

## BIOLOGICAL DIVERSITY (BIOL1221-1223)

### “Endless Forms Most Beautiful”

*“There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; that, whilst this planet has gone cycling on; from so simple a beginning, endless forms most beautiful and most wonderful, have been, and are being evolved.”*

~Charles Darwin, 1859

#### **PLACE AND TIME:**

Lecture (Science Bldg, Rm 11)

Monday & Thursday, 10:00-11:15AM

Laboratory (Science Bldg, Rm 3)

Check your schedule

- Section 31: Monday, 1:00PM - 3:30PM
- Section 32: Thursday, 9:30AM - 12:00PM
- Section 34: Wednesday, 1:00PM - 3:30 PM
- Section 37: Tuesday, 10:00 AM - 12:30 PM
- Section 62: Wednesday, 5:00PM - 7:30 PM
- Section 63: Tuesday, 5:00PM - 7:30 PM
- Section 64: Monday, 5:00PM - 7:30 PM

Recitation (Science Bldg, Rm 11)

Check your schedule

- Section 31: Wednesday, 9:30AM-10:20AM
- Section 32: Wednesday, 10:30AM-11:30AM
- Section 33: Wednesday, 11:30AM-12:30PM

**IMPORTANT: Make sure you are assigned to a lecture, laboratory, and a recitation section.**

#### **DIGITAL OFFICE HOURS:**

Monday & Thursday: 11:30-1:00PM

#### **COURSE INSTRUCTOR:**

Dr. Elise Morton

Office: West Cottage Room 10

E-mail: [elisemorton@fdu.edu](mailto:elisemorton@fdu.edu)

#### **COURSE WEBSITE:**

<http://webcampus.fdu.edu>

#### **TEXTBOOK:**

**NO textbook is required for this course.** However, for reference, you can use the reading list in the tentative syllabus schedule below, which references Campbell Biology (editions 9-11).

#### **TOP HAT:**

We will be using the Top Hat Pro ([www.tophat.com](http://www.tophat.com)) which you will be required to purchase for one semester for \$30. We will be using this platform to facilitate your learning and engagement and assess your understanding of the course material. Specifically, you will be able and required to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message.

- For instructions on how to create a Top Hat account and enroll in our Top Hat Pro course, please refer to the invitation sent to your school email address or consult Top Hat's Getting Started Guide (<https://bit.ly/31TGMLw>).
- If you are new to Top Hat, go to <https://app.tophat.com/register/student> and search for our course with the following join code: **503190**

- If you already have a Top Hat account, go to <https://app.tophat.com/e/503190> to be taken directly to our course.
- Should you require assistance with Top Hat at any time, please contact their Support Team directly by way of email ([support@tophat.com](mailto:support@tophat.com)), the in-app support button, or by calling 1-888-663-5491. Specific user information may be required by their technical support team when troubleshooting issues.

### **LEARNING OUTCOMES:**

This course is designed to meet the information literacy, and critical thinking learning outcomes of Becton College. In addition, this course is designed to meet the following learning outcomes of the BS in Biology program, as set forth by the Department of Biological and Allied Health Sciences, FDU, Florham Campus. Both learning outcomes will be assessed with exams.

- Gain knowledge of biological concepts (which are globally applicable to the study of biological systems across scales of life)
  - Understand the taxonomic relationships between organisms
  - Examine the diversity of life from the microscopic to the macroscopic level
- Possess information literacy
  - Be able to locate and access appropriate sources of information relevant for this course
- Use the scientific method
  - Generate hypotheses, conduct experiments, analyze data, draw conclusions
- Communicate science
  - Discuss and evaluate biological data and experimental observations using the appropriate terminology
  - Become proficient in communicating biological concepts both verbally and in writing

*\*These outcomes will be evaluated by weekly assignments, quizzes, and exams*

### **COURSE GOALS:**

Biology 1221 is the first of two courses that introduce the central principles of the biological world. It is intended for both biology majors and students who are studying a closely related field.

By the end of the semester, students will:

- Have a thorough understanding of the fundamental concepts of evolution, ecology, and the diversity of life;
- Be able to apply those fundamental concepts to real world examples;
- Understand how organisms diversify, know the basic forms of life, and know what defines them; and
- Be able to exercise critical thinking when presented with new or familiar information.

Real-world applications will be presented on each of the major concepts, and you will explore these ideas through a combination of in-class activities, supplemental readings, and homework assignments. Periodic exams will also focus on the application of these concepts and are intended to evaluate your learning progress throughout the course.

