

# Syllabus, Gen Biol: Cells, Genetics and Evolution, Biol 117

Spring, 2020

## Instructor Information

### Instructor

Robert W. O'Donnell

### Email

odonnell@geneseo.edu

### Office Location & Hours

ISC 332A, MTWRF 9:30 to 10:20 other times by appointment

### Supplemental Instructor

Kaitlyn Bertleff (kcb4@geneseo.edu)

**COURSE DESCRIPTION AND OBJECTIVES:** This course begins a general introduction to some of the basic concepts of biology. We will survey topics and address questions from atoms to organic macromolecules to the intracellular structures and functions common to all cells. We will examine the processes of heredity and evolution and, finally, the origin of life and the diversity of one-celled organisms (prokaryotes and protists).

Remember, as in every course we rely on concrete examples to illustrate concepts and principles. You should strive to recognize these general concepts and principles as they emerge from specific examples in the textbook and class. You should also recognize that biology is not merely a collection of terms and facts, but also, and more importantly, includes the process (the scientific method with its observations, hypotheses, and experiments) by which we study the living world.

This course has two main objectives. The first is to increase your biological knowledge and prepare a firm foundation of knowledge for the courses that follow. The second objective is to help you develop the intellectual skills needed for advanced study of biology: to develop the ability to organize information from various disciplines, to fit it into a conceptual framework, to use it in the synthesis of new ideas and to understand how biologists think and approach scientific questions.

Both the textbook and modified mastering biology (access to an on-line biology study site) are required. If you buy a used book, you will need to purchase the modified mastering code directly from the Pearson web site. There are several options and prices vary widely depending on new versus used, campus bookstore versus online, whether you intend to keep it or sell it back. See the announcement in CANVAS, Biol 117.

**COURSE MATERIALS:** course materials will be available within the CANVAS Course Management System, CANVAS. There is also an information section of new student help guides on their website at: <https://wiki.geneseo.edu/display/cit/Canvas+Tips+for+Geneseo+Students>

**E. ASSIGNMENTS:** Topics will be covered as listed in the course outline. The reading assignments should be skimmed before the topic is covered in lecture. This means that you are not expected to have understood all the material in the reading, but you should be familiar with the major themes and vocabulary. Material from both the lectures and readings will be tested on the exams. Associated with each chapter are assignments in Mastering Biology that are graded and will prepare you for the eight quizzes to be taken in Canvas. The calendar in Canvas will list when a quiz opens and when it closes. Quizzes **must be** completed during the scheduled time.

## GRADING:

Exams 1-4 and Mastering Chapter Assignments /Quizzes = 90% of your grade

Top Hat participation points = 5% of your grade (1 point per day)

Top Hat accuracy points = 5% of your grade (1 point per day)  
Total =100%

Grades are based on points earned on your top **four** tests and/or mastering biology points/quizzes (22/24 will be counted) (100 points), Top Hat participation points (25 points) and Top Hat accuracy (25 points). Grades will be assigned according to the following scale:

A 92.5-100%	B+ 86.5-89.49	C+ 76.5-79.49	D 59.5-69.49
A- 89.5-92.49	B 82.5-86.49	C 72.5-76.49	E <59.5
	B- 79.5-82.49	C- 69.5-72.49	

Note: No make-up tests are given since a test or mastering/quiz grade is dropped in your overall grade. No “extra credit” assignments are available.

### **THE USE AND GRADING POLICY OF “EMBEDDED CLASS QUESTIONS USING TOP HAT”:**

A Top Hat account will be provided to you at no cost. You will just need a phone or computer to answer questions during the class. Within the Top Hat grading, four Top Hat classes can be missed with no detrimental effect on Top Hat participation points. Because the lowest third of Top Hat accuracy points are not incorporated in the calculation for Top Hat accuracy, missed classes will also have little effect on one’s grade unless the number of classes missed is significant and the Top Hat accuracy in the classes attended is poor.

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**SUPPLEMENTAL INSTRUCTION:** supplemental instruction (SI) will also be available for this class and information will be provided during the first week of class by the SI leader.

