

**Oakland University**  
**School of Health Science**  
**HS 4150: Nutrient Metabolism (HS 460)**  
Fall 2017

Room: HHB 2023

Time/Day: Monday, Wednesday, Friday 1:20 pm-2:27 pm

Professor: Rosemarie Chirco D'Angelo, PhD

e-mail: rdangelo@oakland.edu

Number of credits: 4 (CRN: 14671)

Office Hours: Tuesday & Thursday 2:00-3:00 pm or by appointment

Office: 3158 Human Health Bldg

Office Phone: 248-364-8847

**COURSE DESCRIPTION**

This course addresses the metabolism of carbohydrates, proteins, fats, vitamins, and minerals. Associations with dietary requirements and disease processes, nutrient interactions, nutrient stability and bioavailability, and food sources will be covered. Replaces NH 450.

Prerequisite(s): HS 301, HS 310, CHM 158 or 145, and BIO 207, 321, MLS 425 or BIO 325.

***This is a senior-level course. It is strongly recommended that students have taken chemistry I & II, anatomy/anatomy lab, and physiology OR biochemistry prior to enrolling in this course.***

**REQUIRED TEXT AND SUPPORTING COURSE MATERIAL**

Sareen S. Gropper and Jack L. Smith (2018) Advanced Nutrition and Human Metabolism, 7<sup>th</sup> edition. Cengage Learning. (required)

Reading chapters that supplement the class material have been assigned from this book but I am giving you lots of supplemental information from other sources.

Linus Pauling Institute at Oregon State University Micronutrient Information Center Website  
The Linus Pauling Institute's Micronutrient Information Center is a source for scientifically accurate information regarding the roles of vitamins, minerals, phytochemicals (plant chemicals that may affect health), and other dietary factors, including some food and beverages, in preventing disease and promoting health. The guide can be found at the following weblink, each section is listed on the right: <http://lpi.oregonstate.edu/mic>

Encyclopedia of Diet Fads (Weblink and PDF)

We will use this for the Project Based Learning Project.

Other readings and supporting course materials are found on Moodle and are on the syllabus as a hyperlink. This is a web-enhanced course; I operate under the assumption that ALL students have access to Moodle and check it for updates frequently. If there are any changes to the class schedule I add an announcement to Moodle, so please pay attention to those emails and check announcements frequently to see if a new one has been posted.

## **Course Learning Outcomes**

**At the completion of this course, students will be able to:**

1. Identify and recall nutrient structures and metabolic pathways.
2. Explain metabolic pathways of carbohydrate, protein, and fat at the cellular and molecular level.
3. Explain metabolic pathways of vitamins and minerals.
4. Identify signs and symptoms of nutrient deficiencies and toxicity.
5. Explain energy balance and whole body energetics.
6. Apply understanding of nutrient metabolism to dietary recommendations.
7. Apply understanding of nutrient metabolism to health and disease states.
8. Find, understand, and evaluate sources of scientific information on nutrient metabolism including scientific writing, diagrams, and case studies.

## **Communication and Office Hours**

Email is the best way to contact me outside of class (rdangelo@oakland.edu). However, it may take me up to 48 hours to respond (longer during weekends). If you do not get a response within this time frame, please feel free to gently remind me or follow-up. Expectations for professional conduct extend into electronic communications with your professor. When emailing me please place 'HS 4150 and your name' in the subject line. All e-mail communication must adhere to the following guidelines: E-mails must contain a salutation (e.g., Hello or Dear Dr. D'Angelo), a grammatically correct and structurally sound group of sentences, a complementary closing (e.g., Sincerely, Best), followed by your name. I will also adhere to these guidelines for e-mails sent to individual students or to the class.

Remember, you are responsible for your own learning and it is better to contact me early for help to resolve any potential problems or confusion with the course material. Office hours are listed or can be setup by appointment. For specific concerns, particularly related to course content, it is best to meet with me in person. If you have any questions about your grades, you **MUST** schedule a meeting or come to office hours. I do not discuss grades over e-mail.

