



# Syllabus: BIO 181N

## Course Information

---

Course Title: Unity of Life I: Life of the Cell  
Course Prefix/Number: BIO 181N  
Semester: Fall 2020  
Class Days/Times: MW 2-4:45 via Zoom  
Credit Hours: 4 credit hours (3 lecture; 3 lab periods)

## Instructor Information

---

Name: Dr. Teresa Newberry  
Phone/Voice Mail: (520) 352-9972  
E-mail: [tnewberry@tocc.edu](mailto:tnewberry@tocc.edu)  
Office location: Available via Zoom or phone  
Office hours: MW 12:30-2 p.m. via Zoom <https://zoom.us/j/91708874341>

## Course Description

---

This is an introductory course for biology majors with an emphasis on the unifying molecular and cellular principles of all life on earth. It covers the principles of structure and function of living things at the molecular, cellular and organismic levels of organization including introduction to the scientific process, scientific measurements and laboratory techniques, chemistry of cells, organization of cells, metabolism, patterns of cell division, patterns of inheritance, nucleic acids, and biotechnology

## Course Prerequisites

1 year of high school Biology or BIO 100N; 1 year of high school Chemistry or CHM 121 or higher. Assessment at or completion of WRT 101 or instructor signature.

## Student Learning Outcomes

1. Explain the unity and interrelationships of life from both Western and O'odham perspective
2. Demonstrate proficiency in using the scientific method to design and conduct experiments.
3. Demonstrate proficiency in using tools for metric measurement, light microscopes, pH meters, and separation techniques such as chromatography and/or electrophoresis.
4. Explain chemical principles that govern normal cell function.
5. Describe the structure and function of cells and cellular components.
6. Describe energy production and utilization by cells.
7. Explain patterns of cell division at the molecular and cellular level.
8. Describe and apply patterns of inheritance



# Syllabus: BIO 181N

9. Explain the role of nucleic acids in cell function.
10. Describe methods and applications of biotechnology

## Course Structure

This course is an integrated lab/lecture course where the labs are integrated into the regular class periods. This course consists of three modules centered on the following themes:

### PART I: INTRO & FOUNDATIONS OF LIFE

—introduction and cell structure & function

--Units 1-3

### PART II: ENERGY OF LIFE

--how living organisms get energy

--Units 4-6

### PART III: CONTINUITY OF LIFE

--genetics and patterns of inheritance

--Units 7-10

Each module consists of multiple units and culminates in an exam. Each unit consists of PowerPoint lectures, assigned reading, films, online homework, practice quizzes, and quizzes using McGraw Hill CONNECT and labs. There will also be one discussion activity for each module to explore current topics in Biology.

This course also includes one final paper. A biographical paper on an important woman or minority scientist and their contribution to the field of genetics, cellular or molecular biology.

The course is an online, synchronous course that meets via Zoom on Mondays and Wednesdays from 2-4:45, so please make sure you are available during this time. This class meeting will include a 45-minute lecture followed by independent work either on your labs or online CONNECT homework. The last 15-minutes of the class will be a class wrap-up and discussion of our work.

## Course Learning Materials and Textbook Information

"Biology 12th Edition" By Peter Raven and George Johnson and Kenneth Mason and Jonathan Losos and Tod Duncan. It is very important to get the CONNECT 360 ISBN10: 1260494659 | ISBN13: 9781260494655 Version. This is an eBook, so you will order this directly. See CANVAS announcements on ordering details.

eScience General Biology 1 Lab Kits. These are provided free to students through a National Science Foundation grant and can be picked up at TOCC or mailed. See CANVAS for details on how to request your preferred delivery method.



# Syllabus: BIO 181N

## Course Outline

- I. Introduction to the Unity of Life
  - a. Characterization of Life—O’odham and Western perspectives
  - b. Unity and Diversity of Life—O’odham and Western perspectives
  - c. Interrelationships in Life—O’odham and Western perspectives
- II. Introduction to the Scientific Process
  - a. Steps of the scientific process
  - b. Analyzing data
  - c. Ethics of experimentation
- III. Scientific Measurements and Laboratory Techniques
  - a. Light microscopy
  - b. Metric measurements
  - c. pH meter
  - d. Spectrophotometer and/or electrophoresis
  - e. Laboratory safety skills
- IV. Chemistry of Cells
  - a. Significance of water to life
  - b. Structures of functions of biological molecules
- V. Organization of Cells
  - a. Prokaryotic cells
  - b. Eukaryotic cells
  - c. Membrane dynamics
- VI. Metabolism
  - a. Energy harvesting pathways
  - b. Photosynthesis
- VII. Patterns of Cell Division
  - a. Mitosis
  - b. Meiosis
- VIII. Patterns of Inheritance
  - a. Chromosomal genetics
  - b. Human genetics
- IX. Nucleic Acids
  - a. Deoxyribonucleic Acid (DNA) structure and replication
  - b. Transcription and translation
  - c. Gene expression
- X. Biotechnology
  - a. DNA manipulation
  - b. Applications of DNA technology**



