

Course Prefix/Number/Title: BIOL 150 General Biology I

Number of Credits: 4

Course Description:

A two-semester sequenced study of the fundamental topics of biology, with an emphasis on cellular biology. Topics Include: bioenergetics, cell structure, physiology principles, genetic function and inheritance.

Pre-/Co-requisites: None

Course Objectives:

Demonstrate an understanding and proficiency in the following:

1. Understand cellular and viral structure and function.
2. Understand fundamental biochemical principles.
3. Understand rudimentary classical genetics.
4. Understand rudimentary molecular genetics and have a familiarity with various DNA technologies.
5. Use knowledge about mechanisms of cellular and molecular processes.

Instructor: Dr. Jessica Guerrero

Office: Virtual/Online

Office Hours: By Appointment

Phone: N/A

Email: jessica.guerrero@dakotacollege.edu

Lecture/Lab Schedule:

Lecture: ONLINE

Lab: ONLINE

Textbook(s):

- Connect Access Card with eBook. Biology. Raven, et al. 2019. 13th Edition. ISBN: 9781259188138
- Student lecture slides may be available on the course page.

Course Requirements:

A = 100-90%

B = 89.5-80%

C = 79.5-70%

D = 69.5-60%

F = below 59.5%

*Please do not request bonus points, rounding of a grade, or a grade change. If there is an opportunity for extra points you will be notified. If you have an 89.49 in Blackboard that does not constitute an 89.5.

Below is a table of course requirements. This is subject to slight modification based on the discretion of the instructor.

| Lecture and Lab Requirements | Total |
|------------------------------|-------|
| Orientation Assignments | 130 |
| Module 1 (includes labs) | 560 |
| Module 1 Exam | 100 |
| Module 2 (includes labs) | 640 |
| Module 2 Exam | 100 |
| Module 3 (includes labs) | 645 |
| Module 3 Exam | 100 |
| Module 4 (includes labs) | 655 |
| Module 4 Exam | 100 |
| Course Project | 100 |
| | |

Tentative Course Outline:

Lecture Outline:

- **Exam 1:** Introduction to Biology, Chemistry, Biomolecule
- **Exam 2:** Energy, Cells, Membranes
- **Exam 3:** Photosynthesis, Cellular Respiration, Mitosis, Meiosis
- **Exam 4:** DNA, Protein Synthesis, Genetics

*For a schedule of academic deadlines please reference the academic calendar on the DCB Website at: <https://www.dakotacollege.edu/academics/academic-calendar>.

General Education Competency/Learning Outcome(s) OR CTE Competency/Department Learning Outcome(s):

- Competency 1: Identifies the interrelationships between humans and their environment.
 - o Learning Outcome 1: Applies scientific methods of inquiry.
 - o Learning Outcome 3: Applies scientific information in everyday life.

Relationship to Campus Focus:

- Class announcement/discussion on news items about technological developments in biology and how that influences the discipline as well as the societal aspects.
- Covers DNA analysis, genetic engineering, and DNA fingerprinting.

- Knowledge of cell structure and function related to microscope development discussed.
- Interject technological developments and how they influence scientific development and societal issues.

Classroom Policies:

- Participation is required in class.
- All exams require Connect Proctoring at the cost of the student. If Connect Proctoring flags your exam attempt for cheating, it will be reviewed by myself and a grading decision will then be made
- Excused absences will be for only the following reasons and still need to be discussed with me via email, text, or phone call: sickness with a doctor's note must be emailed to me, passing of a close family member, if you're an athlete and need to miss class for a game.
- All requests for absences need to be reported to me immediately. If you do not let me know why you have missed a class or discuss with me in advance your participation for that day will result in a ZERO. You need to make advanced arrangements with me—the SOONER THE BETTER. You need to speak with me if you know you will be gone so we can schedule make-up assignments.
- **Missing Exam/Late Policy:** If you know you will be gone during an exam day you need to let me know THREE days in advance. If you miss an exam and I am not aware that you were going to miss it then your grade for that exam will result in a ZERO. There will be no make-up exams for those who do not inform me of their absences on exam days. If you show up late for an exam you are limited to the time period of the class. You will be required to turn in your exam at the close of the course.
- **Blackboard Policy:** You are responsible for checking blackboard and doing coursework on blackboard for this class. If you do not do the assignments on blackboard you will get a ZERO for those assignments. Blackboard assignments must be completed by the time and date indicated by each assignment. No late assignments accepted. If you are going to be absent complete the assignment prior to your absence.
- **Electronic Device Policy:** You cannot be wearing, possessing, using, or harboring any smart technology during ANY exam.