### **INTENDED LEARNING OUTCOMES**

Upon completion of this course students will be able to:

1. Explain what learning involves
2. Identify and plan behaviors that are necessary to do well in college classes
3. Study more effectively for exams
4. Demonstrate knowledge of the basic principles of chemistry and some of their applications to living systems.
5. Demonstrate knowledge of how bio-molecules contribute to the structure and functions of cells.
6. Describe how enzymes work and how their activity controls metabolism.
7. Explain how cells harvest chemical energy from organic macromolecules and produce ATP.
8. Explain how light energy is converted to chemical energy inside the cells of algae and plant cells by the process of photosynthesis.
9. Demonstrate knowledge of the principles of genetics including modes of single gene inheritance and sources of genetic variability such as mutation, independent assortment, and crossing over.
10. Describe and compare the molecular structure of DNA and RNA
11. Explain the biochemical processes transfer biological information from DNA and how these processes are regulated.
12. Describe how the structure of viruses related to their unique life cycles.
13. Identify the basic tools of biotechnology and how they work.
14. Describe characteristics of various genomes and describe how genomes evolve.
15. Demonstrate how the organizing principle of evolution by natural selection explains the unity and diversity of life.

16. Distinguish among the different species concepts.
17. Explain how evolutionary mechanisms contribute to change in gene frequencies in populations (microevolution) and to reproductive isolation (speciation).
18. Describe the history of life on earth as documented by the fossil record
19. Understand systems of nomenclature and how they can relate to evolutionary history of groups.
20. Explain how they received the grade that they did.

**REQUIRED TEXT**

**Campbell Biology: Concepts and Connections**

**Authors: Taylor, Simon, Dickey and Reece**

**Publisher: PEARSON**

**Edition: 9/e**

**ISBN: 9780134610184**, Modified Mastering Biology with Pearson eText, online, \$95.95

**COURSE SCHEDULE**

Day of the Week	Lecture/Exam Dates	Chapter (s)	Topic
R	23-Jan-2020	1	1: Biology: Exploring Life
T	28-Jan-2020	2	2: The Chemical Basis of Life
R	30-Jan-2020	2, 3	2: The Chemical Basis of Life 3: The Molecules of Cells
T	4-Feb-2020	3	3: The Molecules of Cells
R	6-Feb-2020	4	4: A Tour of the Cell
T	11-Feb-2020	4	4: A Tour of the Cell
R	13-Feb-2020	Exam 1	
T	18-Feb-2020	5	5: The Working Cell
R	20-Feb-2020	5, 6	5: The Working Cell 6: How Cells Harvest Chemical Energy
T	25-Feb-2020	6	6: How Cells Harvest Chemical Energy
R	27-Feb-2020	7	7: Photosynthesis: Using Light to Make Food
T	3-Mar-2020	7, 8	7: Photosynthesis: Using Light to Make Food 8: The Cellular Basis of Reproduction and Inheritance
R	5-Mar-2020	8	8: The Cellular Basis of Reproduction and Inheritance
T	10-Mar-2020	Exam 2	
R	12-Mar-2020	9	9: Patterns of Inheritance
T	17-Mar-2020	break	
R	19-Mar-2020	break	
T	24-Mar-2020	9	9: Patterns of Inheritance
R	26-Mar-2020	10	10: Molecular Biology of the Gene
T	31-Mar-2020	10, 11	10: Molecular Biology of the Gene 11: How Genes Are Controlled
R	2-Apr-2020	11	11: How Genes Are Controlled
T	7-Apr-2020	12	12: DNA Technology and Genomics

R	9-Apr-2020	12	12: DNA Technology and Genomics
T	14-Apr-2020	Exam 3	
R	16-Apr-2020	13	13: How Populations Evolve
T	21-Apr-2020	13, 14	13: How Populations Evolve 14: The Origin of Species
R	23-Apr-2020	14	14: The Origin of Species
T	28-Apr-2020	15	15: Tracing Evolutionary History
R	30-Apr-2020	15, 16	15: Tracing Evolutionary History 16: Microbial Life: Prokaryotes and Protists
T	5-May-2020	15, 16	16: Microbial Life: Prokaryotes and Protists

#### EXAM SCHEDULE

Date	Chapters
February 13, 2020	Chapters 1-4
March 10, 2020	Chapters 5-8
April 14, 2020	Chapters 9-12
May 11, 2020, 12 to 2:30	Chapters 13-16

#### STUDENT SUCCESS RESOURCES

Listed below are a number of resources that can help support students' academic success and individual well-being. These statements may be shared through course syllabi as a way to inform students about campus resources.