## **Course Procedures**

Class will be composed primarily of lectures, with in-class activities (printed ahead of time), videos, or demonstrations as needed. As much of this course is dedicated to understanding structures, functions, and biological pathways, students should come to class prepared to take notes. For most of the class meetings, you will be assigned a pre-reading assignment and activity that must be completed before coming to class to help supplement the material. Lecture slides or notes will be made available prior to class. You are responsible for printing out all materials including pre-reading activities and in class activities ahead of time to be fully prepared to participate with your classmates during the class session. It is strongly recommended that students print out slides to take notes by hand. I recommend printing 4 slides per page (choose the option to print 4 pages on one). Any more than 6 slides per page and it will be hard to take notes. Although computers can be useful for note-taking, notebooks, paper and pen (or pencils) are recommended for this course. Students should expect to draw figures and pathways during class.

Readings associated with each topic/class are listed in the Tentative Class Schedule. It is strongly recommended that students read materials before coming to class to familiarize themselves with the

concepts; students should review the material again after lecture and take notes on the readings. Students are responsible for keeping up with the material and should expect to study regularly for this course.

### **Course Work and Grade Determination**

#### **1. Class Attendance/In Class Activity Participation: 60 points (6% of final grade)**

Class attendance and participation will comprise 60 points of the course grade and will be tracked by participation in in-class group activities such as participating in case studies, questionnaires, and pathway modeling. The in class activities are listed on the syllabus and posted on Moodle but some may be added or changed at a later date. You are responsible for printing out or bringing in your computer for in class activities so that you can fully participate. Most of these activities will be worked on in your student groups. To receive credit for that class, students will sign in at the end of the activity. Each activity will be worth 2.5 pts but you can only earn up to 60 pts total toward your final grade. If you are sick, have an emergency, or other personal reason please let me know the reason you missed class as soon as possible either ahead of class or directly following that class period. If you do not contact me it will count toward one of your “free” missed days. It is strongly encouraged to attend class and participate in these activities because it will help you process the material. Students will be penalized 1 point each time they are caught participating in a non-class activity such as sleeping, texting or using phone, and/or on social media websites

#### **2. Homework/Pre-reading Activities: 90 points (9% of final grade)**

There are nine homework/Pre-reading assignments for this course; each one is worth 10 points. Each homework/pre-reading assignment and activity is specific for that topic for that class meeting and may cover lecture material, class videos, or websites. All of the videos and weblinks can be found on Moodle. There are also some short presentations on journal articles and vitamins that will be assigned as group activities (more details later). If the assignment is designated as a pre-reading assignment, it must be completed before you come to class and turned in at some point during that class meeting (due date listed on syllabus). We may review some of the material in class. Again, you are responsible for printing out all materials and activities before coming to class as parts may be collected and graded. The due dates for each assignment are designated in the syllabus but may be changed if necessary.

#### **3. Quizzes: 150 points (15% of final grade)**

There will be 6 quizzes; each quiz is worth 25 points. Quizzes will be posted on Moodle and are expected to take approximately 25-30 minutes. However, I do not set a time limit on quizzes. The quizzes will be added a week or so before the due date and are to be completed by the assigned date by 11:59 pm. Quizzes will be multiple choice, short answer, or matching. It is imperative that students complete the quizzes by the designated time and date, as they will not get extra time.

**ONLINE QUIZZES CANNOT BE ACCESSED OR MADE UP IF YOU MISS THE DUE DATE, NO EXCEPTIONS.** You will have two attempts on the Moodle quizzes and your highest score will be accepted. If you are having technical difficulties with Moodle you must send me an email and let me know before that class session in order to access the online quiz.

#### **4. Exams: 600 points (60% of final grade)**

There are three exams in this course; all of them are worth 200 pts. Each exam is worth 20% of the course grade. The first exam will cover carbohydrate and lipid metabolism, the second exam will cover protein and fed and fasting metabolism, and the final exam will cover micronutrient metabolism. The final exam will cover the newer material but we will be revisiting the past material and expanding on those pathways with Vitamins and Minerals. Exams will consist of multiple choice

and short answer or short essay questions and can come from any In Class Activity, reading, or pre-reading assignments or activities. Students will not need to bring scantrons, the AKindi system will be used. Students are expected to take all tests at the assigned time and on the assigned date. An exception due to illness or an emergency will be at the discretion of the instructor only. **ALL REQUESTS FOR MAKE-UP EXAMS MUST BE MADE WITHIN 24 HOURS OF THE MISSED EXAM. YOU MUST CONTACT ME IMMEDIATELY FOLLOWING THE MISSED EXAM TO DISCUSS THE POSSIBILITY OF TAKING A MAKE-UP EXAM.** You must provide proof of your illness or emergency, for example a note from your doctor. The final exam will occur on the designated date. All students must take a final exam. There are no make-ups for the final exam.

