

# Syllabus



## **BIO 181 N: Unity of Life I: Life of the Cell**

### Course Information

Course Prefix/Number: **BIO181N**

Semester: Fall 2015

Class Days/Times: **TR: 9:00 AM-11:30 AM**

Credit Hours: 4

Course Title: Unity of Life I: Life of the Cell

Room: Science Lab

### Instructor Information:

Name: Dr. Adrian Quijada

Phone/Voice Mail:

E-mail: [jqquijada@tocc.edu](mailto:jquijada@tocc.edu)

Office location: Science Faculty Office, Building A

Office hours: Available only by email appointment

### Course Description:

The cell is the fundamental unit of all life. In this course, we will explore the great diversity of all cellular form and function. Cells have been endowed with the extraordinary ability to build and copy themselves from nonliving substrate and adapt to a wide range of environmental surroundings. Course emphasis is placed on the molecular mechanisms of cell metabolism, growth, division, and communication. This course is central to the biology curriculum at WLC and serves as the bridge between foundational courses in the molecular basis for life and advanced courses in the complexity of multicellular and multiorganismal interactions.

### Course Objectives:

1. During this course students will develop a deeper understanding of what life is and how it functions at the cellular level.
2. Students will develop skills in interpreting scientific data, designing and executing cellular experiments, and communicating scientific data and concepts clearly and effectively.
3. Students will apply their understanding of cell biology to identify and propose solutions in general biology, medical science and human well being.

### Student Learning Outcomes (SLOs) : (Three to Six)

1. Perform activities to demonstrate improvement in the general education goals of communication, critical thinking and mathematics.
2. Utilize scientific methods to formulate and answer questions about cell theory.
3. Describe and explain in detail the properties and roles of biologically important molecules, including proteins, carbohydrates, lipids, and nucleic acids.
4. Describe the structure and function of cells and cellular components in single and

multicellular organisms.

5. Describe how the cell acquires energy.
6. Explain the molecular biology of DNA and their expression as proteins.

**Course Structure:**

The instructor will strive to: a) identify and communicate details, facts and an overview of molecular and cellular systems. b) present the “language” and definitions of molecular cell biology and inform the students of how to access additional information; c) inform students of some of the experimental approaches used to study and explore molecular and cellular biology; c) expose the student to the fundamentals of scientific discovery and approaches to problem solving and information synthesis. The instructor articulates and sets the standards for evaluation of student performance.

The student should be prepared to devote the time required to comprehend and communicate the basic language and dictionary of molecular cell biology. The student will be expected to communicate these concepts both verbally and in writing using the scientific language of the field.

The student should be prepared to distinguish and compare molecular structures, cellular and molecular processes and through knowledge of these molecular structures and functions, compare and describe how these structures interact and function in living systems.

Successful students should be equipped with the basic skills that will allow them to develop and initiate the process of critical thinking, synthesis and problem solving in the molecular cell sciences.

Through this process the student should learn to be more insightful and innovative in the application of new knowledge.

The student should be prepared to commit to the personal discipline and amount of time needed to study, comprehend and communicate the science of molecular cell biology. As such, in order to detail and describe molecules, molecular process and molecular interactions, the student may be required to develop new study habits appropriate to the subject matter of the course.

**Texts and Materials:**

*Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter (2013) Essential Cell Biology.* Taylor & Francis.

**Evaluation and Grading & Assignments:**

Course assessment consists of exams, discussions, comprehensive written assignments, hands-on activities, informal in-class assessment, presentations, and research paper. Study guides will be available to help you prepare for exams. In accordance with my teaching philosophy in which I believe student learning occurs primarily through hands-on, real world application of course materials, exams comprise less than 30% of the final grade (although they are still an important aspect of course assessment and grade). In order to facilitate on-going faculty-student feedback, many class projects are divided into smaller intermediate steps such as topic choice, project proposals, and rough drafts. I welcome student feedback about the course anytime. I will also provide students an opportunity to give me feedback on their course experience through an anonymous mid-course and final course evaluation.

**Himdag Cultural Component:**

*The theme of this course is the Himdag value of kinship relationships (T-I:migi) which explains the unity of life on Earth. During the course, the students have an opportunity to compare and contrast the O’odham way of knowing and scientific methodology using both a traditional story and material on Science presented in a PowerPoint. They also compare and contrast the Western scientific definition of life with the Tohono O’odham definition of life through reflective writing and discussion. The course also includes a discussion and reflective writing on bioethics. Diabetes and nutritional content of traditional foods are topics in this course since these are relevant issues for Tohono O’odham students and are important to the students’ well-being (T-Apedag).*

**Policies and expectations:**

Minimally address attendance, participation, tardiness, academic integrity/plagiarism, absences, missed homework or exams, late assignments, student behavior, official ADA statement, and any other policies you have for your course.

