COURSE INFORMATION

COURSE TITLE
BIO 112—General College Biology II with Lab

COURSE DESCRIPTION
Continues Biology I. Includes ecology, evolution, classification, structure, and function in plants and animals. Includes laboratory experience. This course is a Statewide Guaranteed Transfer course (GT-SC1).

CREDIT HOURS
5

GUARANTEED TRANSFER (GT) PATHWAYS COURSE STATEMENT:
The Colorado Commission on Higher Education has approved BIO 112 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT-SC1 category. For transferring students, successful completion with a minimum C- grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to https://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html.

SUGGESTED PREREQUISITE KNOWLEDGE
Prerequisites and co-requisites will be determined by each individual institution. Students are required by colleges that offer BIO 112 on campus to have taken BIO 111 or an equivalent Biology I course as a prerequisite to BIO 112.

We strongly recommend that you have college-level math, reading, writing, and study skills before enrolling in this course.
CCCOnline Course Policies

The CCCOnline Course Policies page contains information about the student's role in the classroom, grading policies, and rights and responsibilities.
**COURSE MATERIALS**

All course reading material is available online and linked within the course site. You do not need to purchase any additional textbook materials. However, you will need to purchase lab kits.

**MINIMUM COMPUTER REQUIREMENTS**

To complete this course, you will need regular access to a computer from which you can access the internet and use email. In order to ensure that your course functions properly, you must run the System Check. This is a critical step, and taking the time to do it now will eliminate a tremendous amount of frustration for you later. To run the System Check, select Tools in the course NavBar, and then select System Check.

**REQUIRED eTEXT**

**MAIN eText**


**REQUIRED LAB KIT AND MICROSCOPE**

Your required lab kit will be shipped to you after the drop date for this semester. You do not need to purchase the lab kit separately; it is included in your course fees.

On the first day you access the course, submit your shipping address one of two ways:

1. Via a pop-up window that appears in your course for you to submit your shipping address. This must be done prior to the drop date.
   - Students who live abroad should complete this form by the third day of class.
   - The address you provide must be a physical address and not a P.O. box. Lab kits are sent via UPS, which is unable to deliver to a P.O. box.
2. Via a link on your course homepage near the top right, where you can fill in your address. This link will be available until the drop date for the semester.
You only need to submit your address one time.

- Lab kits are ordered 3 days following the drop date and take approximately 10 business days in transit.
- If you do not receive your lab kit tracking information at your student.cccs.edu email account within one week after the drop date, please contact your instructor and she/he will assist you. (Make sure to check your spam folder before contacting the instructor and bookstore.)
- Once the kits are ordered, your instructor will tell you the specific date to contact her/him if you have not received your lab kit by that date.
- If you do not receive your lab kit due to an old or inaccurate mailing address, there will be no deadline extensions for lab assignments. CCCOnline is not responsible for delays or lost lab kits due to customs or APO processing.

Students must perform lab experiments from the lab kit provided to fulfill grade requirements. Each student is responsible for performing each experiment independently: **no sharing of lab kits.** It is the student’s responsibility to ensure that he or she has all needed materials for this course.

A 400-600X microscope as well as a few supplemental materials must be supplied by you as specified in individual labs. Review the following microscope suppliers and select the best deal for you:

1. **Your college bookstore** - Bookstore contact information is available [here](link opens in new window).
2. **Hands-On Learning** -
   - Go to [Hands-On Learning](link opens in new window), select ORDER in the upper right
   - Use the following credentials to login at >ORDER HERE<
     - login: c006104, password: labpaq (all lowercase letters), Select Microscope
3. **Rocky Mountain Microscope** ([link opens in new window]) -
   - RMMC@RockyMountainMicroscope.com or call (970) 484-0307
4. **Online sources**
   - Retailers such as Amazon, eBay, or medical supply companies
THE HAZARDS OF PERFORMING LABS WITH A USED OR EXPIRED LAB KIT:

1. Lab kits acquired prior to this current semester may be out of date and lack appropriate materials due to updates in the lab manual or contents. (If you do not have a complete materials list for a particular lab, your grade for that lab will be adversely affected. The student is responsible for ensuring they have all materials required for any particular lab.)
2. Used kits may contain materials that are expired and create a safety hazard.
3. Used kits may contain parts that have been recalled for safety purposes.
4. Used kits are not covered by the Terms and Conditions or User Agreement of the manufacturer; thus, used kits are a liability issue.

