Western Kentucky University  
Department of Biology  
1906 College Heights Boulevard  
(270) 745-3696

INSTRUCTOR: Dr. Nancy A. Rice  
LECTURE: TR 9:35 am – 10:55 am  
OFFICE HOURS: TCNW 113  
M 9-10 am; T 8 – 9 am  
By appointment as well  
TELEPHONE: (270) 745-5995  
EMAIL: Nancy.Rice@wklu.edu

COURSE DESCRIPTION: This course will provide an introduction to the structure of biological macromolecules (proteins and nucleic acids) and cells with special emphasis on relating molecular structure with cellular function. Specifically, this course will focus on what information is encoded in the genome, and how is that information decoded, and processed to maintain cellular organization.

DROP/WITHDRAWAL/INCOMPLETE: Ceasing to attend class does not activate the drop, withdrawal, or incomplete grade processes. You must submit the appropriate forms for each by the published deadlines to end your enrollment in this class. Failure to complete the appropriate forms may result in a failing grade for this course.

SPECIFIC ACCOMMODATIONS: Any student who requires accommodations because of a physical, learning, psychiatric, vision or hearing disability should contact the Office for Student Disability Services (745-5004) at the beginning of the semester. If you so choose, after documenting your disability with Student Disability Services, please arrange to see me during office hours to discuss your accommodations.

CREDIT HOURS: 3 credit hours  
It is expected that students will study and prepare at least two hours for every hour spent in class. This includes reading the assigned materials in advance and being prepared to participate in class discussion with questions, comments, and observations.

PREREQUISITES: Biology 120/ Chem 120 and honors status; or consent of instructor.

REQUIRED TEXTS: Molecular Biology of the Cell 5th Edition and The Double Helix, Watson, J. In addition, selected articles that are required reading will be available on Blackboard.

ATTENDANCE: Your attendance and participation in this class is essential to you learning the material. It is extremely important that you attend every class session in order to help you do your best in this course. You are expected to arrive on time and remain for the entire class period. Important course announcements are often given at the beginning of class. Quizzes and exams will be given at the start of class as well. Extra time will not be allowed for quizzes or exams if you are late to class. Credit will not
be given for any missed quizzes or exams. If you do miss a class, it is your responsibility to get any missed notes or handouts.

CLASSROOM CIVILITY: Students are expected to assist in maintaining a classroom environment that is conducive to learning and respectful of the instructor and fellow students. The time spent in the classroom is to be a time of intellectual gain, thus students are prohibited from using cellular phones and beepers, making offensive remarks, reading newspapers, or engaging in any form of distraction. Inappropriate behavior shall result in, minimally, a request to leave class.

GRADING AND EXAMS: Student grades will determined by the total number of points earned. Points will be divided as follows:

- Lecture exams #1-3: 3 x 100 points each = 300
- Exam #4/Cumulative final: 1 x 200 points = 200
- Quizzes: 4 x 20 points = 80
- Essay: 1 x 50 points = 50
- Case Study Participation: 1 x 50 points = 50
- (Extra Credit Paper): 1 x 25 points = (25)
- Course total = 680

Final course grades will be determined on the following percentage scale:

- 90-100% A Outstanding
- 80-89% B Above average
- 70-79% C Average
- 60-69% D Below Average
- Below 60% F Failing

EXAM FORMAT: The lecture exams will be given approximately every 3-4 weeks. All exams will be given in class. In class exams start at the beginning of class on the scheduled day and are to be complete by the end of the class period. No extra time will be given if you are late to class. The final exam will be given as per the final exam schedule.

Fair game for exams is material from lecture notes, handouts, anything in the assigned reading from the textbook not covered during lecture, and outside reading as assigned. Exams will include a variety of question formats, i.e. multiple choice, fill-in-the-blank, identify, diagram, and short answer or essay. Tests will be used to not only evaluate the amount of knowledge you have gained but also to test your ability to apply your new found information and skills. You are expected to write your answers legibly using proper English grammar. If I can’t read your answer or it is unclear or incomplete, you will not receive full credit.

Make-up exams will be given only in the case of university approved excused absences. If an exam is missed due to a university-approved excuse, you must contact me a minimum of 1 day prior to the missed exam and I will schedule the make-up day and time. Failure to contact me prior to the exam result in a zero recorded for that test grade.

