

General Biology 111

Fall 2021

Lecturer & Coordinator:

Prof. Brian White

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Office hours: MWF UH Lobby 1:00 – 1:45 PM, 3:00 – 3:45 PM, & by appointment

Coordinator: Stephanie Langford Stephanie.Langfor001@umb.edu – e-mail Stephanie 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. **Lab Manual:** The Lab Manual is *essential* for performing the lab activities; the lab manual also contains pre-labs, worksheets, etc. You can purchase a 3-ring binder with the Lab Manual from Quinn Reprographics (Quinn LL-024) for \$13.75; note that Quinn can't accept payment methods that require entering a PIN. It is also available for free download on the course website. I *strongly* advise you to buy the printed version. You must bring your lab manual to every lab session.
2. **Lecture Handouts & A Problems Approach to Introductory Biology (APAIB)** For each class, there is an essential handout with figures, questions, data, etc. APAIB contains practice problems (both on paper and computer-based) will be used in lab, class, and at home and provide *essential* practice with the material for the exams. You can purchase a 3-ring binder with both the Lecture Handouts and APAIB from Quinn Reprographics (Quinn LL-024) for \$30.25; note that Quinn can't accept payment methods that require entering a PIN. Both are also available for free download on the SPOC and course website, respectively. I *strongly* advise you to buy the printed version. You must bring Lecture Handouts and APAIB to every class session.
3. **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 [7.00x UMass 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 two built-in free on-line textbooks, 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 8-Sep	01 Introduction	NONE
F 10-Sep	02: Building Molecules	
M 13-Sep	03: Drawing Molecules	01: Chemical Structures
W 15-Sep	04: Hydrogen Bonds	
F 17-Sep	05: Reading Molecules	
M 20-Sep	05a: Molecules Extended	02: Chromatography
W 22-Sep	06: Protein Structure; Approximate	
F 24-Sep	07: Protein Structure; Real	[Exam 1 due 11:59PM 9/24]
M 27-Sep	07a: Proteins Extended	03: Protein Structure
W 29-Sep	08: Enzymes	
F 1-Oct	09: Pathways	[Exam 2 due 11:59PM 10/1]
M 4-Oct	10: Metabolism	04: Amylase
W 6-Oct	10a: Metabolism Extended	
F 8-Oct	11: Basic Genetics	[Exam 3 due 11:59PM 10/8]
M 11-Oct	Indigenous Peoples' Day	05: GFP I: Purification & Genetics Introduction
W 13-Oct	12: Mitosis, Meiosis, etc.	
F 15-Oct	12a: Chromosomes Extended	
M 18-Oct	13: Sex-linkage	06: Genetics II
W 20-Oct	14: Pedigrees I	
F 22-Oct	15: Pedigrees II	[Exam 4 due 11:59PM 10/22]
M 25-Oct	15a: Pedigrees Extended	07: Genetics Challenges & Pedigrees
W 27-Oct	16: Proteins & Genetics	
F 29-Oct	16a: Proteins & Genetics II	
M 1-Nov	17: Genetics & The Real World	08: Aipotu I: Genetics & Biochemistry
W 3-Nov	18: Genes are DNA	
F 5-Nov	19: DNA Structure & Replication	[Exam 5 due 11:59PM 11/5]
M 8-Nov	19a: DNA Replication Extended	NONE
W 10-Nov	20: Transcription & Translation	
F 12-Nov	21: Introns	
M 15-Nov	22: Gene Regulation	09: Gene Expression
W 17-Nov	23: Mutations	
F 19-Nov	24: Integration	
M 22-Nov	25: Recombinant DNA I	NONE
W 24-Nov	26: Recombinant DNA II	
F 26-Nov	Thanksgiving	
M 29-Nov	27: Viruses I	10: Aipotu II: Biochemistry & Molecular Biology
W 1-Dec	27a: Viruses II	
F 3-Dec	27b: Virus treatments	[Exam 6 due 11:59PM 12/3]
M 6-Dec	27c: COVID Q&A	11: GFP II: Transformation
W 8-Dec	28: Genetic Disease I	IGV practice
F 10-Dec	29: Genetic Disease II	
M 13-Dec	30: Genetic Disease III	NONE [Exam 7 due 11:59PM 12/17]

Tutor-led Study Groups: There are several tutors to help students in Bio 111. Tutoring is free and open to all students. The tutors will lead weekly study group workshop sessions where they will go over that week's APAIB problems as well as answer questions. Regular attendance is strongly encouraged. You can sign up for tutoring at <http://requesttutor.cs.umb.edu:8080/oats/> 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 regular attendance is expected. There are three lecture sections:

- "The noontime session": MWF 12:00 – 12:50 PM
- "The 2PM session" : MWF 2:00 – 2:50 PM
- "The 4PM session": MWF 4:00 – 4:50 PM

You should attend the session for which you are registered. In an emergency, you may attend the other session. Your iClicker points may not be counted if you attend the wrong session.

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.

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; after that, if you attend a lab other than the one to which you have been assigned, you will be allowed to attend that lab but your pre-lab and any other materials due in that lab will not be graded.

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. **You will not be admitted to lab unless you have a copy the lab manual and a completed pre-lab (if appropriate) 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.
- 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 570 points available in the course:
 - 350 points for your seven take home exams (50 points each)
 - 100 points SPOC; this will be the “Total” shown on the “Progress” page of the SPOC scaled to 100 points.
 - 50 points iClicker: Your iClicker points will be totaled and scaled to 50 points.
 - 70 points for pre-labs (7 pre-labs x 10 points each)
- However, your overall grades are based on a 520-point scale which is approximately:

0 – 200 = F		
201 – 227 = D-	228 – 253 = D	254 – 280 = D+
281 – 307 = C-	308 – 333 = C	334 – 360 = C+
361 – 387 = B-	388 – 413 = B	414 – 440 = B+
441 – 467 = A-	468 – 520 = A	
- Thus, you have a 50-point “safety net” for missed assignments, etc.

