

## BI410 -- Advanced Human Physiology: Nutrition and Metabolism

Fall 2015

### Syllabus

**Instructor:** Dr. Michael Weichhaus  
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**Email Address:** michael.weichhaus@chaminade.edu  
**Office Hours:** Tue: 13:00-17:00, Wed: 13:00-17:00  
**Class Hours:** MWF 10:30-11:20 Wesselkamper 120

### Texts:

- Gropper & Smith 2013 Advanced Nutrition and Human Metabolism, 6<sup>th</sup> Edition: Wadsworth Cengage Learning:  
<http://www.cengagebrain.com/shop/search/9781133104056>

**Pre-requisites:** BI 205/L; BI 206/L; BI 207/L; and BI 208/L

Concurrent enrollment in BI 410 Lab required.

### University Catalogue:

Physiology of energetic and metabolic processes and endocrine control of metabolism in both healthy and disease states. Biochemistry of metabolism and the role of macro- and micronutrients in maintenance of homeostasis are examined.

### Aims of the course:

This course has the student come to an understanding of the physiological and metabolic processes involved in processing nutrients. This ranges from gaining understanding of the organs involved in digestion, to the biochemical processes that transform nutrients to be utilized by cells. Furthermore the course demonstrates the regulation of nutrient processing and aberrations of the process in metabolic diseases. The course employs lectures, group discussions, Q&A sessions and individual learning to accomplish this goal. The student learns to integrate knowledge from different disciplines, such as anatomy, physiology and biochemistry to create a holistic understanding of human physiology. The student furthers their understanding of the scientific method. The course prepares the student for medical, dental, or other graduate school endeavor.

### At the end of the course you should be able to:

1. Identify and distinguish between micro- and macronutrients and their role in the human organism
2. Describe the anatomical and biochemical process of nutrient processing
3. Explain the metabolism of macronutrients for energy and body composition
4. Explain the regulatory processes of nutrient homeostasis in the human body
5. Distinguish between inherent and acquired metabolic diseases and provide examples for each
6. Understand scientific writing and the scientific process of presenting and interpreting data.

## **Evaluation of Student Performance**

1. Separate grades are given for lecture and laboratory. It is possible to receive different grades for lecture and laboratory.
2. Exam grades may be curved, if the class average falls below 70%. Individual assignment will NOT be curved. The scale used is given below.
3. There will be three lecture exams and one final exam for this course. The exam schedule is attached.
4. The final examination is a two-hour comprehensive examination including topics from the beginning of the course and material that has been covered between the final lecture exam and the end of week 15.
5. Extra credit work is NOT available.
6. Missed exams can only be made up for valid excuses (to be determined by the instructor). In cases of illness, a physician's note is necessary. Missed final exams can only be made-up in exceptional circumstances.
7. The lecture grade will be determined in the following manner:

A	Excellent	>90%
B	Good	>80%
C	Average	>70%
D	Below Average	>60%
F	Failure	<60%

<b>Assignment</b>	<b>Percent of grade</b>
Lecture Presentation	17 percent
1 <sup>st</sup> Lecture Exam	16 percent
2 <sup>nd</sup> Lecture Exam	16 percent
3 <sup>rd</sup> Lecture Exam	16 percent
Combined Essay grade	15 percent
Final exam	<u>20 percent</u>
	100 percent

## **Grade Dissemination**

My goal will be to return grades of assignments within one week of the due date. You will be informed by email of the grade you received. Graded exams and materials in this course will NOT be returned, but can be viewed in my office during office hours or by request. Letter grades for exams only will also be posted on the portal website. You may request a breakdown of your grade and your current overall grade any time by email.

## **Class standing:**

The instructor, prior to the withdrawal deadline, will notify students with grades of D or lower. Students receiving deficiency notices are required to arrange a conference with instructor.

## **Late Work Policy**

There are no make-ups for exams, unless a physician's note documents your absence during exams. Lecture presentations CANNOT be made-up. Essays turned in late will be assessed a penalty: a half-letter grade if it is one day late, or a full-letter grade for 2-7 days late. Essays will not be accepted if overdue by more than seven days.

## **Student Expectations**

### **1. Disability Access**

Pursuant to several federal and state laws, including the Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008, and Section 504 of the Rehabilitation Act of 1973, all qualified students with disabilities are protected from discrimination on basis of disability and are eligible for reasonable accommodations or modifications in the academic environment to enable them to enjoy equal access to academic programs, services, or activities. If a student would like to determine if they meet the criteria for accommodations, they should contact the Counseling Center at 808-735-4845 for further information.