Student Email Policy:

Dakota College at Bottineau is increasingly dependent upon email as an official form of communication. A student's campus-assigned email address will be the only one recognized by the Campus for official mailings. The liability for missing or not acting upon important information conveyed via campus email rests with the student.

Academic Integrity:

According to the DCB Student Handbook, students are responsible for submitting their own work. Students who cooperate on oral or written examinations or work without authorization share the responsibility for violation of academic principles, and the students are subject to disciplinary action even when one of the students is not enrolled in the course where the violation occurred. The Code detailed in the Academic Honesty/Dishonesty section of the Student Handbook will serve as the guideline for cases where cheating, plagiarism, or other academic improprieties have occurred.

Disabilities or Special Needs:

Students with disabilities or special needs (academic or otherwise) are encouraged to contact the instructor and Disability Support Services.

You must inform me that you have testing accommodations THREE days prior to each exam. It is your responsibility to schedule your exam in the testing center for proctoring.

Title IX:

Dakota College at Bottineau (DCB) faculty are committed to helping create a safe learning environment for all students and for the College as a whole. Please be aware that all DCB employees (other than those designated as confidential resources such as advocates, counselors, clergy, and healthcare providers) are required to report information about such discrimination and harassment to the College Title IX Coordinator. This means that if a student tells a faculty member about a situation of sexual harassment or sexual violence or other related misconduct, the faculty member must share that information with the College's Title IX Coordinator. Students wishing to speak to a confidential employee who does not have this reporting responsibility can find a list of resources on the DCB Title IX webpage.

CONTENT OUTLINE:

Orientation Assignments

| Assignment | Points | Due Date |
|---|--------|----------|
| Review Course Syllabus | - | |
| Email Etiquette Agreement | 10 | |
| Honor Code Agreement: Plagiarism and Collusion | 10 | |
| Discussion Board Etiquette | 10 | |
| McGraw-Hill: Connect Orientation Videos | 10 | |
| McGraw-Hill: SmartBook 2.0 Overview | 10 | |
| McGraw-Hill: Virtual Labs Orientation Videos | 10 | |
| McGraw-Hill: Fundamentals of Student Success | 10 | |
| McGraw-Hill: Fundamentals of Math and Statistics for Life Sciences | 10 | |
| McGraw-Hill: Scientific Study of Life | 10 | |
| McGraw-Hill: Chemistry of Life | 10 | |
| McGraw-Hill: Cells | 10 | |
| McGraw-Hill: Introduction to Graphing Data and Graphing Interactive | 10 | |
| McGraw-Hill: Graphing Data Interactive | 10 | |

ORIENTATION TOTAL POSSIBLE POINTS- 130

Module 1- Introduction**Chapter 1- The Science of Biology**

| Assignment | Points | Due Date |
|---|--------|----------|
| Chapter 1 SmartBook | 25 | |
| Chapter 1 Assignment | 10 | |
| Scientific Thinking in Everyday Life Relevancy Module | 10 | |
| Chapter 1 Quiz (proctored) | 40 | |

Chapter 2- The Nature of Molecules and Properties of Water

| Assignment | Points | Due Date |
|--|--------|----------|
| Chapter 2 SmartBook | 25 | |
| Chapter 2 Assignment | 10 | |
| pH and Buffers Data and Graphing Interactive | 10 | |
| Properties of Water BioNow Video Activity | 10 | |
| Chapter 2 Quiz (proctored) | 40 | |

Chapter 3- The Chemical Building Blocks of Life

| Assignment | Points | Due Date |
|---|--------|----------|
| Chapter 3 SmartBook | 25 | |
| Chapter 3 Assignment | 10 | |
| Chapter 3 Animations | 10 | |
| Molecules in Milk Data and Graphing Interactive | 10 | |
| Chapter 3 Quiz (proctored) | 40 | |

Module 1 Labs

| Assignment | Points | Due Date |
|---|--------|----------|
| LAB- 1st Lab Virtual Lab Tutorial | 20 | |
| PRE-LAB: Lab Safety | 10 | |
| LAB- Lab Safety | 20 | |
| LAB- Lab Safety Hand Washing | 20 | |
| Lab Safety Quiz (proctored) | 25 | |
| PRE-LAB: Microscope | 10 | |
| LAB- How to use a Microscope! | 20 | |
| LAB- Microscope Observation of Pond Water | 20 | |
| Microscope Lab Quiz (proctored) | 25 | |
| PRE-LAB: Macromolecules (Chemical Composition of Cells) | 10 | |
| LAB- Macromolecules- Lipids | 20 | |
| LAB- Macromolecules- Proteins | 20 | |
| LAB- Macromolecules- Starches | 20 | |
| LAB- Macromolecules- Sugars | 20 | |
| Macromolecule Lab Quiz (proctored) | 25 | |