**5. Problem Based Learning Project (Diet Project): 100 pts (10% of your final grade)**

For this class, I believe in an active learning approach and that we are all a part of the HS 4150 learning community. So you should expect to be actively involved in discussion and activities with your classmates. The modern practice of science involves working with groups. You will work in-groups in class in a variety of ways: developing skills, solving problems and discussing ideas. Individual members are responsible to make sure all group work assignments are completed and turned in on time.

A project based on disease and diet or food lifestyle choices of interest is assigned (please see additional description of the project). You will be working on this project in and out of class over the course of the semester and working on small assignments along the way. The final product will be a problem based learning portfolio and presentation on your diet project that is due at the end of the semester.

**Grade Determination:** Points will be allocated and grade calculated as follows:

	Total # of points	% of your grade
Class Attendance/In Class Activity Participation	Up to 60 pts	6%
9 Homework (10 points each)	90	9%
6 lecture quizzes, (25 points each)	150	15%
3 exams - lecture (200 points each)	600	60%
Problem Based Learning: Diet Project and Presentation (100 pts)	100	10%
	1000	100

**GRADING SCALE**

<b>A</b>	100%	4.0	<b>B</b>	89%	3.5	<b>C</b>	79%	2.9	<b>D</b>	69%	1.9
	99%	4.0		88%	3.5		78%	2.8		68%	1.8
	98%	4.0		87%	3.4		77%	2.7		67%	1.7
	97%	3.9		86%	3.4		76%	2.6		66%	1.6
	96%	3.9		85%	3.3		75%	2.5		65%	1.5
	95%	3.8		84%	3.3		74%	2.4		64%	1.4
	94%	3.8		83%	3.2		73%	2.3		63%	1.3
	93%	3.7		82%	3.2		72%	2.2		62%	1.2
	92%	3.7		81%	3.1		71%	2.1		61%	1.1
	91%	3.6		80%	3.0		70%	2.0		60%	1.0
	90%	3.6									
									<b>F</b>	≤59%	0.0

**Incomplete Grade (“I” grade):** Students who, for reasons beyond their control (illness, bereavement, accident) are unable to complete the work in HS 4150 by the end of the semester may request an Incomplete grade from the professor. The student and the professor must complete the form “Request for an Incomplete Grade,” available from the professor or the Dean of Health Sciences office. The “I” grade must be approved at least one day before the final examination. It is the Professor’s decision whether to allow an Incomplete grade. An Incomplete grade must be converted to a numerical grade within 1 year. Procedures for completing the work in the course are spelled out on the “Request for an Incomplete Grade” form.

### **Expectations of Students**

*Class Participation:* Be Prepared! Active, intelligent participation in class discussion is expected. Regular class attendance, taking notes during class, reading assigned readings, completing pre-reading activities, and participating in class group activities is central to success in this class. Attendance will be taken during or after the in class activities in each class. Due to the nature of the course, students should expect to spend at least as much time out of class studying as they spend in class learning. The more you can repeat information and the more time you spend explaining pathways to yourself, the better you will learn the material. It may also be beneficial to form/join a study group with your classmates and attend meetings regularly. Use your study group to work actively to understand the concepts.

*Classroom etiquette:* Late arrival to class is disruptive to the instructor and other students and will have a negative effect on your in-class activities grade, as will frequent absence from class. You are expected to be seated and ready to begin work at the start of class time. If you arrive later, please enter quietly so that you do not disturb other students. You are expected to wait until I indicate that the class is finished before packing your belongings. Please inform me in advance if, for an exceptional reason, you need to arrive late or leave early on a particular day. If you miss a class, it is your responsibility to notify me personally or by email. Please write HS 4150 in the subject line of email messages along with your name. It is also the student’s responsibility to make sure he/she obtains the missing notes/assignments from a peer, instructor, or MOODLE website.

*Exams and Quizzes:* All students must use the Akindi form provided to you by your instructor for each exam. The form will have the course name and assessment name filled out already. Students must fill in their complete, 8-digit G# s and first and last name. *Points will be deducted if Scantrons are filled out incorrectly*, including failing to fill in circles completely or failing to identify their test form or version of the exam.

