

General Biology 111

Fall 2023

Lecturer & Coordinator:

Prof. Brian White

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Office hours: MWF UH Lobby 1:00 – 1:45 PM & by appointment

Coordinator: Kirsten Ward Kirsten.Ward002@umb.edu – e-mail Kirsten with logistic and technical questions.

Where can I find things on the web?

- **Blackboard** <https://umb.umassonline.net/> this site has the **after class** and **administrative** materials:
 - Class Notes & Class Video – posted after each class
 - Take-Home Exams
 - Grades
- **World-Wide Web Site:** <http://intro.bio.umb.edu> this site has a link to the **On-Line Lab Manual**, **Blackboard**, and the **Bio 111 SPOC**
- **The Bio 111 SPOC** <https://bio111spoc.umb.edu/> this site has materials to help you **get ready for each class**:
 - Video, readings, practice problems, tutorials, etc.

Required Materials:

1. **Course Materials Binder:** This is available from Quinn Reprographics (Quinn LL-024) for \$30.00; note that Quinn can't accept payment methods that require entering a PIN. Individual sections are also downloadable from the course website and SPOC. I *strongly* advise you to buy the printed version. The binder has two parts:
 - a. The **Lab Manual** is *essential* for performing the lab activities; the lab manual also contains pre-labs, worksheets, etc. You must bring your lab manual to every lab session.
 - b. The **Lecture Handouts**. For each class, there is an essential handout with figures, questions, data, etc. You must bring Lecture Handouts to every lecture session.
2. **iClicker Transmitter:** All students must have an "iClicker2 with REEF" transmitter (see later for details) and bring it to each lecture. These are available from many sources including the UMB Bookstore. You should also be sure that you have access to iClicker REEF – that's the web app version of iClicker – in case we have to go remote; if you get a used clicker without REEF, you can get the REEF app from iClicker.com for about \$15. You must bring your clicker to every class session. **You must register your clicker at iclicker.com and use your UMB e-mail.**

Other Requirement

You must sign up for a free account at the SPOC. “SPOC” stands for “Small Personalized On-Line Course” – more on what this means later. You will need access to this to prepare for class sessions, labs, and exams. You will receive an e-mail from UMBSPOC@umb.edu – this is not spam – you should respond to the e-mail and sign up as soon as you get it. **You must use your UMB e-mail to register.** You will not get credit for your SPOC work if you do not register **exactly** as described.

- What is it? In the spring of 2013, I worked with a team of about 20 people at MIT to develop a Massively Open On-line Course (MOOC) called “7.00x”. This course covers the material in Bio 111 and includes lectures, supporting videos, problem sets, and exams. I extensively re-organized these materials to create a custom version for Bio 111; this is the “SPOC”.
- How to use the SPOC materials: The SPOC materials are organized by class “sessions”:
 - All of the materials are accessible from the “Courseware” tab.
 - **Before each class session:**
 - *Watch the lecture and answer the “Core” and “Challenge” questions.* The *Core* questions are easier and you have at least two tries to get them right. The *Challenge* questions are harder; you have an unlimited amount of tries to get them right and, after your first try, you can look at the answer. They are due by 12:00 noon on the day of the corresponding class session and will not be accepted late.
 - You may find it useful to look at the questions *before* watching the video. That way, you can have an idea what to watch for.
 - **In class**, we will go over questions and problems including those from APAIB.
 - **After class**, to prepare for the exam, go over the problems including the APAIB problems and “Extra Practice Problems” until you are confident that you can solve problems like these.
 - **Looking at the answers.** For all of these problems, including those in APAIB, we have provided detailed solutions. These solutions are an essential part of learning the material; you are strongly encouraged to read them carefully. **However**, you should only read them *after* you have tried to write out an answer to the question.
- Can I work with others on the SPOC problems? It depends on which type of problem:
 - **Core Problems:** These must be done on your own. You may not discuss answers with other students or post them on the web, etc.
 - **Challenge Problems:** You are encouraged to talk with other students about these.
- When are the SPOC problems due? SPOC Assignments are due at 12:00 noon on the date indicated and will not be accepted late for any reason. There are no make-ups for SPOC assignments. Do not be confused by the due times that are listed in the SPOC – they are in GMT (Greenwich Mean Time), which is 4-5 hours ahead of our time zone.

Optional Textbook

The 7.00x SPOC has a built-in free on-line textbook, so will not likely need a print or on-line textbook for this class. If you find that the on-line materials are not enough, any of the popular introductory-level college books (“Biology” by Campbell is one example) may be useful.

Other course details:

Course Blackboard site: Bio 111 also has a site on Blackboard (<https://umb.umassonline.net/>). This site has links for the iClicker registration, recorded class sessions, and your grades.

