GRADUATE SURVEY OF BIOCHEMISTRY

BCH 5045 Online

SYLLABUS FALL 2011

Course Description

BCH 5045 – Credits 4; Prereq: Organic Chemistry or consent of the instructor. This course provides an introduction to general biochemistry for graduate students in the Life and Agricultural Sciences that have not previously taken a biochemistry course before, and/or for those that would like a refresher course before going on to more advanced biochemistry courses. The chemical properties of low molecular weight biochemical molecules, macromolecules and supermolecular complexes essential for life are discussed in addition to basic reaction mechanisms and the integration and regulation of biochemical processes. Relevance to everyday life is used to place into context the central role that biochemistry has come to play in everyday life in the 21st century. There is limited discussion for a few major biochemical techniques.

Online Sections

Section #9393 is for students on campus in Gainesville; #6698 is for students in Florida and #5477 is for students outside of Florida.

Instructor

Dr. Charles Guy
1509 Fifield Hall
Department of Environmental Horticulture
University of Florida
Gainesville, FL 32611
Office (352) 273-4528
Email clguy@ufl.edu

Course websites

http://hort.ifas.ufl.edu/teach/guyweb/bch5045/

https://lss.at.ufl.edu/

The second web address is for the logon page to enter the Sakai website for the course. You will need to enter your Gatorlink ID and password to gain access to the course webpage in Sakai.

Required Text Options

Lehninger’s PRINCIPLES OF BIOCHEMISTRY fifth edition
by David L. Nelson and Michael M. Cox


Book Context Webpage
Lehninger Principles of Biochemistry, Fifth Edition continues a long tradition as a benchmark of biochemical text. It presents the fundamentals of biochemistry through selected topics, incorporating the most important recent developments and applications into a singular presentation of the field’s classic core information and knowledge.

Every chapter is fully updated: Including coverage of the human genome and genomics integrated throughout, and key developments since the publication of the third edition, such as the structure of the ribosome. New coverage of DNA-based information technologies shows how advances in DNA technology are revolutionizing medicine and biotechnology; examines cloning and genetic engineering, as well as the implications of human gene therapy. This edition adds boxed features of biochemical methods, medical applications, and the history of biochemistry, adding to those already present of medicine, biotechnology, and other aspects of daily life.

For students:
• Biochemistry in 3D molecular structure tutorials: Self-paced, interactive tutorials based on the Chemscape Chime molecular visualization browser plug-in. Chime tutorial archive provides links to some of the best Chime tutorials available on the Web. Online support is available for the Biochemistry on the Internet problems in the textbook. Flashcards on key terms from the text are also available. Online quizzing for each chapter, a new way for students to review material and prepare for exams. Animated mechanisms viewed in Flash or PowerPoint formats give students and instructors a way to visualize mechanisms in a two-dimensional format. Living Graphs illustrate graphed material featured in the text.

Lehninger Principles of Biochemistry
Cloth Text, 1100pgs.
Estimated Price: $190.95

Text Alternatives
Lehninger Principles of Biochemistry eBook (not recommended because is just a one semester access)
(activation card)
Ebook
Estimated Price: $110.25

Lehninger Principles of Biochemistry, Loose Leaf Edition
Paper Text
Estimated Price: $110.13

Package Options
Lehninger Principles of Biochemistry Absolute Ultimate Guide & eBook (not recommended)
Estimated U.S. Price: $165.95

Lehninger Principles of Biochemistry & Absolute Ultimate Guide
Estimated U.S. Price: $208.95
Lehninger Principles of Biochemistry & eBook (not recommended)
Estimated U.S. Price: $182.95

Principles of Biochemistry & Cellular Metabolic Map Study Guide
Estimated U.S. Price: $186.95

Principles of Biochemistry (Loose Leaf) & Absolute Ultimate Guide
Estimated U.S. Price: $132.95

Principles of Biochemistry, eBook & Absolute Ultimate Guide (not recommended)
Estimated U.S. Price: $211.95

Supplements to the Text

Also For Students
The Absolute, Ultimate Guide combines an innovative study guide with a reliable solutions manual in one convenient volume. A poster-size Cellular Metabolic Map is packaged with the Guide, on which students can draw the reactions and pathways of metabolism in their proper compartments within the cell.

Exploring Genomes, Paul G. Young (Queens University), 0-7167-5738-2
Used in conjunction with the online tutorials found at www.whfreeman.com/young, Exploring Genomes guides students through live searches and analyses on the most commonly used National Center for Biotechnology Information (NCBI) database.

