BIO 102: Principles of Biology II - Summer 2025

University of Rhode Island

INSTRUCTOR

Dr. Daniela Lopes Paim Pinto

EMAIL
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(Email is the preferred way of communication. I will respond within one business day)

ZOOM ROOM

https://uri-edu.zoom.us/my/dlpaim

COURSE OVERVIEW

BIO102 is the second course in a two-part introductory biology series, designed to build on foundational concepts introduced in BIO101. This asynchronous online course explores biological and metabolic diversity, the principles of evolution, plant structure and function, and ecological relationships. Through comparisons between plant and animal systems, students will expand their understanding of how life is organized and interconnected. While asynchronous, the course is not self-paced. It includes major deadlines for exams, assignments, and discussions to help you stay on track. Prerequisite: credit or concurrent enrollment in BIO104.

STUDENT'S HOURS

Access my Starfish calendar and feel free to choose a time that works for you to meet with me. I've made several times available throughout the week, but if none of them work for you, send me an email, and I will gladly accommodate you. Please know that I am readily available to help, so don't hesitate to reach out. The sooner you contact me, the more effectively I can assist you throughout the semester.

COURSE GOALS:

The primary goal of this course is to build a strong foundation of biology knowledge and equip students with the skills needed to understand advanced biology courses and science in general. Throughout this course, you will be part of a dynamic online learning community where active and authentic participation is encouraged to the best of your abilities. This community will likely include people with diverse perspectives, experiences, and beliefs. Learning to bridge these differences while exploring meaningful scientific questions may be one of the most valuable lessons you take from this course. My aim is to assist you in accomplishing the following:

- Describe, compare, and apply core biological concepts, including those related to evolution, biodiversity, plant biology, and ecological interactions, to accurately interpret scientific information and analyze basic biological scenarios.
- Explain the basic principles of evolution and biodiversity and analyze how evolutionary processes contribute to patterns of biological diversity.
- Describe and interpret ecological relationships among organisms and their environments, including energy flow, nutrient cycling, and population dynamics.
- Evaluate real-world issues through a biological lens and discuss how biological knowledge can inform solutions to societal and environmental challenges.
- Use evidence-based reasoning to interpret biological information and apply critical thinking skills to analyze biological claims and everyday life experiences.

Specific learning outcomes by topic are described on page 9 to 11.

COURSE REQUIREMENTS:

(1) **Earned credit or concurrent enrollment in BIO 104 (the lab section for this course)**: If you need assistance finding an open section, please contact the Lab Manager for Biological Sciences, Linda Forrester (lindaforrester@uri.edu). ATTENTION: BIO104 is an in-person course.

(2) **Access to Brightspace:** course material, activities, and communication will be delivered through Brightspace.

(3) **Textbook:** You are required to have access to **Mastering Biology** with Pearson eText: *Biological Sciences, 8th Edition* (Freeman et al.). The **cost** for an 18-week access code, which includes access to the platform and the eText, is **$84.99** and can be purchased at the bookstore or directly through Pearson. A module in Brightspace contains all the information you need to register and link your account to Mastering Biology. We will use Mastering Biology for readings, homework, practice exams, and actual exams throughout the course. When registering for Mastering Biology through Brightspace, you will have a 14-day free trial before payment is required. **ATTENTION**: Students who purchased access to Mastering Biology during Summer 1 for BIO101 **DO NOT** need to purchase it again for BIO102.

(4) **Proctoring system for exams:** This course requires the use of LockDown Browser and a webcam (**Respondus Monitor)** for online exams. The webcam can be built into your computer or can be the type that plugs in with a USB cable. The license to use Respondus Monitor **costs $10** and can be purchased directly when you take your first monitored assignment. A student Quick Start Guide (PDF) is available in Brightspace under the "Mastering Bio" module.

(5) **Computer with reliable, high-speed Internet access and appropriate system and software to support the Brightspace, Mastering Bio and Respondus platforms:** check Brightspace under "Start here" module for specific technology requirements and LMS help (Learning Management System – Brightspace).

