Biochemistry 200 (BMB200)
Fall 2016

Faculty	Susanne Hoffmann-Benning **Coordinator**	223 Biochemistry	Tu 10:00 A.M. – Noon or by appointment	355-9644 hoffma16@msu.edu
	Kevin Haudek	219 Biochemistry	Tue:10:00–11:00 AM Th: 3:00-4:00 PM or by appointment	haudekke@msu.edu 353-4377
T.A.	Sundari Chodavarapu	Reviews to be announced		sundari@msu.edu

Course Rational: In this course, you can learn how the food you eat lets you live. All food can be broken down into four major components, the same major components required for life. This class will systematically present the physical and chemical properties of these components, the role of each of these components in your body, and the processes by which your body utilizes these components.

Course Goals: When you successfully complete this course you will have a conceptual understanding of how the basic components found in the food you eat function in your body.

Course Objectives:

- Explain the roles water, chemical equilibrium, and pH play in your body.
- Recognize the chemical structure of the molecular building blocks found in the food you eat and identify the important chemical and physical properties of these building blocks.
- Describe how these molecular building blocks polymerize into larger molecules and organize into cellular structures.
- Compare and contrast the functions of these building blocks and their polymers in living cells.
- Explain how the chemical and physical properties of these building blocks cause them to carry out their specific functions in your body.
- Describe the basic cellular pathways used to break down the food you eat to produce the cellular building blocks and capture the energy your body needs.
- Discuss the relationship between coenzymes and vitamins and explain the roles of specific coenzymes in metabolism.
- Explain basic physical and chemical concepts that underlie cellular processes and apply these to problems involving your body's utilization of food.
- Explain how information is stored and passed on based on the chemical and physical properties of the molecules found in living cells.
- Explain how our understanding of biochemistry and molecular biology are changing the way society approaches food production and medical problems.

Recommended Text: Lectures will be based on the book "*Biochemistry*", by Mary Campbell and Shawn Farrell, Brooks/Cole Publishing. The book is not required but highly recommended.
6^{th}, 7^{th} or 8^{th} edition is acceptable. Print and e-text are both acceptable
Electronic text purchase link: **http://www.cengagebrain.com/shop/search/9781285429106**

Prerequisites: General chemistry and organic chemistry.

Lectures: Lectures are from 8:00 A.M. to 9:50 A.M. on Tuesdays and Thursdays in Biochemistry room 101. Attendance at lecture is expected and part of your grade comes from classroom participation in your clicker points.

Other required materials: i>clicker2 remote

i>clicker2 Information

This semester we will be using the i>clicker2 classroom response system. This technology can greatly enhance learning during lectures. We will be using clickers during every lecture, including the first one. Starting the first day of class, you will need an i>clicker 2 remote. i>clicker2 remotes are available from the bookstores and you should purchase one, remove it from its packaging, and make sure it will turn on before you come to the first class. ASMSU offers free or low-cost clicker rentals for a semester. Go to the ASMSU Business Office (307 Student Services) to inquire about this program.

This is the i>clicker2. This is the one you need for this course.

This is the original i>clicker. **It will not work for this course.**

This is the i>clicker+. **It will not work for this course.**

Registering your i>clicker2

We will register i>clicker2 before and/or after lecture during the first two weeks of class.

Desire2Learn (D2L): For course information, lecture notes, grades, and announcements, go to d2l.msu.edu and sign in with your MSU NetID and password. Double click on the course name to enter the course. Course e-mail will also be sent through D2L. If you encounter trouble with D2L, please contact the D2L helpdesk.

Grading: Final grades will be based on the assessments shown below:

Quizzes/Homework	12%	(best 4 of 6 quizzes/homework – drop the two lowest scores)
"Clicker" Points	8%	(drop your lowest 4 clicker days)
Exams	80%	(4 exams at 21% each)

The course grades will be determined based on the scale shown below.

Percentage	**Grade**	**Percentage**	**Grade**
90.0% or above	4.0	< 68% to 60.0%	2.0
< 90% to 83.0	3.5	< 60 % to 55.0%	1.5
< 83% to 75.0%	3.0	< 55% to 50.0%	1.0
< 75% to 68.0%	2.5	< 50%	0.0

Assessments:
Quizzes/Homework: There will be six unannounced "mini-exam" quizzes, short classroom writing assignments, or (announced) homework assignments. These will be either short (5-10 question ~ 10 minute) quizzes designed to acquaint you with the style of examination questions you may be ask on an upcoming exam or writing assignments assigned by the instructor. Your two lowest scores from these will be dropped and the remaining scores will count as 12% of your grade. There will be no make-up quizzes. If, on the day of a quiz, you are not in class for any reason, this is one of the scores that will be dropped. If you miss more than two quizzes for any reason, the additional missed quizzes will count as zeros.
"Clickers": This course will use the i>clicker2 classroom response system. See D2L for more details. You will receive 2/3 of a point for sending in any answer and an additional 1/3 point for sending in the correct answer for each question posed during class. The lowest 4 clicker day scores will be dropped from your overall course grade. "Clicker" points will make up 8% of your grade. It is your responsibility to bring your clicker to class each day. If you forget to bring your clicker or miss class for any reason, you will receive no points for that day. Because we drop multiple days of clicker scores, you can miss or forget your clicker for several days of class and still get full credit. If you replace your clicker during the semester, please notify the TA. Any student found using another student's clicker will be considered cheating and in violation of the Academic Honesty policy listed below.
Exams: On Sept. 29, Oct. 20, and Nov. 15 from 8:00 A.M. to 9:00 A.M. there will be midterm exams. Exams will not be followed by lecture. The final exam will be on Monday, Dec. 12, at 7:45 A.M. in BCH101 (the normal lecture room) covering material taught after exam III. The exams will count as 80% your grade (20% for each exam).