# Syllabus: BIO 181N

## Course Schedule and Important Dates

LECTURE SCHEDULE FALL 2020 (See CANVAS for Assignment for updated Due Dates)

Dates	Unit #	Unit Name	Reading Assignments	Assignment Due Dates
<b>PART I: INTRO &amp; FOUNDATIONS OF LIFE</b>				
8/24-9/5	1	Introduction to the Unity of Life	Chapter 1: Science of Biology "Native Science" by Greg Cajete: Forward, Intro & Body Sense	CANVAS Intro: 8/24 Reading & Discussion on Traditional Technology: 8/29 Syllabus Quiz: 8/29 Email to Prof: 8/29 Connect Biology Prep: 8/29 <b>Labs 1 &amp; 2</b>
9/5-9/12	2	The Chemical Building Blocks of Life	Chapter 3	Connect Biology Prep: 8/28 Discussion on O'odham vs. Western Science Definition of Life: 9/4 Dialectic Journal: 9/11 <b>Labs 3 &amp; 5</b>
9/14-9/26	3	The Cell—The Smallest Unit of Life	Chapters 4 & 5	<b>Exam I: Units 1-3 Lab 4 &amp; 6</b>
<b>*****FALL BREAK*****</b>				
<b>PART II: ENERGY &amp; HEALTH</b>				
10/5-10/10	4	Energy & Metabolism	Chapter 6	<b>Lab 8</b>
10/12-10/17	5	How Cells Harvest Energy	Chapter 7	<b>Lab 10</b>
10/19-10/24	6	Photosynthesis	Chapter 8	<b>Exam II: Units 4-6</b>
<b>PART III: CONTINUITY OF LIFE</b>				
10/28 & 10/30	7	How Cells Divide	Chapter 10	Biographical Research Paper due: 11/4 <b>Lab 11</b>
11/4-11/6	8	Sexual Reproduction & Meiosis	Chapter 11	
11/13-11/18	9	Genetics	Chapters 12 & 13.1 & 13.2	<b>Lab 13</b>
11/20-12/2	10	Genes and How They Work	Chapter 14.1, 14.2 & 15	<b>Lab 12</b>
12/3-12/9	11	BioTechnology & Ethics of Experimentation	Chapter 17	<b>Lab 14</b> Reflection Ethics of Experimentation
12/11				<b>Exam III: Units 7-10</b>



# Syllabus: BIO 181N

## BIO 181: Unity of life I: Life of the Cell

TENTATIVE LAB SCHEDULE FALL 2020

Lab #	Laboratories & Class Activities
1	Lab 1: Introduction to Science
2	Lab 2: General Lab Safety
3	Lab 3: Chemical Bonding Fundamentals
4	Lab 4: Introduction to the Microscope Cellular Fundamentals
5	Lab 5: The Chemistry of Life Lab
6	6: Diffusion and Osmosis Lab
7	7: Enzyme Catalysis Lab (Extra Credit)*
8	Lab 8: Metabolism Genetic and Biological Processes
9	Lab 9: Hierarchies of Life (Extra Credit)*
10	Lab 10: Unicellular Organisms
11	Lab 11: Mitosis and Meiosis
12	Lab 12: Transcription and Translation
13	Lab 13: Genetics of Organisms
14	Lab 14: Biomolecular Techniques

## Evaluations and Grading & Assignments:

90 and above is an A

80 - 89 is a B

70 - 79 is a C

60 - 69 is a D

Under 60 is Failing

## Your grade will be determined by the following:

Grades	#	POINTS	TOTAL	PERCENTAGE
Lab eScience	12	30	360	24%
CONNECT HOMEWORKS	10	30	300	20%
CONNECT PRACTICE QUIZZES	10	20	200	13%
CONNECT ONLINE QUIZZES	10	20	200	13%
EXAMS	3	50	150	10%
DISCUSSIONS	3	30	90	6%
TERM PAPER & ASSIGNMENTS		120	120	8%
INTRO MODULE & ATTENDANCE		110	110	6%
			1500	100%



# Syllabus: BIO 181N

## Himdag Cultural Component

Tohono O'odham traditions and cultural beliefs will be discussed as relevant course topics, and only as appropriate to the Tohono O'odham Nation's traditional standards for sharing information as determined by the Himdag committee.

The theme of this course is the Himdag value of kinship relationships (T-I:migi) which explains the unity of life on Earth. In this course students learn about the unity within the diversity of life and how cell biology and chemistry reflects the inter-relatedness or kinship (t-i:migi) of all organisms. Through class discussions and readings, the students will reflect on O'odham concepts of life in relation to the Western Science definition of life. They will apply their knowledge of metabolism to understand health issues on the Nation. The students will formulate a personal ethic regarding the use of plants, animals and humans in science teaching and research, incorporating perspectives from Western science and TOCC Himdag core values and indigenous research practices.

## Policies and Expectations

---

### Attendance Policy

You are expected to arrive to class on time and be prepared to participate in each class period. Four unexcused absences may result in withdrawal and a "W" or "Y" will be recorded. You may request to be excused from class for religious observances and practices, for illness, for school or work-related travel or for personal or family emergency. If you will be absent, please notify the instructor as soon as possible (approved by Faculty Senate April 2014).

