

BIBC 120: Nutrition

Fall Quarter 2018

Instructor: Aaron Coleman, Ph.D.
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Office Hours: York Hall 3080A (my office) and York 2300 (conference room); we will move to the conference room to accommodate larger numbers.
Tuesday 1:00 – 2:00 PM

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. The first 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.

The second overarching goal of the class is to provide you with the tools necessary to critically evaluate nutritional claims. We are a society bombarded with claims about the health effects of various diets and nutritional supplements from both credible and non-credible sources. Sorting out scientifically valid information from marketing and media hype requires the knowledge described above, and the ability to assess the credibility of various sources.

Required Textbook: M. McGuire and K.A. Beerman. Nutritional Sciences: From Fundamentals to Food, 3rd Edition, 2013. Cengage Learning. ISBN: 978-0-8400-5820-1. You will automatically have access to the eBook on TritonEd through RedShelf, a distributor of online textbooks that has a special arrangement with the UCSD Bookstore. This access will be free for the first two weeks of the quarter. After two weeks, your student account will be charged for access through the remainder of the quarter. **If you do not want to purchase access past week 2, you must actively opt out by Friday of week 2, otherwise your account will be charged.** Instructions for opting out are given on the RedShelf page on TritonEd.

Additional Reading: There will be some additional reading assignments from research and review articles (see lecture schedule). You will be able to access these articles through TritonEd.

Discussion Sections: Discussion sections will begin in week 2 of the quarter. Attendance and participation are required on weeks when activities are scheduled (see table below). You may only attend the section in which you are enrolled on these weeks. The IAs will turn away students not on the roster for that section. On weeks where section activities are not scheduled, attendance is not mandatory and all sections will be open (you may attend any section you wish). Your midterm exam will be returned to you in your enrolled section.

Discussion Section Activity Schedule		
Week	Activity	Participation points
2	Introduction to Jang <i>et al.</i> , 2018 research article on fructose metabolism	5 pts. participation
3	Discussion of Jang <i>et al.</i> , 2018 after reading full article;	5 pts. participation
4	Discuss ideas for nutritional claim assignment; How to do a PubMed search Attendance not required but can only attend enrolled section	
5	Open (attendance not required) – Review for exam	
6	Final idea for nutritional claim assignment due in section Work on nutritional claim assignment/PubMed searches	5 pts. participation
7	Open (attendance not required)	
8	Open (attendance not required)	
9	Introduction to Ridaura <i>et al.</i> , 2013 research article on gut microbiota and energy metabolism	5 pts. participation
10	Discuss Ridaura <i>et al.</i> , 2013 after reading full article	5 pts. participation

Exams and Grade Assignments: Your grade will be determined from the following.

Assignment	Point Value
Midterm Exam	435
Final Exam	435
Nutritional Claim Assignment	95
Discussion section attendance and participation	25
Research Article Online Quizzes (2 x 5 pts. each)	10
Point Total	1000

The final exam will be comprehensive. If your score on the final exam is higher than your score on the midterm exam, your final exam score will be given 50% more weight (652.5 points) and your midterm exam will be weighed 50% less (217.5 points). 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. 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	Assigned Reading course text (McGuire)
1	Course introduction and nutritional science definitions Dietary Reference Intakes and food labels Assessing nutritional claims	Chap. 1, all Chap. 2, 38 – 64
2	Overview of the digestive system Digestion and absorption of carbohydrates Lactase persistence and lactose intolerance	Chap. 3, 81 – 101; 106 – 111 (skip section on neural and hormonal regulation, p. 86) Chap. 4, 115 – 134
	Additional required reading: Jang <i>et al.</i> , 2018, The small intestine converts dietary fructose into glucose and organic acids, Cell Metabolism (doi:10.1016/j.cmet.2017.2.016) Read for week 3 discussion section	
3	Digestion and absorption of proteins Gluten	Chap. 5, 163 – 166; 176 - 179
4	Digestion and absorption of lipids; Lipoproteins Fiber and the role of the gut microbiota	Chap. 6, 219 – 245
5	Metabolism of carbohydrates, insulin and glucagon regulation of blood glucose, diabetes, glycemic index	Chap. 4, 135 – 144 and pages 147 – 157 Review if necessary: Chap. 7, 279 – 299 Chap. 5, 184 – 187
	Midterm Exam on Saturday, November 3 rd , 10 am – 12 noon	
6	Metabolism of lipids; trans fats, saturated fats, mono and poly-unsaturated fats, cholesterol	Chap. 6, 246 – 251 and pages 254 - 263
	Additional required reading: (short review article) Svendsen <i>et al.</i> , 2017, Saturated fat—a never ending story? Food and Nutrition Research (doi:10.1080/16546628.2017.1377572)	
7	Metabolism of proteins, protein quality	Chap. 5, 187 – 195
	Nutritional Claim Assignment due Monday, Nov 12 th , 11:59 pm	
8	Energy balance, hormonal regulation of satiety, dieting	Chap. 8, 323 – 336, 340 – 358
	Additional required reading: a. Walker and Parkhill, 2013, Science Perspectives (short review article), Fighting obesity with bacterial, Science (doi:10.1126/science.1243787) b. Ridaura <i>et al.</i> , 2013, Gut microbiota from twins discordant for obesity modulate metabolism in mice, Science (doi:10.1126/science.1241214) Read for week 9 discussion section—abridged reading; see TritonEd	
9	Water soluble vitamins; vitamin B ₁₂ , vitamin C	Chap. 10, 419 – 423
	Fat soluble vitamins; vitamin D	Chap. 11, 461 – 470
10	GMO foods; vitamin A deficiency and “golden rice.”	
Final Exam Friday, December 14 th , 7 – 10 pm		