NUIP 6450 Nutrition Biochemistry
Fall 2023
Tuesday 9:00-10:30 am – EHSEB Rm 4100B
Thursday – 9:00-10:30 am – EHSEB Rm 4100B
Credit Hours: 3

Instructor: Lisa Joss-Moore, PhD
Contact information: lisa.joss-moore@hsc.utah.edu
Office Hours/Location:TBD

Course Description:
This course is designed to give students a thorough working knowledge of cellular biochemistry, genetics, and epigenetics as it pertains to human physiology, nutrition and metabolism. Background material will be supplemented and reinforced through study of relevant systems and disease states. *The material covered includes knowledge competencies required by the Accreditation Council on Education for Nutrition and Dietetics*:

Pre- or co-requisites:
Admission to the Coordinated Master's Program in Dietetics or consent of NUIP Department.

Required Materials:
Most readings will come from peer-reviewed literature and will be provided for you on CANVAS. General use references listed below are available on closed reserve in Eccles Library.

- **Genetics: A conceptual approach** Pierce, B. A., New York: W.H. Freeman. 2012.
- **Biochemistry**. MLA. **Berg**, Jeremy M, John L Tymoczko, and Lubert Stryer. 6th ed. New York, N.Y.: W. H. Freeman, 2006.

Student Learning Outcomes:
By the end of this course, you will be able to:
1. Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical, evidence-based practice decisions. (KRDN 1.1)
2. Apply critical thinking skills. (KRDN 1.3)
3. Evaluate research and apply evidence-based guidelines, systematic reviews and scientific literature in nutrition and dietetics practice. (CRDN 1.2)
4. Describe concepts of nutritional genomics and how they related to medical nutrition therapy, health and disease. (KRDN 3.5)
5. Describe the metabolic consequences of environmental and nutritional impacts.
6. Translate the role of biochemistry to nutritionally relevant systems and disease states.

Teaching and Learning Methods:
In this course we merge active learning with lectures, discussion and current scientific literature to explore the course concepts and achieve learning objectives. Students will be expected to participate. Full participation is defined as timely attention to all assignments and group activities, as well as verbal contributions within class time. While enthusiasm cannot be mandated, it will be beneficial to the learning experience!

Assignments:
Three assignments, 5 quizzes, and 10 "one-minute papers" will be given throughout the semester. A final assessment will take place in finals week. Details are available on CANVAS and will be discussed in class.

Students will be expected to participate. Full participation is defined as timely attention to all assignments and group activities, as well as verbal contributions within class time.

- **Assignment 1** (50 pts): Your 'favorite topic' paper. Throughout the course we will learn about many aspects of gene-environment interactions. The material we learn can then be applied to any area you are interested in. To get things started, I would like you to identify an area of interest connecting some aspect of nutrition and disease.

- **Assignment 2** (100 pts) - At the start of semester in Assignment 1 you identified a topic that interested you, something that interfaced with dietetics, nutrition, disease, etc.... You'll create both a short document to submit, as well as a 5-7 minute presentation integrating your favorite topic with things that you've learnt during the semester.

- **Assignment 3 (Student Journal Club)** (100 pts): Each student will be randomly assigned a date throughout the semester to present a paper covering a "Biochemistry in Action" topic. Papers will be assigned 2 weeks prior to presentation date. Presentations should be 15 minutes followed by 5-10 minutes of class discussion. Details will be provided in class. All students are expected to read the assigned papers and be prepared to ask at least one intelligent question during each session.

- **Quizzes** (10 pts each): There will be five quizzes given throughout the semester.

- **One Minute Paper** (5 pts each): There will be 10 of these short in-class assessments.

- **Final** – (50 pts): Lustig Critique Assignment. This assignment involves watching a presentation and delivering a critique. This will be a group assignment.

Total points possible is 400.

Grading Criteria:
Grades will be determined based on a percentage of total points earned. Grades at or above the .5 level will be rounded up; grades at or below .4 level will be rounded down.

Range		Grade		Range		Grade		Range		Grade
92.5	100	A		79.5	82.4	B-		66.5	69.4	D+
89.5	92.4	A-		76.5	79.4	C+		62.5	66.4	D
86.5	89.4	B+		72.5	76.4	C		59.5	62.4	D-
82.5	86.4	B		69.5	72.4	C-		0	59.4	E

Course Schedule:
Note: Our schedule is subject to revision based on the needs of our class; any updates will be made available for students through Canvas.