COURSE GRADING:

Exams (3 total, lower grade dropped)……40%
Final exam……..20%
Practice exams……...15%
Interactive Readings…….....10%
Class work……..….8%
Discussion Boards ……..……7%

Guaranteed Grading Scale for the Course: **A** = 93, **A-** = 90, **B+** = 88, **B** = 83, **B-**= 80, **C+** = 78, **C** = 73, **C-** = 70, **D+** = 68, **D** = 63, **D-** = 60 **F** < 60

Final grades will be rounded up to the nearest whole number using two decimal places. For instance, if you have an 92.52% that will be rounded up to 93% and you will receive an A for the course. If, however you have an 92.44%, that does not round up to 93% and your grade will remain in the A- range.

ASSIGNMENTS AND EXAMS

EXAMS: There will be three exams, one after each unit. The lowest exam grade will be dropped. You can only access each exam after completing at least one attempt of the corresponding practice exam. Each exam will count for 20% of your final grade. They will be timed, and the format will be very similar to practice exams. Questions are based on the lecture material (slides, video lecture, class work) and textbook readings and completed one at a time without the option to return to previous questions. Exams will only be available on exam days (check suggested course schedule on page 7 and Brightspace for the exact dates), so please plan your agenda accordingly. The Learning Outcomes (LOs) listed below are study guides for the exams. Exams will be administered through Mastering Bio using Pearson LockDown Browser and *Respondus* Monitor Proctoring. If you require accommodations for time extensions or other needs, please provide me with the appropriate documentation at least a few days before an exam due date.

FINAL EXAM: This is cumulative and covers the general aspects of all chapters studied in the course, with a particular focus on climate change. The final exam will count for 15% of your final grade and **cannot** be dropped from your final grade. The exam will follow the same guidelines and format of the other exams, except that there will be no final practice exam and it may be longer that midterm exams. The same missed exam policy applies to the final exam. The exam will be available on July 25/26. Check Brightspace for the exact times.

MISSED EXAM: Each student must complete every exam except in the event of a documented emergency or significant illness. You must provide a university-approved excuse and documentation if you miss an exam. It is your responsibility to inform me as soon as possible, preferably before the exam. Failure to provide proper documentation will result in a 25% penalty for the missed exam. However, taking the exam with a penalty is still better than receiving a zero. If you miss only one exam, you have also the option to not take it and count as your dropped exam grade.

→ If you miss an exam without a university-approved excuse and would like to schedule a make-up exam with the 25% penalty, you must contact me **within 48 hours**. After that, your missed exam will be your dropped exam grade if that is your first missed exam, or you get a 0 if you missed more than one exam. There are NO **exceptions** to this policy.

The missed exam policy also applies to the final exam.

PRACTICE EXAMS: There will be three practice exams. You can take each up to 5 times for a grade and revisit it for additional practice. They are an opportunity to test your ability to meet learning objectives that are VERY likely to appear in your exams. Practice exams will use the same format of questions and time as the actual exam. When grading the practice exams, your overall grade will correspond to the average of all your attempts. These practice exams will be administered through Mastering Bio using Pearson LockDown Browser and *Respondus* Monitor Proctoring, exactly as with the actual exam. No practice exam grades will be dropped. However, these assignments do accept late submissions for half-credit.

INTERACTIVE READINGS: Interactive readings consist of text chapters spaced with practice problems or videos to help you learn key concepts before you apply that knowledge in other assignments. When

completing these assignments, you have unlimited attempts to answer correctly for full credit. Late submissions are accepted for half-credit. They will be completed in Mastering Bio.

CLASS WORK: These assignments will involve application of the material that you prepared from readings, lectures, and supplemental videos. Class works are crucial and required because it helps us (you and me) to identify what you do or don't understand. For the most part, any **reasonable** answer gets full credit, so, answer honestly. To receive feedback on these assignments before the exam, please submit them at least 3 working days before the due date. Check suggested course schedule on page 7 and Brightspace for the exact due dates.

