

Course Description

This course will introduce students to the study of biology at the beginning of their course of study. Central ideas in the biological sciences will be highlighted, with an **emphasis on the process of scientific discovery and investigation**. The course will provide the basis for more advanced coursework and learning experiences in biological sciences as students delve into the curriculum of study. This is a required course for all NJIT and Rutgers-Newark Biology majors.

Instructors

Instructor
Caroline DeVan, Ph.D
(She/her)
CKB 340F
caroline.m.devan@njit.edu

Office Hours: Tuesdays 9:00am – 11:00am & Fri 2:30-4:00pm OR please email me for an appointment. I am happy to meet with you in person in my office or online via zoom.

Course Website:
<http://canvas.njit.edu/>

Recitation Instructor: **Joshua Shreibeis** (he/him)
jgs45@njit.edu
Sections H01 & H03

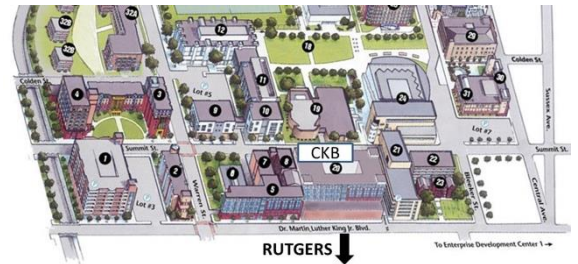
To meet with your recitation instructor, please email to schedule an appointment.

Class Meetings

Class meets twice weekly for lecture and once weekly for recitation. This course is offered in the Face-to-Face Instructional Delivery Mode.

Lecture: Wednesday & Friday 1:00pm- 2:20pm Kupfrian 205

Recitations: Section H01: Friday 4:00pm - 5:20pm CKB 126
Section H03: Monday 2:30pm – 3:50pm CKB 302



Course Policies:

- Compliance with current NJIT policies is required.
- All course materials (including recordings of lectures) are for students' own use only (no sharing or posting anywhere).
- Homework assignments and projects may be submitted late, but 10% of the points available for each 24 hours after the assignment was due will be deducted from late submissions. The maximum deduction is -50%.
- Late submissions (up to 10 days late) of learning journals will receive half credit. After this time, no late submissions will be accepted.
- Exams cannot be completed late without documentation of an excusable absence from the [Office of the Dean of Students](#). Quizzes cannot be completed late or excused, but the lowest score will be dropped at the end of the semester.
- Each student is expected to do their own submitted work **independently**. (See Academic Dishonesty statement on p. 3.)
- Research shows that use of cell phones, laptops, and other devices causes distraction and impairs learning not only for the person using the technology but also for people near to the person using the technology. Therefore, technology use of this kind is permitted only when answering Poll Everywhere questions or when completing group work as specified by the instructor. Plan to take notes by hand on paper. Note: If you have accommodation needs around technology that have been registered with the [Office of Accessibility Resources and Services](#), let me know.
- All class communication will be to your NJIT email address – check your email regularly.
- This course expects students to work without artificial intelligence (AI) assistance unless specifically stated in the directions of an assignment. For assignments in which AI use is permitted, the AI must be cited as is shown within the [NJIT Library AI citation page](#) for AI. If you have any questions or concerns about AI technology use in this class, please reach out to your instructor prior to submitting any assignments.

Recitation Policies: Recitation is an essential part of the course, in which you will meet in smaller groups to discuss class concepts and work together to solve biological problems. Recitation materials (available on Canvas) must be printed or downloaded to a laptop or tablet. A phone is not an acceptable format for viewing recitation materials. Your recitation instructor may have additional policies.

