

Biology of Nutrition and Health

When and where do we meet?

Class lecture: 84396 – 1957 E Street 213/2:20-3:10 or 84395 – Funger 103/5:00-5:50
Office hours: Lisner 344/Wednesday 2-3pm

Who should you know?

Lecture instructor: Tara Scully, Lisner 344, tscully@gwu.edu, 202-994-7195
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Why should you care about the Biology of Nutrition and Health?

Have you ever heard the expressions, “Tell me what you eat and I will tell you what you are,” or “You are what you eat?” While neither of these phrases are meant to be taken literally, they are meant to imply that the food you eat will impact your state of mind and overall health. So think about why is everyone going gluten-free? What is the link between the food you eat, genetics and heart disease? Why is there an increase in the prevalence of diabetes across the globe? How and/or does this relate to you?

I want to explore with you the value and function of your bodies, your food and other organisms. We need to start preparing for a lifetime of health behavior like we prepare and study for our professional careers. Together we will explore the tools needed to establish a good foundation to understand nutrition and common medical problems related to food. I want you to pay attention to your health so you can enjoy your wealth.

How will this course help you in the future?

The objectives of this course are crafted so that you can leave this class and retain information for future use in real world applications. For instance, many public policies on health are related to literacy. During this course you will find yourself (a well-educated individual) learning a lot about what is in the food you eat and how challenging it can be for an uneducated person to eat well. The health care problem is plastered across the news right now which includes aspects of politics, business, and very personal and religious issues. This course will touch on just a few but important health issues which are long-term problems that most people don't understand. If you can't understand what you are eating and how it may be harmful and how it can lead to a chronic disease, how can we criticize or implement effective practices in the real world. What are the solutions?

Within this course you will leave being able to:

1. Define the common characteristics of life.

2. Explain how your body takes in food, digests and uses it and what can happen when things go wrong.
3. Evaluate food labels/ingredients and understand the constitution of a good personalized diet.
4. Constructively and practically think about what makes you unique, what factors influence preventable health issues and how both of these affect longevity.
5. Collaboratively apply content to case scenarios to determine likely outcomes.
6. Illustrate general principles of inheritance and recognize how these can be used in agriculture and medicine.
7. Critically analyze a diet or food-related health issue and present your argument to your fellow classmates.
8. Connect a topic discussed throughout the semester to your everyday life.

How will you succeed in this course?

Participate. You are expected to actively participate in the course based upon your own goals for success in this course. There are students from many different backgrounds and knowledge in this class. Many activities within lecture and lab rely on group work so be cognizant of their perspectives and their value throughout the semester. On the same track, you should be prepared for these activities in order to contribute in your own right.

Communicate. This course is designed to meet the needs of every end of the spectrum, from experts (those who took AP biology) to those who are novices (some students haven't seen a biology book for 8 or more years). It can be very challenging to speak up and ask questions during class but please do as you are not alone. I am also willing to field questions before and after class, on blackboard, during review sessions, during office hours or via email. If you start this habit early in the semester, then I will be able to identify what challenges you are having and help you succeed in this course.

How will you and I evaluation your progress?

- Lab evaluations [prequiz, lab handout, postquiz (5pts. each)] (24%)
 - Each pre-quiz covers any information within the chapter introduction or within the lab activities assigned that week. The quizzes are posted 24 hours prior to the start of your lab period and close at the start of your lab period.
 - The lab handout grade will include on-time attendance of lab, attending the correct lab section, possession of the lab manual for that day's activities, participation during lab activities, and completion of the manual questions for each assigned activity. Grading of lab activity questions includes grammar, spelling, the accuracy of answers and the use of one's own wording.
 - Each post-quiz covers any information within the lab activities completed the week before. The quizzes are 5 short answer questions which will be given at the beginning of the next lab section.
- Lab presentations (80pts./16%)
 - In groups of 2 or 3 students choose either a type of specific diet (ex. Atkins) or a food-related health issue (ex. Type 2 diabetes). Your presentations should be no less than 8 minutes and no more than 12 minutes. They can be any visual format or combination of formats (video, powerpoint, audio, role play, etc.) The rubric is

posted to blackboard for the requirements to execute the presentation successfully. In the presentation you are expected to explain your topic and the challenges of your topic. You will have an entire lab session (week 8) for your group to discuss and submit your topic to your lab instructor and get advice from them as well.

