BI410 -- Advanced Human Physiology: Nutrition and Metabolism

Syllabus **Fall 2017**

Instructor:	**Dr. Michael Weichhaus**
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Office Hours:	**Tue: 13:00-16:00, Thu: 13:00-16:00**
Class Hours:	**MWF 10:30-11:20 Wesselkamper 120**

Texts:

Gropper & Smith 2018 Advanced Nutrition and Human Metabolism, 7th Edition: Wadsworth (ISBN-13: 978-1305627857; ISBN-10: 1305627857)
Cengage Learning; Amazon

6th Version:
Cengage Learning: http://www.cengagebrain.com/shop/search/9781133104056
Amazon: http://amzn.to/2bcnjVO

2nd version available in the library (Catalogue: QP141 .G76 1995)

Canvas

You are enrolled in the online version of this course through canvas.
Website: https://chaminade.instructure.com
Apple: http://apple.co/1wD5aok
Android: http://bit.ly/1ekgN4M

Pre-requisites: BI 308/L

Concurrent/Previous 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:

Course Learning Outcomes	Program Learning Outcomes
1. Identify and distinguish between micro- and macronutrients and their role in the human organism	4. An understanding of the chemical and physical principles that unite all life forms, and of biological organization at the molecular, cellular, tissue, organ, organism and system levels. 6. An understanding of the etiology of major human disease burdens in terms of pathophysiological mechanisms, epidemiology within populations and possible therapeutic approaches
2. Describe the anatomical and biochemical process of nutrient processing	4. An understanding of the chemical and physical principles that unite all life forms, and of biological organization at the molecular, cellular, tissue, organ, organism and system levels. 6. An understanding of the etiology of major human disease burdens in terms of pathophysiological mechanisms, epidemiology within populations and possible therapeutic approaches
3. Explain the metabolism of macronutrients for energy and body composition	4. An understanding of the chemical and physical principles that unite all life forms, and of biological organization at the molecular, cellular, tissue, organ, organism and system levels. 6. An understanding of the etiology of major human disease burdens in terms of pathophysiological mechanisms, epidemiology within populations and possible therapeutic approaches
4. Explain the regulatory processes of nutrient homeostasis in the human body	4. An understanding of the chemical and physical principles that unite all life forms, and of biological organization at the molecular, cellular, tissue, organ, organism and system levels. 6. An understanding of the etiology of major human disease burdens in terms of pathophysiological mechanisms, epidemiology within populations and possible therapeutic approaches
5. Distinguish between inherent and acquired metabolic	4. An understanding of the chemical and physical principles that unite all life forms, and of biological

diseases and provide examples for each	organization at the molecular, cellular, tissue, organ, organism and system levels. 6. An understanding of the etiology of major human disease burdens in terms of pathophysiological mechanisms, epidemiology within populations and possible therapeutic approaches
6. Understand scientific writing and the scientific process of presenting and interpreting data.	1. An understanding of the scientific method and the ability to design and test a hypothesis 2. The ability to visualize, statistically evaluate, validate and interpret scientific data, and to communicate science effectively both orally and in writing; 3. The ability to acquire and comprehend information from published scientific literature and to employ computational resources in the resolution of biological problems 7. An understanding of the entry requirements, career pathways and progression for the major post-graduate fields of research, education and the health professions

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. There will be three lecture exams and one final exam for this course. The exam schedule is attached.

3. 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.

4. 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.

5. Extra credit may be available at the discretion of the instructor.

6. 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%

Assignment	**Percent of grade**
Lecture Presentation	17 percent
1st Lecture Exam	16 percent
2nd Lecture Exam	16 percent
3rd Lecture Exam	16 percent
Combined Essay grade	15 percent
Final exam	20 percent
	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 or 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. Please note that university policies require you to be present during class times.

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.

On-Campus Tutoring

- Retention, Advising, and Career Preparation offers free, one-on-one tutoring for all undergraduate students at Chaminade. Subjects tutored include, but are not limited to: biology, chemistry, math, nursing, English, etc. The tutoring corps consists of trained Peer and Professional Tutors.
- Tutoring is available by appointment only. Tutoring takes place in either the Student Support Services building during the hours of 8:30 a.m. to 4:30 p.m., Monday to Friday.
- In order to receive tutoring, a student can visit the Student Support Services building and complete an information form. After submitting this form, a staff member will assist the student in creating an online account that allows him/her to book a tutoring appointment through the online system.
- All appointments must be made two days prior to the desired appointment. Cancellations must be made 24 hours in advance.