1. **Canvas.** You need to ensure that you can access the course website (<http://canvas.njit.edu>) ASAP! Log-in with your UCID.
2. **Textbook.** We will use the textbook OpenStax+ Biology 2e, supplemented with additional readings. All supplemental readings will be provided via links on the course website.
3. **SimUText.** We will be using SimUText to access several SimBio tutorials and labs that will be completed for homework and sometimes as a part of recitations. The cost of a subscription is \$49.00 when purchased through SimBio: <https://www.simutext2.com/student/register.html#/key/Uh2r-JYxM-b8Fs-qwAA-5YBW>. To purchase using financial aid, please contact the NJIT Bookstore. See Canvas for additional information.
4. **Poll Everywhere App:** In order to gauge your understanding of topics we discuss in lecture, I will regularly poll the class using Poll Everywhere. Your responses to these polls will be used to determine participation and attendance (see Course Assessments p. 3). The Poll Everywhere app is required for this course. Go to this link to download the app: <https://www.polleverywhere.com/mobile>. The app is free. Use your NJIT UCID or email to log into the app. See Canvas for additional information
5. **Writing Materials.** You should bring materials to take notes to every class meeting. Handwriting notes is recommended.
6. **Laptop or Tablet.** Some classes will require the use of a laptop or tablet.

In-person communication during class and office hours and Canvas message app are the preferred forms of communication. If you do talk to me before/during/after class asking me to do a task, please send a follow-up email through the Canvas message app. You can email me directly as well, but I may respond more slowly. When emailing me through the Canvas app or directly please indicate your full name and the course you are in as part of the email subject line. I will be checking the Canvas messaging app and my email regularly throughout the work week during normal business hours. Outside of these times I will respond to messages and emails as soon as possible, but do not expect an immediate reply.

Office hours: Office hours are open times when you can come discuss with me any questions or concerns you have about the course or course material. Office hours will be held each week at the regularly scheduled times. You can visit my office or attend via Zoom – use the Office Hours Zoom links posted to canvas. You DO NOT need an appointment to attend office hours. I can meet with more than one person at a time so please bring a friend if you would like!

Appointments: I am always happy to make an appointment with a student. Ideally appointments should be made in advance. To schedule an appointment, you should message me through the Canvas app – be sure to include your name, the class you are in, and the times you are available to meet in your message. Appointments take place in person or online.

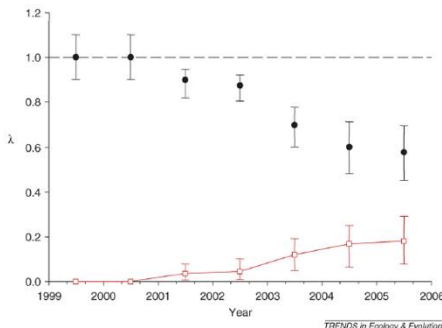
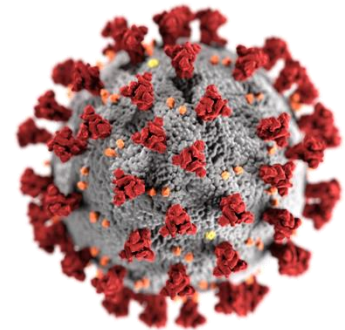


Figure 1 (left) – DFTD. Effect of DFTD on the growth rate of the devil population on the Freycinet Peninsula, Tasmania (black) and the prevalence of DFTD in the total devil population over the same time period (red). From: McCallum. 2008. Trends in Ecology and Evolution 23: 631-637.

Figure 2 (right) – SARS-CoV-2 virion. Illustration of the virus identified as the cause of an outbreak of the respiratory disease COVID-19. CDC Public Health Image Library (PHIL).



*Discuss making up missed class time or work with your instructors as soon as possible. We provide numerous reminders of course deadlines and expect you to be responsible for meeting them. However, we will make every effort to work with you if you are struggling or falling behind. **Be sure to communicate with us about your concerns regarding the course, the earlier the better! We are here to help.***

Accessibility Statement: Please let me know if you are eligible for accommodations for a disability. If you are in need of accommodations due to a disability, please contact the Office of Accessibility Resources & Services (OARS) to discuss your specific needs: <https://www.njit.edu/accessibility>