DISCUSSION BOARDS: These boards make 7% of your final grade and serve as a platform for applying the material covered in lectures helping you to prepare for the applied questions on the exams. For each discussion board, you will be required to:

1. Post a thoughtful response: Engage with the board's topic by posting a thoughtful and substantive response. Your post should demonstrate a clear understanding of the material and include relevant applications or examples.
2. Respond to a colleague: In addition to your post, you must respond meaningfully to at least one colleague's post. Your response should contribute to the discussion by adding new insights, asking questions, or providing constructive feedback. Simple answers, for example, "I agree with …" "I think this process is super cool." "No way" "Thank you for sharing that", etc. are not considered valid answers.

CLASS FORMAT

This is an asynchronous online course, which means there are no required live meetings but it's **NOT self-paced**. Instead, it is designed with a consistent structure of due dates for readings, assignments, and exams. At the beginning of each unit, it is recommended that you devote some time to determine what is involved and how much of your time will be required to complete the necessary readings, activities and meet deadlines. Each content module covers one unit of the course and is divided into topics according to the suggested course schedule provided below. Within each module, you will find a list of learning objectives, chapters assigned for reading, pre-recorded lectures, slides or guided notes, supplementary videos, and accompanying assignments. Start by reading the chapters assigned for each module. Watch the pre-recorded lectures using the slides or guided notes to help you identify the most critical information covered. Watch the supplemental videos and work on the class work assignments and discussion boards. At any moment during this process, contact me by email if you need extra clarification or have any questions/concerns or schedule an appointment using Starfish calendar. Students' "office" hours will be essential for us to connect, supplement your asynchronous work, clarify questions, and to further practice any necessary skills. Be sure to check out the "Start here" module, which includes all the information you need to get started, including needed technology, course policies, my contact information, and a suggested schedule to complete the work.

ADDITIONAL COURSE POLICIES

USE OF COURSE MATERIALS: all materials provided in this course are solely for the personal use of students enrolled in BIO102 summer 2025 ONLY. It includes (but is not limited to) slides, class work, quizzes, practice exams, exams, study guides, and any other material available in Brightspace or distributed by email. Students are prohibited from sharing these materials in any way or posting them on third-party websites such a Chegg, One Class, Course Hero, Numerade, Quizlet, etc.

NETIQUETTE GUIDELINES FOR AN ONLINE COURSE:

- **Respect:** it's essential to show respect to your peers and professor, when communicating online. Remember that your words may be interpreted differently than you intended without facial cues and body language. This includes the use of humor and sarcasm. Before sending a message, ask yourself if you would say the same thing in person.
- **Share your knowledge:** one of the great benefits of online learning is the diverse experience of your peers, allowing you to learn from each other. Feel free to share your knowledge with the group in the discussion boards, including resources and reference materials.
- **Practice kindness:** avoid bullying or provoking arguments when expressing your opinion or presenting controversial topics. Disagreeing with others while remaining respectful and preventing personal attacks is possible. Remember to treat others the way you would like to be treated.
- **Be mindful of other people's time and attention:** ensure your messages are clear and brief, and avoid sending large files or images, unless requested. Please note that responses may not be immediate, so refer to the syllabus for further information.

CHEATING AND PLAGIARISM WILL NOT BE TOLERATED. URI'S REGULATIONS REGARDING CHEATING WILL BE APPLIED.

CHEATING (URI POLICY) - ACADEMIC INTEGRITY: Integrity and Honesty are key community values at URI. Cheating and plagiarism are not acceptable and will be dealt with according to University's guidelines. Any exam or assignment that the instructor has reason to believe is plagiarized ***in whole or in part*** will receive a zero and the student(s) involved will be reported to the Office of Community Standards. We strongly encourage you to study in groups, but examinations, homework, and quizzes are to be completed individually. A student's name on any work including electronic submissions on Brightspace from your accounts shall be regarded as assurance that the work is the result of the student's own independent thought and study. Most academic work builds on the contributions of others. Students have an obligation to know how to quote, paraphrase, summarize, or reference the work of others with integrity. A source need not be given for common knowledge within a discipline. Utilizing campus academic resources including the Academic Enhancement Center and the Writing Center are encouraged.

