BIO 220: Molecular Biology

Course: CRN# 21492, Section 1, Tuesday/Thursday 8:30am-9:45am, WH 160A
Prerequisites: BIO 122, BIO 123 and CHE 110 (C or better)
Corequisite: BIO 221
Instructor: Dr. Helen Chun
Contact: NSM A-141, hchun@csudh.edu, (310) 243-3381
Office Hours: Monday 10:00am-12:00pm, Tuesday 11:00am-1:00pm, or by appointment

Biology Office: Gaby Gomez-Dominguez, NSM A-143, (310) 243-3381

Course Description
This course examines the fundamental concepts of molecular biology at the introductory level. Course topics present the current understanding of molecular mechanisms. Topics include the chromosome structure, DNA replication and repair, transcription, translation, gene expression, common biotechnology methods, and molecular evolution. Both prokaryotic and eukaryotic systems will be emphasized. We will focus on making connections between these topics and understanding the biological significance. This section is taught with a team-based learning format that does not include traditional lectures.

Student Learning Outcomes
At the successful complete of the course, you will be able to:
• Describe the structure of chromosomes
• Explain in detail the process of DNA replication
• Explain in detail the process of transcription
• Explain in detail the process of translation
• Describe different approaches in gene regulation
• Describe the main concepts of DNA recombination
• Describe the major pathways of DNA repair
• Explain effects of mutations on gene expression and regulation
• Explain the differences between prokaryotic and eukaryotic systems in DNA replication, transcription, translation and gene regulation
• Describe the fundamental concepts and patterns of molecular evolution
• Describe when and how to use basic biotechnological tools, equipment and methodology
• Use and apply basic knowledge to answer or solve complex problems within a team dynamic
• Construct rational explanations to express or defend positions to team members

Required Materials
• Required: Introductory level or higher molecular biology textbook
  Recommended: Molecular Biology of the Cell, 5th Ed, (Bruce Alberts)  Note: same as BIO 320
  As an alternative to purchasing this textbook, you may rent it directly from the publisher.
  http://www.garlandscience.com/textbooks/0815341059.asp?type=ebook
• Required: BLACKBOARD – Study material and other information are found under CONTENT
  Announcements are found under ANNOUNCEMENTS
  Grades will be posted in the GRADE CENTER
• Required: Clicker - Turning Point Response Card NXT
  This can be rented from the Bookstore
<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>UNIT</th>
<th>READING (Alberts, 5th)</th>
<th>CLASS</th>
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<tr>
<td>1</td>
<td>Tues, Jan 26</td>
<td>Welcome</td>
<td>Readings due before the first day of the Unit</td>
<td>HELLO!</td>
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<td>Thurs, Jan 28</td>
<td>Introduction to TBL</td>
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<td>Formation of Groups</td>
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<td>Tues, Feb 2</td>
<td>UNIT 1:</td>
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<td>Thurs, Feb 4</td>
<td>Cells; Molecular Evolution; Methods I - Cells; Biochemistry; DNA</td>
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<td>Team Exercises</td>
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<td>Thurs, Feb 11</td>
<td>Protein Structure; Methods II - Protein Purification and Analysis; Chromosome</td>
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<td>Exam</td>
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<td>Thurs, Feb 18</td>
<td>DNA Replication; Replication Initiation/Telomeres; DNA Repair; Methods III - DNA</td>
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<td>Thurs, March 10</td>
<td>Gene Expression Regulation; Methods IV- Gene Expression</td>
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<td>Thurs, March 17</td>
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<td>Thurs, March 24</td>
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<td>Gene Expression Regulation; Methods IV- Gene Expression</td>
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<td>14</td>
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<td>RATs</td>
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<td>Thurs, May 5</td>
<td>Gene Expression Regulation; Methods IV- Gene Expression</td>
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<td>Team Exercises</td>
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<td>15</td>
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<td>Thurs, May 12</td>
<td>Translation Components Translation Mechanism</td>
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<td>FINAL</td>
<td>Thurs, May 19</td>
<td>CUMULATIVE EXERCISE 8:30am-10:30am</td>
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I reserve the right to change the syllabus as needed
Grading
Your grade will be determined by three performance categories and your BIO 221 grade: 1) Individual Performance, 2) Team Performance, and 3) Team Maintenance.