The student takes full responsibility for any hazards from lab experiments performed with a used or expired lab kit.
COURSE COMPETENCIES AND OUTCOMES

STUDENT COMPETENCIES

The competencies you will demonstrate in this course are as follows:

A. Recognize terminology, specific facts, experimental methodologies, and general concepts related to evolution, classification, structure and function in plants and animals, and ecology.
B. Read, analyze and apply the concepts learned to interpret new situations.
C. Distinguish between the principles and purposes of procedures and techniques introduced in the laboratory.
D. Inspect the role of research in the biological sciences and become aware of its impact on society.
E. Employ the scientific method to the extent of formulating a hypothesis, designing a set of experiments with controls, analyzing results, and deriving conclusions.
F. Experience the scientific method by examining current and/or classical research.
G. Demonstrate the ability to select and apply contemporary forms of technology to solve problems or compile information.
H. Write and speak clearly and logically in presentations and essays.

The module outcomes that will permit you to demonstrate course competencies are:

MODULE 1

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Competencies</th>
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</thead>
<tbody>
<tr>
<td>1 Define an organization and what separates living from nonliving things.</td>
<td>A, B</td>
</tr>
<tr>
<td>2 Describe how species, and populations within those species, change over time at both ecological and genetic levels.</td>
<td>A, B</td>
</tr>
<tr>
<td>3 Explain how evolution is used to understand the history of living organisms through phylogeny.</td>
<td>A, B</td>
</tr>
<tr>
<td>4 List the levels of biological organization, and consider how they relate to our current understanding of phylogenetics.</td>
<td>A, B</td>
</tr>
<tr>
<td>5 Explore how researchers have studied and continue to study mechanisms of speciation and population evolution in the field and laboratory.</td>
<td>D, F, G</td>
</tr>
<tr>
<td>6 Recall evolutionary mechanisms to identify evolutionary processes in real or simulated biological systems.</td>
<td>C, E</td>
</tr>
<tr>
<td>7 Explore evolutionary processes, including the evolution and origin of species, the evolution of populations, and the phylogenies and history of life.</td>
<td>A</td>
</tr>
</tbody>
</table>
## Module 2

### Outcomes
1. Recognize the differences between viruses, bacteria, archaea, and eukarya (protists, plants, animals, fungi), as well as their evolutionary relationships.  
2. Define the characteristics of a living organism.  
3. Reflect on the relationship between biological complexity and the value, successfulness, and importance of an organism.  
4. Recall the defining characteristics of protists, plants, animals, and fungi, while examining real and simulated examples of each.  
5. Reflect on and critically evaluate labs that are performed to evaluate wherein learning can be applied in new situations.

### Competencies
- A
- A
- A, B, G, H
- C, E
- B, H

## Module 3

### Outcomes
1. Recall the major plant groups, their defining characteristics, and their evolutionary relationships.  
2. Describe the adaptations that allowed plants to colonize land and the challenges that helped select for these traits.  
3. Compare structure and physiology between the major groups of plants.  
4. Explore what it means to be a plant and the roles plants play in ecosystems across the globe.  
5. Identify the parts of flowers, fruits, and seeds and how they all work together.  
6. Reflect on the ways in which photosynthesis and plant evolution impacted life on Earth.  
7. Discuss connections between the colonization of land by plants, global CO2 levels, and climate change.  
8. Reflect on and critically evaluate labs that are performed to evaluate wherein learning can be applied in new situations.