The following are examples of academic dishonesty:

- Using AI and problem-solving websites for assignments and exams
- Unauthorized possession or access to exams
- Unauthorized communication during exams

- Unauthorized use of another's work or preparing work for another student
- Taking an exam for another student
- Altering or attempting to alter grades
- The use of notes or electronic devices to gain an unauthorized advantage during exams
- Facilitating or aiding another's academic dishonesty.

RESPECT: Respect is a core foundation of my teaching philosophy and, in this learning community, respect for one another's viewpoints, backgrounds, and contributions is a requirement. Engaging in thoughtful discussions and interactions that are free from offensive or disrespectful language is expected in all circumstances, including discussion boards. Respect towards the instructor involves engaging thoughtfully completing course modules and adhering to deadlines. Respect towards fellow students requires active participation in discussions, acknowledging different viewpoints, and maintaining a courteous tone in interactions. I encourage an environment where diverse perspectives are valued, fostering a productive and inclusive atmosphere for all participants.

DISABILITY, ACCESS, AND INCLUSION SERVICES: Your access in this course is important. Please send me your Disability, Access, and Inclusion (DAI) accommodation letter early in the semester so that we have adequate time to discuss and arrange your approved academic accommodations. If you have not yet established services through DAI, please contact them to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom. DAI can be reached by calling: 401-874-2098, visiting: web.uri.edu/disability, or emailing: dai@etal.uri.edu.

ANTI-BIAS STATEMENT: We respect the rights and dignity of each individual and group. We reject prejudice and intolerance, and we work to understand differences. We believe that equity and inclusion are critical components for campus community members to thrive. If you are a target or a witness of a bias incident, you are encouraged to submit a report to the URI Bias Response Team at www.uri.edu/brt. There you will also find people and resources to help.

BIOLOGICAL SCIENCES BEREAVEMENT STATEMENT:

If you are grieving or have experienced the death of a loved one, the Biological Sciences Faculty, Staff, and Teaching Assistants understand and want to support you during this difficult time. Some of the questions you have may be about missing class or your assignments. We encourage you to first reach out to the Dean of Students Office using the Bereavement Notification Request Form (https://cm.maxient.com/reportingform.php?UnivofRhodeIsland&layout_id=32) or you may call your Dean (if you are in University College, contact 874-5903 and ask to speak to the UC Dean about a private matter; if you are in CELS contact Dean Anderson in the Office of Student Affairs, 874-5026 or kand@uri.edu), so they can notify all your instructors about your circumstances. The University Counseling Center can also offer further support (401-874-2288, https://web.uri.edu/counseling/crisis/).

➔ Please don't hesitate to contact me so we can create a plan to help you succeed in this class, even during these difficult times. Remember, your mental well-being is more valuable than your grade.

FINANCIAL HELP: Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to contact the Dean of Students (401-873-2098) for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable her to provide any resources that she may possess.

Need help with BIO 102? This is a challenging course. Success requires that you keep pace with the work, understand course concepts, and study effectively. Remember, you have several resources for help:

- Your professor: meet with me by zoom. I take your learning seriously and am pleased to help. Please don't wait until the day before the exam or the end of the semester.
- Your "virtual classmates": connect to your peers using Brightspace chat, discussion board or even in the lab, and form study groups.
- Academic Enhancement Center: The Academic Enhancement Center (AEC) offers face-to-face and online services (tutoring) to undergraduate students seeking academic support. Services are based out of 4th Floor Roosevelt Hall (Phone: 401-874-2367), and online. Peer tutoring is available for STEM & BUS-related courses through the Drop-In Center and small-group tutoring.

