

# Biochemistry 200 (BMB200)

Fall 2009

<b>Faculty</b>	Jon Stoltzfus <b>Course Coordinator</b>	305 Biochemistry	M 1:30 – 2:30 P.M. T 3:30 – 4:30 P.M. R 10:15 – 11:15 A.M. or by appointment	432-8775 stoltzfu@msu.edu
	Susanne Hoffmann-Benning	120 Biochemistry	T 10:00 A.M. – Noon R 10:00 – 11:00 A.M. or by appointment	355-9644 or 432-9281 hoffma16@msu.edu
	Michael Feig	218B Biochemistry	by appointment	432-7439 feig@msu.edu
<b>T.A.</b>	Fadhiru Kamba	1260 Anthony	T 5:00 – 6:00 P.M. R 5:00 – 6:00 P.M.	kambafad@msu.edu

**Text:** *Biochemistry*, 6<sup>th</sup> ed., 2009, Mary Campbell and Shawn Farrell, Brooks/Cole (Thomson).

**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.

**ANGEL:** For course information, lecture notes, grades, and announcements, go to <http://angel.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 ANGEL. If you encounter trouble with ANGEL, please contact Dr. Stoltzfus.

**Absence from examinations and quizzes:** There are no makeup quizzes or exams 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.

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

Quizzes/Homework	8%	(6 to 8 quizzes/homework - drop the two lowest scores)
"Clicker" Points	8%	(75% of the total points possible equals full credit)
Exams	84%	(best 4 of 5 at 21% each)

The course grades will be determined based on the scale shown below. Note that 89.99 is < 90 and will **NOT** be rounded up. No matter where the cutoffs are drawn, someone will always be just below the cutoff. If you are just below a cutoff, do not ask for your grade to be adjusted.

Percentage	Grade	Percentage	Grade
90.00% or above	4.0	< 68.00% to 60.00%	2.0
< 90.00% to 83.00%	3.5	< 60.00% to 55.00%	1.5
< 83.00% to 75.00%	3.0	< 55.00% to 50.00%	1.0
< 75.00% to 68.00%	2.5	< 50.00%	0.0

## Assessments:

**Quizzes/Homework:** There will be six to eight unannounced "mini-exam" quizzes or short writing 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 asked on an upcoming exam or writing assignments described by the instructor. Your two lowest scores from these will be dropped and the remaining scores will count as 8% 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 a classroom response system. 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. If you receive 75% of the possible "clicker" points during material for a particular exam, you will receive full credit for the "clicker" portion of your grade. "Clicker" points will make up 8% of your grade (2% for material related to each exam). 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 you only need 75% to get full credit, you can miss one day and still get full credit. If your clicker malfunctions during class, please notify the TA immediately.

**Exams:** On Oct. 1, Oct. 22, Nov. 12, and Dec. 10 from 8:00 A.M. to 8:50 A.M. there will be midterm exams. These exams will be followed by lecture. On Wednesday Dec 16 at 7:45 A.M. in BCH101 (the normal lecture room) there will be a comprehensive final. The best four of these five exams will count as 84% your grade (21% for each exam). There will be no make-up exams (see **Absence from examinations and quizzes** above).

**Course Rationale:** In this course, you can learn how what 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.

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.

Describe the basic cellular pathways used to break down the food you eat and produce the cellular building blocks and energy your body needs.

Discuss the relationship between coenzymes and vitamins and the role of 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.