#### Geneseo Mission and Values

SUNY Geneseo has several core documents that articulate our shared commitments and learning objectives. These include:

- SUNY Geneseo Mission, Vision and Values: <https://www.geneseo.edu/about/mission-vision-and-values>
- Community Commitment to Diversity, Equity and Inclusion: <https://www.geneseo.edu/diversity/commitment>
- Geneseo Learning Outcomes for Baccalaureate Education: <https://www.geneseo.edu/provost/globe-geneseo-learning-outcomes-baccalaureate-education>

#### Bias-Related Incidents

*“We are here to listen, to learn, to teach, to debate, to change, to grow. We should all be safe to pursue these goals at SUNY Geneseo while being who we are. Together, we commit ourselves to pluralism, cultivating a community that respects difference and promotes a sense of inclusion and belonging.”*

As this excerpt from our Community Commitment to Diversity, Equity, and Inclusion states, here at SUNY Geneseo, we want to provide a space where everyone feels welcome to learn and grow in their identities as well as in their role as students, faculty, and staff. If in the unfortunate instance you experience an incident of bias, we encourage you to reach out to the Chief Diversity Officer ([routenberg@geneseo.edu](mailto:routenberg@geneseo.edu)) and/or our University Police Department. In trying to create an environment that facilitates growth through diverse thoughts and ideas, reporting incidents of bias - including threats, vandalism, and microaggressive behaviors - can help bring a better understanding of our campus climate as well as provide opportunities for learning and restoring harm.

### **Accessibility**

SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will be made for medical conditions related to pregnancy or parenting. Requests for accommodations including letters or review of existing accommodations should be directed to the Office of Accessibility in Erwin 22 ([disabilityservices@geneseo.edu](mailto:disabilityservices@geneseo.edu) or 585-245-5112). Students with accommodation letters should contact their faculty members as early as possible in the semester to discuss specific arrangements. Additional information on the Office of Accessibility is available at [www.geneseo.edu/dean\\_office/disability\\_services](http://www.geneseo.edu/dean_office/disability_services).

### **Well-Being**

Prioritizing well-being can support the achievement of academic goals and alleviate stress. Eating nutritious foods, getting enough sleep, exercising, avoiding drugs and alcohol, maintaining healthy relationships, and building in time to relax all help promote a healthy lifestyle and general well-being.

Concerns about academic performance, health situations, family health and wellness (including the loss of a loved one), interpersonal relationships and commitments, and other factors can contribute to stress. Students are strongly encouraged to communicate their needs to faculty and staff and seek support if they are experiencing unmanageable stress or are having difficulties with daily functioning. The Dean of Students (585-245-

5706) can assist and provide direction to appropriate campus resources. For more information, see [www.geneseo.edu/dean\\_students](http://www.geneseo.edu/dean_students).

## **Mental Health**

As a student, you may experience a range of challenges that can impact your mental health and thus impact your learning; common examples include increased anxiety, shifts in mood, strained relationships, difficulties related to substance use, trouble concentrating, and lack of motivation, among many others. These experiences may reduce your ability to participate fully in daily activities and affect your academic performance.

SUNY Geneseo offers free, confidential counseling for students at the Lauderdale Center for Student Health and Counseling, and seeking support for your mental health can be key to your success at college. You can learn more about the various mental health services available on campus at [health.geneseo.edu](http://health.geneseo.edu).