Course Schedule

Date	In-Class Activity	Lab & [take home exam]
W 6-Sep	01 Introduction	NONE
F 8-Sep	02: Building Molecules	
M 11-Sep	03: Drawing Molecules	01: Chemical Structures
W 13-Sep	04: Hydrogen Bonds	
F 15-Sep	05: Reading Molecules	
M 18-Sep	05a: Molecules Extended	02: Chromatography
W 20-Sep	06: Protein Structure; Approximate	
F 22-Sep	07: Protein Structure; Real	[Exam 1 due 11:59PM 9/22]
M 25-Sep	07a: Proteins Extended	03: Protein Structure
W 27-Sep	08: Enzymes	
F 29-Sep	09: Pathways	[Exam 2 due 11:59PM 9/29]
M 2-Oct	10: Metabolism	04: Amylase
W 4-Oct	10a: Metabolism Extended	
F 6-Oct	11: Basic Genetics	[Exam 3 due 11:59PM 10/6]
M 9-Oct	Indigenous Peoples' Day	05: GFP I: Purification & Genetics Introduction
W 11-Oct	12: Mitosis, Meiosis, etc.	
F 13-Oct	12a: Chromosomes Extended	
M 16-Oct	13: Sex-linkage	06: Genetics II
W 18-Oct	14: Pedigrees I	
F 20-Oct	15: Pedigrees II	[Exam 4 due 11:59PM 10/20]
M 23-Oct	15a: Pedigrees Extended	07: Genetics Challenges & Pedigrees
W 25-Oct	16: Proteins & Genetics	
F 27-Oct	16a: Proteins & Genetics II	
M 30-Oct	17: Genetics & The Real World	08: Aipotu I: Genetics & Biochemistry
W 1-Nov	18: DNA Structure & Replication	
F 3-Nov	18a: DNA Replication & Im9	[Exam 5 due 11:59PM 11/3]
M 6-Nov	19: Transcription & Translation	09: Gene Expression I
W 8-Nov	20: Introns	
F 10-Nov	21: Gene Regulation	
M 13-Nov	22: Mutations	10: Gene Expression II Im9 Mutants I
W 15-Nov	23: Integration	
F 17-Nov	24: Recombinant DNA I	
M 20-Nov	25: Recombinant DNA II	NONE
W 22-Nov	26: Cancer I	
F 24-Nov	Thanksgiving	
M 27-Nov	27: Cancer II	11: Aipotu II: Biochemistry & Molecular Biology; Im9 Mutants II
W 29-Nov	28: Cancer III	
F 1-Dec	29: Viruses I	[Exam 6 due 11:59PM 12/1]
M 4-Dec	29a: Viruses II	12: GFP II: Transformation & IGV practice & Im9 Results & Cancer Cells
W 6-Dec	29b: Viruses III	
F 8-Dec	30: Genetic Disease I	
M 11-Dec	31: Genetic Disease II	NONE
W 13-Dec	32: Genetic Disease III	[Exam 7 due 11:59PM 12/13]

Tutor-led Study Groups: There are several tutors to help students in Bio 111. Tutoring is free and open to all students. Regular attendance is strongly encouraged. You can sign up for tutoring at <https://blogs.umb.edu/subjecttutor/> Tutoring usually starts in the second week of class.

Class Session Video I make a digital audio & video recording of each class session and post these Blackboard. **DANGER**: these are not a substitute for attending class!!!

Class Session Notes from this year. I am using a Tablet PC to write notes on the screen. After each lecture, I will post these notes on Blackboard.

iClicker Beginning with the second class session, several times during the class, I will ask a short multiple-choice question to make sure that you are able to apply the material we are working with (note that the exams will **not** be multiple-choice).

You will submit your answer as described below; you will receive credit for each answer you submit, whether it is correct or not. Answers are due during the lecture on the day the question was asked; no late answers will be accepted; there are no make-ups for missed iClicker questions. Note that clicking in an answer for another student is considered cheating and will result in failing the class.

Using an iClicker This looks like a small TV remote control. You transmit your answer to the receiver in in the auditorium and the computer logs your answer. There is also an app called iClicker REEF that allows you to respond remotely if you cannot be in class.

You will need to register your iClicker so you can get credit. You do this by going to iClicker.com, clicking on the "Register a remote" link, and following the directions there. **You must use your UMB e-mail to register; you will not get credit if you use another e-mail address.**

Course Policies:

Class Sessions: Class Sessions meet in University Hall 1100 and regular attendance is expected. There are two lecture sections:

- "The noontime session": MWF 12:00 – 12:50 PM
- "The 2PM session": MWF 2:00 – 2:50 PM

You should attend the session for which you are registered. In an emergency, you may attend the other session.