1. Individual Performance – 50%
   a. Individual Readiness Assessment Tests (25%)
   b. Unit Exams: individual component (25%)

2. Team Performance – 40%
   a. Team Readiness Assessment Tests (20%)
   b. Unit Exams (team component) (20%)

3. Peer evaluation
   Serves as a multiplier for team performance score

4. BIO 221 grade – 10%

Total: 100%

Grading Scale
94 - 100% = A
90 – 93% = A-
87 – 89% = B+
83 - 86% = B
80 – 82% = B-
77 – 79% = C+
73 – 76% = C
70 – 72% = C-
67 – 69% = D+
60 – 66% = D
Below 60% = Fail

Team-Based Learning Format
The course is divided into 6 units and for each unit, you will take RATs, complete in-class team exercises, and get tested with the unit exam.

Readiness Assessment Test (RAT)
Each unit will begin with RATs, which are short multiple-choice quizzes. You will be provided study slides, reading assignments, and supplemental material to help you prepare for the RATs. These will be posted on Blackboard. You will take the RAT on your own (every student submits answers), and then retake the same RAT with your team (every team submits one set of answers). RATs are closed-book and require the Turning Point clicker to record your answers. Other electronic devices will not be allowed. Makeup RATs are not allowed.

In-class Team Exercise
Class meeting times will be used for teams to work on exercises made to apply the knowledge you gained while preparing for the RATs. Every member of the team is expected to participate in these exercises. Electronic devices will not be allowed during team exercises unless I indicate differently. Any points accumulated during the team exercises are extra credit and cannot be made up.

Unit Exams
Each unit will end with an exam to assess your knowledge of key concepts and application of course content. The exam will be separated into an individual component and team component. The individual component will have questions in simple formats (multiple choice, fill in the blank, etc) and the team component will include questions that require applying concepts and data analysis. Exams are closed-book and will not include the use of electronic devices. Exams must be taken when scheduled and cannot be taken out of the room unless instructed to do so. Makeup exams will only be given to serious excuses with verification. If you are aware of a schedule conflict ahead of time, including observance of religious holidays, please schedule with me to take the exam earlier. If you miss an exam, it is your responsibility to schedule your makeup exam with me. Expect that the makeup exam may be a different written exam. The final exam will be cumulative with an emphasis on the newest material. Cell phones and other communication/listening devices must be turned off during exams; if they go off during an exam, you will be required to turn in your paper, even if incomplete.
Peer Evaluation
You will have three opportunities to assess the contributions that each team member has made to the work of the team. This contribution should reflect your judgment of your teammates’ performance in:

• Preparation – Were they prepared when they came to class?
• Contribution – Did they contribute productively to group discussions and team work?
• Respect for other’s ideas – Were they respectful of other’s opinions? Encouraged expression of opinions?
• Ability of handling conflicts – Were they reasonable when disagreements occurred?

The first peer evaluation will not count towards your Team Performance but will serve as an indicator to show how you are doing within your team. This will give students a chance to improve. Your second and third peer evaluations will be incorporated into your Team Performance.

Supplemental Instruction (SI) – Extra Credit
SIs are 75-minute sessions, outside of lecture, designed to give you a more complete understanding of the course material. The format will vary with each session, but may include discussions of historical experiments, exercises to improve your grasp of course content, and review discussions. SI is organized by me, but will be led by our designated SI Leaders and scheduled at various times throughout the week. You will earn a maximum of 2-points/week for your participation in a SI workshop or office hour. SI points are extra credit and will be incorporated into your lecture grade. Attendance will be taken during SI workshops and office hours.

