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## BIOB 260.00: Cellular and Molecular Biology

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## Cellular and Molecular Biology

BIOB 260

Autumn 2014

Urey Lecture Hall 101, MWF, 9:10 am-10:00 am

Discussion sessions: T or R, 9:10 am-10:00 am or 4:10 pm-5:00 pm

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**Text:** Alberts *et al.*, Essential Cell Biology, 4th ed. (ISBN: 9780815344544)

**Clicker:** i>Clicker or i>Clicker+ (<http://www.iclicker.com>)

Graduate Teaching Assistants: Jon Andrews, Lauren Foltz, and Sundaresh Shankar

**Learning outcomes** are to understand life at the cellular and subcellular levels; to think critically and solve scientific problems; and to appreciate the role molecular processes play in modern biology. This course will emphasize biological principles, scientific concepts, and information syntheses while fostering an appreciation of cellular structure and function as well as the role of genes and genetic processes at the molecular level.

Students will be able to:

- ✓ Contrast the features that distinguish prokaryotic and eukaryotic cells.
- ✓ Given the thermodynamic and kinetic characteristics of a biochemical reaction, predict whether it will proceed spontaneously and the rate at which it will proceed.
- ✓ Recognize structures of the five major classes of building-block molecules that make up cellular macromolecules and membranes.
- ✓ Compare how the properties of water affect lipid membranes and the three-dimensional structures of macromolecules, and functional interactions between them.
- ✓ From their structures, predict which solutes will be able to diffuse spontaneously through a pure phospholipid bilayer membrane and which will require transport by membrane-associated proteins.
- ✓ Outline the flow of matter and energy in the processes by which organisms fuel growth and cellular activities, and explain how these processes conform to the laws of thermodynamics.
- ✓ Using diagrams, demonstrate how the information in a gene is stored, replicated, and transmitted to daughter cells.
- ✓ Describe how the information in a gene directs expression of a specific protein.
- ✓ Describe how cells are organized, and the role of membranes, organelles and cytoskeletal elements in energy and information transformations.
- ✓ Compare the ways cells convert extracellular signals into intracellular signals that transduce information to govern cell division, cell death, and cell differentiation.

**Required course prerequisites** are C– or better in BIOB 160 and CHMY 123 or 143.

### Grading

There are a total of 550 points to earn:

Four midterm exams, 100 points each; lowest curved score discarded (300 points total)

One final exam, cumulative, 100 points

Quizzes, 70 points total

Participation points, 80 points total; scaled from total clicker question points

The top 10 to 20 percentile of class will be awarded a grade of A or A–.  
The median score of the class will approximately define the partition between grades of B and C.  
A total score of 275 points (50%) or less will be failing (grade of F).  
Pluses (+) and minuses (–) will be used (A, A–, B+, B, B–, C+, C, C–, D+, D, and D–).  
A CR grade is equivalent to a D– or better and a NCR grade is equivalent to an F.

There are **no make-ups** for missed quizzes or clicker questions. Make-ups for missed exams are strongly discouraged, but requests with a compelling and verifiable excuse will be considered on a case-by-case basis.

You must submit your request to have an **exam re-graded** in writing to the professors within two weeks of the return of the graded exam and your exam will be completely re-graded.

**Exams and quizzes** will cover material from lecture, discussion sections, and assigned reading. Midterm exams are during class (9:10 a.m.) on September 22, October 17, and November 10. The fourth midterm exam and the final exam are given together at **8:00 a.m.** on December 10. All exams will be in Urey Lecture Hall 101. Exams will be normalized (using a Z-score). Most quizzes will be in discussion sections. All exams and quizzes are closed book: no outside materials are allowed; electronic devices (including cell phones, translators, calculators, MP3 players, and others) are not allowed during exams or quizzes without the explicit permission of the professor. You must buy and bring a **SCANTRON form** for each midterm exam and the final exam.

**Clickers** will be used for participation points and some quizzes. i>Clickers should be registered during the first week of class: use your i>Clicker at least once in class and then complete the form at: <http://www1.iclicker.com/register-an-iclicker>

1. Enter your First Name and Last Name in the appropriate boxes.
2. Enter your UM student ID (not your NetID; do not use dashes).
3. Enter your i>Clicker remote ID (this is the unique set of numbers and letters located on the bottom of the back of the clicker; ask the professor if you cannot read it).
4. Enter the verification code that appears on the screen, which will appear as a slightly distorted series of numbers and/or letters. Click the “Enter” button.
5. You will see an on-screen message confirming that registration was successful. Your student ID is now linked to your unique i>Clicker remote ID. You can use one i>Clicker for multiple classes and only need to register on the web once per semester.

PDF files of lectures and supplementary material as well as videos of some lectures will be available to **download** from Moodle: <http://umonline.umt.edu/>

**Accommodations** to ensure accessibility of students with disabilities will be gladly made, but to qualify you must be registered with Disability Services for Students (DSS). Arrangements for accommodations on exams must be through DSS.

**Academic misconduct** will be reported and handled as described in The University of Montana Student Conduct Code. *All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available online at:* [http://www.umt.edu/vpsa/policies/student\\_conduct.php](http://www.umt.edu/vpsa/policies/student_conduct.php)

**Dropping course or changing grading status** will strictly follow the University policies and procedures, which are described in the catalog. Requests to drop the course or change the grading status to benefit a student’s grade point average will not be approved.