## **HELPFUL TIPS FOR STUDENTS:**

1. **Attend and actively participate** in class. Arrive before the time each class is scheduled to begin to ensure that you are on time.
2. **Ask questions!** If you need clarification, ask your colleagues, consult other resources (e.g. textbooks) and/or the instructor.
3. Take thorough and organized **notes**. Review them after and before each class.
4. Keep up with the **readings**. Read actively (i.e., Ask yourself - Does this all make sense? Could I explain this to someone else?).
5. If you **miss a class**, get lecture notes from a colleague shortly after your absence.
6. Attendance is required and in-class activities, participation, and quizzes will be a substantial part of your grade (see below). There will be no make-ups for missed in-class activities, etc. unless you have a valid excuse (see below for policy). You will need to contact the instructor if you need to miss an exam due to an emergency situation. In addition, I would also encourage you to contact both your team members, and me, when you do miss a class.
7. Form a **study group**. This will allow you to explain your thoughts and clarify them, which is an important way to learn.
8. Come to class mentally prepared to learn and be engaged each day.
9. **Don't wait until the last minute to study** for the exam.

## **CLASS POLICIES FOR LECTURE AND LAB:**

1. Lecture, recitation, and laboratory attendance is **required**.
2. Excused absences **require documentation** which may include a doctor's note or a letter from the Dean of Students.
3. In the case of illness, notification of your instructor via email is required at least **two hours** before class. For any scheduled school or sports trips, proper documentation must be provided **within the first two weeks of the semester** in order for the absence to be excused.
4. Make-up exams must be completed within one week of the excused absence.
5. Assignments must be turned in on-time. Late assignments will be penalized at 10% per day and after five days, assignments will no longer be accepted.
6. If you miss a laboratory, it will affect your laboratory grade (which makes up 40% of the total grade for the course).
7. You will be required to use electronic devices for answering TopHat questions, quizzes, and exams. However, use of any electronic device for any purpose unrelated to this class is not permitted and will result in zero participation points.

## **COVID-19 SAFETY POLICIES:**

1. In accordance with University policies regarding COVID-19 safety measures, **face masks are required at all times**. As long as this requirement is in effect, any student who does not comply with this policy will be asked to leave the classroom and will be reported to the Dean of Students. To protect the health and well-being of all students, instructors reserve the right to terminate any class session during which any student or students fail to comply with the University-wide face mask requirement.
2. You will be assigned a seat at the beginning of class and you must sit in this seat during the entire semester. This is important for contact tracing in the case of a positive COVID-19 test.

## **LEARNING ENVIRONMENT:**

In this course, you will be given the opportunity to explore organismic biology, you will be introduced to core concepts in evolution and ecology, and you will learn about the marvelous biological diversity observed on this planet. In the **collaborative case-based teaching environment** of this course, lectures and supplemental readings and assignments are intended to function as a guiding tool to apply concepts and information to the “real world”. Thus, this course will give you the opportunity to actively engage with the course material while learning to critically evaluate scientific knowledge. Case studies will be presented throughout the course and are usually solved through collaboration with your colleagues. Periodic exams will evaluate your learning progress throughout the course and will focus primarily on the application of key concepts.

## **LEARNING ASSESSMENT:**

### **BIOL 1221: Lecture** (50% of final grade)

Exams 1-3: 100 points each (300 points total)

Final Exam (cumulative): 100 points

Participation [assignments, participation/engagement, and attendance]: 70 points

iNaturalist (more information will be provided; due end of semester): 30 points

### **BIOL 1222: Laboratory** (40% of final grade)

Quizzes/Post-lab Homework/Activities

\* See lab syllabus for more information

### **BIOL 1223: Recitation** (10% of final grade)

Attendance, assignments, worksheets, activities, and quizzes: ~100 points

### **FINAL GRADES** (Lecture, Lab, & Recitation combined)

$\geq 93\%$  = **A** |  $90-92.99\%$  = **A-** |  $87-89.99\%$  = **B+** |  $83-86.99\%$  = **B** |  $80-82.99\%$  = **B-**

$77-79.99\%$  = **C+** |  $73-76.99\%$  = **C** |  $70-72.99\%$  = **C-** |  $60-69.99\%$  = **D** |  $<60\%$  = **F**

## **ACADEMIC INTEGRITY:**

Academic integrity requires that all academic work be wholly the product of an identified individual or individuals. Collaboration is only acceptable when it is explicitly acknowledged. Ethical conduct is the obligation of every member of the University community, and breaches of academic integrity constitute serious offenses. Since a lack of integrity hinders the student’s academic development, it cannot be tolerated under any circumstances. Violations include but are not limited to: cheating, fabrication, plagiarism, and denying others access to information or material. **Any plagiarized work will receive zero points (which also includes exams) and, without any exceptions, you will be reported to the Dean of Students.** Additional sanctions as described in the student handbook may also be applied.

## **ACADEMIC ACCOMODATIONS:**

Any student with documented medical, psychological or learning disabilities, who feels they may need in-class academic adjustments, reasonable modifications, and/or auxiliary aids and services while taking this course, should first contact the Disability Support Services (DSS) to discuss their specific needs. At the Florham Campus, including the School of Pharmacy and study abroad programs, contact the Director of Disability Support Services at 973-443-8079. At the Metropolitan Campus, online and off-campus programs,

contact the Director of Disability Support Services at 201-692-2076. For Vancouver Campus, contact the Deputy Campus Executive at 604-648-4463. Once the academic adjustments, modifications, or auxiliary aids and services are approved by DSS, make an appointment to see the professor.