Assessment of Learning – Components

- 1. **Learning Journal** – At the end of each week, you will have an assigned prompt on Canvas asking you to reflect on your own learning and progress in the course. Only instructors can see your entries. Students earn 1 point for each complete, thoughtful response to a learning journal, and can earn up to a total of 10 points for this grade component. It is not necessary to complete the journal every week to earn full credit. 10 pts total
- 2. **Participation** - Lecture participation (15 pts) will be assessed using Poll Everywhere questions. Each lecture will include at least a couple of questions. You must answer (correct or not) at least 80% of the questions to receive full credit for this component; lower response rates are scaled accordingly. Recitation participation (10 pts) will be earned by active participation during recitations. Students who contribute to recitation discussions in at least 10 recitations will receive full credit for recitation participation. 25 pts total
- 3. **Quizzes** - During the course, there will be 4 quizzes to assess your understanding of concepts that we have covered in class and your ability to apply that knowledge. These are intended to provide practice as part of your preparation for exams and to give you an opportunity to mark your progress. 40 pts total
- 4. **Homework** - There will be 8 homework assignments throughout the course that will require more in-depth work on a topic and application of knowledge. Homework assignments will be SimBio modules completed through SimUText. Homework will be discussed in either Recitation or Lecture. 80 pts total
- 5. **Projects** – Science often requires pulling together information from multiple sources to arrive at an end result. The course will include two projects that consist of several components that build towards a final goal. 80 pts total
- 6. **Exams** – There will be two exams that cover the application and understanding of the material covered in the course. These exams will also require you to apply the skills that we have emphasized. See course schedule for exam dates. 120 pts total

Evaluation

Course Grade

Your grade for this course will be based on the components described on the left. You can choose how your grade is calculated by determining the weight of each grade component as a percentage of your total semester grade, within the given ranges. Your final grade will be the highest of two possible grades: the grade that results from your selected weight (Your %) or the one resulting from the standard weight (Standard %).

Grade Component	% Range	Standard %	Your %
Learning journal	2-4%	3%	
Participation	5-9%	7%	
Quizzes	9-13%	11%	
Homework	18-27%	22.5%	
Projects	18-27%	22.5%	
Exams	28-40%	34%	

Grades will be determined by the higher of the final percentage of the possible points earned (as described above, rounded to a whole number), following the standard grade scale.

- A > 90%
- B+ 85-89%
- B 80-84%
- C+ 75-79%
- C 70-74%*
- D 60-69%
- F < 60%

Grades are not curved, and there is no individual extra credit.

*You must earn a C or better in order to progress within the Biology major.

Academic Dishonesty: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>. Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

A. Biological Principles

Students will be able to...

1. Identify mechanisms of evolutionary change and explain how they lead to genetic change in populations through time.
2. Describe the structural characteristics of nucleotides (DNA/RNA) and explain how they are related to the functions of these molecules.
3. Identify the basic steps involved in gene expression and describe ways that gene expression can be regulated so that different cells produce different proteins.
4. Be able to transcribe information from DNA to RNA and to translate mRNA into amino acid sequences.
5. Interpret information depicted on a phylogenetic tree.
6. Outline the stages of cell division (mitosis and meiosis), explain what occurs during each stage, and describe how the nuclear DNA of daughter cells compares to that of the original cell.
7. Be able to utilize a Punnett square to predict the potential genotype/phenotype of offspring.
8. Define and give some examples of interspecific interactions and describe how different types of interactions affect the population sizes of the species involved.
9. Identify the different trophic levels in a community and explain how energy moves through them.
10. Explain traits related to an organism's life history and what influences the evolution of different life history strategies.

B. Learning, Reasoning, and Problem-Solving Skills

Students will be able to...

1. Monitor and adapt their personal learning strategies throughout the semester.
2. Develop a plan for their continued learning beyond this course.
3. Propose hypotheses to explain observed phenomena.
4. Design a basic experiment to test a hypothesis, taking into account the ethical and methodological considerations for proper experimental design.
5. Identify and describe patterns in data and interpret statistical analysis of others' results.
6. Communicate scientific information effectively in written and graphical form.
7. Attribute primary sources for scientific writing using proper citation format.
8. Synthesize concepts from multiple biological scales.
9. Apply knowledge to solve problems in biology.
10. Cooperate with their peers to solve problems as part of a team.

Individual class sessions will have more specific content outcomes, based on what is being discussed that week and how it relates to the larger goals of the course. Look for those in the lecture slides for each topic.

Succeeding in Concepts in Biology

Learning is an active process, and it requires actively thinking, discussing and writing. Being successful at this process necessitates you understanding how you best learn biology. That requires thinking about more than just what you are learning, but how you are learning it. This is referred to as metacognition. Practicing this process will make you more efficient learners and better able to learn and integrate new material. We want you to do well in this course. In fact, we want to help you develop skills in this course that will help you do well in every course you take from this point forward. So, don't treat these things as a chore you just have to do for this course. These are all suggestions that can be helpful in any class that you take.

