Energy Balance, Weight Control, and Eating Disorders (skip the section on Eating Disorders)
- Widespread Misconceptions About Obesity (Can Fam Physician, 2014)
- "Racism and Obesity are Inextricably Linked" (Boston.com, 2021)
- U.S. Obesity Trends Map by Race/Ethnicity, State and Territory (CDC)
- Promoting Ethnic Parity in Health, Leaving Behind "Race": A Challenge for the Global Community (Am J Clin Nutr editorial, 2020)
- BMI and Mortality - Time to Revisit Current Recommendations for Risk Assessment (Am J Clin Nutr editorial, 2020)
- Dietary Supplements for Weight Loss Fact Sheet for Health Professionals (NIH ODS)

Assignments:

- Online lecture - Energy Balance
- Online lecture - Weight Management
- Week 7 quiz
- Week 7 digest
- Discussion #3 - Weighing in on Popular Diets

Week 8 - July 10-16
Course Topic(s): Fat-Soluble Vitamins

Fat-Soluble Vitamins

Learning Objectives:

Upon completion of this week, students will 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, in general, how their solubility affects their absorption, transport, storage, and excretion.
- List the common and chemical names for each fat-soluble vitamin and their primary food sources
- Outline the major functions or role of each fat-soluble vitamin in the body.
- Describe the common deficiency symptoms for each fat-soluble vitamin and the conditions in which deficiencies are likely to occur
- Describe the toxicity symptoms caused by the consumption of each fat-soluble vitamin in excess of their tolerable upper intake level (UL)
- Consider the reasons for why certain population groups might be at risk for fat-soluble vitamin deficiencies
- Illustrate the role of vitamin A in vision.
- Diagram the process by which active vitamin D is produced in the body via sunlight exposure and its limitations
- List the antioxidant vitamins and the major cell components they protect against oxidative stress

Required readings:

- Wardlaw, Chapter 12 - Fat-Soluble Vitamins
- Vitamin D Fact Sheet for Health Professionals (NIH ODS)
- The Vitamin D-lemma (Nature, 2011)

Assignments:

- Online lecture - Fat-Soluble Vitamins
- Activity (optional)- Fat-Soluble Vitamins Chart
- Week 8 quiz
- Week 8 digest
- Discussion #4 - Vitamin D Recommendations

Week 9 - July 17-23
Course Topic(s): Water-Soluble Vitamins

Water-Soluble Vitamins

Learning Objectives:
Upon completion of this week, students will be able to:

- List the common and chemical names for each water-soluble vitamin and their primary food sources
- Outline the major functions or role of each water-soluble vitamin in the body.
- Describe the common deficiency symptoms for each water-soluble vitamin and the conditions in which deficiencies are likely to occur
- Describe the toxicity symptoms caused by the excess consumption of each water-soluble for which a UL has been established
- Consider the reasons for why some population groups might be at risk for certain water-soluble vitamin deficiencies
- Outline the process by which vitamin B12 from food sources is digested and absorbed.
- Compare the different types of vitamin-related anemias and how they develop.

Required readings:

- Wardlaw, Chapter 13 - Water-Soluble Vitamins

Assignments:

- Online lecture - Water-Soluble Vitamins
- Activity (optional)- Water-Soluble Vitamins Chart
- Week 9 quiz
- Week 9 digest
- Reflection #3

Week 10 - July 24-30
Course Topic(s): Major Minerals, Water

Major Minerals & Water

Learning Objectives:
Upon completion of this week, students will be able to:

- Summarize the key functions of water in the body.
- Explain the components of water balance (water “in” vs. water “out”) and why it is considered an essential nutrient
- Discuss the daily water recommendations for humans and how they relate to water balance.
- Summarize the general similarities and differences between vitamins and minerals.
- Describe the general differences between major, trace, and ultra-trace minerals with regard to human health.
- List the factors that affect mineral bioavailability in general.
- List the primary food sources for each major mineral
- Outline the major functions or role of each major mineral in the body for which an AI or RDA has been established.
- Describe the common deficiency symptoms associated with each major mineral and the conditions in which deficiencies are likely to occur.
- Describe the toxicity symptoms caused by the excess consumption of each major mineral for which a UL has been established
- Consider the reasons for why some population groups might be at risk for certain major mineral deficiencies

- Diagram the process by which calcium homeostasis is maintained in the human body, and list the major hormones and organs involved.
- Identify the risk factors for the development of *osteoporosis* and describe the role of physical activity and dietary factors in preventing this disease.
- Define "*electrolyte*," list the major electrolyte minerals, and describe their common functions
- Compare the effects of sodium and potassium on blood pressure, and discuss the role of diet in the development and treatment of hypertension.

