

MCDB 3500

Molecular Biology

<http://dosequis.colorado.edu/Courses/MCDB3500/>

12:00 PM - 12:50 PM

Monday, Wednesday and Friday

CHEM 140

Teachers

Lecturer: Michael Stowell

Email: Michael.stowell@colorado.edu

Office hours: Wednesday, 13:00 – 15:00 in MCDB B231, or by appointment.

Teaching fellow: Michelle Smith

Email: michelle.k.smith@colorado.edu

TA: Jonathan Langberg

Email: jonathan.langberg@colorado.edu

TA hours : Monday 16:00 & Thursday 10:00 both in MCDB A350

What does the course cover?

MCDB 3500 deals with the central dogma of biology.

We will discuss the most important molecules in cells (**DNA, RNA, and protein**) and how their synthesis is regulated.

We will relate how these events control biological processes, how to design and interpret an experiment, and what conclusions can or cannot be drawn from a given experiment.

Methods of teaching/learning

Textbook: Preferentially read before each class.

Powerpoint slides and board: The board/overhead will be used a lot to explain the textbook material and the powerpoint slides in an alternative way - so take notes.

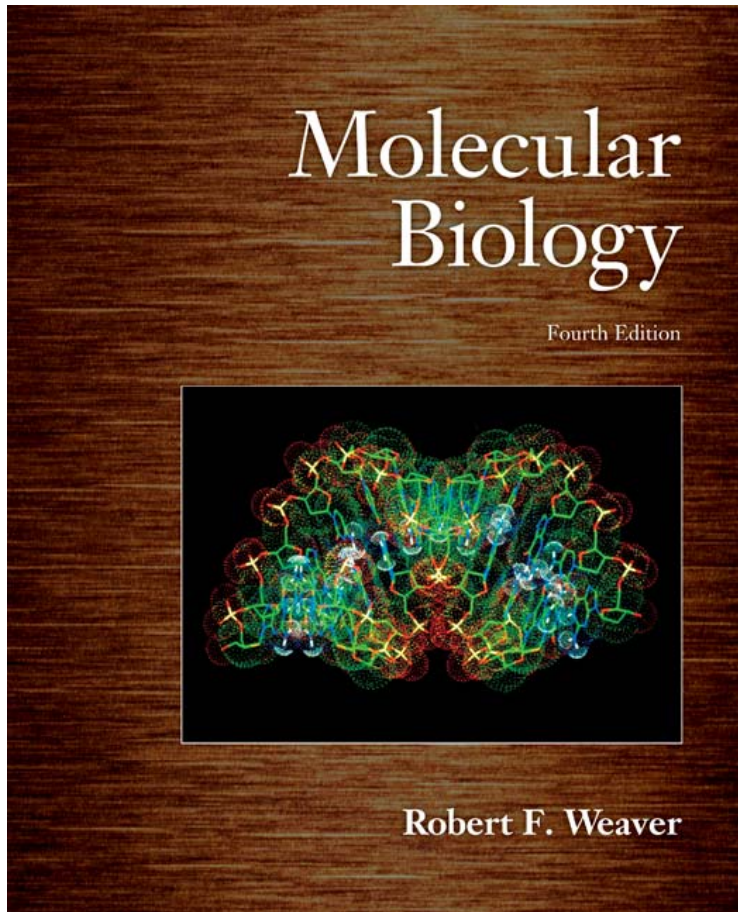
Clickers: Breaks up the monotony of a lecture and forces you to think through newly discussed material and put it in context.

Practice questions: Practice questions will be given before each exam.

Homework: Homework (generally a few multiple choice questions or a survey) will be due every Friday morning 11:00, except for the first week and exam weeks.

Textbook

Robert F. Weaver, Molecular Biology 4th Edition, McGraw-Hill, 2007 is required.



Emphasis on experimental details.

Share or, much better, own a copy!

One copy on reserve at the library.

www.mhhe.com/weaver4

890 pages

Powerpoint lectures

A powerpoint lecture will be uploaded as a pdf file on the course website at least 24 hrs in advance.

You can download and print out the lecture slides to take notes during the lecture.

The slides provide only a skeleton of what happens in a lecture.

You may find the lecture slides unintelligible without your own written notes.

i-Clickers

- Rapid feedback
- Engagement
- Foster active learning in a large classroom setting.



Why do we put emphasis on experiments?

- Science is not a collection of facts!
- Science is the attempt to describe the world around us using experimental observations to generate hypotheses/theories.
- All the concepts you have learned in science classes (e.g. shown as figures in textbooks) are hypotheses based on experimental observations and may be altered in the future if new experiments prove the hypotheses incorrect.
- Nature doesn't lie. It functions in a certain way. It is the scientists objective to figure out how, by designing experiments to test specific questions.

Before each exam

A practice exam will be provided.

One review session will be held before each exam, usually 5-6 PM a few days before the exam, or during class, depending on which room is available.

The review session is meant to provide for last-minute clarification of any still-obscure points - therefore come prepared with lots of questions.

Exams & grading

Three term exams: During class time. Covers only material between exams. Each term exam will count **20%** of your final grade.

Final exam: During finals week. Will count **25%** of your grade. The final exam covers i) the lectures between the third term exam and the final, as well as ii) the concepts (as opposed to the details) of the material covered in the lectures for term exams 1-3.

Clicker use: Counts **5%** of your grade. This is based on whether you answer clicker questions and not on whether you get the answers right.

Homework: Weekly multiple choice questions, a few surveys and the pre-test today. Counts **10%** of your grade.

Your grade will be based on your position relative to the others who faced the same coursework.

Overview of class

First quarter

DNA structure, Molecular cloning, Bacterial transcription.

Exam 1: Wed. Feb. 10 (50 minutes, Closed Book).

Second quarter

Eukaryotic transcription, Chromatin.

Exam 2: Mon. Mar. 8 (50 minutes, Closed Book).

Third quarter

DNA replication, RNA processing.

Exam 3: Mon. Apr. 12 (50 minutes, Closed Book).

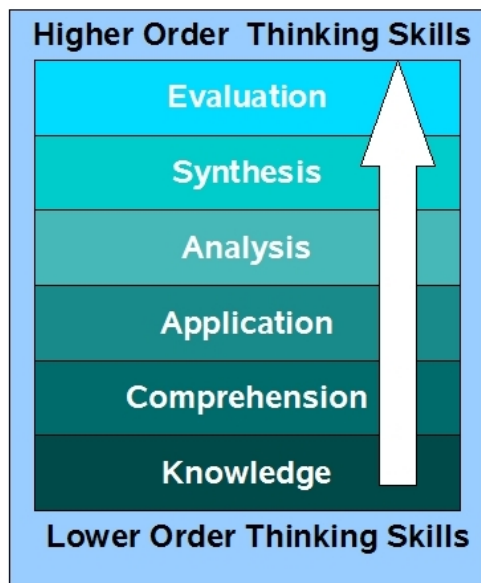
Fourth quarter

Translation.

Final exam

Covers Fourth quarter material in depth and the concepts of 1st-3rd quarter (2.5 hours, Closed Book).

Mon. May 4: 4:30 - 7:00 PM.



BLOOM'S TAXONOMY

Benjamin Bloom (1956)

- Developed a classification of levels of intellectual behavior important in learning.
- Found that > 95 % of the test questions students encounter require them to think only at the lowest possible level...the recall of information.

1. Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.

2. Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate,

3. Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.

4. Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.

5. Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.

6. Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support, value, evaluate.