



Cell Biology

4 Credits BIO 302C Spring Semester, 2022

Faculty: Dr. Palmer Masumbe Netongo

Office: Nursing Building Room 213

Office Hours (face-to-face or online): Monday: 8:00-9:30 am.

Preferred Communication: Email and/or text; will respond within 24 hours

E-mail: pnetongo@navajotech.edu

Office Phone: 505-387-7391 # 1035

Modality (face-to-face, hybrid, or online): face-to-face and hybrid

Class Location and Meeting Times (if face-to-face): Wet Lab 109/ TR: 9.30 AM -10.50 AM.

Meeting Hours and Online Hours (if hybrid): TR: 9.30 AM -10.50 AM.

Lab Meeting Times: F 11.00 AM - 12.20 PM

Required Materials:

Textbook: Cell Biology, Thomas D. Pollard/ William C. Earnshaw/ Jennifer Lippincott-Schultz/ Graham T. Johnson an Introduction. 3rd Edition. ELSEVIER. ISBN:978-0-323-34126-4/ ISBN: 978-0-323-41740-2

Laboratory Manual: Anthony Contento: Laboratory Exercises & techniques in cellular Biology. 2013 Johnson Wiley & Sons, Inc

Tools: Pencils for Lab Exercises.

Lab Fee: \$125.00

Tools: Every student is required to have a laptop.

Mission, Vision, and Philosophy

Mission: Navajo Technical University honors Diné culture and language, while educating for the future.

Vision: Navajo Technical University provides an excellent educational experience in a supportive, culturally diverse environment, enabling all community members to grow intellectually, culturally, and economically.

Philosophy: Through the teachings of Nitsáhákees (thinking), Nahátá (planning), Íina (implementing), and Siihasin (reflection), students acquire quality education in diverse fields, while preserving cultural values and gaining economic opportunities.

Course Description: The purpose of the course is to enable students to understand the cell as a microcosm that demonstrates all the themes that connect the concepts of biology. Topics to be covered include Microscopy and cell investigation, prokaryotic and eukaryotic cell anatomy and physiology, endomembrane systems and their functions, cytoskeletons and function, extracellular matrix, membrane structure and function, passive and active membrane transport, cellular metabolism, cellular respiration, photosynthesis, cell communication, cell cycle and cell culture. Loss of cell cycle control and cancer will be emphasized. *Lab included. Prerequisite: BIO-1120 or BIO-1210 or permission of the instructor.*

Course Objectives

After successfully completing this course, students should be able to:

1. Explain the molecular basis of life at the cellular level.
2. Describe the dynamic mechanisms that support life.
3. Apply up-to-date general principles to explain precise mechanisms about biological processes.
4. Justify experimental organisms and specialized cells and tissues of vertebrates that appropriately illustrate these general principles.
5. Show proof of experience in cell biology techniques by the semester long Capstone labs.

Week	Date	Chapters	Assignment	Quiz
1	01/18-08/22	1: Introduction to Cells / Lab 1 & 2	Read Pp. 1-23	
2	01/24/-01/29	2: Evolution of life / Labs 3 & 4	Read Pp. 24-50	
	02/01	Quiz on Chapters 1- 2	Quiz	Chpt. 1-2
3	02/01-02/05	3 & 4: Molecular Structures & Dynamics/ Biophysical Principles /Labs 5 & 6	Read pp. 51-71	
4	02/07-02/12	5 & 6: Macromolecular Assembly / Research Strategy/ Labs 7 & 8.	Read pp. 72-106	
	02/21	Holiday-President's Day		
5	02/14-02/19	7 & 8: Chromosome organization/DNA Packaging in Chromatin & Chromosomes/ Labs 9 & 10	Read pp. 107-148	
	02/22	Quiz on Chapters 3- 5	Quiz	Chpt. 3-5
6	02/22-02/26	9: Nuclear Structure & Dynamics/ Labs 11 & 12	Read pp. 149-175	
7	02/28-03/05	10 : Gene Expression/ Labs 13 & 14	Read pp. 176-200	
8	03/07-03/11	MIDTERM EXAM COVERING Chapters 6-8	MIDTERM	Chpt. 6-7
	03/14-03/18	Spring Break		
9	03/21 - 10/26	11 & 12 : Eukaryotic RNA processing/ Protein Synthesis & Folding / Labs 15 & 16	Read pp. 201-238	
10	03/28-04/02	13 & 14: Membrane Structure & Dynamics /Membrane Pumps/ Labs 17 & 18	Read pp. 238-263	
	04/05	Quiz on Chapters 8- 11	Quiz	Chpt. 8-11
11	04/04-04/09	15/16 & 17: Membrane Carriers./ Membrane Channels/ Membrane Physiology / Labs 19 & 20	Read pp. 264-289	
12	04/11- 04/16	18/19 & 20: Posttranslational Targeting of proteins/Mitochondria, Chloroplast and peroxisomes & Endoplasmic Reticulum/ Labs 21 & 22	Read pp. 290-318	
13	04/18-04/23	21/22 & 23: Secretory Membrane system & Golgi apparatus/ Endocytosis and Endosomal Membrane System & Processing & Degradation of cellular components/ Labs 23 & 24	Read pp. 319-357	
14	04/26	Quiz on Chapters 12/13/16-17	Quiz	Chpt. 12-13
14	04/25-04/30	24 & 25: Plasma Membrane Receptors/ Protein Hardware for signaling/ Labs 25 & 26	Read pp.358-388	
15	05/02-05/07	26 & 27 : Second Messenger / Integration of Signals / Labs 27 – 30 Revision	Read pp. 439- 491	
16	05/9	FINAL EXAMINATION	FINALS	Chpt. 16-17 & 27-28