### Competencies
- A
- A, B, D, F
- A, C, E, G
- A, B, D, F
- A, B, C, E
- A, B, D, F, G
- A, B, D, F, G, H
- B, H

## Module 4

### Outcomes
1. Explore what makes an animal different from the other living organisms we have already studied.  
2. List the major invertebrate phyla, and explain how they address the challenges of life faced by all living organisms.  
3. Recall the main vertebrate phyla, and know the major features that are used to distinguish them from each other.  
4. Review the primary evolutionary relationships of animals, and discuss why researchers still disagree about these relationships.  
5. Discuss how human beings fit into the rest of the animal kingdom.  
6. Observe animal development and/or morphology, and design experiments to elucidate the function of various animal systems or behavior.  
7. Examine the process of research in the biological sciences: who does research and how the results are interpreted and communicated.  
8. Reflect on and critically evaluate labs that are performed to evaluate wherein learning can be applied in new situations.

### Competencies
- A
- A
- A
- A, B, D, F, G
- A, B, E, F, G
- C, E
- B, D, G, H
- B, H
**Module 5**

**Outcomes**

1. Recall the basic roles living organisms play in communities and ecosystems and how they interact with each other.
2. Explore how ecological processes scale up from the activity of individuals in local ecosystems to regional and global scales.
3. Examine biomes and the role they play in understanding ecosystems around the globe.
4. Explore the relationship between evolutionary and ecological processes.
5. Recall ecological processes and descriptors to examine ecology in real and simulated systems.
6. Explore the concept of ecosystem services, and explain how it can help place value on ecosystems for humans.
7. Examine the roles humans typically play in the ecosystems in which we live.
8. Examine the research process in organismal biology, and interpret and present your findings.
9. Reflect on and critically evaluate labs that are performed to evaluate wherein learning can be applied in new situations.

**Competencies**

- A
- A, B, D, F, G
- A, B
- A, B
- C, E
- A, B, D, F, G, H
- A, B, D, F
- B, D, G, H
- B, H
GRADING AND EVALUATION

METHODS

The methods for evaluation include a combination of evaluating discussion participation, labs, and assignments. Rubrics will be provided for the evaluation. Information on accessing rubrics is provided on the Course Rubrics page in the Syllabus module of the course content.

This page summarizes all of the graded assignments for the course. You should print it out and post it somewhere that is easily accessible.

This course is not self-paced and is not open-exit. All work is to be completed before 11:59 p.m. MST/MDT on the due date listed on the Course Schedule page.

GRADING POLICIES

Mark all module due dates on your calendar for this class. You may submit assignments ahead of schedule. Assignments, discussions, and labs will be given throughout the term with set due dates. See the Course Schedule page for these dates, and make note of them in your calendar. The instructor will communicate any changes to these due dates to the class.

Your final grade in this course will be based on the total points that you earn. The grades are final and non-negotiable. They are a measure of your own aptitude and effort. It is expected that you will accept your own performance as an integral part of yourself.

DEADLINES

This course is not designed to be self-paced. Within the schedule of the course, though, you have great flexibility with your study time. For the most part, the course is organized according to the week of the semester. Assignments and labs are spread throughout the course, and they have specific deadlines; you must submit each assignment before its deadline expires. If you have an emergency resulting in a missed due date, contact your instructor as soon as possible. No late work is accepted in this course (except in the case of documented emergencies, such as a doctor’s note, military papers, etc.). Due dates will be enforced. Please remember, due to the nature of an online course, it is the student’s responsibility to have access to a functioning computer in order to complete the coursework. Late assignments will not be accepted without prior approval.

It is strongly recommended that you do not wait until the last minute to complete or submit assignments. There are many things that can and do go wrong: your internet connection might go down, your computer’s hard drive may crash, or you may get ill. You are welcome (and encouraged) to work ahead of schedule to submit work before it is due. Please contact your instructor if you have any
questions about what is being asked in any assignment or discussion question. The goal here is learning. Keep that in mind, and enjoy the course.

**COMMUNICATING DIFFICULTIES/ABSENCES**

It is your responsibility to contact the instructor in a timely manner if you become ill or have scheduling or computer problems that would keep you from participating in course activities for an entire week.

**KEEP A COPY OF ALL SUBMISSIONS**

Be sure to save copies of everything you send to the instructor, including both emails and assignments. Murphy's Law of the Computer seems to be that what can go wrong, will.