Students are expected to arrive on time for exams and complete the Moodle quizzes by the designed date. For the exams and quizzes, students will not be given extra time, regardless of the reason they are late for a quiz or an exam. **Students may not use anything during exams**-no notes, calculators, phones, or other materials. If I see a phone out or being used (without my permission), I will assume you are cheating. Students will receive a 0 on the exam. Since the quizzes are not timed and you can work on them at home, I encourage you to use your book and notes to complete them. It may be helpful to go through the first round and see how you do and then go back and review questions you got wrong.

*Cell-phones:* Cell phones must be turned off or set to silent during class and exams. Please refrain from using your phones (e.g. text messaging, checking Facebook, internet) in class. This is disrespectful to me (Dr. D’Angelo) and your classmates. It will also distract you from learning and trust me, you don’t want to be distracted.

## **Academic Conduct**

The Oakland University policy on academic conduct will be strictly followed with no exceptions:

*“All members of the academic community at Oakland University are expected to practice and uphold standards of academic integrity and honesty. Academic integrity means representing oneself and one’s work honestly. Misrepresentation is cheating since it means students are claiming credit for ideas or work not actually theirs and are thereby seeking a grade that is not actually earned. “*

As outlined in the University’s academic conduct policies, the following are two examples of academic dishonesty:

1. *Cheating*: “Cheating on examinations. This includes using materials such as books and/or notes when not authorized by the instructor, copying from someone else’s paper, helping someone else copy work, substituting another’s work as one’s own, theft of exam copies, or other forms of misconduct on exams.” **USING A CELLPHONE DURING EXAMS IS ALSO CONSIDERED CHEATING.**
2. *Plagiarism*: “Plagiarizing the work of others. Plagiarism is using someone else’s work or ideas without giving that person credit; by doing this students are, in effect, claiming credit for someone else’s thinking. Whether students have read or heard the information used, they must document the source of information. When dealing with written sources, a clear distinction should be made between quotations (which reproduce information from the source word-for-word within quotation marks) and paraphrases (which digest the source of information and produce it in the student’s own words). Both direct quotations and paraphrases must be documented. Even if students rephrase, condense or select from another person’s work, the ideas are still the other person’s, and failure to give credit constitutes misrepresentation of the student’s actual work and plagiarism of another’s ideas. Buying a paper or using information from the World Wide Web or Internet without attribution and handing it in as one’s own work is plagiarism.”

Please see the Academic Conduct Policy in the Academic Policies and Procedures, for further details.

Breaches of academic conduct policy will not be tolerated. Students who are found guilty of academic misconduct may receive a 0.0 for the course.

**Special Considerations:** Students with disabilities who may require special considerations should make an appointment with campus Disability Support Services. Students should also bring their needs to the attention of the instructor as soon as possible.

## **Emergency Preparedness**

In the event of an emergency arising on campus, the instructor will notify you of actions that may be required to ensure your safety. It is the responsibility of each student to understand the evacuation and “lockdown” guidelines to follow when an emergency is declared. These simple steps are a good place to start: lock all doors, shut off all technology and lights, turn on cell phones and make them silent, and move away from all windows.

☑ OU uses an emergency notification system through text, email, and landline. These notifications include campus closures, evacuation, lockdowns and other emergencies. **Register for these notifications at [oakland.edu/uts/emergency\\_notification](http://oakland.edu/uts/emergency_notification)**

☑ If an emergency arises on campus, call the OUPD at **248-370-3331**. Save this number in your phone, and put it in an easy-to-find spot in your contacts.

**Time Schedule and Topical Outline:** The class schedule, below, indicates class dates, exam dates, specific topical material to be covered, and reading/pre-reading assignments and activities. The instructor reserves the right to make adjustments to this schedule as necessary.

