USABO 101S 2025

Course Description & Goals

USA Biology Olympiad (USABO) is the premier biology competition for high school students. USABO 101 program focuses on preparing highly motivated students for qualification of USABO semifinal and beyond in the long run. Over the course of around 1 year, all the topics which come up in the AP biology exam and additional topics in USABO exam will be covered. This course is suitable for students who are interested in learning advanced biology. Students will learn the fundamental concepts of biology, which will not only prepare them for USABO201, but also provide valuable preparation for the AP Biology Exam and biology/chemistry-related school classes such as Biology, H. Biology, AP Biology and Chemistry. All lectures are given in English.

Instructor

John Kim – STEM & ROOT Academy Founder

Tentative Class Schedule

2025 Summer

- **Period:** 6/14-8/9 (16 sessions, 32 hours), **No Class: 7/5 (Independence Day)*
- **Time: 6-8PM (PT), Tues / Sat**

2025 Fall: 8/11-12/20 (18 sessions, 36 hours)
2 hours/session * 1 session/week
* *No Class: Thanksgiving week*

2026 Spring: 1/5-6/6 (21 sessions, 42 hours)
2 hours/session * 1 session/week
* *No Class: Spring Break*

Class Format

- Zoom (Live Online) - Lecture

- Google Classroom - Providing Lecture Materials and other materials
  - Assigning / grading HW
  - Communicating with students
  - Keeping students informed of current and upcoming events

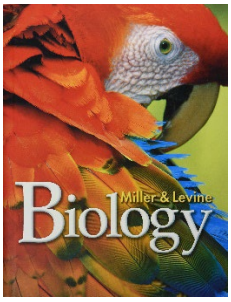
Class Materials

- **We will provide all class materials** (Lecture notes, Study guides, Quizzes, Simulation Tests, etc.) **except the textbooks.**

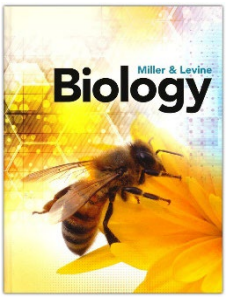
- 3- ring binder (or other organizer of choice for lecture notes and handouts): **Lecture materials should be printed out** and organized in order.

- **Textbooks** (**Purchase** via Thriftbooks, Amazon, Chegg, etc. **prior to the first class**)

  1. Biology, Miller & Levine, Pearson – An easier book for self-study recommended for those without any previous background in biology. If you already have a basic biology textbook, there is no need to purchase this textbook.



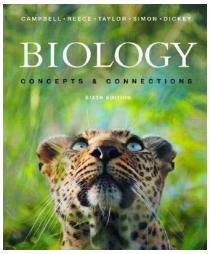
2014 edition



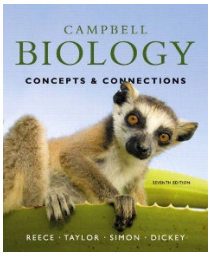
2019 edition

2014 Edition: ISBN-10: 0133235742 / ISBN-13: 9780133235746
2019 Edition: ISBN-10: 0328925128 / ISBN-13: 9780328925124

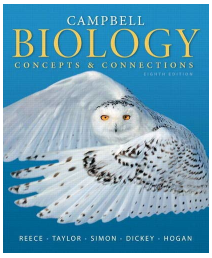
2. Campbell Biology: concepts & connections (6th edition or newer), Campbell, Reece, Taylor et al., Pearson – This is the main textbook. Any book from 6th edition or newer is acceptable.



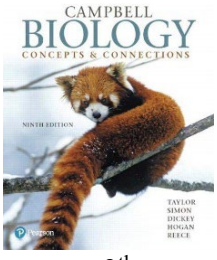
6th



7th



8th



9th

6th Edition: ISBN-10: 0321489845 / ISBN-13: 9780321489845
7th Edition: ISBN-10: 0321696816 / ISBN-13: 9780321696816
8th Edition: ISBN-10: 0321885325 / ISBN-13: 9780321885326
9th Edition: ISBN-10: 013429601X / ISBN-13: 9780134296012

Class Policies, Expectations and Rules

- Join every class on time (**5 min prior to each class**) with your materials (lecture notes, textbook, supplementary handouts) out and ready.
- Spend at least 30 minutes (**right before each class**) reviewing/previewing materials.
- Turn on webcam and **show your face**. I would like to see what you are up to, just as you would be required to attend in-person classes.
- **Take notes** while listening to my lecture.
- **Actively participate in Q&A** during the class.
- **Submit weekly assignments on time** (due date/time for each HW will be set/notified via google classroom)
- Eating and drinking is allowed only if it does not cause any distraction.