Week	Date	Topics, Readings, Assignments, Due Dates
1	8/22	**Introductions, course structure and expectations.** We will also review transcription and translation. We'll be thinking about these basic biological processes from the "who cares" perspective!
2	8/29	**Going Deeper**. We will focus on the structural elements within the nucleus - i.e. chromatin; the mechanisms of regulation of gene expression - i.e. epigenetics; and other fancy transcriptional tools - i.e. alternative splicing. **Assignment 1 Due**

3	9/5	**Gene-environment Interactions.** We will explore the triggers by which epigenetic modifications occur.
4	9/12	**Developmental Origins of Disease.** We will start the week looking at an example of developmental programming that incorporates much of what we have discussed previously.
5	9/19	**Journal Club presentation 1.** Students will then work on group assignments identifying triggers that prompt epigenetic changes.
6	9/26	**DOHaD and Metabolism.** We will discuss the intersection of DOHaD and metabolic disease. **Assignment 2 Due**
7	10/3	**Journal Club presentation 2. Integration of metabolism.** We will also integrate the idea of epigenetic influences on these regulatory nodes. We will expand our focus this week to lipid metabolism.
8	10/9	**Fall Break**
9	10/17	**Journal Club presentation 3.** Plus **Lipids.** We will discuss all things lipids, including developmental needs and disease relationship.
10	10/24	**Lipids Continued.** We will continue our discussion of lipids and examine of lipids in non-adipose tissue.
11	10/31	**Journal Club presentation 4. Inflammation and Adipose**. We will examine how inflammation originates in adipose and the consequences.
12	11/7	**Inflammation and the gut**. We will examine the gut and roles of microbiome in inflammation.
13	11/14	**Journal Club presentation 5.** Personalized Nutrition – evidence-based? We will define personalized nutrition and examine whether it is evidence-based.
14	11/21	**Personalized Nutrition Continued.** We will continue our discussion of evidence-based personalized nutrition.
15	11/28	**Review and Final Presentations (Assignment 3)**
16	12/5	**Final Presentations (Assignment 3)**

Course Policies:
Submitting Assignments: All assignments, unless otherwise announced, must be submitted to the designated area of Canvas. Do not submit assignments via email.

Late Assignments: Late assignments will suffer from a 10% daily grade reduction unless there is prior consent from instructor.

Other information:

1. ***Covid –19 Information: The A COVID-19 Campus Guidelines.*** Please refer to the University's COVID-19 Central website for the latest information and guidelines.

   COVID-19 Central @ The U
   801-213-2874
   coronavirus.utah.edu

   Please note that students in clinical programs should remain in close contact with their program director about the latest guidelines pertaining to COVID-19.

2. ***The Americans with Disabilities Act***. The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this

class, reasonable prior notice needs to be given to the Center for Disability & Access (CDA; http://disability.utah.edu/; 162 Olpin Union Building; 801-581-5020). CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the CDA.

3. ***Addressing Sexual Misconduct***. Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

4. ***The Code of Student Rights and Responsibilities***. The code, which specifies student rights as well as conduct involving cheating, plagiarism, collusion, fraud, theft, etc., is provided at http://regulations.utah.edu/academics/6-400.php.

5. ***Wellness Statement***. Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness, http://wellness.utah.edu/; 801-581-7776.

6. **University Safety Statement:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu

7. ***Drop/Withdrawal***. Please check the academic calendar for more information pertaining to dropping and withdrawing from a course. Withdrawing from a course and other matters of registration are the student's responsibility.

8. ***Veterans Center***. If you are a student veteran, I want you to know that the U of Utah has a Veterans Support Center on campus. They are located in Room 418 in the Olpin Union Building. Hours: M-F 8-5pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: http://veteranscenter.utah.edu/. Please also let me know if you need any additional support in this class for any reason.

9. ***LGBT Resource Center***. If you are a member of the LGBTQ community, I want you to know that my classroom is a safe environment. Additionally, please know that the U of Utah has an LGBT Resource Center on campus. They are located in Room 409 in the Olpin Union Building; their hours are M-F 8-5 pm. You can visit their website to find more information about the support they can offer, a list of events through the center and links to additional resources: http://lgbt.utah.edu/. Please also let me know if there is any additional support you need in this class.

10. ***Learners of English as an Additional/Second Language***. If you are an English language learner, please be aware of several resources on campus that will support you with your language development and writing. These resources include: the Writing Center (http://writingcenter.utah.edu/); the Writing Program (http://writing-program.utah.edu/); the English

Language Institute (http://continue.utah.edu/eli/). Please let me know if there is any additional support you would like to discuss for this class.