Date	Topics, Reading, and In-Class Activities	Pre-reading Assignments, Due Dates for Quizzes, and Exams
<u>Week 1</u> Wed 1/3/2018	Course Introduction and Start Review of Cell Biology <b>In Class Activity1:</b> Discussion and Metabolism Questionnaire	
Fri 1/5/2018	Continue Review of Cell Biology and Metabolism <i>Readings: Gropper, Chapter 1</i> <b>In Class Activity2:</b> Cell Biology Review Questions and Chart (group work)	<i>Cell Biology Units by Scitable and Chapter 1</i> <a href="https://www.nature.com/scitable/ebooks/essentials-of-cell-biology-14749010/what-is-a-cell-what-are-the-14751770">https://www.nature.com/scitable/ebooks/essentials-of-cell-biology-14749010/what-is-a-cell-what-are-the-14751770</a>
<u>Week 2</u> Mon 1/8/2018	Energy, Metabolic Pathways, and Enzymes <b>In Class Activity3:</b> Revisit Metabolism Questionnaire after reading article	<i>Pre-Reading Assignment: Nutrient utilization in humans (link below and on Moodle)</i> Da Poian, A. T., El-Bacha, T. & Luz, M.R.M.P (2010). Nutrient utilization in humans: Metabolism Pathways. Nature Education, 3(9): 11 <b>Pre-reading Activity1:</b> Metabolism Questionnaire and Questions on Article (10 pts)
Wed 1/10/2018	Continue Energy and Metabolism <b>In Class Activity4:</b> Case Study on Energy and Enzymes	
Fri 1/12/2018	The Digestive System <i>Readings: Gropper, Chapter 2</i> <b>In Class Activity5:</b> Digestive System Overview from Innerbody website	<i>Pre-reading Assignment: Innerbody website: Look over digestive system</i> <a href="http://www.innerbody.com/image/digeov.html#full-description">http://www.innerbody.com/image/digeov.html#full-description</a>
<u>Week 3</u> Mon 1/15/2018	<b>NO CLASS MARTIN LUTHER KING DAY</b>	
Wed 1/17/2018	Digestion and Absorption of Nutrients <b>In Class Activity6:</b> Tracking the nutrients from food (broad discussion)	<i>Pre-Reading: Watch the following animations on chemical and hormonal digestion</i> <a href="http://www.johnwiley.net.au/highered/interactions/media/Energy/content/Energy/dig2a/bot.htm">http://www.johnwiley.net.au/highered/interactions/media/Energy/content/Energy/dig2a/bot.htm</a> <a href="http://www.johnwiley.net.au/highered/interactions/media/Energy/content/Energy/dig7a/frameset.htm">http://www.johnwiley.net.au/highered/interactions/media/Energy/content/Energy/dig7a/frameset.htm</a> <b>Pre-reading Activity2:</b> Complete Questions from the 2 Videos (10 pts)

Fri 1/19/2018	Carbohydrates: Structures of Simple and Complex <i>Reading: Gropper, Chapter 3 and Chapter 4 (skim)</i> <b>In Class Activity7:</b> Practice with structures	<b>PBL1:</b> Discuss topic for Diet project with your group
<u>Week 4</u> Mon 1/22/2018	Carbohydrates; Digestion, absorption, and transport <b>In Class Activity8:</b> Tracking digestion of carbohydrates only	<b>Due:</b> Quiz 1 Cell Bio and Digestion
Wed 1/24/2018	Carbohydrate Metabolism: Glycogen: Glycogenolysis and Glycogenesis <b>In Class Activity9:</b> Practice with reactions	<i>Pre-Readings: Watch the following Animations</i> <a href="http://www.wiley.com/college/fob/quiz/quiz15/15-1.html">http://www.wiley.com/college/fob/quiz/quiz15/15-1.html</a> <a href="http://www.wiley.com/college/fob/quiz/quiz15/15-21.html">http://www.wiley.com/college/fob/quiz/quiz15/15-21.html</a> <b>Pre-reading Activity3:</b> Complete Questions from the 2 Videos (10 pts)
Fri 1/26/2018	Carbohydrate Metabolism (Glycolysis and Gluconeogenesis) <b>In Class Activity10:</b> Glycolysis Case Study and Practice with reactions in Glycolysis (group work)	
<u>Week 5</u> Mon 1/29/2018	<b>Librarian visits class to speak about Research for PBL Diet Project</b> <b>In Class Activity11:</b> Librarians' activity <b>(Subject to Change based on Availability)</b>  <b>PBL 2:</b> 3 Questions to get started and research log <b>Turn in Group Contract</b>	
Wed 1/31/2018	Carbohydrate Metabolism continued Cellular respiration: Krebs Cycle and Electron Transport Chain <b>In Class Activity12:</b> Tracking the carbons through cellular respiration and Krebs cycle worksheet	
Fri 2/2/2018	Lipids: Structure and biological importance <i>Reading: Gropper, Chapter 5</i> <b>In Class Activity13:</b> Lipid Structure Animations and Questions	<b>Due:</b> Quiz 2 Carbohydrates