Attendance
Attendance is expected for each class meeting. Regular attendance is essential for a good performance in this course. Formal attendance will not be taken in; however, choosing not to attend class and learning the course material independently dramatically decreases your chance of performing well. Points earning during class can only be earned when you are present and participating. Studying the course content alone using material uploaded onto BLACKBOARD is not a good substitute for missing class.

Computer/Information Literacy Expectations
Laptops, tablets, and other devices with internet capabilities are not allowed in class unless I indicate otherwise. Cameras and other image-capturing equipment are prohibited. Please see me about audio recording devices. Cell phones, hands-free equipment and listening devices should be turned off and put away.

Students in this class are expected to: 1) use the university email system (Toromail), 2) use Blackboard, 3) be able to access web resources through the internet, and 4) be able to paraphrase concepts without plagiarizing. For additional information about computing on campus, including tutorials, students should go to:
http://www.csudh.edu/infotech/labs

Some Advice
I will do my best to help you understand the content in our course, but I cannot learn the material for you. Here are pointers to help you succeed in this course:

• Attend every class prepared
• Study content from our course 30 minutes a day. You will be surprised how well this works!
• Use online tools for clarification or to gather additional information
• Attend SI workshops and office hours weekly
• Work with LSAMP and TLC tutors.
• Work together in study groups (only if this works for you)
• Visit me during office hours or send me emails
• Sleep well and exercise regularly. Don’t laugh….these are important!
Professional and Respectful Conduct
Professional and respectful conduct is expected from everyone involved in our course. Disrespectful conduct includes, but is not limited to, continually arriving late/leaving early, talking on the phone, text messaging, disruptive talking, making abusive/threatening comments, causing physical harm. Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to University disciplinary action because such behavior inhibits other students' ability to learn. I reserve the right to deduct points from your grade, disqualify you from earning extra credit points, or require the disruptive student to leave class pending discussion and resolution of the issue. I may choose to report a disruptive student to the Student Affairs Office (WH A-410, (310) 243-3784) for disciplinary action.

Disabled Student Services
If you are a student who requires special accommodations, please see me. CSUDH adheres to the American with Disabilities Act with respect to providing reasonable accommodations for students with temporary and permanent disabilities. To receive accommodations, students with disabilities must register with Disabled Student Services. For more information, please contact their office in Welch Hall D-180 at (310) 243-3660 (voice) or (310) 243-2028 (TDD).

Biology Department Withdrawal Policy
Please refer to the University catalog for the proper procedures and deadlines for withdrawals.

Academic Dishonesty
The faculty and staff of the Biology Department honor a code that embodies responsible and respectful conduct within our community so we may establish a learning environment that is fruitful and encourages advancement towards your personal goals. You are a member of our community.

Academic dishonesty usually refers to forms of cheating and plagiarism, which result in students giving or receiving unauthorized assistance in an academic exercise or receiving credit for work that is not their own. All forms of academic dishonesty are expressly forbidden by University rules and will not be tolerated in this course. Any student engaged in improper conduct will be subject to disciplinary action by the University and may receive a fail in the course. Please refer to the University catalog for the campus policy and disciplinary action.

I value sound moral character, so choosing to behave dishonestly is a trait that I strongly dislike. No matter what the situation is that compels you to cheat or plagiarize, please realize that it is your choice and that you should be held responsible for your actions. In the unfortunate event I must report an act of academic misconduct, the Vice President of Student Affairs will be notified and you will be asked to meet with the appropriate campus official to discuss your case. You may be asked to agree to disciplinary sanction as determined by the University. Note that the sanction will include that the final grade earned in this course will not be allowed to be repeated and cancelled (code AAAP045.001). If you are aware of academic misconduct that is occurring in this class, please report it to me either verbally, in writing, or via email. You may choose to identify yourself or remain anonymous. Please see me if you have any questions.

Final Notes
You are welcome to talk to me about advising issues, career plans and other questions unrelated to our course. I am not just your instructor, but a resource to help you succeed while at CSU Dominguez Hills. I am glad to be of help.

NOTE: Enrollment in this course is acknowledgment that you have read and understood the course policies described. I reserve the right to change the syllabus as needed.