

## **Chemistry 521 Advanced Biochemistry Fall 2014**

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### **Instructor contact**

Jenq-Kuen (Jack) Huang, Ph. D.  
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Phone: 309-298-1207  
Office: Currens Hall 548B  
Office hours: M. W. F. 9:00-10:20 am, other times by appointment.

### **Class meeting time and place**

T. Th. 5:00-6:15 pm. Currens 202

### **Course prerequisite**

Chem. 421 or equivalent.

### **Course description**

This is an advanced course in biochemistry that emphasizes the storage and flow of genetic information. Topics will include structure-function of proteins, mechanisms of DNA, RNA and protein biosynthesis, control of gene expression, and biotechnology. **This is a web-enhanced course.**

### **Course Objectives**

Upon successful completion of this course in advanced biochemistry, the students will be able to

1. Identify the principles of structure and function of proteins, model the structure of a protein, and relate the protein structure to the function.
2. Describe the detailed processes of DNA replication, DNA repair, RNA synthesis, protein synthesis, and protein targeting in both prokaryotic and eukaryotic organisms.
3. Describe the principles of gene organization and control of gene expression in both prokaryotic and eukaryotic organisms.
4. Describe the general principles of recombinant DNA technology and interpret the outcome of experiments that involve the use of these techniques.
5. Describe properties of cancerous cells to mutational changes in gene function.
6. Demonstrate ability to interpret and critique of biochemical research articles.

### **Textbook**

Textbook is not required. There are several suggested reference books in the reference desk in WIU Physical Science Library, and the ebooks listed in my Westernonline.

There are several excellent biochemistry books in our physical science library. The following books are recommended:

1. Biochemistry by Berg, Tymoczko and Stryer
2. Genes VIII by Benjamin Lewin
3. Biochemistry by Voet and Voet
4. Biochemistry by Lehninger
5. Biochemistry by Garrett and Grisham
6. ebooks listed in My Westernonline

### **Instructor communication and feedback**

- Students are encouraged to contact the instructor with questions about the content, grading, etc., of the course. This can be done by face to face meetings or by email through Zimbra to [J-Huang3@wiu.edu](mailto:J-Huang3@wiu.edu). I will answer emails within 24 hours during the regular business days but less frequent during the weekend or scheduled WIU breaks.
- For the Discussion Board Assignments, I will try to provide feedback and assign grades within 1-2 weeks from their due date.
- Other assignments (e.g., Projects, term paper, exams) will be graded within 1-2 weeks of their due date.

### **Instructor's expectations of students and communication**

- Regular and punctual class attendance is vitally important to a student's academic achievement. Students are expected to attend ALL class meetings regularly and punctually. **Each unexcused absence will lower your class grade by 2 percentage point (or 14 points).** The only exception for missing a class would be a serious documented medical illness or participation in University sponsored trips such as athletics or professional meeting (not sorority/frat, or other clubs).
- Cell phones and laptops must be turned off and put away while in class. Also, class time is not a social hour. Please refrain from casual conversation during class time.
- Students are responsible for all information and materials given in class whether you are present or not.
- Since this is a web-enhanced course, it is imperative that you familiarized yourself with the technology needed to navigate the course website at the beginning of the class.
- **Participation Requirements.** Students are expected to self-motivate themselves and are expected to read ahead, prepare for class and participate in class discussion. Students are expected sign in to class website at least 3 times a week. Participation in Discussion Board Assignments, chat with other students in projects and any other community events is required.

- There will be **strict due dates and deadlines** for all assignments in order to keep our community of learners on the same topic of focus. I can accept two late assignments (Discussion board or homework) without penalty if those assignments reach my desk in a week after the deadline. . Additional late or missing assignments will not be graded. It is a good idea to complete assignments early so that technical difficulties will not prohibit you from meeting deadlines.
- Students are expected to respect others. When communicating with your classmates online use good "netiquette". Disagreements and discussions about ideas are expected but personal attacks will not be tolerated. The Core Rules of Netiquette can be found at <http://www.albion.com/netiquette/corerules.html>.

### Technology Support (Help Desk)

For technical issues regarding Western Online WIU's U-Tech help desk can be reached by phone at **309-298-2704** or E-mail: [ucss@wiu.edu](mailto:ucss@wiu.edu).

### Grading

90% and above- A; 80-89%- B; 70-79% - C; 60-69% - D; 59% and below - F

#### Grading assignments

Assignment	Possible points
3 exams – 100 points each	300
Comprehensive final exam – 120 points	120
*Discussions – 6 discussions, 12 points each	72
Homework assignments – 6 assignments, 20 points each	120
**Research term paper	88
Total	700

If it should be necessary to miss an exam, please notify the instructor in writing, before the fact, if possible. The only acceptable excuses for missing an exam are personal illness, family emergencies or University sponsored functions (i.e. WIU band trips, field trips in other WIU classes, WIU athletics, etc.). Make-up exams are always designed to be at least as difficult as the regular exam. Students are required to use Online Absence Reporting System (OARS) any time they miss class by log on to [wiu.edu/oars](http://wiu.edu/oars) and submit an absence form for that day's classes. The system is served to help students and faculty document absences; it doesn't excuse students from class. It is the instructor's discretion on how to use the absence information based on the attendance policy.