<u>Week 6</u> Mon 2/5/2018	Lipids: Digestion, absorption, and transport <b>In Class Activity14:</b> Tracking digestion of lipids only	<i>Pre-Readings: Watch the following Animations:</i> <a href="http://www.wiley.com/college/grosvenor/0470197587/animations/Animation%20Lipid%20Digestion%20and%20Absorption/Energy/media/content/dig/anima/dig5a/frameset.htm">http://www.wiley.com/college/grosvenor/0470197587/animations/Animation Lipid Digestion and Absorption/Energy/media/content/dig/anima/dig5a/frameset.htm</a> <a href="http://www.wiley.com/college/grosvenor/0470197587/animations/Animation%20Lipid%20Metabolism/Energy/media/content/met/anima/met4a/frameset.htm">http://www.wiley.com/college/grosvenor/0470197587/animations/Animation Lipid Metabolism/Energy/media/content/met/anima/met4a/frameset.htm</a> <b>Pre-reading Activity4:</b> Complete Questions from the 2 Videos (10 pts)
Wed 2/7/2018	Lipid Metabolism: beta oxidation and fatty acid synthesis <b>In Class Activity15:</b> Tracking fatty acid metabolism Animation and Practice with reactions	<b>Due:</b> Quiz 3 Lipids
Fri 2/9/2018	<b>PBL 3:</b> Main Stream Media recommendations <b>Due Part 1 PBL Project:</b> Introduction to Disease (Link on Moodle)	
<u>Week 7</u> Mon 2/12/2018	<b>EXAM 1: CELL BIOLOGY, CARBOHYDRATE, AND LIPID METABOLISM</b>	
Wed 2/14/2018	Proteins: Structure and biological importance <i>Reading: Gropper, Chapter 6</i>	
Fri 2/16/2018	Translation: Protein synthesis <b>In Class Activity16:</b> Protein translation practice	
<u>Week 8</u> Mon, Wed, Fri 2/19-23/2018	<b>WINTER RECESS NO CLASS</b>	
<u>Week 9</u> Mon 2/26/2018	Digestion, absorption, and transport of proteins	<i>Pre-Readings: Watch the following Animations:</i> <a href="http://www.wiley.com/college/grosvenor/0470197587/animations/Animation%20Protein%20Digestion%20and%20Absorption/Energy/media/content/dig/anima/dig4a/frameset.htm">http://www.wiley.com/college/grosvenor/0470197587/animations/Animation Protein Digestion and Absorption/Energy/media/content/dig/anima/dig4a/frameset.htm</a> <a href="http://www.wiley.com/college/grosvenor/0470197587/animations/Animation%20Protein%20Metabolism/Energy/media/content/met/anima/met3a/frameset.htm">http://www.wiley.com/college/grosvenor/0470197587/animations/Animation Protein Metabolism/Energy/media/content/met/anima/met3a/frameset.htm</a> <b>Pre-reading Activity5:</b> Complete Questions from the 2 Videos (10 pts)
Wed 2/28/2018	Degradation of amino acids (specific pathways) and Urea cycle <b>In Class Activity17:</b> Grouping amino acids activity and Practice with urea cycle	