- In class participation (50 pts./10%)
 - Clicker questions will be given during every lecture to assess in-class points. You must answer all questions during the lecture period to get credit for attending. You must attend 70% of lectures to receive full attendance credit.
- Group activities (50pts./10%)
 - Groups will be assigned via blackboard and remain the same throughout the semester. The group activities will mainly be case studies with short answer questions. Groups will be generated on blackboard and every Thursday 20 minutes will be dedicated to completing the case study. If the group completes the case study and receives greater than a 75% they will receive full credit for the case study = 8 points. You will only be required to complete 5 full credit case studies. The remaining 10pts will be a peer evaluation completed at the end of the semester.
- Connections assignment (50pts./10%)
 - Student learning outcome: to apply one topic discussed during the semester to their daily lives. You have a friend who asked why you are taking The Biology of Nutrition and Health and how does it relate to you? Choose one topic that we have discussed that has truly interested you during this semester and write a generic but accurate description of that topic. Then describe how specifically this one topic relates to you as a person in your daily life. Next think of one question you would like to ask your friend about their knowledge of the topic. Then ask three friends or family to answer the question. Reflect on their answers.
- Lecture exams (Midterm 60pts. and Final Exam 90pts./30%)
 - Exams will be multiple choice
- Additional activity for participation points – move up 1/3 of letter grade: To gain extra points throughout the semester you can choose to do a biology portfolio. This is a compilation of several potential activities that are uploaded to blackboard before due dates throughout the semester. Each of these activities can be done twice, the first due date is before the first exam Oct. 12th and the second due date is Dec. 4th. In order to get credit you must complete 28/30 points available. Start early.
 - Under **journal tab** (this is completely private to you and the instructor)
 1. Lecture self-reflection
 2. Lab self-reflection
 - Under **blog tab** (this is open to all students to see)
 3. Post a link to an article/media related to a topic we have or are covering with a brief summary
 4. Post a joke
 5. Post a picture of a nutrition label of a food or food product you ate; give a brief explanation of the nutritional composition

6. Post a picture related to a food-related health issue; give a brief explanation of the issue
 7. Attend a scientific seminar/lecture and write a summary of the talk
 8. Create a concept map linking lecture content to one lab activity
 9. Post a video exemplifying a lab activity/concept
 10. Do a daily diary of the food you eat, tally the major nutritional components
- Under **discussion tab** (this is open to all students to see)
 11. Post an outline of a lecture on the discussion board
 12. Post a question on a discussion board about lab
 13. Post a question on a discussion board about lecture
 - Recorded by instructor
 14. Attend office hours
 15. Attend a review session

Schedule of Learning

Week 1: Aug. 25th – 29th	
Before lectures	Read chapter 1: The Nature Of Science And The Characteristics Of Life
Tuesday	Orientation, background assessment survey, introduction to scientific method
Thursday	How are you a scientist?
Before lab	Read policies and procedures
Lab	Orientation
Week 2: Sept. 1st – 5th	
Before lectures	Read chapter 6: Cell Structure And Internal Compartments
Tuesday	Why can a single-celled organism kill you?
Thursday	Diamonds are forever, why aren't fossil fuels? Group activity 1: concept map of cellular structure and function
Before lab	
Lab	No lab
Week 3: Sept. 8th – 12th	
Before lectures	Read chapter 5: Chemical building blocks
Tuesday	What do you really need to survive?
Thursday	Why is reading a food label much like finding a sunken treasure? Group activity 2: case study 1
Before lab	Read and take prequiz
Lab	Exploring Life under a Microscope: Activities 4, 5 and 7
Week 4: Sept. 15th – 19th	
Before lectures	Read chapter 8: Energy And Enzymes
Tuesday	How does food get from your mouth to your derrière?
Thursday	Why do you poop? Group activity 3: case study 2

