**SYLLABUS**

**INTRODUCTORY BIOCHEMISTRY AND MOLECULAR BIOLOGY**

**BCMB/BIOL/CHEM 3100**

**Fall Semester 2015**

10:10-11:00 AM, **Mon. Wed. & Fri,** Room C127 - Life Sciences

Breakout Session: 5:00-5:50 PM, ** Tues.** Room C127 – Life Sciences

**INSTRUCTORS:**

Professor Daniel DerVartanian (last half of course)
Department of Biochemistry and Molecular Biology
A218 Life Sciences
Phone: 706-542-4620
email: dervar@bmb.uga.edu

Professor Debra Mohnen (first half of course)
Department of Biochemistry and Molecular Biology
Complex Carbohydrate Research Center, Room 2044
315 Riverbend Rd.
Phone: 706-542-4458
email: dmohnen@ccrc.uga.edu


or


**WEBSITE:** The class syllabus, homework, and other information is available at [http://www.ccrc.uga.edu/~dmohnen/bcmb3100/list.html](http://www.ccrc.uga.edu/~dmohnen/bcmb3100/list.html)

**NOTE:** we do **NOT** use ELC for this course

**CLASS NOTES:** Most material in this course is discussed in detail during class and it is therefore essential that you **attend class every day.** Supporting information is in the text and it is expected that you also read the text. Partial class notes for the 1st half of the course will be available on the class website. Mandatory class notes for the 2nd half of the course are available on the class website. Representative old exams from Dr. DerVartanian are included with the mandatory class notes for the 2nd half of the course.

**GRADING:** Grades will be based on four exams (25% each). An unexcused absence at an exam will be counted as a grade of zero for that exam. If an emergency arises, the **instructor must be informed prior to the start of the exam.** Quizzes and homework assignments will be periodically given during the semester, and discussed during the breakout sessions. You are STRONGLY advised to complete all homework assignments, as this enhances your understanding of the material and will prepare you for the exams. **All students are strongly encouraged to form study groups consisting of four people.** Some homework will include participation in study groups. Attending the breakout sessions, attending class, reading the book and reading the lecture notes is mandatory.
**OFFICE HOURS:** We very much want to help you in your goal to learn biochemistry. We will be available at the breakout sessions and you are encouraged to use this time if you have questions or need additional help. Dr. Mohnen’s office hours are on Monday afternoon morning from 1:00-2:30 pm at the CCRC, Room 2044.

**EXAMS:** You will have four exams. A 50 minute exam will be given three times during the semester and once during the final examination period. Each exam will primarily cover the material discussed since the prior exam, although you may be tested about basic concepts on any exam. In the case of severe illness or family emergency, you must inform the instructor PRIOR to the exam. In addition, presentation of a signed letter from your doctor, etc., will be required. In that case, you may be excused from the exam, and your grade will be based on the other 3 exams, or you may be required to take a make-up exam. An unexcused absence will result in a grade of zero. An absence will be counted as unexcused if the instructor is not notified before the exam is given.

**HONORS OPTION:** This course is an honors option course. To receive honors, a 10-15 page research report is required along with a 15-20 minute presentation before the full Honors class. This will take place on at the CCRC on a to-be-determined time on Dec. 8. The application for Honors through the Honors office must be completed by Sept. 4 (or earlier if required by Honors Department) and an email confirmation of your application MUST be sent to Dr. Mohnen by Sept. 8. Also, you must inform Dr. Mohnen in the breakout of your intent to take the class for Honors by Sept. 8. Other deadlines include: Sept. 15 before or after breakout give Dr. Mohnen a copy of the biochemical research paper you selected, labeled with your name and email address. Meet with Dr. Mohnen at end of breakout session by Oct 13 to OK research paper selection; Outline of your paper DUE Nov. 3, sent to Dr. Mohnen via email. The outline needs to be approved before you write the paper. **FINAL PAPER DUE Dec. 8.** Each student must give an oral presentation of their Honors paper at CCRC on Dec. 8. See the website or instructor for further information. The paper is due by 5:00 P.M. Dec 8. No exceptions.
## INTRODUCTORY BIOCHEMISTRY
### BCMB/BIOL 3100
#### Fall Semester 2015

*Approximate timing of course topics for MWF lectures (MWF 10:10-11:00)*

Note: Mandatory Breakouts every Tuesday from 5:00-5:50 are not shown below.

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<th>Date</th>
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<tbody>
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<td>Aug. 17</td>
<td>Chap. 1, Chap. 2</td>
<td>Oct. 12</td>
<td>Chap. 36/37</td>
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<td>Aug. 19</td>
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<td>Aug. 24</td>
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<td>Aug. 31</td>
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<td>Sept. 2</td>
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<td>Sept. 4</td>
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<td>Sept. 7</td>
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<td>Sept. 11</td>
<td><strong>EXAM 1</strong></td>
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<td>Sept. 14</td>
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<td>Dec. 8</td>
<td>Chap. 30 Last Day of Classes (Friday Class Schedule in Effect)</td>
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<td>Dec. 9</td>
<td>READING DAY</td>
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[Withdrawal deadline: Oct. 22]

Drop/Add: Aug. 17 – Aug. 21

Dec. 11 – EXAM 4, Friday, 8:00-11:00 am
BCMB 3100 Course syllabus

Chapter Number and Title (2nd edition), **required reading,
(Recommended Homework problems in Version 2). [Note: recommended problems for Version 3 will be
given in the lecture material]