**SUMMARY OF GRADING**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Student Icebreaker Discussion (1 @ 5 points)</td>
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<tr>
<td>Discussions (5 @ 15 points each)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Think About It! Discussions (4 @ 5 points each)</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Project (1 @ 50 points)</td>
<td>50</td>
<td>5%</td>
</tr>
<tr>
<td>Quizzes (3 @ 50 points each)</td>
<td>150</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm and Final (2 @ 150 points each)</td>
<td>300</td>
<td>30%</td>
</tr>
<tr>
<td>Lab Activities (12 @ 30 points each; 1 lab report @ 40 points)</td>
<td>400</td>
<td>40%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,000</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Grading Scale**

A = 90 to 100%  B = 80 to 89%  C = 70 to 79%  D = 60 to 69%  F = 59% and below

**DISCUSSIONS**

1. You have two types of discussions per module. In the first discussion, you will look at a topic from the broader module in more detail. You will answer some questions, provide some opinions, and then back up those opinions, all in order to understand these biological concepts more deeply. All references must be cited using APA Style. Please refer to the CCCOnline APA Citation Toolkit.

2. In your Think About It! discussions, you will use notes taken on difficulties, surprises, or things that went right during the completion of your lab kits. You will post these reflections and help your peers out by responding to their posts.
3. In each discussion, it is expected that you post an initial post and at least two follow-up posts. Initial posts should be made by the third day of the discussion opening to allow time for interaction. Response posts should be made on at least two separate days. Initial discussion posts should have a minimum length of 150 words, and response posts should be a minimum of 50 words each. However, do not aim to do the minimum; a strong grade is earned by going above and beyond the minimum.

4. Discussions are a very important part of this class experience and cannot be made up after each week's discussion ends. Discussions are where we examine unique and interesting applications of course content, and students will benefit from other class members' contributions and questions.

ASSIGNMENTS

LAB KITS

1. You will complete the Lab Kit assignments that are loaded in D2L for each module. You will compile all worksheets and any questions into one Word document, and you will turn in one document to the assignment folder for each lab. Please only load one file per lab.

2. For Lab 6: Kingdom Plantae: Simple Plants and Gymnosperms, you will complete a brief lab report. Your report will include the following: Abstract; Introduction (includes your hypothesis predicting what you think you will learn by conducting the experiment); Materials and Methods; Results (worksheets); Discussion; Conclusions (explain what you learned and whether your hypothesis correctly predicted what you would learn); and any possible references. The purpose is for you to briefly summarize each lab in the format of a formal lab report to demonstrate an understanding of what you learned during the experimental processes you conducted. The lab report should also have attached the worksheets of your answers for each exercise. See the rubric for specific grading details.

3. Be sure to review the grading rubrics for the labs before you submit your lab assignments to the D2L folder.
ASSSESSMENTS

QUIZZES, MIDTERM, AND FINAL EXAM

The quizzes, midterm, and final exam will test your knowledge of the topics covered in all modules, with questions drawn from both the readings and the Exploration pages. Questions may cover multiple topics and require you to synthesize information and/or apply it to new situations.

The midterm will cover the Exploration pages in Modules 1-3 and the following chapters:

- Chapters 18–20
- Chapter 21: Sections 1, 2, 4
- Chapter 22: Sections 1, 2, 3, 5
- Chapter 23: Sections 1, 2, 4
- Chapter 24: Sections 1, 3, 4, 5
- Chapters 25, 26, 30, and 32

The final will cover the Exploration pages in Modules 1-3 and the following chapters:

- Chapters 27–29
- Chapters 44–47

PROJECT

Your project will be assessed during Modules 4 and 5. Do not wait until Module 5 to start work on the project because you will need to spend 30 hours on the project. The purpose of this project is to challenge your understanding of the way scientific research is done, as well as stretch your reading, research, and interpretive skills by examining a real-life scientific study. You will also prepare a presentation on your topic and provide feedback to your classmates on theirs.

