BIBC 120: Nutrition

Winter Quarter 2014

Instructor: Aaron Coleman, Ph.D.
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Office Hours: Wednesdays 9 – 10:30 AM

Course Objectives: This course will examine the anatomical, physiologic, and biochemical basis for human nutrition. We will follow how nutrients are extracted and absorbed from food via the digestive process, investigate how different nutrients are integrated into our metabolism, and examine the biochemical roles of various nutrients in maintaining health. An overarching goal of the class will be to relate how the diet choices we make in our everyday lives affect our physiology and metabolism at the biochemical level. Part of this will be to understand the various disease states that are either the result of malnutrition, or that are caused by physiologic/genetic factors and that can lead to a malnourished state. We will examine some of the current research being done to understand the etiology of these disease states.

Main course text: M. McGuire and K.A. Beerman. Nutritional Sciences: From Fundamentals to Food, 3rd Edition, 2013. Cengage Learning. ISBN: 978-0-8400-5820-1.

Additional Reading: There will be some additional reading assignments from journal articles (see lecture schedule. You will be able to access these articles through Ted; the URL will be provide for each article and it can be accessed free of charge through the university server.

Ted (TritonLink Education): We will be using Ted (https://ted.ucsd.edu) as the course web site. All students will need to be able to access Ted. Once you are enrolled in the class you will have access using your ACS username and password. Be sure to check the course website frequently for announcements and updates on assignments. Many of the materials for the class will be downloaded from here, including practice questions to help you prepare for the exams.

Discussion Sections: Discussion sections will begin in week 2 of the quarter. You must sign up for the discussion section you wish to attend using the online Sections Tool at http://sections.ucsd.edu/ (instructions and an overview of the process are given at http://sections.ucsd.edu/overview.shtml). Online enrollment will begin at 5 PM on Tuesday, Jan. 7th and selection of sections is on a first-come, first-serve basis, up to 30 students per section. Note that some discussion sections listed in the schedule of classes may not be offered. It is important to attend the discussion section you are signed up for; the only place where you can get back your midterm exams is at your designated section. The TAs have the right to turn away students who are not registered for their section.

Exams and Grade Assignments: Your grade will be determined from two midterm exams and the final exam. Each midterm exam has a base point value of 300 points, but the exam on which you receive the higher score will be weighed 50% more heavily from this base value, and the exam on which you receive a lower score will weighed 50% less from the base.

Exam	**Date**	**Point Value**
Midterm 1	Tues, Feb 4th	150 or 450
Midterm 2	Thurs, March 6th	150 or 450
Final Exam	Thurs, March 20th	400
Class Point Total		1000

Make-up exams will not be given, except in case of illness that is documented by a note from a physician. Grades will be based on the following un-curved scale using the adjusted point total from the three exams. The grade cutoffs may be adjusted downward at the instructor's discretion.

905-1000	A	760-779	C+
895-904	A-	695-759	C
880-894	B+	675-694	C-
800-879	B	590-674	D
780-799	B-	0-589	F

Week	Lecture Topics (Tentative Schedule) and Assigned Reading
1	Course introduction; nutritional science definitions; review the chemical structure of biological molecules important in nutrition; overview of the digestive system
	Chap. 1, pp. 5-10 and pp. 22-28 Chap. 6, pp. 219-236 Chap. 3, pp. 81-100, 106-110 Chap. 4, pp. 115-125
	Chap. 5, pp. 163, 164, 169-174 (only as necessary for review)
2-3	Digestion/absorption of carbohydrates, proteins, and lipids; lactase persistence and lactose intolerance; the role of fiber
	Chap. 4, 126-133 Chap. 5, 176-178 Chap. 6, 236-243
4	Role of the intestinal microbiota; Celiac Disease
	Chap. 2, p. 32 Walker and Lawley, 2013. Therapeutic modulation of intestinal dysbiosis. *Pharmacological Research*. **69**:75-86. Science Perspectives: Fighting Obesity with Bacteria. 2013. *Science* **341**:1069-1070. Ridaura, *et. al.*, 2013. Gut microbiota from twins discordant for obsesity modulate metabolism in mice. *Science* **341**:1079. (You only need to read the "Research Article Summary.")
5	Midterm Exam 1 on Tuesday, Feb 4th in lecture
	Dietary reference intakes and food labels
	Chap. 2, pp. 38-44, 58-63
6-7	Energy metabolism; regulation of blood glucose by insulin and glucagon; glycemic index; essential amino acids and amino acid deficiencies; cholesterol and atherosclerosis; essential fatty acids and eicosanoids
	Chap. 7, pp. 279-299 Chap. 4, pp. 133-143 Chap. 5, pp. 183-195, 165, 166 Chap. 6, pp. 242-250
8	Energy balance; diseases of unbalanced metabolism; diets and fasting; understanding the scientific basis for nutritional claims
	Chap. 1, 10-21 Chap. 2, 44-46 Chap. 8, all Chap. 9, 394-412 Nutrition and Diabetes (end of Chap. 4), 147-157
9	Midterm Exam 2 on Thursday, March 6th in lecture (covers since first exam)
	Water soluble vitamins
	Chap. 10, all
10	Fat soluble vitamins; vitamin A deficiency; genetically-modified organisms (GMOs) and "golden rice"
	Chap. 11, all
	Comprehensive Final Exam, Thursday, March 20th from 11:30 – 2:30 PM