### **2. Title IX Compliance**

Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. Should you want to speak to a confidential source you may contact the following:

- Chaminade Counseling Center 808 735-4845.
- Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role.

### **3. Attendance Policy**

As a senior level course, you are solely responsible for your learning. Attendance during lecture is one way to familiarize yourself with the learning material, however you may by now have discovered more effective ways of learning. As such attendance during lecture is not mandatory. You are responsible to familiarize yourself on all topics/material covered during your absence.

### **4. Academic Conduct Policy**

The success of the Honor Code is made possible only with the acceptance and cooperation of every student. Each student is expected to maintain the principles of the Code. Example of Honor Code violations include, but are not limited to:

- Giving or receiving information from another student during an examination;
- Using unauthorized sources for answers during an examination;
- Illegally obtained test questions before the test;
- Any and all forms of plagiarism – submit all or part of someone else's work or ideas as your own;
- The destruction and/or confiscation of school and/or personal property.

Violations of the Honor Code are serious. They harm other students, your professor, and the integrity of the University. Alleged violations will be referred to the Office of Judicial Affairs. If found guilty of plagiarism, a student might receive a range of penalties, including failure of an assignment, failure of an assignment and withholding of the final course grade until a paper is turned in on the topic of plagiarism, failure of the course, or suspension from the University.

Violations of Academic Integrity: Violations of the principle include, but are not limited to:

- Cheating: Intentionally using or attempting to use unauthorized materials, information, notes, study aids, or other devices in any academic exercise.
- Fabrication and Falsification: Intentional and unauthorized alteration or invention of any information or citation in an academic exercise. Falsification is a matter of inventing or counterfeiting information for use in any academic exercise.
- Multiple Submissions: The submission of substantial portions of the same academic work for credit (including oral reports) more than once without authorization.
- Plagiarism: Intentionally or knowingly presenting the work of another as one's own (i.e., without proper acknowledgment of the source).
- Abuse of Academic Materials: Intentionally or knowingly destroying, stealing, or making inaccessible library or other academic resource materials.
- Complicity in Academic Dishonesty: Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.

Plagiarism includes, but is not limited to:

- Copying or borrowing liberally from someone else's work without his/her knowledge or permission; or with his/her knowledge or permission and turning it in as your own work.
- Copying of someone else's exam or paper.
- Allowing someone to turn in your work as his or her own. DO NOT provide your work to someone else for reference.
- Not providing adequate references for cited work.
- Copying and pasting large quotes or passages without properly citing them.

### **Appropriate Technology**

1. Please have a mobile device (e.g. cell phone, tablet, laptop) with you in class. Alternatively you may bring your laptop. Lecture slides will be available to you prior to class through google slides. These are provided to you as an additional learning tool. You may also need to consult the course's e-book during class.
2. Use the class' twitter handle (@BI410Fall2015) to post comments, ask questions (especially during lectures), answer questions and review posted/linked material. [twitter.com/BI410Fall2015](https://twitter.com/BI410Fall2015)
3. Participation in in class polling is encouraged through PollEverywhere. Instructions will be provided during class. [pollev.com/bi410weichhaus](https://pollev.com/bi410weichhaus)

## Writing assignments

- As part of your scientific development a good grasp of finding and interpreting scientific literature is of utmost important.
- Essay topics (choose ONE of each color for each assignment):
  1. **“Provide a clear and concise overview of the causes, symptoms, diagnosis and treatment for celiac disease”**  
Or  
**“Provide a clear and concise overview of the causes, symptoms, diagnosis and treatment for irritable bowel syndrome”**
  2. **“Detail at least five different acquired liver diseases”**  
Or  
**“Describe the role of the gastrointestinal tract in immune response”**
  3. **“Describe the ethnic variability of obesity susceptibility in people living in Hawaii and provide a hypothesis for potential discrepancies you may find”**  
Or  
**“Provide a clear and concise overview of the causes, symptoms, diagnosis and treatment for at least three different eating disorders”**
- Your essay needs to include the following sections:
  - (Abstract)
  - Introduction
  - Summary of the literature
  - Discussion of relevant literature
  - Conclusion
  - Reference section
- Each essay should contain at between 1500-2000 words. The word limit excludes the abstract, figure/table legends and the references. Your essay should cite at least 10 primary resources.
- Essays are due by 5pm on the due date marked below. Essay’s may be submitted in hard-copy during class or in my mailbox (located in room 115 WSC), by email or through a shared google document. Submissions after this time are subject to the late policy mentioned above.
- I highly advise you to submit through google. Start and share your work with me early and I will be able to provide guidance and comments on your progress, if you prefer. [drive.google.com/drive/my-drive](https://drive.google.com/drive/my-drive)
- Potential resources:
  - Google Scholar: [scholar.google.com](https://scholar.google.com)
  - Pubmed: [ncbi.nlm.nih.gov/pubmed](https://ncbi.nlm.nih.gov/pubmed)
  - Sullivan Library: [lib.chaminade.edu/search-db\\_title.php](https://lib.chaminade.edu/search-db_title.php)