1. You will need to conduct research online and through the CCCOnline Library to complete this project.

2. All references in your reports must be cited using APA Style. Please refer to the CCCOnline APA Citation Toolkit.

3. All answers should be in complete sentences.
4. You can conduct research through the CCCOnline Library. If you go to the Library's [Research and Database resource page](#) and click *Biology*, you will see the many resources pertaining to biology to which the Library has access. Also, you can explore the [curated resources](#) that have been prepared specifically for the biology classes.
**Course Schedule (15 Week)**

The schedule is subject to change as needed.

This page summarizes all of the graded assignments, exams, and reading assignments for the course. If you want, you can print it out and post it somewhere handy.

All assignments are described in detail on the module assignment pages. If you have questions, check there and/or send the instructor an email.

**This course is not self-paced and is not open-exit.** All assignments, labs, quizzes, discussions, etc., are to be completed by no later than 11:59 p.m. MST/MDT of the due date.

NOTE: Important CCCOnline semester dates (e.g., drop/withdraw/term end) appear on the [CCCOnline Calendar](#).

### Module 1

<table>
<thead>
<tr>
<th>Reading/Assignments/Exams</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read Module 1 General College Biology II Reading Packet, Chapters 18–20</td>
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<tr>
<td>Exploration of Evolutionary Processes</td>
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<tr>
<td>Student Icebreaker Discussion</td>
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<tr>
<td>Discussion 1: What Is a Species?</td>
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<tr>
<td>Module 1: Quiz</td>
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<tr>
<td>Lab 1: Introduction to Evolution</td>
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<td>Lab 2: The History of the Theory of Evolution</td>
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<td>Lab 3: The Evolutionary Process</td>
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</tbody>
</table>

### Module 2

<table>
<thead>
<tr>
<th>Reading/Assignments/Exams</th>
<th>Due Dates</th>
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</thead>
<tbody>
<tr>
<td>Read Module 2 General College Biology II Reading Packet</td>
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<tr>
<td>• Chapter 21: Sections 1, 2, 4</td>
<td></td>
</tr>
<tr>
<td>• Chapter 22: Sections 1, 2, 3, 5</td>
<td></td>
</tr>
<tr>
<td>• Chapter 23: Sections 1, 2, 4</td>
<td></td>
</tr>
<tr>
<td>• Chapter 24: Sections 1, 3, 4, 5</td>
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<tr>
<td>Exploration of Biological Diversity</td>
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<tr>
<td>Discussion 1: Biological Complexity and Value: Are More Complex Organisms Better?</td>
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<tr>
<td>Discussion 2: Think About It!</td>
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<tr>
<td>Module 2: Quiz</td>
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<tr>
<td>Lab 4: Natural Selection: Hardy Weinberg</td>
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</tbody>
</table>
MODULE 3

Reading/Assignments/Exams
Read Module 3 General College Biology II Reading Packet, Chapters 25, 26, 30, and 32
Exploration of Plant Diversity
Discussion 1: Plants, Energy, and Changes on a Global Scale
Discussion 2: Think About It!
Module 3: Midterm Exam
Lab 5: Taxonomy of Living Things
Lab 6: Kingdom Plantae: Simple Plants and Gymnosperms
Lab 7: Kingdom Plantae: Angiosperms

MODULE 4

Reading/Assignments/Exams
Read Module 4 General College Biology II Reading Packet, Chapters 27–29
Exploration of Animal Diversity
Discussion 1: The Animal in the Human Suit
Discussion 2: Think About It!
Module 4: Quiz
Lab 8: Kingdom Animalia: Invertebrates
Lab 9: Kingdom Animalia: The Protostomes
Lab 10: Kingdom Animalia: The Deuterostomes
Lab 11: Kingdom Animalia: Class Mammalia

MODULE 5

Reading/Assignments/Exams
Read Module 5 General College Biology II Reading Packet, Chapters 44–47
Exploration of Ecology
Discussion 1: Ecosystem Services
Discussion 2: Think About It!
Module 5 Project Assignment: Part 2, The Presentation: How Science Gets Done
Module 5: Final Exam
Lab 12: Population Ecology
Lab 13: Carbon Footprint and Sustainable Living

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