1. **Be Present.** It's important to "show up" to class. Limit your distractions, be prepared to take notes, and be active in your participation with the class. Engagement in class activities means that you will learn more and struggle less when you work on your own later.
2. **Be Proactive.** This applies to a number of contexts. For example, cramming for an exam is something that many students do, and sometimes it even feels vaguely successful—especially when memorization of something for short-term recall is the goal. Memorization of facts is not the point of this course though, so that strategy is even less likely to work here. Being proactive also means that you need to think about how you are doing and make an effort to improve. In other words, don't wait until you see your final grade posted online to care about how you are doing in the course.
3. **Talk.** Talking through an idea can help with your understanding. Discussion will be a big part of this course, so we will encourage your active discussion during lecture and recitation. But, talking things through shouldn't end when you walk out of class. Form study groups, meet virtually, and talk about the class.
4. **Use the Learning Outcomes.** I have provided the overall goals for you just above this section and will include more specific ones throughout the semester. These are posted for your benefit to help guide your studying and illustrate key ideas and skills you should work to master.
5. **Test Yourself.** Take some time to think about the material that has been covered in class. Potentially, ask yourself (or your classmates) questions like:
 - What were the main topics from this class session? (Objectives? Questions?)
 - What do I need to know in order to understand that concept, question or problem?
 - Can I break the topic into smaller parts? What parts can I explain in a manner that makes sense to me?
 - What parts are unclear or don't make sense yet?
 - How does today's class session relate to the larger goals of the course?

Clues to the answers to several of these questions will be found in the specific learning outcomes emphasized for each class/topic.

Your classroom as well as your college experience is meant to be a place where the free flow of ideas is encouraged and nurtured. It is not acceptable for any community member to make hurtful and demeaning remarks, or otherwise disrupt your learning experiences or your safety. As such, there are many NJIT support systems and policies of which you should be aware.

Basic Needs

Students who face challenges securing their food or a safe and stable place to stay are urged to contact the Dean of Students (dos@njit.edu). If you are comfortable doing so, please notify me as well.

Food Insecurity: If you are experiencing food insecurity, there is a food pantry on campus for your convenience (You must bring your UCID).

Campus Center, Room 478

foodpantry@njit.edu

See website for updated hours: <https://www.njit.edu/foodpantry/hours-and-general-information>

Student Parents

If circumstances arise that necessitate your absence from class - such as the illness of a child, closing of day care for inclement weather, etc. - please contact me as soon as possible so we may make arrangements to keep you up-to-date with course material and activities. If you should need any other kind of assistance for circumstances relating to your status as a student and parent, please consider contacting the Dean of Students and Campus Life at 973.596.3466 for a referral to appropriate services including on and off campus support.

Emergency Support

Crises Happen: If you experience a life emergency and are unsure which support services to turn to, NJIT Public Safety can connect you to emergency support systems - call 973.596.3111.

For medical, psychological or psychiatric emergencies you can also call:

St. Michael's Medical Center
973.877.5000

If you want to report a concern about another students' well-being you can also reach out to the NJIT CARE Team (<https://www.njit.edu/care/>) or the Dean of Students Office.

Consensual, Healthy Personal & Professional Relationships

Your body is your own and NJIT strives to protect its community members from any unwanted advances. Title IX prohibits discrimination based on sex, including harassment, domestic and dating violence, sexual assault, and stalking. Sexual violence undermines students' academic success. Anyone dealing with sexual misconduct should consider talking to someone about their experience, so he/she/they can get the support needed.

Confidential Resource:

- [Center for Counseling and Psychological Services \(C-CAPS\)](#) Campbell Hall, Room 205 (Main Level) | 973.596.3414

Non-Confidential Resources:

- [NJIT Public Safety](#)
973.596.3111
- [Dean of Students Office](#), 255 Campus Center | 973.596.3466

Mental Health and Stress Management

Center for Counseling and Psychological Services (C-CAPS) is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available.

<https://www.njit.edu/counseling/gethelp>

Diminished mental health, including significant stress, mood changes, excessive worry, or problems with eating and/or sleeping can interfere with optimal academic performance. The source of symptoms might be related to your course work; if so, please speak with me. However, problems with relationships, family worries, loss, or a personal struggle or crisis can also contribute to decreased academic performance. Please seek out help as needed.