Module 1 Exam

| Assignment | Points | Due Date |
|-----------------------------|--------|----------|
| Module 1 Exam: Introduction | 100 | |

MODULE 1 TOTAL POSSIBLE POINTS- 660

Module 2- Cells**Chapter 4- Cell Structure**

| Assignment | Points | Due Date |
|----------------------------|--------|----------|
| Chapter 4 SmartBook | 25 | |
| Chapter 4 Assignment | 10 | |
| Chapter 4 Animation | 10 | |
| Chapter 4 Quiz (proctored) | 40 | |

Chapter 5- Membranes

| Assignment | Points | Due Date |
|---|--------|----------|
| Chapter 5 SmartBook | 25 | |
| Chapter 5 Assignment | 10 | |
| Chapter 5 Animation | 10 | |
| Membrane Fluidity Data and Graphing Interactive | 10 | |
| Enzyme Kinetics Data and Graphing Interactive | 10 | |
| Chapter 5 Quiz (proctored) | 40 | |

Chapter 6- Energy and Metabolism

| Assignment | Points | Due Date |
|----------------------------|--------|----------|
| Chapter 6 SmartBook | 25 | |
| Chapter 6 Assignment | 10 | |
| Chapter 6 Animations | 10 | |
| Chapter 6 Quiz (proctored) | 40 | |

Module 2 Labs

| Assignment | Points | Due Date |
|---|--------|----------|
| LAB- Cell Lab | 20 | |
| LAB- Passive v. Active Transport Cell Membrane Lab | 20 | |
| PRE-LAB: Diffusion | 10 | |
| LAB- Diffusion Across a Selectively Permeable Membrane | 20 | |
| LAB- Diffusion- Effect of Concentration | 20 | |
| LAB- Diffusion- Effect of Density | 20 | |
| LAB- Diffusion- Effect of Molecular Weight | 20 | |
| Diffusion Lab Quiz (proctored) | 25 | |
| PRE-LAB: Osmosis | 10 | |
| LAB- Osmosis- Movement of Water Across a Selectively Permeable Membrane | 20 | |
| LAB- Osmosis- Plant Cells | 20 | |
| LAB- Osmosis- Animal Cells | 20 | |
| Osmosis Lab Quiz (proctored) | 25 | |
| PRE-LAB: Enzymes | 10 | |
| LAB- Enzyme Lab Part 1 | 20 | |
| LAB- Enzyme Lab Part 2 | 20 | |
| LAB- Enzyme Lab Part 3 | 20 | |
| LAB- Enzyme Lab Part 4 | 20 | |
| Enzyme Lab Quiz (proctored) | 25 | |

Module 2 Exam

| Assignment | Points | Due Date |
|----------------------|--------|----------|
| Module 2 Exam: Cells | 100 | |

MODULE 2 TOTAL POSSIBLE POINTS- 740

Module 3- Cellular Processes**Chapter 7- How Cells Harvest Energy**

| Assignment | Points | Due Date |
|----------------------------|--------|----------|
| Chapter 7 SmartBook | 25 | |
| Chapter 7 Assignment | 10 | |
| Chapter 7 Animations | 10 | |
| Chapter 7 Quiz (proctored) | 40 | |

Chapter 8- Photosynthesis

| Assignment | Points | Due Date |
|---|--------|----------|
| Chapter 8 SmartBook | 25 | |
| Chapter 8 Assignment | 10 | |
| Chapter 8 Animations | 10 | |
| Photosynthetic Pigments Data and Graphing Interactive | 10 | |
| Energy Part II BioNow Video Activity | 10 | |
| Chapter 8 Quiz (proctored) | 40 | |

Chapter 10- How Cells Divide

| Assignment | Points | Due Date |
|--|--------|----------|
| Chapter 10 SmartBook | 25 | |
| Chapter 10 Assignment | 10 | |
| Chapter 10 Animations | 10 | |
| Regulation of the Cell Cycle Data and Graphing Interact. | 10 | |
| Chapter 10 Quiz (proctored) | 40 | |