Grading Plan:

90-100 = A
80-89 = B
70-79 = C
60-69 = D
0-59 = F

Allocation of Grades

Exams 40%
Homework/Presentations 10%
Tests/Quizzes 20%
Full Attendance 5%
Lab Work/Capstone Lab 25%

Course Policies

Grading Policy

Each student must do his or her own homework and **capstone labs**. Discussion among students on homework and cases is encouraged for clarification of assignments, technical details of using software, and structuring major steps of solutions - especially on the course's website. Students must do their own work on the homework and exam. Cheating and Plagiarism are strictly forbidden. Cheating includes but is not limited to: plagiarism, submission of work that is not the student's own, submission or use of falsified data, unauthorized access to exam or assignment, use of unauthorized material during an exam, supplying or communicating unauthorized information for an assignment or exam. There is no make-up for a failed test or exam, so prepare well for any exam/test. Attendance at weddings or honeymoons or other unimportant events are no excuse for missing classes/test/exams.

Participation

Students are expected to attend and participate in all class activities- as listed above, as it is 5% of the grade. Points will be given to students who actively participate in class activities including field trips, laboratories, and ask questions of guest speakers and other presenters.

Cell phone and headphone use

Please turn cell phones off or place them on silence or vibrate mode **BEFORE** coming to class. Also, answer cell phones **OUTSIDE OF CLASS** (not in the classroom). Exercising cell phone use courtesy is appreciated by both the instructor and classmates. Headphones are to be removed before coming to class.

Attendance Policy

Students are expected to attend all class sessions. A percentage of the student's grade will be based on class attendance and participation. Absence from class, regardless of the reason, does not relieve the student of responsibility to complete all course work by required deadlines. Furthermore, it is the student's responsibility to obtain notes, handouts, and any other information covered when absent from class and to arrange to make up any in-class assignments or tests if permitted by the instructor. Incomplete or missing assignments will necessarily affect the student's grades. Instructors will report excessive and/or unexplained absences to the Counseling Department for investigation and potential intervention. **Instructors may drop students from the class after three (3) absences unless prior arrangements are made with the instructor to make up work and the instructor deems any excuse acceptable.**

Study Time Outside of Class for Face-to-Face Courses

For every credit hour in class, a student is expected to spend two hours outside of class studying course materials.

Study Time for Hybrid or Blended Courses

For a hybrid or blended course of one credit hour, a student is expected to spend three hours per week studying course materials.

Study Time for Online Courses

For an online course of one credit hour, a student is expected to spend four hours per week studying course materials.

Academic Integrity

Integrity (honesty) is expected of every student in all academic work. The guiding principle of academic integrity is that a student's submitted work must be the student's own. Students who engage in academic dishonesty diminish their education and bring discredit to the college community. Avoid situations likely to compromise academic integrity such as: cheating, facilitating academic dishonesty, and plagiarism; modifying academic work to obtain additional credit in the same class unless approved in advance by the instructor, failure to observe rules of academic integrity established by the instructor.

Diné Philosophy of Education

The Diné Philosophy of Education (DPE) is incorporated into every class for students to become aware of and to understand the significance of the four Diné philosophical elements, including its affiliation with the four directions, four sacred mountains, the four set of thought processes and so forth: Nitsáhákees, Nahát'á, Íina and Siih Hasin which are essential and relevant to self-identity, respect and wisdom to achieve career goals successfully.

Students with Disabilities

The Navajo Technical University and the Biology program are committed to serving all enrolled students in a non-discriminatory and accommodating manner. Any student who feels he/she may need an accommodation based on the impact of disability, or needs special accommodations should inform the instructor privately of such so that accommodations arrangement can be made. Students who need an accommodation should also contact the Special Needs Counselor, Virginia Edgewater whose phone number is 505-786-4138. Students needing accommodation must be familiar with the regulations regarding this overture. Granting of accommodation needs would not compromise academic standards.

Any student who feels that she or he may need special accommodations should contact the Accommodations Office (<http://www.navajotech.edu/student-services#accomodations-services>) in accordance with the university's Disability Accommodations Policy (see http://www.navajotech.edu/images/about/policiesDocs/Disability_Exhibit-A_6-26-2018.pdf).

Helping Students Learn:

1. Read the assigned text before and after classes
2. Take class notes in paraphrased formats, then recopy and revise these notes after classes.
3. Prepare adequately for the labs beforehand and develop an effective plan for carrying out laboratory exercises.
4. Join small study group (between 3-5 students) to accomplish homework problem sets. Try the homework on your own and then meet periodically with study group members to review them. Attempt and complete all assigned work and turn them in timely. Grades will be subtracted from late submission of homework.
5. If necessary, contact me during the above stated office hours:
6. Do not procrastinate, and so complete all work as when due to recall freshly the studied material.
7. Set enough time aside in your daily schedule for this class and the preparation required. Sessions should be short and intense to keep your focus.
8. Study session: 1 hour via stem lab students.
9. For a one credit course, the length of time you should spend studying for the course should be twice the credit hours. Therefore, you need to study for at least two hours per week in order to perform well in that course. Thus, for a 4-credit course, you need independent studies at home that will be equal to two times the number of the course credit hours, i.e. 8 hours per week for good results.

Email Address

Students are required to use NTU's email address for all communications with faculty and staff.

Final Exam Date: May 10, 2021