Assignments & Self -Study

1. **Study Guide**: The study guide posted in our Google Classroom should be used for self-study and as preview/review material. After each class, complete the corresponding study guide up to the topic covered during the class, by referring to the lecture notes and textbook. Answer keys to the study guide will be posted at the end of each chapter. Students will need to review incorrect questions.
2. **End of Chapter Quiz (Closed book)** – I expect students to miss **no more than 5** questions. If you miss more than 5 questions, it indicates that you need to spend more time on self-study, including review/preview, and pay more attention during class.
3. **Review of Incorrect Questions -** Before class starts, you need to correct the missed questions on the quiz and the study guide. Additionally, if you have any questions that you cannot answer or do not understand, make a list before class, and ask those questions in class. We will go over them together.

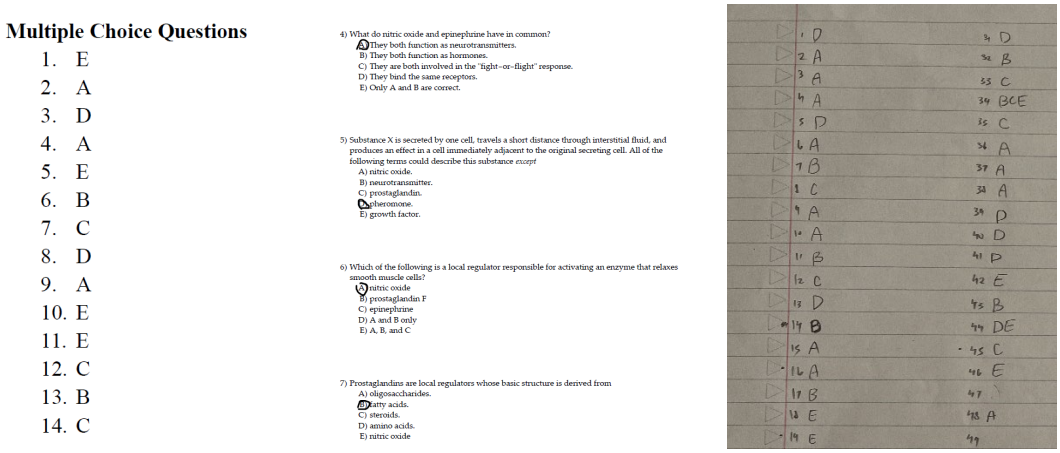
Assignment Submission

- Homework must be submitted by **7PM (PT) a day before** the following class. Assignments will be graded as soon as possible such that students have enough time to make corrections and know what questions to ask before class.

- Your homework must be submitted as **"one" PDF or google doc file only**. (**No photos such as .jpeg)**

- **Recommended PDF file converters or apps** to write on PDF files

    - For PC/Mac, use www.combinepdf.com : jpeg → PDF conversion
    - For Tablet/Ipad: GoodNotes, Notability, Documents, Onenote, Samsung Notes.
    - For Phone: Camscanner- PDF scanner app
    - No Kami App– not compatible with google classroom. But if you still want to use Kami, generate PDF file using the app first and use www.combinepdf.com to do PDF → PDF conversion. Submit PDF file generated from the "combinepdf.com"



Multiple Choice Questions

1. E
2. A
3. D
4. A
5. E
6. B
7. C
8. D
9. A
10. E
11. E
12. C
13. B
14. C

4) What do nitric oxide and epinephrine have in common?
A) They both function as neurotransmitters.
B) They both function as hormones.
C) They are both involved in the "fight-or-flight" response.
D) They bind the same receptors.
E) Only A and B are correct.

5) Substance X is secreted by one cell, travels a short distance through interstitial fluid, and produces an effect in a cell immediately adjacent to the original secreting cell. All of the following terms could describe this substance *except*
A) nitric oxide.
B) neurotransmitter.
C) prostaglandin.
D) pheromone.
E) growth factor.