### Make-up policy:

Late assignments that can be made up will be accepted but will be penalized 10% for each day of tardiness. Failure to submit a project results in a grade of zero (0). An F is a better grade! At the instructor's discretion, extra credit opportunities and optional activities may be provided. No work will be accepted after the last day of class.

### Incomplete Policy

Incomplete (I) grades are not awarded automatically. The student must request an "I" from the instructor who can choose to award an Incomplete only if all three of the following conditions are met:

1. The student must be in compliance with the attendance policy.
2. The student must have unavoidable circumstance that would prohibit the student from completing the course.
3. The student must have completed over 75% of the course requirements with at least a "C" grade.



# Syllabus: BIO 181N

Incompletes are not a substitute for incomplete work due to frequent absences or poor academic performance. Incomplete grades that are not made up by the end of the ninth week of the following semester will be automatically changed to an F if the agreed upon work, as stipulated on the written form signed by the instructor and the student when the I grade is awarded, is not completed.

## **Instructor Withdrawals**

Students who have missed four consecutive classes (or the equivalent) not submitted any assignments nor taken any quizzes by the 45th day census report, due on 10/8/2020, are assumed NOT to be participating in the class and may be withdrawn at the faculty member's discretion. [faculty members should be clear in their withdraw policy, if you do not withdraw students please note in appropriate sections].

## **Student Withdrawals**

Students may withdraw from class at any time during the first 2/3 of the semester without instructor permission and without incurring any grade penalty. Please be sure to withdraw yourself by 11/9/2020 if you do not expect to complete the class, otherwise you may receive an "F" grade.

## **Special Withdrawals (Y) Grade**

The "Y" grade is an administrative withdrawal given at the instructor's option when no other grade is deemed appropriate. Your instructor must file a form stating the specific rationale for awarding this grade. "Y" grades are discouraged since they often affect students negatively. Your instructor will not award a "Y" grade without a strong reason.

## **Equal Access Statement/Disability Accommodations**

Tohono O'odham Community College seeks to provide reasonable accommodations for qualified individuals with disabilities. The College will comply with all applicable regulations, and guidelines with respect to providing reasonable accommodations as required to ensure an equal educational opportunity. This process includes self-identifying as a student with a disability, providing supporting documentation of their disability, and being approved for services through the Disability Resources Office (DRO). It is the student's responsibility to make known to their instructor(s) the student's specific needs within the context of each class in order to receive appropriate accommodations. We will work together in order to develop an accommodation plan specifically designed to meet the individual student's requirements.

For more information or to request academic accommodations, please contact: Anthony Osborn, TOCC Disabilities Resource Coordinator, aosborn@tocc.edu, or 520-383-0033 for additional information and assistance.



# Syllabus: BIO 181N

## Title IX

Tohono O'odham Community College encourages each student to have the knowledge and skills to be an active bystander who intervenes when anyone is observed or being harassed or endangered by sexual violence. Sexual discrimination and sexual violence can undermine students' academic success and quality of life on campus and beyond. We encourage students who have experienced or witnessed any form of sexual misconduct to talk about their experience and seek the support they need.

Confidential support and academic advocacy can be found with: Student Services Title IX Coordinator/Counselor, Alberta Espinoza, M.Ed. located in I-We:mta Ki: Room 18. Phone 520-383-0033 email: aespinoza@tocc.edu

## Conduct: Bias, Bullying, Discrimination and Harassment

Tohono O'odham Community College faculty and staff are dedicated to creating a safe and supportive campus environment as a core value. Harassment based on age, class, color, culture, disability and ability, ethnicity, gender, gender identity and expression, immigration status, marital status, political ideology, race, religion/spirituality, sex, sexual orientation, and tribal sovereign status will not be tolerated.

## Classroom Behavior & Netiquette

- Student behavior is also detailed in student handbook under Student Code of Conduct Violations
- Netiquette is a set of rules for behaving properly online. Something about cyberspace makes it easy for people to forget that they are interacting with other real people. The following bullet points cover some basics to communicating online:
  - Be sensitive to the fact that there will be cultural and linguistic backgrounds, as well as different political and religious beliefs, plus just differences in general.
  - Open discussion is an important part of learning and critical thinking especially in a course like this which where we examine complex environmental issues.
  - Use good taste when composing your responses in Discussion Forums. Swearing and profanity will not be tolerated and your message will be removed immediately if it contains either of these.
  - Also, please consider that slang can be misunderstood or misinterpreted.
  - Don't use all capital letters when composing your responses as this is considered "shouting" on the Internet and is regarded as impolite or aggressive. It can also be stressful on the eye when trying to read your message.





# Syllabus: BIO 181N

- Be respectful of others' views and opinions.
- Avoid "flaming" (publicly attacking or insulting) them as this can cause hurt feelings and decrease the chances of getting all different types of points of view.
- Use good grammar and spelling. Avoid using text messaging shortcuts.

## DISCLAIMER

---

This syllabus is designed to evolve and change throughout the semester based on class progress and interests. You will be notified of any changes as they occur.