

BIBC 120: Nutrition

Winter Quarter 2015

Instructor: Aaron Coleman, Ph.D.
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Office Hours: Tuesday 2 – 2:45 PM and Wednesday 2 – 2:45 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 the scientifically valid information from the marketing and media hype requires the knowledge described above, and the ability to assess the credibility of various sources.

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 and internet sources (see lecture schedule). You will be able to access these articles through Ted; the URL will be provided 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. All of the course materials will be available 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 11 PM on Tuesday, Jan. 6th and selection of sections is on a first-come, first-serve basis, up to 30 students per section. It is important to attend the discussion section you are

signed up for. You will be getting your graded midterm exams back at your specific section; note that this is the only way to pick up your exams. 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, a final exam, and the nutritional claim assignment. Each midterm exam has a base point value of 280 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 | Weds, Feb 4 th (6-7:20 pm) | 140 or 420 |
| Midterm 2 | Thurs, March 5 th (in lecture) | 140 or 420 |
| Final Exam | Tues, March 17 th | 375 |
| Nutritional Claim Assignment | due Friday, Feb 13 th | 65 |
| 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. The grade cutoffs may be adjusted downward at the instructor's discretion.

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|----------|----|---------|----|
| 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 (additional assigned reading) | 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 – 100; 106 – 111 (skip section on neural and hormonal regulation, p. 86) Chap. 4, 115 – 134 |
| 3 | Digestion and absorption of proteins Gluten Digestion and absorption of lipids | Chap. 5, 163 – 166; 176 - 179 Chap. 6, 219 – 245 |
| 4 | Fiber and the role of the gut microbiota Walker and Lawley, 2013. Therapeutic modulation of intestinal dysbiosis. Science Perspectives: Fighting Obesity with Bacteria. Research article summary: Ridaura, <i>et. al.</i> , 2013. Gut microbiota from twins discordant for obesity modulate metabolism in mice. | |
| | Metabolism Lipoproteins | Chap. 7, 279 – 299 Chap. 5, 184 - 187 Chap. 6, 242 – 245 |
| 5 | Health effects of carbohydrates, insulin and glucagon regulation of blood glucose, diabetes, glycemic index | Chap. 4, 135 – 144 Nutrition Matters: Nutrition and diabetes, pp. 147 – 157 |
| 6 | Health effects of lipids, cholesterol transport and atherosclerosis, omega-3 and omega-6 fatty acids Harvard School of Public Health review: Fats and cholesterol, out with the bad, in with the good | Chap. 6, 246 – 251 Nutrition Matters: Nutrition and cardiovascular health |
| | Health effects of proteins, protein quality, protein malnutrition | Chap. 5, 187 – 195 |
| 8 | Energy balance, hormonal regulation of satiety, dieting | Chap. 8, 323 – 336, 340 – 358 |
| 9 | Water soluble vitamins Vitamin B ₁₂ | Chap. 10, 419 – 423, and material covered in lecture |
| 10 | Fat soluble vitamins, vitamin A deficiency, genetically modified organisms (GMOs) and “golden rice” | Chap. 11, 461 – 470, and material covered in lecture |