**Course Policies Requirements:**

(1) Attend class regularly; (2) Complete in-class and out-of-class assignments and submit to the instructor; (3) Take all exams (4) Complete all class projects & presentations.

**Attendance:**

You are expected to arrive to class on time and actively participate each class period. Quizzes and exams are given out at the beginning of class time. Field trips and class activities begin at the start of class and may be missed if you do not arrive to class on time. Because exams, lab work and/or other assignments potentially occur every class period, points potentially will be lost each class period missed. If you miss all or a portion of a class, then you are solely responsible for obtaining missed class material from fellow students. Complete attendance is mandatory during student project presentations; otherwise presentation points will be forfeited. Four consecutive, unexcused absences may result in withdrawal. You may request to be excused from class for religious observances and practices, for illness, for travel or for personal or family emergency. If you will be absent or have been absent, please notify the instructor as soon as possible.

**Make-up policy:**

Missed exams can be made up within two days of the exam date. Late assignments that can be made up will be accepted but will be penalized 25%. Laboratories cannot be made up. At the instructor's discretion, extra credit opportunities and optional activities may be provided.

**Academic Integrity:**

Violations of scholastic ethics are considered serious offenses by Tohono O'odham Community College, the Student Services Department, and by your instructor. Students may consult the TOCC Student Handbook sections on student code of conduct, on scholastic ethics and on the grade appeal procedure. Copies are available at Tohono O'odham Community College.

All work done for this class must be your own. While you may discuss assignments with other class members, the final written project must clearly be your own. You may use work from books and other materials if it is properly cited. Copying from a book without proper reference or from a person under any circumstances will result in an "F" for the assignment, and at the instructor's discretion, possibly an "F" for the course.

**ADA Compliance:**

Tohono O'odham Community College strives to comply with the provisions of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. If you have a learning problem, physical disability, or medical illness that requires you to have any special arrangements, please inform your instructor at the beginning of the semester so your academic performance will not suffer because of the disability or handicap.

**Classroom Behavior:**

Because of insurance limitations, non-registered visitors are not allowed at class sessions or on field trips. Possession of drugs, alcohol or firearms on college property is illegal. Food and beverages are allowed in classrooms. Pets, telephones, pagers and other electronic devices that distract students are not allowed in classrooms. Students creating disturbances that interfere with the conduct of the class or the learning of others will be asked to leave.

**Course Feedback:**

All assignments, written papers and quizzes will be graded and returned to the students one week after the assignment is due. E-mail and phone messages will be returned within two days. A student or the instructor may request a student conference at any time during the semester.

**Instructor Withdrawals:**

Students who have missed four consecutive classes, not submitted any assignments nor taken any quizzes by the 20th day census report, due on June 22nd, 2014 are assumed NOT to be participating

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

**Incomplete (I) grade:**

"I" grades are not awarded automatically. The student must request an "I" from the instructor who will judge the student's ability to complete the course on his or her own. Generally the student must have completed over 80% of the course requirements with at least a "C" grade. An "I" requires a written contract between the student and the instructor listing work to be completed as well as how and when the work will be done. If the work is not completed within the contract period, the "I" grade automatically reverts to an "F." "I" grades will not be re-evaluated during the final two weeks of the semester when class activities are normally at their most intense.

**Special Withdrawal (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.

**Final Grades:**

Students will receive a grade transcript from the college mailed to the address given with registration materials at the end of the summer period when all grades have been recorded.

**SPECIAL NOTE TO STUDENT:** For privacy and security reasons, instructors are advised NOT to give grades over the telephone. Grades will only be emailed with written permission from the student.

Your instructor will make every attempt to follow the above procedures and schedules, but they may be changed in the event of extenuating circumstances.

Students submitting assignments through the mail or by email are advised to make copies for their own protection.

If you move during the semester, please file a change of address form with the Student Services Office, and inform your instructor.

**Course Outline:**

1. Cells: The Fundamental Units of Life - **August Week 2-3**
2. Chemical Components of Cells
3. Energy, Catalysis, and Biosynthesis
4. Protein Structure and Function - **September Week 1, 2, 3**
5. DNA and Chromosomes
6. DNA Replication, Repair, and Recombination
7. From DNA to Protein: How Cells Read the Genome - **October Week 1**
8. Control of Gene Expression - **October Week 3-4**
9. How Genes and Genomes Evolve
10. Modern Recombinant DNA Technology
11. Membrane Structure - **November Week 1**
12. Transport Across Cell Membranes
13. How Cells Obtain Energy from Food - **November Week 2**

14. Energy Generation in Mitochondria and Chloroplasts
15. Intracellular Compartments and Protein Transport
16. Cell Signaling - **November Week 3**
17. Cytoskeleton
18. The Cell Division Cycle
19. Sexual Reproduction and the Power of Genetics - **November Week 4**
20. Cellular Communities: Tissues, Stem Cells, and Cancer
21. FINAL EXAM – **December Week 1**

**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.