SUGGESTED COURSE SCHEDULE TO VIEW CONTENTS CONSIDERING THE DUE DATES:

UNIT	WEEK	DATE	COURSE TOPIC	READINGS	ASSESSMENTS*	DUE DATES
1: Biodiversity and Evolution	1	06/23 (M)	Biological, metabolic, and microbial diversity	54.1- 54.3; 52.2 (pg.1149) 26.1, 26.3	IR1 IR2 CW1 CW2 CW3 DB1 Practice Exam 1 Exam 1	**Wednesday July 2nd:** all unit 1 course work including exam 1 must be submitted by 11:59pm EST
		06/25 (W)	Natural selection and misconceptions	22		
		06/27 (F)	Evolutionary processes	23		
		06/30 (M)	Phylogenetic analysis	25.1		
		07/02 (W)	**(EXAM 1)**			
2: How plants work	2	07/05 (S)	Plant adaptations to life on land	28 (28.3: pg 600-605)	IR3 IR4 CW4 CW5 DB2 Practice Exam 2 Exam 2	**Monday July 14:** all unit 2 course work including exam 2 must be submitted by 11:59pm EST
	3	07/07 (M)	Form and function in land plants and animals	34.2, 34.3, 34,4; 39.2		
		07/9 (W)	Photosynthesis and Endosymbiosis	10; 27.3 (partial)		
		07/11 (F)	Nutrition and Reproduction on land	36.1, 36.5; 41.1, 41.3; 28.3: pg 606-612; 38.1		
		07/14 (M)	**(EXAM 2)**			
3: Ecology: shaping the future of biodiversity	4	07/16 (W)	Population Ecology	51.2, 51.3, 51.5	IR5 IR5 IR6 CW6 CW7 DB3 Practice Exam 3 Exam 3	**Wednesday July 23:** all unit 3 course work including exam 3 must be submitted by 11:59pm EST
		07/18 (F)	Community Ecology	52.1-52.3		
	5	07/21 (M)	Ecosystems	53.1		
		07/23 (W)	**(EXAM3)**			
		07/24 (Th)	Climate change	53.3; 54.2 (revisit), 54.4		
		07/25 - 07/26 (F/S)	**FINAL EXAM**	Cumulative	Final exam	**Friday July 25 through Saturday 26:** Final exam

* IR = Interactive Reading; CW = Course work; DB = Discussion Board

COURSE LEARNING OUTCOMES PER TOPIC: (use this as a study guide for exams)

Unit	Topic	Learning objectives
1: Biodiversity and evolution	Biological & Metabolic diversity	• Define Biological Diversity • Explain how biodiversity is measured. • Explain the importance of conserving biodiversity for humans. • Explain how habitat loss, habitat fragmentation, climate change, over-harvesting, and invasive species affect biodiversity • Compare key elements of prokaryotic versus eukaryotic cell structure • Contrast respiration in animals with microbial respiration. • Recall common electron acceptors and donors used by microbial organisms for energy
	Natural Selection and misconceptions	• Define adaptation, fitness, evolution, and theory. For each term, explain how its use in science differs from its use in everyday English. • Distinguish the theory of evolution by natural selection from prior ideas about how species change. • Recall 4 types of natural selection. • Recall examples of evidence regarding: (a) whether species change through time and (b) whether they are related by common ancestry • Correct common misconceptions about natural selection and evolution. • Use scientific evidence to evaluate the myth of biological race.
	Evolutionary Processes	• Apply the Hardy-Weinberg principle to determine if a population is evolving. • Define genetic drift and describe how it influences allele frequencies. Explain why it is more important in small populations than in large populations and why it eventually leads to fixation or loss of alleles. Provide examples of events or processes that cause drift. • Define gene flow and describe how it impacts allele frequencies in the source and recipient population. • Defend the statement "mutation is the ultimate source of genetic variation," and explain why mutation is random with respect to its impact on an individual's fitness. • Explain why natural selection, genetic drift, gene flow, mutation, and/or non-random mating can each produce genotype frequencies different from those expected under the Hardy-Weinberg principle.
	Phylogenetic Analysis	• Interpret a phylogenetic tree by identifying key features (e.g., root, nodes, branches, tips), recognizing nested monophyletic groups, identifying synapomorphies, and determining the most recent common ancestor of given taxa. • Given a phylogeny and information about a trait in the species included, mark the tree to indicate where changes in the trait occurred • Use genetic data to build a phylogeny and to identify an unknown organism. • Apply parsimony to choose the best phylogeny.