Fri 3/2/2018	<b>PBL 4:</b> Finding research articles on your disease and diet choices <b>Due Part 2 PBL Project:</b> Main Stream Media Recommendations	
<u>Week 9</u> Mon 3/5/2018	Integration and Regulation of Metabolism (Carbs, Lipids, and Proteins) <i>Readings: Gropper, Chapter 7</i> <b>In Class Activity18:</b> <i>Case study on metabolism and homeostasis (Ben's bad day Part 2)</i>	<b>Due:</b> Quiz 4 Proteins <b>Pre-Reading activity6:</b> Fed and Fasting Metabolism: Bens Bad Day Webquest (Regulation of Homeostasis: Part 1) <a href="http://ats.doit.wisc.edu/biology/ap/ho/ho.htm">http://ats.doit.wisc.edu/biology/ap/ho/ho.htm</a>
Wed 3/7/2018	Fed and Fasting Metabolism (Insulin resistance and diabetes) <b>In Class Activity19:</b> <i>Regulation of metabolism chart (what is happening and when?)</i>	
Fri 3/9/2018	Sports Nutrition and Metabolism in Exercise <b>In Class Activity20:</b> <i>Intense vs Moderate Exercise Journal Article</i>	<b>Due:</b> Quiz 5 Integration of Metabolism and Exercise
<u>Week 10</u> Mon 3/12/2018	Journal Article continued <b>In Class Activity21:</b> <i>Journal article presentations</i>	<i>Pre-Reading: Journal article assignment</i> <b>Pre-reading activity7:</b> Presentation of journal article figure (group work)
Wed 3/14/2018	Water Soluble Vitamins (B Vitamins) Thiamin, Riboflavin, Niacin <i>Reading: Gropper, Chapter 9</i> <b>In Class Activity22:</b> <i>Tracking the B-vitamins in metabolic pathways and Vitamin Chart</i>	<i>Reading: Micronutrient information Center Vitamins</i> <a href="http://lpi.oregonstate.edu/mic/vitamins">http://lpi.oregonstate.edu/mic/vitamins</a> <b>PBL 5:</b> Your project and integration of Pathways <b>Due Part 3 PBL Project:</b> Two CATS draft (Link on Moodle)
Fri 3/16/2018	Water Soluble Contin: Pantothenic Acid and Biotin	
<u>Week 11</u> Mon 3/19/2018	<b>EXAM 2: PROTEIN, INTEGRATION OF METABOLISM, FED &amp; FASTING STATE, EXERCISE METABOLISM</b>	
Wed 3/21/2018	Water Soluble Contin: Folate, Vitamin B12, B6	

Fri 3/23/2018	Antioxidants & Vitamin C, Vitamin E	<b>Pre-reading Activity8:</b> Student Short presentations on Water Soluble Vitamins
<u>Week 12</u> Mon 3/26/2018	Fat Soluble Vitamins Vitamin A & Carotenoids and Vitamin K <i>Reading: Gropper, Chapter 10</i> <b>In Class Activity23:</b> Vitamin Chart	<i>Reading: Micronutrient information Center Vitamins</i> <a href="http://lpi.oregonstate.edu/mic/vitamins">http://lpi.oregonstate.edu/mic/vitamins</a> <b>Pre-reading Activity8:</b> Short Presentations on Fat Soluble Vitamins
Wed 3/28/2018	Vitamin D and Major Minerals Calcium <i>Reading: Gropper, Chapter 10 and 11</i> <b>In Class Activity24:</b> Tracking calcium and vitamin D status	
Fri 3/30/2018	Major minerals Contin. Phosphorous, Magnesium <i>Reading: Gropper, Chapter 11</i> <b>In Class Activity25:</b> Mineral Chart	<b>PBL 6:</b> Vitamins and Minerals affected by your disease and diet <b>Due Part 4 PBL Project:</b> Nutrient Metabolic Pathways
<u>Week 13</u> Mon 4/2/2018	Water and Electrolytes Na, Cl, and K <i>Reading: Gropper, Chapter 12</i> <b>In Class Activity26:</b> Water poisoning case study	
Wed 4/4/2018	Essential Trace minerals Iron, Zinc, Copper, Manganese <i>Reading: Gropper, Chapter 13</i> <b>In Class Activity27:</b> Comparison of minerals and Mineral chart	
Fri 4/6/2018	Essential Trace minerals Iodine and Selenium, Chromium, and Molybdenum	<b>Due Quiz 6:</b> Vitamin and Minerals
<u>Week 14</u> Mon 4/9/2018	Part 5 of project (Diet Project Presentations)	
Wed 4/11/2018	Part 5 of project (Diet Project Presentations)	
Fri 4/13/2018	Vitamin and Mineral Deficiency Diseases Review <b>In Class Activity28:</b> Case Study Questions and go over questions from students	<b>Pre-reading Activity9:</b> Make up a case study based exam question about Vitamin and Minerals
<u>Week 15</u> Mon 4/16/2018	Course Wrap up <b>Due:</b> Turn in PBL portfolios	

<u>Week 16</u> Mon 4/23/2018	<b>Final Exam</b> <b>3:30-6:30 pm</b>
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