## Biology 410 / Fall 2015

Week	Date	Lecture	Chapter	Comments	
1	8/24	Syllabus of course, Course overview, Cellular Recap	Chapter 1		
	8/26	Upper GI tract	Chapter 2		
	8/28	Lower GI tract			
2	8/31	Digestive and absorptive processes			
	9/2	Hormonal Regulation of digestion			
	9/4	Carbohydrates: overview	Chapter 3		
3	9/7	Labor Day – No class			
	9/9	Carbohydrate digestion and metabolism I	Chapter 3	Essay 1 due	
	9/11	Carbohydrate digestion and metabolism II			
4	9/14	Carbohydrate digestion and metabolism III			
	9/16	Hormonal Regulation of glucose homeostasis			
	9/18	EXAM #1			
5	9/21	Digestion of dietary fiber and health implications I	Chapter 4		
	9/23	Digestion of dietary fiber and health implications II			
	9/25	Lipids: overview	Chapter 5		
6	9/28	Lipids: Digestion and absorption			
	9/30	Lipids: Transport and metabolism I			
	10/2	Lipids: Transport and metabolism II			
7	10/5	Lipids: Disease risk and Ethanol			
	10/7	EXAM #2			
	10/9	Protein: Amino Acid structure/Digestion and absorption	Chapter 6		
8	10/12	Columbus Day Holiday – No class			
	10/14	Amino Acid metabolism	Chapter 6	Essay 2 due	
	10/16	Nitrogen containing non-proteins			
9	10/29	Protein: Functional role	Chapter 7		
	10/21	Regulation of metabolism I			
	10/23	Regulation of metabolism II			
10	10/26	Measuring body composition and energy regulation	Chapter 8		
	10/28	EXAM #3			
	10/30	Water-soluble vitamins: Vitamin C, Thiamine, Riboflavin	Chapter 9	Student presentations	
11	11/2	Water-soluble vitamins: Niacin, Pantothenic Acid, Biotin			
	11/4	Water soluble vitamins: Folate, Vitamin B12, Vitamin B6	Chapter 10		
11/6	Fat-soluble vitamins: Vitamin A, Vitamin D, Vitamin E				
12	11/9	Vitamin K, Calcium, Phosphorus	Chapter 10/11		
	11/11	Veteran's Day – No class			
	11/13	Magnesium, Sodium/Potassium/Chloride, Iron	Chapter 11/12	Student presentations	
13	11/16	Zinc/Copper, Selenium/Chromium, Manganese/Molybdenum	Chapter 13		
	11/18	Iodine, Fluoride/Arsenic/Boron, Nickel/Silicon/Vanadium	Chapter 12		
	11/20	Water and Electrolytes Recap			
14	11/23	Vitamin Recap I	Chapter 9/10		
	11/25	Vitamin Recap II			
	11/27	Thanksgiving Recess – No class			
15	11/30	Minerals Recap	Chapter 11	Essay 3 due	
	12/2	Trace Element Recap	Chapter 13		
	12/4	Unassigned for lecture flexibility			
16	12/10	Final Exam: 11am – 1pm			

Reading assignments may not be repeated in class. You are responsible for covering the material contained in the textbook. The material covered during lecture time MAY NOT BE sufficient to cover the material examined during quizzes.

Every effort has been made to insure that the material in this syllabus is accurate and complete. However, occasionally changes must be made to the printed schedule. Thus the instructor reserves the right to make any changes in the contents of this syllabus that he deems necessary or desirable. These changes, if any, will be announced as soon as the need for them becomes apparent.