Before lab	Read and take prequiz
Lab	Chemical Building Blocks: Activity 5 - Nutrition label activity with demonstration of tests for major nutrients (post quiz 1)
Week 5: Sept. 22nd – 26th	
Before lectures	Read chapter 7: Cell Membranes, transport and communication
Tuesday	Are you absorbing it?
Thursday	Does everyone get diarrhea? Group activity 4: case study 3
Before lab	Read and take prequiz
Lab	Energy and Enzymes: Activity 6 Cheese lab (post quiz 2)
Week 6: Sept. 29th – Oct. 3rd	
Before lectures	Read chapter 27: Animal Nutrition And Digestion
Tuesday	Do you get hangry? (hungry + angry)
Thursday	If I eat food with preservatives, does that mean my body will be preserved? Group activity 5: concept map of diabetes
Before lab	Read and take prequiz
Lab	Food Science: Activity 1 Gluten and Plant Growth (posted to BB) (post quiz 3)
Week 7: Oct. 6th – 10th	
Before lectures	Read chapter 26: Maintaining The Internal Environment
Tuesday	Do you have an eating disorder?
Thursday	Can I survive on a cotton ball diet? Review
Before lab	Read and take prequiz
Lab	Food Science: Activity 2 Cooking with Heat, Acid and Microwaves and 4 The Power of Salt (post quiz 4)
Week 8: Oct. 13th – 17th	
Before lectures	Study!
Tuesday	Midterm Exam
Thursday	Why are frogs green but can't make their own food?
Before lab	
Lab	Group presentations meetings – review of topics by TAs. (post quiz 5)
Week 9: Oct. 20th – 24th	
Before lectures	Read chapter 9: Photosynthesis and Respiration
Tuesday	Does Red Bull really give you wings?
Thursday	Why should I exercise? Group activity 6
Before lab	Read and take prequiz
Lab	Food Science: Activity 5 Food Safety
Week 10: Oct. 27th – 31st	
Before lectures	Read chapter 10: Cell division
Tuesday	If DNA is the end all be all, is life predetermined?
Thursday	Why should I texted my parents today? Group activity 7
Before lab	Read and take prequiz
Lab	Photosynthesis and Cellular Respiration: Activity 1 and 5 (post quiz 6)

Week 11: Nov. 3rd – 7th	
Before lectures	Read chapter 12: Patterns of inheritance
Tuesday	If your aunt Hazel has heart disease will you have it to?
Thursday	Is there really a normal weight or BMI for all humans? Group activity 8
Before lab	Read and take prequiz
Lab	Human Genetics: Activity 1 (post quiz 7)
Week 12: Nov. 10th – 14th	
Before lectures	Read chapter 13: Chromosomes and human genetics
Tuesday	Shouldn't we all be gluten free?
Thursday	Why is cancer so common? Group activity 9
Before lab	Prepare for presentations
Lab	Lab presentations groups 1-6 (post quiz 8)
Week 13: Nov. 17th – 21st	
Before lectures	Read chapter 11: Stem cells, cancer and human health
Tuesday	Will the human genome allow us to be gods?
Thursday	Should you be afraid of Frankenfood? Group activity 10
Before lab	Prepare for presentations
Lab	Lab presentations groups 6-12
Week 14: Nov. 24th – 28th	
Before lectures	Read section 14.7-14.8 and chapter 15: From gene to protein and connections assignment due
Tuesday	What should I eat at Thanksgiving dinner?
Thursday	No lecture – Thanksgiving
Before lab	
Lab	No lab – Thanksgiving
Week 15: Dec. 1st – 5th	
Before lectures	Read chapter 16: DNA technology
Tuesday	No lecture – makeup day
Thursday	How can we bring it all together?
Final Exam	TBA – comprehensive exam