Required readings:

- Wardlaw, Chapter 14 - Water & Major Minerals
- Racial/Ethnic and Socioeconomic Disparities in Hydration Status Among U.S. Adults and the Role of Tap Water and Other Beverage Intake (Am J Public Health, 2017)
- Salt Reference Intake Levels Updated (MedPage Today, 2019)
- Calcium Fact Sheet for Health Professionals (NIH ODS)

Assignments:

- Online lecture - Water
- Online lecture - Major Minerals
- Activity (optional)- Major Minerals Chart
- Week 10 quiz
- Week 10 digest
- Discussion #5 - Strategies to Reduce Sodium Intake

Week 11 - Jul 31-Aug 6
Course Topic(s): Trace Minerals

Trace Minerals

Learning Objectives:

Upon completion of this week, students will be able to:

- List the primary food sources for each trace mineral
- Outline the major functions or role of each trace mineral in the body.
- Describe the common deficiency symptoms associated with each trace mineral and the conditions in which deficiencies are likely to occur.
- Describe the toxicity symptoms caused by the excess consumption of each trace mineral for which a UL has been established.
- Consider the reasons for why some population groups might be at risk for certain major mineral deficiencies
- Describe, in general, the absorption, transport, storage, and excretion of iron and zinc, with an emphasis on the role of the mucosal block.
- Compare the availability of iron from plant vs. animal food sources and the potential health implications of different dietary preferences.
- Identify and describe the potential health consequences of trace mineral interactions (e.g., iron, zinc, copper) in humans.

Required readings:

- Wardlaw, Chapter 15 - Trace Minerals

Assignments:

- Online lecture - Trace Minerals
- Activity (optional)- Trace Minerals Chart
- Week 11 quiz
- Week 11 digest
- Diet project, part 4
- Select topic for final summation project

Week 12 - Aug 7-13
Course Topics: Lifecycle Nutrition I, II

Lifecycle Nutrition I: Pregnancy & Lactation

Learning Objectives:

Upon completion of this week, students will be able to:

- Explain why a nutritionally adequate diet is important long before a pregnancy is established.
- Discuss the role of folate/folic acid during the early stages of fetal development, and the rationale for folic acid fortification programs.
- Define the terms "*critical period*," *"neural tube defect (NTD),"* and "*spina bifida*."
- Summarize the increased nutrient needs of the mother during pregnancy, including total calories, and the micronutrients required for blood production, cell growth, and bone development, and their impact on the mother and fetus.
- Describe the relationship between maternal weight gain during pregnancy and infant birthweight, and the health implications for both mother and infant.
- Discuss the specific nutrient needs of the mother during lactation, including additional calories and fluids, and list the habits that are incompatible with lactation.
- Outline the benefits of breastfeeding for both the infant and mother

Required readings:

- Wardlaw, Chapter 16 - Nutritional Aspects of Pregnancy & Breastfeeding
- Prenatal Foundations: Fetal Programming of Health and Development (Zero to Three, 2014)

Lifecycle Nutrition II: Infancy, Childhood, & Adolescence

Learning Objectives:

Upon completion of this week, students will be able to:

- Compare the energy (calorie), water, macronutrient, and micronutrient needs of infants, children, and adolescents, and how they relate to the physiological changes that occur with each stage of development.
- Describe how the growth and nutritional status of infants and children is assessed, and how this information is applied.
- Discuss the recommendations for feeding an infant during the first year, and how breast milk, infant formula, and the introduction of solid foods affect their nutritional health.
- Describe the nutritional problems that may occur during the growing years (obesity in particular) and their potential impact on future health.

Required readings:

- Wardlaw, Chapter 17 - Nutritional During the Growing Years
- Factors Influencing Children's Eating Behaviours, Fig 1 & Table 1 (Nutrients, 2018)
- Maternal, Infant, and Child Health - Overview (HealthyPeople.gov)

Assignments:

- Online lecture - Lifecycle I: Pregnancy & Lactation
- Online lecture - Lifecycle II: Infancy, Childhood, and Adolescence
- Week 12, chapter 16 quiz
- Week 12, chapter 17 quiz
- Week 12 digest
- Reflection #4

Week 13 - Aug 14-20
Course Topics: Lifecycle Nutrition III, Diet & Health

Lifecycle Nutrition III: Adulthood & Aging

Learning Objectives:

Upon completion of this week, students will be able to:

- Discuss the physiological changes that occur throughout the aging process and the nutritional implications of these changes.
- Summarize the nutrients of concern for aging adults and identify the reasons why they are of concern in this particular population.
- Outline food-related factors that can predict malnutrition in older adults.

Required readings:

- Wardlaw, Chapter 18 - Nutrition During the Adult Years
- Tufts University's MyPlate for Older Adults
- The State of Senior Hunger in America (Feeding America, 2020)

Diet & Health

Learning Objectives:

Upon completion of this week, students will be able to:

- Categorize the important lifestyle factors (modifiable and non-modifiable) that promote health and disease throughout the adult years
- Describe the development of, risk factors for, and nutrition recommendations specific to each of the major diet-related chronic diseases discussed (cardiovascular disease, hypertension, type 2 diabetes, and cancer).
- Summarize the potential impact of adhering to the recommendations outlined by the *Dietary Guidelines for Americans* and its related food guide graphic, *MyPlate,* on diet-related chronic disease risk in adults.

Required readings:

- Whitney & Rolfes, Chapter 18 - Disease Prevention
- Addressing Health Disparities Among Minority Populations (JAMA Neurology, 2020)

Assignments:

- Online lecture - Lifecycle III: Aging & the Elderly
- Online lecture - Diet, Disease, & Health
- Week 13, chapter 18 (Wardlaw) quiz
- Week 13, chapter 18 (Whitney & Rolfes) quiz
- Week 13 digest
- Discussion #6 - Dietary Supplement Use

Week 14 - Aug 21-25
Course Topic(s): Final Assignments

Final Assignments

Assignments:

- Diet Project, Part 5
- **Final Summation Project**

Disclaimer: This schedule is subject to modification at the instructor's discretion.