6) Which of the following is a local regulator responsible for activating an enzyme that relaxes smooth muscle cells?
A) nitric oxide
B) prostaglandin F
C) epinephrine
D) A and B only
E) A, B, and C

7) Prostaglandins are local regulators whose basic structure is derived from
A) oligosaccharides.
B) fatty acids.
C) steroids.
D) amino acids.
E) nitric oxide

Google doc PDF jpeg/google doc

Notification of Absence & Make-up Policies

- Students/parents must notify STEM & ROOT Academy as promptly as possible of any absence (**at least 24h prior to a scheduled class**)

- If a student is going to be absent from class, we will send you **a recording** of the live lecture. You can also find the full content of the class in our google classroom so you can follow along and do homework.

- Make-up recording will be available only for **1 week**, until the following class. Make sure to watch it as soon as possible to keep your pace.

Academic Dishonesty

Plagiarism (the practice of taking someone else's work or ideas and passing them off as one's own) is a severe offense. Examples of academic dishonesty include (not an exhaustive list): **copying work from another student or the internet, using online searches to find answers to questions**, posting answers to assignments online.

Class curriculum & Textbook Reading Schedule – Miller & Levine Biology

	Miller & Levine Biology	Theme
Ch 1	The Science of Biology	**Intro**
Ch 2	The Chemistry of Life	**Biochemistry**
Ch 7	Cell Structure and Function	**Cell Biology**
Ch 8	Photosynthesis	
Ch 9	Cellular Respiration	
Ch 10	Cell Growth and Division	
Ch 11	Introduction to Genetics	**Genetics**
Ch 12	DNA	**Molecular Biology**
Ch 13	RNA & Protein Synthesis	
Ch 14	Human Genome	
Ch 15	Genetic Engineering	
Ch 16	Darwin's Theory of Evolution	**Evolution**
Ch 17	Evolution of Populations	
Ch 19	History of Life	
Ch 20	Viruses and Prokaryotes	**Microbiology**
Ch 29	Animal Behavior	**Ecology**
Ch 5	Populations	
Ch 4	Ecosystems and Communities	
Ch 3	The Biosphere	
Ch 6	Humans in the Biosphere	
Ch 22	Introduction to Plants	**Plant Anatomy & Physiology**
Ch 23	Plant Structure & Function	
Ch 24	Plant Reproduction & Response	
Ch 25	Introduction to Animals	**Animal Anatomy & Physiology**
Ch 26	Animal Evolution & Diversity	
Ch 27	Animal Systems - I	
Ch 28	Animal Systems - II	
Ch 30	Digestive & Excretory Systems	
Ch 31	The Nervous System	
Ch 32	Skeletal, Muscular, & Integumentary Systems	
Ch 33	Circulatory & Respiratory Systems	
Ch 34	Endocrine and Reproductive Systems	
Ch 35	Immune System and Disease	

Class curriculum & Textbook Reading Schedule – Campbell Biology C&C

	Campbell Concepts & Connections	Theme
Ch 1	The Life of the Cell	**Intro**
Ch 2	The Chemical Basis of Life	**Biochemistry**
Ch 3	The Molecules of Cells	**Cell Biology**
Ch 4	A Tour of the Cell	
Ch 5	The Working Cell	
Ch 6	How Cells Harvest Chemical Energy	
Ch 7	Photosynthesis: Using Light to Make Food	
Ch 8	The Cellular Basis of Reproduction and Inheritance	**Genetics**
Ch 9	Patterns of Inheritance	
Ch 10	Molecular Biology of the Gene	**Molecular Biology**
Ch 11	How Genes Are Controlled	
Ch 12	DNA Technology and Genomics	
Ch 13	How Populations Evolve	**Evolution**
Ch 14	The Origin of Species	
Ch 15	Tracing Evolutionary History	
Ch 35	Behavioral Adaptations to the Environment	**Ecology**
Ch 36	Population Ecology	
Ch 37	Communities and Ecosystems	
Ch 34	The Biosphere: An Introduction to Earth's Diverse Environments	
Ch 38	Conservation Biology	
Ch 31	Plant Structure, Growth, and Reproduction	**Plant anatomy & Physiology**
Ch 32	Plant Nutrition and Transport	
Ch 33	Control Systems in Plants	
Ch 20	Unifying Concepts of Animal Structure and Function	**Animal anatomy & Physiology**
Ch 21	Nutrition and Digestion	
Ch 22	Gas Exchange	
Ch 23	Circulation	
Ch 24	The Immune System	
Ch 25	Control of Body Temperature and Water Balance	
Ch 26	Hormones and the Endocrine System	
Ch 27	Reproduction and Embryonic Development	
Ch 28	Nervous Systems	
Ch 29	The Senses	
Ch 30	How Animals Move	