Lecture Notebook, 0-7167-5954-3
Bound volume of black and white reproductions of all the text's line art and tables, allowing students to concentrate on the lecture instead of copying illustrations. Also includes: Essential reaction equations and mathematical equations with identifying labels; Complete pathway diagrams and individual reaction diagrams for all metabolic pathways in the book; References that key the material in the text to the CD-ROM and Web Site

http://www.whfreeman.com/lehninger/

Course Goal

The course is intended to meet the needs of students wishing to gain an appreciation of biochemistry through the survey of basic biochemical principles and metabolic pathways common to prokaryotes, plants and animals. The overarching aim is to provide a foundational level of understanding of the biochemical mechanisms of cell function. The goal is to enhance one's knowledge and to benefit the student's future endeavors within all areas of the life sciences.

General Course Objectives and Learning Outcomes
At the completion of the course, students should be able to:

- Possess a general understanding of the major types of biochemical molecules, including small, large and supermolecular components found in cells
- Be able to immediately recognize the different types of biochemical molecules and know their essential chemical characteristics that make them indispensable for life
- Understand basic energy metabolism of cells
- Know the structure of DNA and RNA and why these molecules have different roles in the storage and decoding of the information of heredity and cell function
- Explain the fundamentals of regulation of gene expression
- Identify some of common reaction mechanisms in biochemical processes
- Describe how enzymes work and know how to determine basic enzyme kinetics
- Appreciate the importance of water as polar solvent in biological chemistry
- Recognize the value of the importance of biochemistry in everyday life in the 21st century
- Comprehend the role biochemistry in the practice of medicine and medical research

Course Expectations

- Review the slide sets prior to viewing the lectures
- Keep current in studying the content of lectures and slide sets
- Prepare for weekly quizzes and major exams
- Complete the quizzes and exams as scheduled
- Maintain the highest ethical standards of academic honesty
- Try to make biochem fun and interesting

Course Organization

The course is based on streaming video of lectures recorded during in-class lectures in Fall 2010. To update lecture content, additional content on advances and discoveries that have occurred since recording the lectures will be added to slide sets that will not be contained in the lecture videos. **All information contained in the lectures and slide sets will be fair game for exams unless stated otherwise.** The pace of the lectures will be swift covering material from parts of most of the chapters in the text. Lecture slide sets and lecture streaming videos, based largely on the text, will be posted in advance on the course website and made available each week. You should review the slide set before viewing the lectures. Please be prepared to ask questions and make insightful comments about the assigned material throughout the duration of the course using the Chat feature of the SAKAI e-Learning course website at: [https://lss.at.ufl.edu/](https://lss.at.ufl.edu/) or the Discussion forums feature of SAKAI. You can always email me if you have a question at anytime during the week. As time permits, I will expand and embellish on the slide sets.
As your instructor, I will strive to make this course as relevant to both the professional and personal needs of all the members of the class. Lectures will be based on PowerPoint presentations using imagery from the required text and other appropriate sources.

Course Computer and Internet Access Requirements

Minimum Computer Hardware Recommendation for BCH 5045

The following minimum hardware configuration is recommended:

Hardware/Internet Requirements

• Intel Core 2 Duo, or i series processor,

• 3GB of RAM (32-bit) or 4GB of RAM (64-bit)

• 120 Gigabyte Hard Drive with a speed of 7,200rpm

• DVD-R/RW Drive

• Support for DirectX 11 and dedicated graphics card

• USB 2.0 ports, more than 1

• 100mbit or 1Gbit Ethernet Adapter for Broadband

• WiFi 802.11 b/g or n wireless networking on laptops

• Sound card, and speakers or headphones

• 1024 by 768 or higher resolution monitor

• Printer

Other configurations and software recommendations beyond those shown below can be found at: http://training.helpdesk.ufl.edu/samplecomputer7.shtml

1. All students should have dedicated access to a computer using a modern operating system such as Windows 7 or Mac OS X. Students should make sure to have access to a back-up computer (work, friend or relative’s computer) in case of equipment failure.

2. A high-speed Internet connection is highly essential for accessing the lecture videos. Some wireless connections may also be problematic.

3. Your hardware should include speakers, microphone, or headphones for the presentations. A webcam is not necessary, but could be helpful for videoconferencing over the Internet

Software Requirements

This software is available at no cost (the one exception is the MS Office suite, however there is a free alternative). Many technical problems you might encounter can be resolved by installing the latest version of the following software. Click on the logo(s) to download.
1. Firefox Web Browser – In order to simplify compatibility issues, we ask all students to access their courses using Firefox (Chrome, Internet Explorer or Safari have limited functionality).

2. Adobe Flash Player – Many courses include A/V presentations which require the Flash Player.

3. Adobe Reader – Many courses include .pdf documents which require Adobe Reader.

4. Java Runtime Environment – Many courses incorporate content which requires JRE.

5. MS Office or Open Office – Courses require updated business suite applications. Open Office is a free alternative to the MS Office suite. You can get Open Office here.