**1 & 2. Biochemistry and Unity of Life /
    Water, Weak Bonds, Generation of Order Out of Chaos
    Chapter 1HW: #4-9, 11, 12 (page 15)
    Chapter 2HW: #1-16, (page 32)

**3. Amino acids
    Chapter 3HW: #1-15 (pages 43-44)

**5. Techniques in Protein Chemistry
    Chapter 5HW: #1-19 (pages 89-90)

**4. Protein Three-Dimensional Structure
    Chapter 4HW: #1-34 (pages 64-66)

**9. Hemoglobin, an Allosteric Protein
    Chapter 9HW: #1-18,21,23,24 (pages 152-154)

**6. Basic Concepts of Enzyme Action
    Chapter 6HW: #1-11,15,16,20,21 (pages 103-104)

**7. Enzyme Kinetics and Regulation
    Chapter 7HW: #1-8,10-15,17,19,20,22,23 (pages 120-124)

**8. Enzyme Mechanisms and Inhibitors
    Chapter 8HW: #2,3,5-13,15 (pages 152-153)

**10. Carbohydrates
    Chapter 10HW: #1,3-10,12,13,15-22,25 (pages 176-177)

**11. Lipids
    Chapter 11HW: #1-16,18 (pages 190-191)

**12. Membrane Structure and Function
    Chapter 12HW: #2-7,10-11,13-18,20,22,24,26,28,33 (pages 210-213)

**13 Signal-Transduction Pathways
    Chapter 13HW: #1-2,5,7-11,13,23-24 (pages 232-234)

**33. Structure of DNA and RNA
    Chapter 33HW: #1-8,10,11,13-16,21 (pages 594-596)

**34. DNA Replication
    Chapter 34HW: #1-5,7,10,12,13 (pages 611-612)

**35. DNA Repair and Recombination
    Chapter 35HW: #7,8,13,14 (pages 624-625)

**36. RNA Synthesis & Regulation in Bacteria
    Chapter 36HW: #2-11,13-15,18-23,26,27 (pages 642-643)

**37. Gene Expression in Eukaryotes
    Chapter 37HW: #1-17,19-21 (pages 657-659)

**38. RNA Processing in Eukaryotes
    Chapter 38HW: #1-15 (pages 671-672)

**39. The Genetic Code
    Chapter 39HW: #1-5,7-10,14-17,19-23,25 (pages 687-688)

**40. The Mechanism of Protein Synthesis
    Chapter 40HW: #2-4,6-9,12,13,15,16,18,27 (pages 706-708)

41. Recombinant DNA Techniques (supplemental reading)
The following material is covered in DerVartanian’s mandatory class notes which are available on the class website. 
(Be sure to obtain Dr. DerVartanian’s class notes from the class website prior to Oct. 16.)

14 Digestion: Turning a meal into Cellular Biochemicals  
15. Metabolism: Basic Concepts and Design (supplemental reading)  
16. Glycolysis (supplemental reading)  
17. Gluconeogenesis (supplemental reading)  
18. Preparation for the Cycle (supplemental reading)  
19. Harvesting Electrons from the Cycle (supplemental reading)  
20. The Electron-Transport Chain (supplemental reading)  
21. The Proton-Motive Forces (supplemental reading)  
22. The Light Reactions  
23. The Calvin Cycle (supplemental reading)  
26. The Pentose Phosphate Pathway  (supplemental reading)  
27. Fatty Acid Degradation (supplemental reading)  
30. Amino Acid Degradation, the Urea Cycle and the Nitrogen Cycle

Additional Extra Reading  
24. Glycogen Degradation (supplemental reading)  
25. Glycogen Synthesis (supplemental reading)

All academic work must meet the standards contained in “A Culture of Honesty.” Students are responsible for informing themselves about those standards before performing any academic work. The policy can be found at http://www.uga.edu/honesty/ahpd/culture_honesty.htm.

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.
Hints for how to succeed in BCMB 3100 (from Debra Mohnen, August 2015)

BCMB3100 is a demanding, information-rich course that will serve as the foundation for your upper level biology-related courses. To succeed in Introductory Biochemistry you need to **work at the material EVERY DAY**. You can not cram for this course. With a measured learning pace you will enjoy the course and learn a great deal. If you procrastinate and cram you will be stressed, unhappy, and probably not perform well. You cannot learn the material by osmosis. You must **read, think deeply, and learn each concept to serve as a foundation for the next**.

Based on previous student comments **IT IS HIGHLY RECOMMENDED THAT EVERY STUDENT GET TOGETHER WITH FOUR OTHER STUDENTS IN THE COURSE TO FORM A STUDY GROUP.** The study groups are encouraged to meet at least once a week. **Use the study groups to your advantage!!** We learn best by repeated exposure to ideas and concepts. The best way to identify what you do, or do not, understand is to try to teach it to someone else. The study groups give you this opportunity.

**Other Hints**

- **Read all the assigned material at least three times.**
  1. before lecture skim-read to overview chapter organization, content and new concepts
  2. read in detail
  3. reread the chapter to summarize main concepts

- **Read the assigned chapters before lecture!**

- **Do the recommended homework. Practice enhances performance.**

- **Bring your partial class notes to lecture to avoid excessive writing**

- **Meet with your study group at least once per week**

- **If you need help, please see me at the end of the Breakout Session or in the Office Hours**

- **Keep up!!!!!!**

- **Attend class!!!!!!!**

- **A so-called “self-quiz” may be given in class. Use the self-quiz as a tool to measure how well you are learning the material.**

- **Bring a calculator to all exams. ONLY BLACK PENS may be used for exams.**
  [NO pencils or red or blue pens.]