Attending Class Remotely Because this course is based on active learning, conversations with your classmates and teachers are a very important part of success in the course. Thus, both lecture and lab are designed to work best in-person. However, it is not always possible to attend class in person; there are some back-up options available:

- If you are unable to attend **lecture** in person, you can participate in the class via the "Zoom Links for BeaconFlex" on the course Blackboard page. You can also use the iClicker REEF app to participate in the iClicker questions. The zoom chat will be available for somewhat limited interaction with classmates. There is no need to notify the professor or your TA if you will be using this option.
- If you are unable to attend **lab** in person, you should notify your TA. You can attend another lab section that meets that same week. If you are unable to attend any lab in a particular week, you can turn in your pre-lab and any lab exercises to your TA by e-mail. Pre-labs are due before the start of your regular lab period; any worksheets are due by the end of your regular lab period. You can obtain any data you missed from your lab partners. Videos of lab exercises from Fall 2021 can be found on the course Blackboard site.

It is important to note that these remote alternatives are not designed to replace in-person attendance but are intended simply to be better than not attending at all. You will miss the very important interactions with classmates and teachers and, while we will make every effort to keep the technology working, we cannot promise that zoom, iClicker REEF, etc. will work perfectly every day.

Lab Sections: Lab sections meet in ISC-2210, -2300, and -2310. Some labs involve hands-on activities; others involve problem-solving exercises. Lab sections will be assigned before the first week of class; you may not switch sections after that time. Attendance in lab is expected. As an emergency back-up, if you are unable to attend lab, video recordings of lab sections from 2021 are available on the course Blackboard site under "Lab Video".

In an emergency, you may make up a missed lab by attending another section that meets during the same week with the permission of the TA; TAs may refuse entry to students once the section is full. You may attend only one make up lab section per semester.

You must read the lab manual before lab. Some labs have pre-lab exercises based on the lab manual; these are due at the start of lab and will not be accepted late. **There will be a 10-point penalty if you do not have a printed copy of your lab manual with you.**

Exams:

- There will be seven take-home exams given in class during the semester. There will not be a final exam. Details can be found on Blackboard.
- There will be no make up exams. No conflict exams will be given. No extensions will be given.
- Each exam is due as specified on the course Blackboard site. Late exam submissions will be penalized 10 points for each 24 hours they are late.

Exam Re-grades: Occasionally, we make mistakes when grading. If you feel that your exam was graded in error, you can request a re-grade. Instructions and notes for re-grading:

- Re-grades must be in writing; because different TAs graded different questions, neither your TA nor I can re-grade your exam "on the spot".
- When asking for a re-grade, you should include the following:
 - A specific explanation of what needs to be re-graded. Don't simply say, "Re-grade question 3"; you should explain why your answer deserves more credit than we gave. If it is an addition error, explain which numbers were added up incorrectly.
 - Re-grade requests that do not follow these rules will be returned without review.
- Re-grade requests must be turned in to your TA or Brian White within 2 weeks of the date the exam was graded.

Grades: Your final grade will be calculated as follows:

- There are 575 points available in the course:
 - 350 points for your seven take home exams (50 points each)
 - 75 points for the SPOC; this will be the your cumulative total on the SPOC scaled to 75 points.
 - 50 points for iClicker questions: Your iClicker points will be totaled and scaled to 45 points.
 - 100 points for Lab: There are 250 points in lab; your total lab points will be divided by 2.5 and then added to your point total.
- However, your overall grades are based on the following approximate scale:

0 – 225 = F		
226 – 250 = D-	251 – 275 = D	276 – 300 = D+
301 – 325 = C-	326 – 350 = C	351 – 375 = C+
376 – 400 = B-	401 – 425 = B	426 – 450 = B+
451 – 475 = A-	476 – 575 = A	
- Thus, you have a 99-point “safety net” for missed assignments, etc. That is, you can lose up to 99 points and still get an A in the class. This safety net covers all events, excused and not-excused.
- There is no extra credit.

Grades will be posted as they become available on Blackboard.

Snow days: If class is cancelled due to snow, check the course Blackboard site for announcements.

Incompletes: Incompletes will only be granted under certain special conditions. To receive an incomplete, you must be doing well in the course and the work to be completed must be a well-defined unit of the course. An incomplete **must** be arranged in advance of your absence at a meeting **in person** with Brian White.