## **Academic Support Services**

The campus provides a range of support services to help students thrive in their classes. These services include:

- Tutoring, both drop-in and by-appointment, with student tutors in the Writing Learning Center, the Math Learning Center, and a range of department-based tutoring centers
- Online tutoring through the SUNY-wide STAR-NY system ([www.starny.org/tutoring\\_schedule](http://www.starny.org/tutoring_schedule))
- Supplemental Instruction, in which trained student assistants review lecture material from specific classes

Information on times and locations is available through the Center for Academic Excellence website at [www.geneseo.edu/library/center-academic-excellence](http://www.geneseo.edu/library/center-academic-excellence).

## **Library Research Help**

Milne Library has an award-winning staff trained in finding the best information. They have created online research guides, self-help databases, and are available for individual

consultation. Research Librarians are available for walk-in consultations and students may request appointments with staff experts in particular fields. Full information on Milne Library research resources, hours, and consultation options is available at [www.geneseo.edu/library/ask-us](http://www.geneseo.edu/library/ask-us).

### **Academic Integrity and Plagiarism**

Milne Library offers frequent workshops to help students understand how to paraphrase, quote, and cite outside sources properly. These sessions are meant to educate about the importance of using original ideas and language, and how to incorporate paraphrases and quotes into writing. The complete list of library workshops can be found at [www.geneseo.edu/library/library-workshops](http://www.geneseo.edu/library/library-workshops).

Academic dishonesty includes cheating, knowingly providing false information, plagiarizing, and any other form of academic misrepresentation. College policies and procedures regarding academic dishonesty are available at [www.geneseo.edu/handbook/academic-dishonesty-policy](http://www.geneseo.edu/handbook/academic-dishonesty-policy).

### **Computer and Technology Support**

For assistance with your computer or mobile device, visit the CIT HelpDesk in Milne Library. CIT provides self help guides on a range of computer issues, including access to the campus network, Canvas, printing, software guides, and other resources. The CIT Self Help Guides at [wiki.geneseo.edu/display/cit/CIT+Self+Help](http://wiki.geneseo.edu/display/cit/CIT+Self+Help) can be helpful in finding quick solutions to basic technology issues.

CIT also provides free access to over 7,500 online tutorials for software, digital tools, web development, programming, and design through lynda.com training resources available at [wiki.geneseo.edu/display/cit/Lynda.com+Training+Library](http://wiki.geneseo.edu/display/cit/Lynda.com+Training+Library).

### **Food Security for SUNY Geneseo Students**

SUNY Geneseo students who find themselves in a position of food insecurity and do not have the financial resources to support their food and nutrition needs can access the Geneseo Groveland Food Pantry located at the First Presbyterian Church, 31 Center Street in Geneseo. Students can utilize the pantry once with no referral or contact with the College. At this visit they will be provided items that will address their basic needs for several days. If a student continues to face difficulties providing for their own

nutritional needs beyond their first visit to the pantry they should connect with Susan Romano, Director of Financial Aid to receive a brief letter that they will present to the staff at the pantry that verifies their need. If students do not have a FAFSA on file for any reason they should contact Dr. Leonard Sancilio, Dean of Students, to discuss their particular situation and options. The Geneseo Groveland Food Pantry is open on the following days and times:

Tuesday: 10 AM - 2 PM

Wednesday: 4 PM - 6:30 PM

Thursday: 10 AM - 2 PM

If you have any questions please contact Dr. Leonard Sancilio, Dean of Students at: [sancilio@geneseo.edu](mailto:sancilio@geneseo.edu) or 585-245-5706.

### **Religious Observations and Class Attendance**

Student attendance in classes on religious holidays is governed by New York State Education Law 224-a (see <https://www.geneseo.edu/apca/classroom-policies>). Students who anticipate an absence due to religious observations should contact their faculty member as soon as possible in advance to arrange make up plans. A calendar of major religious observations may be found at: [https://www.cs.ny.gov/attend\\_leave\\_manual/030Appendices/B-CalendarofLegalHolidays/2020calendar.html](https://www.cs.ny.gov/attend_leave_manual/030Appendices/B-CalendarofLegalHolidays/2020calendar.html)