Absence from Examinations and Quizzes: There are no makeup quizzes or clicker points during the semester. If you must miss a quiz or an exam for any reason, including but not limited to, religious observance, other MSU activities, jury duty, court appearances, incarceration, illness, hospitalization, or death of a family member, the missed quiz or exam will be dropped as the lowest grade for that assessment. If you miss an exam and provide an excuse according to MSU exam policy, we will provide one make-up exam option within one week. You will need to be prepared to document your illness or the extenuating circumstances that caused you to miss the exam. Oversleeping won't do it.
For excuses see https://msu.edu/unit/ombud/classroom-policies/index.html#attend-final

Academic Honesty: The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards. Academic honesty as described in the Spartan Life Handbook (see in particular: Protection of Scholarship and Grades and Integrity of Scholarship and Grades) is expected. For the written homework assignment, you can discuss your work with friends, however, the writing has to be in in your own words. Quotes from the text will not count as your own words and will not be counted as answer to the questions. More than 30% identity to other homework assignments, the original text, or other publications will be considered plagiarism and will result in a "0" and a report to the Dean's office. If you are unsure, use cross check or ask your instructors.

Students with Disability Requests: Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a verified individual services accommodation ("VISA") form. Please present this form to Dr. Hoffmann-Benning at the start of the term and/or two weeks prior to the accommodation date (test, project, etc). Requests received after this date will be honored as possible.

Lecture Schedule BMB 200-Fall 2016

Date	Day	Lec. #	Topic	Instructor	Reading
1-Sep	Th	1	Are you what you eat? - An overview of biochemistry.	SHB	Chapter 1
		2	Cell composition and compartmentalization; animal/plant cells	SHB	
6-Sep	Tu	3	Water; acid/base/pH; buffers	SHB	Chapter 2
		4	Amino acids	SHB	Chapter 3
8-Sep	Th	5	Peptides, proteins and their synthesis	SHB	Chapter 3
		6	Three-dimensional structure of proteins	SHB	Chapter 4
13-Sep	Tu	7	Protein purification and characterization techniques	SHB	Chapter 5
		8	Folding and disease; protein function	SHB	Chapter 4
15-Sep	Th	9	Introduction to enzymes	SHB	Chapter 6
		10	The behavior of proteins: Enzymes	SHB	
20-Sep	Tu	11 & 12	The behavior of proteins: Enzymes, Mechanisms, and Control	SHB	Chapter 7
22-Sep	Th	13 & 14	Lipids and membranes	SHB	Chapter 8
27-Sep	Tu	15	Membranes	SHB	Chapter 8
		16	"Chocolate, Cannabis, and the Chemistry of the Brain"	SHB	
29-Sep	Th		**Exam I - Lectures 2 - 16**	SHB/SC	
4-Oct	Tu	17 & 18	Nucleic Acid Structure	SC/SHB	Chapter 9
6-Oct	Th	19 & 20	DNA Replication and DNA Repair	SC/SHB	Chapter 10
11-Oct	Tu	21 & 22	RNA Transcription and Control	SHB	Chapter 11
12-Oct	Th	23 & 24	Protein Synthesis	SHB	Chapter 12
18-Oct	Tu	25 & 26	The good, the bad, and the evil: are GMOs our friend or foe?	SHB	Chapter 13
20-Oct	Th		**Exam II - Lectures 17 - 26**	SC/SHB	
25-Oct	Tu	27 & 28	Sugars	KH	Chapter 16
27-Oct	Th	29 & 30	Basics of metabolism and thermodynamics	KH	Chapter 15
1-Nov	Tu	31 & 32	Glycolysis	KH	Chapter 17
3-Nov	Th	33 & 34	Glycolysis and Fermentation	KH	Chapter 17
8-Nov	Tu	35 & 36	Storing and using carbohydrates	KH	Chapter 18
10-Nov	Th	37 & 38	Other carbohydrate pathways	KH	Chapter 18
15-Nov	Tu		**Exam III - Lectures 26-38**	KH/SC/SH	Chapter 19
17-Nov	Th	39 & 40	Pyruvate oxidation	KH	Chapter 19
22-Nov	Tu	41 & 42	Citric acid cycle	KH	Chapter 20
24-Nov	Th		THANKSGIVING –NO CLASS		
29-Nov	Tu	43 & 44	Oxidative phosphorylation	KH	Chapter 22
1-Dec	Th	45 & 46	Metabolism of fats	KH	Chapter 23
6-Dec	Tu	47 & 48	Photosynthesis	KH	Chapter 19
8-Dec	Th	49 & 50	Amino acids and nucleotides	KH	Chapter 19
12-Dec	Mon		**Final – Lectures 39-50** - 7:45 A.M. in BCH 101	KH/SHB	

Please note that material covered on each date may deviate slightly from this schedule and topics on each exam may change based on the rate the material is covered in class.