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. In general, snow days before exams will not cause the exams to be moved; if a snow day falls on an exam day, the exam may be held in the next class period – check Blackboard to be sure.

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.

Acommodation 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.

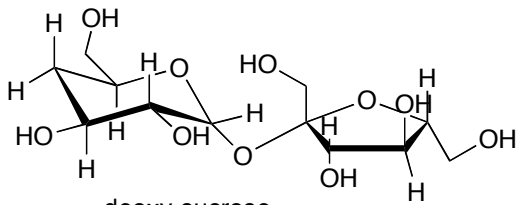
If you are using adaptive software with Blackboard Vista, please contact the instructor for information regarding the software's interface with the LMS.

Health, Wellbeing, and Success

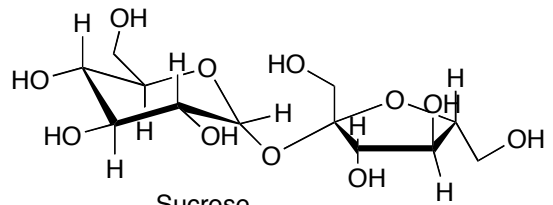
We are still coming through the COVID-19 pandemic. Due to the emerging COVID-19 variants, all members of the UMass Boston community — students, faculty, and staff — as well as contractors and visitors are required to wear face coverings in public indoor spaces on the UMass Boston campus. The requirement applies to vaccinated and non-vaccinated individuals. Wearing a face covering is important for the health and safety of our community, and each of us has a responsibility to do our part. While on campus, if you notice someone without a face covering indoors, you should feel free to distance yourself to the extent possible or, if you are comfortable doing so, politely remind them of the university policy requiring face coverings for all individuals indoors. As an instructor, for classes on campus, I will remind all students about the indoor masking policy. I will ask students to leave class if they do not comply and I may also refer students to the Dean of Students. If a student refuses to wear a face covering and does not heed requests to comply with the policy, the UMass Boston Police Department may be called to assist. To safeguard your own health and safety as well as that of all students, staff, and faculty, you are reminded that vaccinations are required for all faculty, staff, and students, with limited exceptions (see www.umb.edu/healthservices/corona_virus_information/coronavirus_vaccination_requirements).

Following current public health guidance from the CDC and given the protection flowing from a highly vaccinated population, enhanced HVAC and air filtration systems, and the indoor face covering mandate, we have lifted the social distancing requirement. However, if you have symptoms of COVID-19, you should not come to campus. Flexibility and support will be provided for students in such situations and are addressed in this syllabus.

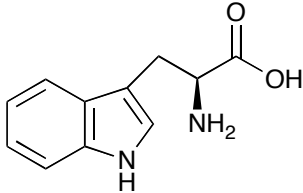
Bio 111: Sweet Molecules



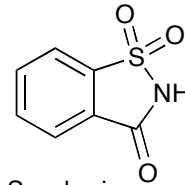
deoxy-sucrose
MRS = 0.95
 $\Delta G = -6.67$ kcal/mol



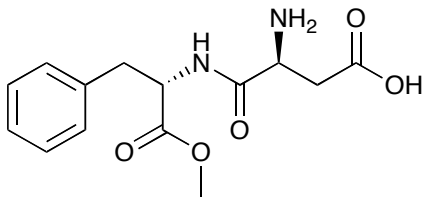
Sucrose
MRS = 1
 $\Delta G = -6.71$ kcal/mol



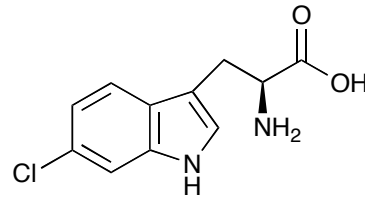
d-tryptophan
MRS = 21
 $\Delta G = -8.5$ kcal/mol



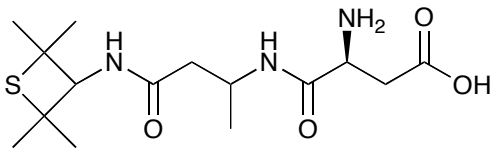
Saccharin
MRS = 161
 $\Delta G = -9.7$ kcal/mol



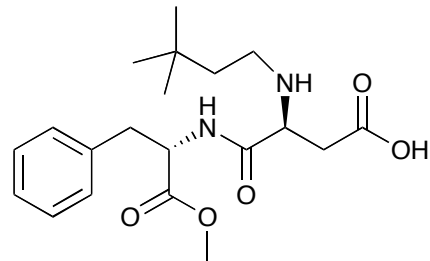
Aspartame
MRS = 172
 $\Delta G = -9.7$ kcal/mol



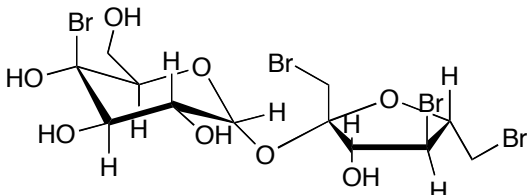
6-chloro-d-tryptophan
MRS = 906
 $\Delta G = -10.7$ kcal/mol



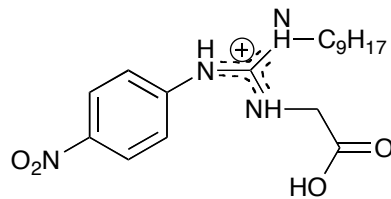
alitame
MRS = 1,937
 $\Delta G = -11.1$ kcal/mol



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