Online Tutoring through Smarthinking

- All CUH students are eligible to use Smarthinking, an online tutoring system. Students are able to access Smarthinking via their Canvas account.
- Through Smarthinking, students are able to connect in real-time with an expert educator in a variety of subjects using a virtual whiteboard technology. Students also have an option to schedule a 30-minute appointment with a tutor of their choice. The Online Writing Lab provides students with the ability to receive a detailed, personalized critique of any written assignment through a formal critique process.
- All sessions are archived and available for students to review at any time for studying or test preparation.

- For any questions related to tutoring services, please contact Nicolle Bekers, Tutor Coordinator, at nicolle.bekers@chaminade.edu.

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. Participation in in-class polling is encouraged through PollEverywhere. Instructions will be provided during class. pollev.com/weichhaus

3. Pop quizzes will be given through kahoot.it.

Writing assignments

- As part of your scientific development a good grasp of finding and interpreting scientific literature is of utmost important.

- You will be assigned three different essay topics due as noted below.

- Each assay 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 11.59pm on the due date marked below. Essays must be submitted through canvas (https://chaminade.instructure.com). Submissions after this time are subject to the late policy mentioned above.

- Potential resources:

    - Google Scholar: scholar.google.com
    - Pubmed: ncbi.nlm.nih.gov/pubmed
    - Sullivan Library: lib.chaminade.edu/search-db_title.php

Biology 410 / Fall 2017

Week	Date	Lecture	Chapter	Comments
1	8/28	Syllabus of course, Course overview, Cellular Recap	Chapter 1	
	8/30	Upper GI tract	Chapter 2	
	9/1	Lower GI tract		
2	9/4	Labor Day – No class		
	9/6	Digestive and absorptive processes	Chapter 2	
	9/8	Hormonal Regulation of digestion		
3	9/11	Carbohydrates: overview	Chapter 3	
	9/13	Carbohydrate digestion and metabolism I		**Essay 1 due**
	9/15	Carbohydrate digestion and metabolism II		
4	9/18	Hormonal Regulation of glucose homeostasis		
	9/20	Digestion of dietary fiber and health implications	Chapter 4	
	9/22	**EXAM #1**		
5	9/25	Lipids: overview	Chapter 5	
	9/27	Lipids: Digestion and absorption		
	9/29	Lipids: Transport and metabolism		
6	10/2	Lipids: Disease risk and Ethanol		
	10/4	Protein: Amino Acid structure/Digestion and absorption	Chapter 6	**Essay 2 due**
	10/6	Amino Acid metabolism		
7	10/9	Columbus Day Holiday – No class		
	10/11	Protein: Functional role	Chapter 6	

	10/13	Nitrogen containing non-proteins		
8	10/16	**EXAM #2**		
	10/18	Nucleic Acid metabolism	Chapter 6	
	10/20	Regulation of metabolism I	Chapter 7	
9	10/23	Regulation of metabolism II		
	10/25	Measuring body composition and energy regulation I	Chapter 8	
	10/27	Measuring body composition and energy regulation II		
10	10/30	**EXAM #3**		
	11/1	Vitamin C, Thiamine, Riboflavin	Chapter 9	**Student presentations**
	11/3	Niacin, Vitamin B5, Vitamin B6		
11	11/6	Folate, Biotin, Vitamin B12,		
	11/8	Vitamin A, Vitamin D, Vitamin E,	Chapter 10	
	11/10	Vitamin K, Sodium/Potassium/Chloride, Calcium,	Chapter 10/11/12	
12	11/13	Magnesium, Phosphorus, Zinc	Chapter 11/13	
	11/15	Iron 1+2, Copper	Chapter 13	
	11/17	Veterans Day – No class		
13	11/20	Chromium, Iodine, Manganese	Chapter 13	**Student presentations**
	11/22	Molybdenum, Fluoride	Chapter 13/14	
	11/24	Thanksgiving Recess – No class		
14	11/27	Water and Electrolytes Recap	Chapter 11	

	11/29	Vitamin Recap I	Chapter 9	
	12/1	Vitamin Recap II	Chapter 10	
15	12/4	Minerals Recap	Chapter 12	**Essay 3 due**
	12/6	Essential Trace Element Recap	Chapter 13	
	12/8	Non Essential Trace Element	Chapter 14	
16		**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 ensure 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.