SCIENTIFIC ARTICLES/QUIZZES: During the course of the semester, you will be asked to read a variety of research articles posted on Blackboard by your instructor corresponding to topics being discussed in class. After reading and studying the articles we will discuss each in class. These articles will
introduce you to important molecular biology concepts and will teach you how to think about science. While reading the articles, you should concentrate on each figure or table. Discussion will focused around five questions: what is the question being addressed?; what experimental approach was used to sole the problem?; what are the results of the experiment?; what broad concepts and new principles emerge from the results?; how do the results benefit society? At the end of each discussion section you will be given a take-home quiz. The quizzes will cover the experiments described in the article and will count 20 points. They are due the following class period.

ESSAY: Students are required to read The Double Helix, by James Watson and write an essay over any aspect of the book. The essay is to be typed and is not to exceed 3 double spaced pages. The essay will be graded for content, style and grammar.

CASE STUDY: Participation in two group assignments will be required during the semester and is worth 50 points of your grade. Students will be assigned to a group on the day the case study is introduced. Cases will be used to discuss the issues surrounding cloning and genetic privacy. Assignments can be downloaded from Blackboard. Following the case discussion on cloning, you may earn up to 25 points extra credit if you write a paper about the controversy of cloning. The paper is to be written in a particular novel way. No credit will be given if you do not follow this format. The paper must be at least 5 typewritten, double-spaced pages long. The paper must be a dialogue between two people on opposite sides of the question. It should be written in the form of a script or play. Examples can be found on Blackboard under the Assignments tab.

ACADEMIC INTEGRITY: Students are expected to do their own work throughout this course and demonstrate academic integrity. Academic dishonesty in the form of cheating or plagiarism will not be tolerated. Please refer to the WKU Student handbook for polices and definitions regarding academic integrity at:
http://www.wku.edu/Dept/Support/StuAffairs/StuLife/handbook/academicOffenses.htm

COURSE OUTLINE:

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<thead>
<tr>
<th>Date</th>
<th>Lecture Material</th>
<th>Chapter</th>
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<tr>
<td>1/27</td>
<td>Introduction to course; Bonds and molecular interactions</td>
<td>2</td>
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<tr>
<td>1/29</td>
<td>Amino acids</td>
<td>3</td>
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<td>Proteins</td>
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<td>Protein folding and modification</td>
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<td>2/3</td>
<td>Paper discussion - prions</td>
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<tr>
<td>2/5</td>
<td>Video: Brain Eater: Mad Cow Epidemic Quiz 1 due</td>
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<tr>
<td>2/10</td>
<td>Enzymes /Regulation of Protein function</td>
<td>3</td>
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<td>2/12</td>
<td>Protein purification and characterization</td>
<td>8</td>
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<tr>
<td>2/17</td>
<td>Catch up – Jeopardy Review</td>
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<td>2/19</td>
<td>Exam I</td>
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<tr>
<td>2/24</td>
<td>Membranes</td>
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Cell organization - Organelles and cytoskeleton

2/26
Nucleic Acids
DNA organization
Chromatin

3/3
DNA replication
DNA damage and repair

3/5
Paper discussion – DNA replication

3/9 - 3/13
No class – Spring Break

3/17
Quiz 2 due
Catch up – Jeopardy Review

3/19
Exam II

3/24
Transcription Overview
Transcription – prokaryotes

3/26
Eukaryotic transcription
Eukaryotic transcription; RNA processing
Double Helix Essay due

3/31
Video: Secrets of Photo 51

4/2
Control of gene expression (transcriptional regulation)

4/7
Paper discussion – Transcriptional regulation

4/9
Translation
Quiz 3 due

4/14
Video: CLONE
Take home Exam III handed out – due 4/17

4/16
Case Study – “Cloning Man’s Best Friend”

4/21
No Class – ASBMB Meeting

4/23
Recombinant DNA techniques

4/28
Genomics
Gene inactivation in eukaryotes

4/30
Paper discussion – Microarrays
Introduction to Case Study – Genome Privacy
Extra Credit due

5/5
Case Study – Genome Privacy and SNPs
Quiz 4 due

5/7
Congressional Hearing on Genome Privacy
5/12 Final Exam 10:30 AM

* This lecture schedule is approximate and may be adjusted slightly as the course proceeds. Exact exam dates and assignment due dates will be announced in class at least one week prior to exams.