**\*It is your responsibility to arrange such accommodations AT LEAST ONE WEEK BEFORE an exam.**

**INCLUSIVITY STATEMENT:**

Education as a transformative and intellectual inquiry is the foundation of a democratic society. Although the scientific process aims for objectivity, a great deal of science reflects the priorities, perspectives, implicit and explicit biases of a small subset of privileged voices. This is historically true, and it is still true today. Recognizing this reality and advocacy for social equality must be central to our mission as educators. In this class, I strive to model critical-thinking, self-reflection, advocacy, and respect for all racial, ethnic, and cultural minorities, immigrants, members of the LGBTQ+ community, and people of all religious faiths. I deeply value your participation in this process and welcome any and all feedback regarding the content of this course and how it can be improved to meet the goal of diversity, inclusion, and equal representation in science and education.

**Biological Diversity Tentative Lecture Schedule**  
(Chapters refer to Campbell Biology, 9<sup>th</sup>-11<sup>th</sup> editions)

**Week 1:**

Monday, August 23: Introduction, The Organization of Life – Chapter 1  
Thursday, August 27: Darwin and Natural Selection I – Chapters 22, 23

**Week 2:**

Monday, August 30: Darwin and Natural Selection II – Chapters 22, 23  
Thursday, September 2: Evolutionary Forces & Hardy-Weinberg Equilibrium – Chapters 22, 23

**Week 3:**

Monday, September 6: **LABOR DAY**  
Thursday, September 9: Speciation – Chapters 22, 24

**Week 4:**

Monday, September 13: Phylogenies and the Tree of Life – Chapters 24, 26  
Thursday, September 16: **EXAM #1**

**Week 5:**

Monday, September 20: Prokaryotic Life: Bacteria and Archaea – Chapter 27  
Thursday, September 23: Protists I – Chapter 28

**Week 6:**

Monday, September 27: Protists II / Early Plant Life – Chapters 28 & 29  
Thursday, September 30: Early Plant Life / Evolution of Seed Plants – Chapter 30

**Week 7:**

Monday, October 4: Evolution of Seed Plants / Plant Form and Function I – Chapters 29 & 35  
Thursday, October 7: Plant Form and Function II/Fungi I – Chapter 35-38

**Week 8:**

Monday, October 11: **FALL BREAK**  
Thursday, October 14: Fungi II – Chapter 31

**Week 9:**

Monday, October 18: **EXAM #2**  
Thursday, October 21: Overview of Animal Diversity and Animal Development I – Chapters 32 & 47

**Week 10:**

Monday, October 25: Animal Development II – Chapters 32 & 47  
Thursday, October 28: Invertebrates I: Sponges, Cnidarians – Chapter 33

**Week 11:**

Monday, November 1: Invertebrates II: Lophotrochozoa – Chapter 33  
Thursday, November 4: Invertebrates III: Lophotrochozoa (cont) – Chapter 33

**Week 12:**

Monday, November 8: Invertebrates IV: Ecdysozoa – Chapter 33  
Thursday, November 11: Invertebrates V: Ecdysozoa (cont) – Chapter 33

**Week 13:**

Monday, November 15: **EXAM #3**  
Thursday, November 18: Echinodermata and Invertebrate Chordates – Chapters 33 & 34

**Week 14:**

Monday, November 22: Vertebrates I: Fish – Chapter 34

Thursday, November 26: **THANKSGIVING BREAK**

**Week 15:**

Monday, November 29: Vertebrates II: Amphibians & Reptiles (including Birds) – Chapter 34

Thursday, December 2: Vertebrates III: Reptiles (including Birds) – Chapter 34

**Week 16:**

Monday, December 6: Vertebrates IV: Mammals – Chapter 34

**FINAL EXAM: Thursday, December 9<sup>th</sup>, 11:00AM**

**Tentative Recitation Schedule**

Wednesday, August 26 – Diversity & Genetics

Wednesday, September 1 – Hardy Weinberg, Speciation

Wednesday, September 8 – Phylogenies

Wednesday, September 15 – Review for Exam 1

Wednesday, September 22 – Review Exam 1

Wednesday, September 29 – Plants and alternation of generations

Wednesday, October 6 – Fungi life cycle

Wednesday, October 13 – Review for Exam 2

Wednesday, October 20 – Review Exam 2

Wednesday, October 27 – Animal Development

Wednesday, November 3 – Invertebrate Life

Wednesday, November 10 – Review for Exam 3

Wednesday, November 17 – Review Exam 3

Wednesday, November 24 – THANKSGIVING BREAK

Wednesday, December 1 – Vertebrates & Review