# Lecture Schedule

BMB 200-Fall 2009

Date	Day #	Topic	Instr.	Reading
3-Sep	Th	<b>1 Are you what you eat? - An overview of biochemistry.</b>	JS	Chapter 1
		<b>2 Cell composition and compartmentalization; animal/plant cells</b>	SHB	
8-Sep	Tu	<b>3 Water; acid/base/pH; buffers</b>	SHB	Chapter 2
		<b>4 Amino acids</b>	SHB	Chapter 3
10-Sep	Th	<b>5 Peptides, proteins and their synthesis</b>	SHB	Chapter 3
		<b>6 Three-dimensional structure of proteins</b>	SHB	Chapter 4
15-Sep	Tu	<b>7 Protein purification and characterization techniques</b>	SHB	Chapter 5
		<b>8 Folding and disease; protein function</b>	SHB	Chapter 4
17-Sep	Th	<b>9 Introduction to enzymes</b>	SHB	Chapter 6
		<b>10 The behavior of proteins: Enzymes</b>	SHB	
22-Sep	Tu	<b>11 The behavior of proteins: Enzymes, Mechanisms, and Control</b>	SHB	Chapter 7
		<b>12</b>	SHB	
24-Sep	Th	<b>13 Lipids and membranes</b>	SHB	Chapter 8
		<b>14</b>	SHB	
29-Sep	Tu	<b>15 Lipids and membranes</b>	SHB	Chapter 8
		<b>16</b>	SHB	
1-Oct	Th	<b>Exam I - Lectures 2 - 16</b>	SHB	
		<b>17 Introduction to Molecular Biology</b>	MF	Chapter 9
6-Oct	Tu	<b>18 Nucleic Acid Structure</b>	MF	Chapter 9
		<b>19</b>	MF	
8-Oct	Th	<b>20 DNA Replication and DNA Repair</b>	MF	Chapter 10
		<b>21</b>	MF	
13-Oct	Tu	<b>22 RNA Synthesis and Transcription</b>	MF	Chapter 11
		<b>23</b>	MF	
15-Oct	Th	<b>24 Protein Synthesis</b>	MF	Chapter 12
		<b>25</b>	MF	

Date	Day #	Topic	Instr.	Reading
20-Oct	Tu	<b>26</b> <b>Biotechnology</b>	MF	Chaper 13
		<b>27</b>	MF	
22-Oct	Th	<b>Exam II - Lectures 17 - 27</b>	MF	
		<b>28</b> <b>Why does food equal energy?</b>	JS	Chapter 15
27-Oct	Tu	<b>29</b> <b>Sugars</b>	JS	Chapter 16
		<b>30</b> <b>Can your body store sugar?</b>	JS	
29-Oct	Th	<b>31</b> <b>What happens when you eat sugar?</b>	JS	Chapter 17
		<b>32</b>	JS	
3-Nov	Tu	<b>33</b> <b>What happens when you eat sugar? (Continued)</b>	JS	Chapter 17
		<b>34</b>	JS	
5-Nov	Th	<b>35</b> <b>Can your body make sugar?</b>	JS	Chapter 18
		<b>36</b>	JS	
10-Nov	Tu	<b>37</b> <b>What else can your body do with sugar?</b>	JS	Chapter 18
		<b>38</b>	JS	
12-Nov	Th	<b>Exam III - Lectures 28 - 38</b>	JS	
		<b>39</b> <b>Why do you exhale carbon dioxide?</b>	JS	Chapter 19
17-Nov	Tu	<b>40</b> <b>Why do you exhale carbon dioxide?</b>	JS	Chapter 19
		<b>41</b> <b>Can your body make sugar from fat?</b>	JS	
19-Nov	Th	<b>42</b> <b>Why must you breath in oxygen?</b>	JS	Chapter 20
		<b>43</b>	JS	
24-Nov	Tu	<b>44</b> <b>What happens when you eat fats?</b>	JS	Chapter 21
		<b>45</b> <b>Can your body make fat from sugar?</b>	JS	
26-Nov	Th	<b>Thanksgiving</b>		
1-Dec	Tu	<b>46</b> <b>Where does sugar come from?</b>	JS	Chapter 22
		<b>47</b>	JS	

Date	Day #	Topic	Instr.	Reading
3-Dec	Th	<b>48</b> Why is it an essential amino acid?	JS	Chapter 23
		<b>49</b> Do you need to eat DNA?	JS	
8-Dec	Tu	<b>50</b> Putting it all together!	JS	Chapter 24
		<b>51</b>	JS	
10-Dec	Th	<b>Exam IV - Lectures 39 - 51</b>	JS	
		<b>Final Review</b>	JS	
16-Dec	W	<b>Comprehensive Final - 7:45 to 9:45 A.M. in BCH 101</b>	SHB, MF, JS	

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.