Campbell Hall, Room 205 (Main Level) | 973.596.3414

Special Accommodations

If you have a disability or a personal circumstance that will affect your learning in this course, please let me know as soon as possible so that we can discuss the best ways to meet your needs. Any student who needs accommodation for disabilities should also contact the Office of Accessibility Resources and Services (OARS): <https://www.njit.edu/accessibility/>

Kupfrian Hall, Room 201, 973.596.5417 | oars@njit.edu

Religious/Cultural Observance Students who have religious or cultural observances that coincide with this class should let me know by email within the first two weeks of class. I strongly encourage you to honor your cultural and religious holidays! However, if I do not hear from you within the first two weeks, I will assume that you plan to attend all class meetings.

Supporting Academic Integrity Our community functions best when its members treat one another with honesty, fairness, respect, and trust. The college promotes the assumption of personal responsibility and integrity, and prohibits all forms of academic dishonesty and misconduct.

Issues of Concern (Non-Emergency)

Alert the Dean of Students Office (dos@njit.edu) about issues of concern, including academic and non-academic violations (<https://www5.njit.edu/doss/reporting/>).

Course Schedule

Schedule: Dates listed by week. Our “week” will go from Tuesday – Monday. Lectures will meet twice every week and recitation will meet every week, unless otherwise noted. Please note that this is the proposed schedule and is subject to change. A more detailed schedule will be continually updated via the Canvas course site.

Week Starts Tuesday	Week #	Lecture Topic	Recitation	Assignments/Notes
9/2	1	Wed - Intro: Syllabus, Class goals Fri - Scientific Method & Experimentation	Succeeding in College	Academic Engagement Assignment
9/9	2	Wed – Experimentation & Interpreting Graphs Fri – Diversity of Life	Biodiversity of Life	
9/16	3	Wed– Natural Selection Fri – Mechanisms of Evolution	MRSA & Interpreting Graphs	HW 1: SimBio: Darwinian Snails
9/23	4	Wed – Quiz 1 , Viruses and Vaccines Fri – DNA/RNA Structure & DNA Replication	Disease Spread Models	Project 1, Part 1 HW 2: How Diseases Spread
9/30	5	Wed–Transcription Fri – RNA Processing, Translation	Project 1: Graphing Variants Codon Bingo	HW 3: SimBio – DNA Explored
10/7	6	Wed– Regulation of Gene Expression Fri - Mutation & Phylogenetic Trees	Cystic Fibrosis	Project 1, Part 2 HW 4: SimBio - Transcription & Translation Explored
10/14	7	Wed - Quiz 2 , Phylogenetic Trees (continued) Fri – COVID-19	Project 1: Decoding New Variants SARS	HW 5: SimBio - Gene Regulation
10/21	8	Wed– Scientific Writing Fri - DFTD	Project 1: Writing	Project 1, Part 3
10/28	9	Wed - Exam 1 Fri – Cell Cycle/Mitosis	DFTD – Part 1	Project 1, Part 4
11/4	10	Wed – Cancer Fri – Epigenetics	DFTD – Part 2	HW 6: SimBio – Mitosis Explored
11/11	11	Wed - Meiosis/Mendelian Inheritance Fri – Inheritance	Genes and Cancer	Project 2, Part 1 HW 7: SimBio - Meiosis Explored
11/18	12	Wed – Quiz 3 , Population Genetics Fri - Life History Strategies	Pedigrees	Project 2, Part 2 HW 8: SimBio – Medelian Pigs
11/25	13	Wed - Interactions/Mutualism Fri - No class - Thanksgiving!	NO Recitations	WED 11/26 – NJIT on FRI schedule
12/2	14	Wed – Competition/Predation Fri – Quiz 4 , Food Webs	Tasmanian Food Web	Project 2, Part 3
12/9	15	Wed - Future for Tasmanian Devils Fri – Reading Day – no class	NO Recitations	Project 2, Part 4
12/14-12/20		Exam 2 & Post-Quiz - During Final Exam Period*		Final Exam Schedule will be posted here: http://www.njit.edu/registrar/exams/