Windows-based computers are the dominant choice in most University of Florida academic programs. Students considering purchasing other platforms, such as a Mac, should carefully examine the requirements and recommendations of their academic programs.

Computer Performance

Most students at UF will take courses that will use online delivery and communications. Many of these courses use Sakai. The minimum recommendation provided here is one that ensures that a student will have a reasonable use experience when dealing with online and learning materials. More importantly a smooth experience will make learning more effective for the student.

Lectures will be delivered live and by streaming video. Because the file format is very large for a 50-minute lecture at a suitable resolution, a high speed broadband internet connection is absolutely required. Broadband is any connection to the customer of 256 kbit/s (0.256 Mbit/s) or more. The FCC definition of broadband is 200 kbit/s (0.2 Mbit/s) in one direction, and advanced broadband is at least 200 kbit/s in both directions. Check with your Internet service provider to determine the data transmission rate of your connection.

The streaming video content can be viewed using Windows Media Player or other equivalent player.

Grading

Course grades will be based on 600 points. There will be three exams worth 100 points each and a partially comprehensive final worth 200 points. There will be 11 weekly quizzes each worth 10 points. Quizzes will be given at the beginning of each week, and require no more than 10 minutes to complete. The lowest quiz grade will be dropped.

Missed exams will count as a zero unless an arrangement to take a make-up is made PRIOR to the test date.

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<thead>
<tr>
<th>Grading Scale</th>
<th>Grade</th>
<th>Grade Point Equivalent</th>
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</thead>
<tbody>
<tr>
<td>540 and above</td>
<td>A</td>
<td>4.00</td>
</tr>
<tr>
<td>480-539</td>
<td>A−</td>
<td>3.67</td>
</tr>
<tr>
<td>420-479</td>
<td>B</td>
<td>3.00</td>
</tr>
<tr>
<td>360-419</td>
<td>B−</td>
<td>2.67</td>
</tr>
<tr>
<td>300-359</td>
<td>C</td>
<td>2.00</td>
</tr>
<tr>
<td>270-299</td>
<td>C−</td>
<td>1.67</td>
</tr>
</tbody>
</table>
The grading scale WILL NOT be adjusted or curved.

University of Florida Honor Code

The University of Florida Honor Code was recently revised (9/24/2008) and may be found in the Regulations of the University of Florida under section 6C1-4.041

Preamble: In adopting this Honor Code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the University community. Students who enroll at the University commit to holding themselves and their peers to the high standard of honor required by the Honor Code. Any individual who becomes aware of a violation of the Honor Code is bound by honor to take corrective action. Student and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon the community acceptance and enforcement of the Honor Code.

The Honor Pledge:

"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code."

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied:

"On my honor, I have neither given nor received unauthorized aid in doing this assignment."

REMINDER: YOU HAVE SIGNED THE FOLLOWING STATEMENT

"I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

Software Use

The principles for using and managing software derive from U.S. copyright law, the Florida Computer Crimes Act, and legal agreements in the form of licenses and purchase agreements. That foundation makes the basic policy governing software clear:

All faculty, staff, and students of the University of Florida are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

University of Florida Counseling Services

If during the course of the semester you experience a personal crisis, help is available through the UF Counseling Center P301 Peabody Hall, telephone number 392-1575. Information is available on the web at: http://www.counsel.ufl.edu/
Evening and Weekend Resources -

For emergencies occurring in the evening or on the weekend, crisis-counseling services are available through the Alachua County Crisis Center by calling 264-6789. Students may also call the clinician on-call at Student Mental Health for phone call back and consultation at 392-1171.

Students with Disabilities Act

Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act of 1990 are the primary pieces of legislation that affect postsecondary institutions and students with disabilities.

The Rehabilitation Act of 1973 was designed to empower individuals with disabilities to gain employment, economic self-sufficiency, independence, inclusion and integration into society. Section 504 of the Rehabilitation Act of 1973 was designed to ensure that any program or activity receiving federal assistance did not discriminate on the basis of disability for “otherwise qualified” individuals. No “otherwise qualified” individuals, solely by reason of their disabilities can “be denied the benefits of, be excluded from participation in, or be subjected to discrimination” in these programs.

Reasonable accommodations are established by the Disability Resource Center (DRC). Students with disabilities are issued accommodation letters which specify their accommodations and are responsible for providing the letters to their faculty members. Upon receipt of the accommodation letter, a faculty member is responsible for reviewing the information in the letter and providing the requested accommodations. If there are any questions or concerns about the information contained in the letter, a faculty member should immediately contact the Disability Resource Center. Unless the DRC is contacted, it can only be assumed that there are no questions or concerns with any particular student's accommodation package. Most classroom accommodations are easy to arrange and will not take much time to administer. If, however, assistance is needed, please contact the DRC. The Disability Resource Center attempts to make the accommodation process as efficient and effective as possible for everyone involved.

August 1, 2011