



CELL&MOLECULAR BIOLOGY

4 Credits
BIO 2120
Spring, 2022

Instructor: Dr. Irene Ane Anyangwe

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Office: ROOM 108, Wet Lab

Class Location: Wet Lab, Room 109

Office Hours: Tuesday: 11.00 am-12.00pm

Lab: M 3:30 PM – 4. 50 PM

Class Meeting Times: TR: 8.30AM-9.20AM

The Cell&Molecular Biology (BIO2120-1C) course will be offered as an In Person class. Lectures will hold on Tuesdays and Thursdays, and labs on Wednesdays. All labs, Quizzes and Finals shall be in Person.

Required Materials:

Textbook:

Reece, J.B., Urry, L.A., Cain, M.L, Wasserman, S.A., Minorsky, P.V. and Jackson, R.B. Campbell Biology, 10th Edition, Pearson Education, Inc. NY. (2014). ISBN: 13: 978-0-321-77565-8.

Laboratory Manual:

Morgan, J.G. and Carter, M.E.B. Investigating Biology; Laboratory Manual, 8th Edition, Pearson Education, Inc. NY. (2014). ISBN: 13: 978-0-321-83899-5 **Tools:** Pencils for Lab Exercises.

Lab Fee:\$125.00

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: This is a four (4) credit hour course designed to provide basic information in biology for non-Biology majors. The course teaches biology principles that are valuable to non-scientists in the modern world. Topics include basic facts of life and genetic basis of behavior of living organisms, and their interactions with the environment and ecosystem. Health perspectives of the various concepts as they apply to humans will be discussed.

Course Description: This is a four (4) credit hour course designed to provide a strong foundation for understanding both current knowledge and new developments of biological concepts. As a continuum of BIO-120, this course focuses on population genetics, evolution, ecology, behavior, plant and animal physiology, and survey of diversity of organisms. An introduction to microbiology with emphasis on principles of infection and immunity is also part of the course.

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

1. Recognize the interaction genes, its expression leading to diversity in a population and evolution.
2. Describe the behavior and interactions in an ecosystem with plants and animals with diversities.
3. Identify changes, leading to infections and immunity. Lab is included.

COURSE OUTCOMES	COURSE MEASUREMENTS
Applying scientific methods to evaluate claims and to demonstrate a deeper understanding of	Knowledge of scientific methods will be measured by class test and quizzes, and by laboratory exercises.

biology and the process of science.	
Identify the significance of nonlife or biomolecules in the activities and functions of various life forms.	Grasp of the usefulness of biological molecules in determining the properties of life will be determined by essays, oral presentation, and observations of student's performance at tasks, quizzes, homework and exams.
Make connections on how biological molecules help shed light on diverse biological questions and diseases.	Knowledge of the role of aberrant biological molecules on puzzles and diseases will be determined by essays, oral presentation, and observations of student's performance at tasks, quizzes, homework and exams.
Develop scientific communication by writing and presenting scientific information based on experimental data.	Knowledge of scientific communication skills will be assessed by critiquing student's laboratory reports, organization and presentation of their results to their peers during discussion and summary sessions in the laboratory.
Applying knowledge and developing critical thinking skills.	Critical thinking measured by means of laboratory exercises that ask students to work logically through problems, critique results and modify hypothesis. Students would also apply their knowledge to new problems and make connections between topics.

Week	Date	Chapters	Assignment	Quiz
1	01/18-01/21	14: Mendel and the gene idea/ Lab Topic 14	Read Pp269-293	
2	01/24/01/28	22, 23: Descent with Modification: A Darwinian view of life and the Evolution of Population/ Lab Topic 22&23 Assignments	Read Pp. 466-503 Assignment	Assignment: Chpt 14, 22&23

3	01/31-02/04	26&27: Phylogeny & the tree of life , Bacteria and Archaea bacteria. lab 26&27.	Read Pp. 551- 590	
4	02/07-02/11	29&30: Plant diversity 1:How plants colonized land.&Plants diversity11. The evolution of seed plants.	Read Pp. 616-670	
	02/14	Quizz	Chapters 14,22,23,26,27,29,30	Quizzes
5	02/14-02/18	33&34: An introduction to invertebrates; The origin and evolution of vertebrates	Read pp. 684-755	
	02/21	HOLIDAY-PRESIDENT'S DAY		
6	02/28-03/04	36&37: Resources acquisition and transport in vascular plants. Soil and plant nutrition.	Read pp782-819	
	03/08	MIDTERM		
	03/14-03/18	SPRING BREAK		
7	03/21-03/25	38&39Angiosperm reproduction and biotechnology; Plant responses to internal and external signals	Read pp. 820-870 ASSIGNMENT	
8	03/28-04/01	40&41 Basic principles of animal form and function; Animal Nutrition	Read pp. 871-918	
9	04/04-04/08	42&43: Circulation and gas exchange; The immune system	Read pp. 919-974	
10	04/11-04/15	44&45 Osmoregulation and excretion; Hormones and the endocrine system	Read pp. 975-1016	
11	04/18-04/22	46&47Animal reproduction; Animal Development	Read pp. 1017-1064	
12	04/25-04/29	51&52 Animal Behavior; The introduction to ecology and the biosphere Quiz	Chapters.40,41,42,43,44,45,46,47,51,52	Quiz
13	05/02-05/06	REVISION	Read pp. 1188-1235	
16	05/10	FINAL EXAMS	Exam Date: 05/10	

Course Policies

Grading Policy

Each student must do his or her own homework and case studies. 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. **No repeat/retake of failed tests or exams would be entertained. Failure to submit assignments on due dates would not be entertained.**

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. **Signing the acceptance sheet attached to this syllabus would indicate your agreement to abide by these rules, and would be used against you in case of violation.**

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 regularly attend all classes for which they are registered. A percentage of the

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	25%
Full Attendance	5%
Lab Work	20%

student's grade will be based on class attendance and participation. Absence from class, regardless of the reason, does not relieve the student of his/her responsibility to complete all course work by the 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 academic counselor for investigation and potential intervention. Instructors will drop students from the class after 3 absences unless prior arrangements are made with the instructor to make up work and the instructor deems any excuse acceptable. **Unexcused absence from any test/exam without prior permission from the professor will not be entertained, and would fetch a grade of F.**

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

Siuh 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, Malcolm McKerry, whose phone number is 505-786-4138.

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. **When you finish reading a passage, close the book and write what you remember- in your own words.**
10. For a 1 credit course, the length of time you should spend studying for that course is twice the credit hours. Thus, you need to study for at least 2 hours per week in order to do well in that course. Thus, for a **4 credit course**, you need to study for about twice the number of credit hours, i.e. **8 hours per week for good results.**