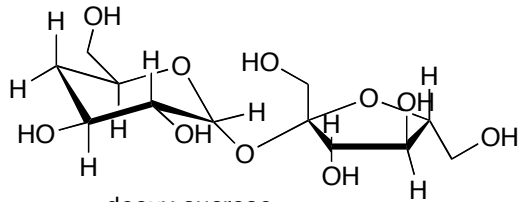
Academic Conduct: Students are required to adhere to the Code of Student Conduct, including requirements for the Academic Honesty Policy, delineated in the University of Massachusetts Boston Graduate Studies Bulletin and relevant program student handbook(s).

http://www.umb.edu/life_on_campus/policies/code In this course, penalties for academic misconduct, including plagiarism (copying from another student, a book, or the internet), are strictly enforced. It is my policy to make the consequences of being caught cheating on a given exercise much more severe than the consequences of not turning in that particular exercise.

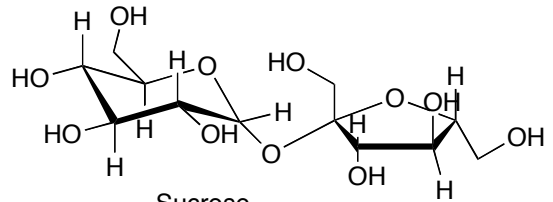
Accommodation for Students with Disabilities: Section 504 and the American with Disabilities Act of 1990 offer guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, you may obtain adaptation recommendations from the UMass Boston Ross Center 617-287-7430. You need to present and discuss these recommendations with me within a reasonable period, prior to the end of the Drop/ Add period.

If you are using adaptive software with Blackboard Vista, please contact the instructor for information regarding the software’s interface with the LMS.

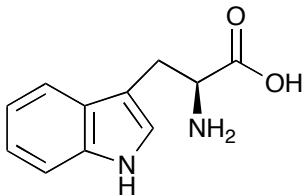
Bio 111: Sweet Molecules



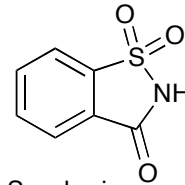
deoxy-sucrose
MRS = 0.95
 $\Delta G = -6.67$ kcal/mol



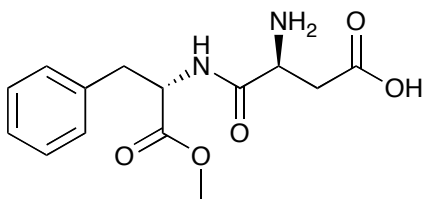
Sucrose
MRS = 1
 $\Delta G = -6.71$ kcal/mol



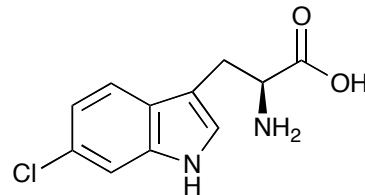
D-tryptophan
MRS = 21
 $\Delta G = -8.5$ kcal/mol



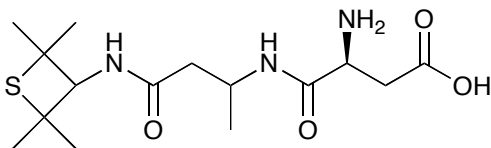
Saccharin
MRS = 161
 $\Delta G = -9.7$ kcal/mol



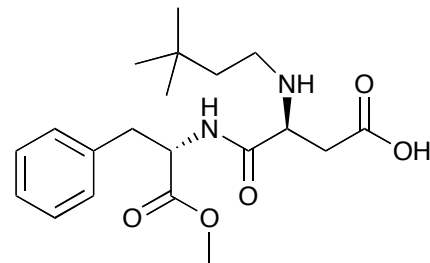
Aspartame
MRS = 172
 $\Delta G = -9.7$ kcal/mol



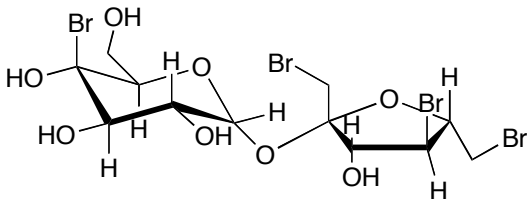
6-chloro-D-tryptophan
MRS = 906
 $\Delta G = -10.7$ kcal/mol



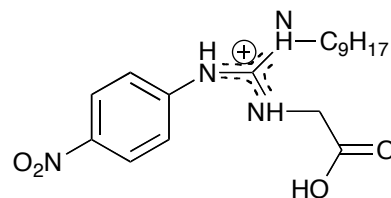
alitame
MRS = 1,937
 $\Delta G = -11.1$ kcal/mol



neotame
MRS = 11,057
 $\Delta G = -12.1$ kcal/mol



tetra-bromo sucrose
MRS = 13,012
 $\Delta G = -12.2$ kcal/mol



sucronic acid
MRS = 200,000
 $\Delta G = -13.8$ kcal/mol