2: How plants work	Plant adaptation to Life on Land	• Correlate the several challenges plants had to overcome to live in the terrestrial environments with the adaptations that allowed life on land. • Interpret the evolutionary history of green plants using a phylogeny. • Compare key traits of nonvascular plants, seedless vascular plants, gymnosperms, and angiosperms.
	Form and function in land plants and animals	• Analyze the relationships among the cells, tissues, and/or organs involved in a given plant or animal physiological system, including how their structures correlate with their functions and how they interact in terms of function • Define a meristem (in plants) and contrast with stem cell (in animals) • Identify the relationship between apical meristems, primary meristems, and three major tissue types in plants. • Describe the four primary types of tissues in multicellular, complex animals are and contrast with those from plants. • Analyze the growth processes that allow shoots and roots to increase in length and width.
	Photosynthesis and Endosymbiosis	• Given the summary reactions for photosynthesis and respiration, compare 1) the reactants and products of each process, and 2) the energy transformations that occur. • Compare and contrast the starting and ending points of photosynthesis and cellular respiration. • Explain how light is converted to chemical energy during photosynthesis and identify how O_2 is produced. • Compare the different pathways used for carbon fixation and explain why they are necessary. • Explain the process of endosymbiosis and using your knowledge or information provided on a specific example, describe the costs and benefits to each organism involved.
	Nutrition in Plants and animals	• Explain how plants absorb useful nutrients when they can and cannot produce their own food. • Identify the role of bacteria and fungi in nutrient acquisition by plants. • Contrast nutrient acquisition in plants and animals. • Explain how energy is produced through diet and digestion in animals.
	Reproduction on Land	• Summarize the major features of alternation of generations. • Compare and contrast the life cycles of nonvascular plants, seedless vascular plants, gymnosperms, and angiosperms. • Given a diagram of a plant lifecycle, label when and where mitosis, meiosis, and fertilization occur, and identify haploid and diploid phases. • Explain the role of sexual and asexual reproduction in flowering plants.

3: Ecology: shaping the future of biodiversity	Populations	• Recall 4 processes that determine a population size. • Given information presented as graphs, tables, or equations, describe how the size of a population has changed over time. • Explain the trade-offs that occur in life-history patterns. • Recognize the three general types of survivorship curves and list examples of each. • Apply population growth equations to make predictions about future population sizes and growth rates. • List density-dependent and independent factors that affect population growth rates
	Communities	• Classify 4 types of species interactions. • Define niche and distinguish between fundamental and realized niche. • Predict the ecological consequences of changes to a community, such as removing an apex predator or introducing a disease, using information from a food web or species interactions. • Explain the difference between abiotic and biotic factors in an ecosystem and provide examples of how these factors can affect the communities present. • Describe the factors determining community structure and dynamics. • Contrast structure and function of late and early successional communities
	Ecosystems	• Explain why there is typically less biomass and fewer individuals and species at the top of a food chain than at the bottom. • Predict the consequences of changes in primary production due to perturbations such as drought, fire, flood, extreme temperatures, or nutrient influx or loss. • Define NET primary productivity (NPP) and describe the flow of energy through ecosystems. • Use the productivity pyramid to explain biomagnifications of pollutants. • Explain how and why NPP is changing on land and in the ocean
	Climate change	• Explain how human activities impact climate change by disrupting the global carbon cycle. • Recall 4 general consequences of climate change for organisms. • Identify processes that produce positive and negative feedback on climate change. • Analyze the effects of climate change on organisms in aquatic and terrestrial ecosystems. • Evaluate whether/how humans may help to sustain biological diversity in the face of climate change.

If you have read this syllabus, you are on the right track to succeed in this class!
Best wishes for a successful and rewarding learning experience!

Dr. Daniela Lopes Paim Pinto
Assistant Teaching Professor – Biological Sciences Dept.