Chapter 11- Sexual Reproduction and Meiosis

| Assignment | Points | Due Date |
|-----------------------------|--------|----------|
| Chapter 11 SmartBook | 25 | |
| Chapter 11 Assignment | 10 | |
| Chapter 11 Animations | 10 | |
| Chapter 11 Calculations | 10 | |
| Chapter 11 Quiz (proctored) | 40 | |

Module 3 Labs

| Assignment | Points | Due Date |
|---------------------------------------|--------|----------|
| PRE-LAB: Cell Respiration | 10 | |
| LAB- Cellular Respiration Lab Part I | 20 | |
| LAB-Cellular Respiration Lab Part 2 | 20 | |
| Cell Respiration Lab Quiz (proctored) | 25 | |
| PRE-LAB: Photosynthesis | 10 | |
| LAB-Photosynthesis Lab Part 1 | 20 | |
| LAB-Photosynthesis Lab Part 2 | 20 | |
| LAB-Photosynthesis Lab Part 3 | 20 | |
| LAB-Photosynthesis Lab Part 4 | 20 | |
| Photosynthesis Lab Quiz (proctored) | 25 | |
| PRE-LAB: Cell Division | 10 | |
| LAB- Mitosis | 20 | |
| LAB- Meiosis | 20 | |
| Cell Division Lab Quiz (proctored) | 25 | |

Module 3 Exam

| Assignment | Points | Due Date |
|-----------------------------------|--------|----------|
| Module 3 Exam: Cellular Processes | 100 | |

MODULE 3 TOTAL POSSIBLE POINTS- 745

Course Project

| Assignment | Points | Due Date |
|-----------------------------|---------------|-----------------|
| Biology 150- Course Project | 100 | |

Module 4-Genetics and Inheritance**Chapter 14- DNA: The Genetic Material**

| Assignment | Points | Due Date |
|-----------------------------|--------|----------|
| Chapter 14 SmartBook | 25 | |
| Chapter 14 Assignment | 10 | |
| Chapter 14 Animations | 10 | |
| Chapter 14 Calculations | 10 | |
| Chapter 14 Quiz (proctored) | 40 | |

Chapter 15- Genes and How they Work

| Assignment | Points | Due Date |
|--|--------|----------|
| Chapter 15 SmartBook | 25 | |
| Chapter 15 Assignment | 10 | |
| Chapter 15 Animations | 10 | |
| Mutation Data and Graphing Interactive | 10 | |
| Chapter 15 Quiz (proctored) | 40 | |

Chapter 12- Patterns of Inheritance

| Assignment | Points | Due Date |
|-----------------------------|--------|----------|
| Chapter 12 SmartBook | 25 | |
| Chapter 12 Assignment | 10 | |
| Chapter 12 Animations | 10 | |
| Chapter 12 Calculations | 10 | |
| Chapter 12 Quiz (proctored) | 40 | |

Chapter 13- The Chromosomal Basis of Inheritance and Human Genetics

| Assignment | Points | Due Date |
|---|--------|----------|
| Chapter 13 SmartBook | 25 | |
| Chapter 13 Assignment | 10 | |
| Chapter 13 Animations | 10 | |
| Chapter 13 Calculations | 10 | |
| Variation on Mendelian Genetics D&G Interactive | 10 | |
| Chapter 13 Quiz (proctored) | 40 | |

Module 4 Labs

| Assignment | Points | Due Date |
|---|--------|----------|
| PRE-LAB: DNA Structure and Function | 10 | |
| LAB- DNA Structure Lab | 20 | |
| LAB- Gel Electrophoresis Lab | 20 | |
| LAB- Protein Synthesis Lab | 20 | |
| DNA Lab Quiz (proctored) | 25 | |
| PRE-LAB: Mendelian Genetics | 10 | |
| LAB- Mendelian Genetics Lab 1 | 20 | |
| LAB- Mendelian Genetics Lab 2 | 20 | |
| LAB- Mendelian Genetics Lab 3 | 20 | |
| LAB- Mendelian Genetics Lab 4 | 20 | |
| Mendelian Genetics Lab Quiz (proctored) | 25 | |
| PRE-LAB: Human Genetics | 10 | |
| LAB- Human Genetics Lab | 20 | |
| Human Genetics Lab Quiz (proctored) | 25 | |

Module 4 Exam

| Assignment | Points | Due Date |
|---|--------|----------|
| Module 4 Exam: Genetics and Inheritance | 100 | |

MODULE 4 TOTAL POSSIBLE POINTS- 755