An incomplete grade will **NOT** be given to a student with a failing grade. No incomplete will be given to a student without documented evidence of an emergency that requires that the student be away from the university for at least two consecutive weeks or requires that the student miss the final examination. The student shall notify the instructor of the emergency as soon as possible and prior to the final examination.

Seating will be assigned by the instructor during the exams and/or any other time deemed necessary.

**\*Discussion Board grading policy:** Discussion grades will be based on combination of student participation and on the quality of the posts. A minimum of two messages (an original and a response) must be posted for each discussion.

- Original Posting (7 points)
  - Deliver information that is rich in content full of thought, insight, analysis, and cite sources. (4 points)
  - Mention of at least 2 specific points from the PowerPoint reading assignment or other sources (please cite detailed sources). (1 point)
  - Make clear connections to previous or current content or to real-life situations. (1 point)
  - Contain new ideas, connections, or applications. (0.5 points)
  - Very few grammatical and spelling errors. (0.5 point)
- Reply to Others' Postings (3 points):
  - Discuss at least one point you like/agree with, and one point you dislike/disagree with, and why. (3 points)

**\*\* Research term paper:** The term paper must on a topic of biochemical relevance and must be chosen in consultation with the instructor. You must choose a fresh topic that you have not used in other courses and each student must have a different topic. Majority of your research articles must be selected from biochemistry journals (eg. [Journal of Biological Chemistry](#), [Biochemistry](#)). The topic along with the major research articles should be approved by the instructor by **Oct. 28, 2014**. It is strongly encouraged that you start working on your term paper early in the semester. The penalty for late submission is 1% per day. The paper is to be approximately fifteen typed, double-spaced, pages and must include **no less than eight research journal references with publication dates 2000 or later**. The term paper must be **your own work and in your own words**. Sources of ideas or information must be referenced. The term paper will be graded based on content, construction and conciseness. Grammar, punctuation, and spelling will be worth 5% of the term paper mark. The paper is due on or before **Nov. 28**. The penalty for late term paper is 5% per day; the first penalty is applied 4 days after the deadline (Tuesday). Term paper will not be accepted after the end of classes. Research term paper presentation by students will be scheduled during the weeks of **Dec. 1 and Dec. 8**. Incidents of

plagiarism will result in a grade of zero for the assignment and may result in a failing grade for the whole course.

### **Statement on Ethics**

Western Illinois University, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. Students have rights and responsibilities (<http://www.wiu.edu/provost/students/>). The following action is prohibited under the Student Conduct Code. Disorderly Conduct: Any behavior which disrupts the regular or normal functions of the University community, including behavior which breaches the peace or violates the rights of others. Plagiarism, cheating, and other forms of academic dishonesty constitute a serious violation of University conduct regulations. Any student convicted of academic dishonesty, can receive a failing grade and may be subject to further academic penalties. Web address for Academic Integrity Policy (<http://www.wiu.edu/policies/acintegrity.php>). Please remember that **you are expected to do your own work at all times**. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

### **Emergency evacuation procedures for the building**

If a fire alarm should happen to ring, or if students are ordered to evacuate a lab or classroom by the instructor, the students should walk to the nearest stairwell (Do not use the elevators) and proceed to the ground floor and out the building. Any student on an upper floor who cannot physically proceed down the stairs should go to the southernmost stairwell and await assistance. If the building should be evacuated all students and personnel should gather at the southwest corner of the Higgins Parking lot near the fence (parking lot just outside the building) to wait further instructions.

### **Emergency Preparedness**

WIU Office of Risk Management and Emergency Preparedness provides resources on how to respond to emergency situations. Please view the video resources at [www.wiu.edu/rmep/](http://www.wiu.edu/rmep/) (Click "Resources" on the left side of the page).

### **Americans with disabilities act (ADA) statement**

In accordance with University policy and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. For the instructor to provide the proper accommodation(s) you must obtain documentation of the need for an accommodation through [Disability Resource Center](#) (DRC) and provide it to the instructor. It is imperative that you take the initiative to bring such needs to the

instructor's attention, as he/she is not legally permitted to inquire about such particular needs of students. Students who may require special assistance in emergency evacuations (i.e. fire, tornado, etc.) should contact the instructor as to the most appropriate procedures to follow in such an emergency. Contact Disability Resource Center (DRC) at 298-2512 for additional services.

**Lecture Topics (tentative):**

1. Amino acids, peptides, and proteins
2. DNA
3. DNA replication
4. DNA repair
5. DNA rearrangement
6. Transcription
7. Translation
8. Protein life cycle
9. Regulation of gene expression
10. Recombinant DNA technology

**Tentative Exam Schedule:**

<b>Dates</b>	<b>Event</b>
Thursday, Sep 25	First exam
Thursday, Oct 23	Second exam
Thursday, Nov. 20	Third exam
Tuesday, Dec. 16 at 6:00 p.m.	Final

**Holidays and other important dates**

<b>Date</b>	<b>Event</b>
August 25, Mon. 2014	First Day of Classes
September 1, Mon. 2014	Labor Day Holiday
October 10, Fri. 2014	Fall break
November 24-28, Mon.-Fri. 2014	Thanksgiving break
December 15-19, Mon. –Fri. 2014	Final exam week
December 20, Sat. 2014	Commencement

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**SYLLABUS MAY BE SUBJECTED TO CHANGE WITH NOTICE.**

**Last Updated August 12, 2014 by Dr. Jenq-kuen Huang, Department of Chemistry, Western Illinois University**