

The University of Findlay
College of Sciences
Fall Semester, 2XXX

*The Mission of the University is to equip our students
for meaningful lives and productive careers.*

Course Number/Title BIOL 152.52 Introduction to Cell and Molecular Biology

Credit Hours: 3 (4 with Lab)

Class Time/Place:

Prerequisites:

Instructor:

Course Description A review of the chemistry of life, including atoms, chemical bonding, water, polarity, and pH, and an introduction to the structure of major bio-molecules and their relationship to cellular structure and function, metabolism, photosynthesis, and cell to cell communication. An introduction to the chromosomal theory of inheritance, mitosis and meiosis, the cell cycle, the biology of DNA, and Mendelian and molecular genetics, evolution, speciation, and population genetics.

Relationship to the Conceptual Framework This course supports the technical, integrative and problem solving aspects of the Biology curriculum by providing problem sets, and experience in techniques employed by modern experimental biology. This course will require the student to integrate and synthesize information and concepts from different disciplines (biology, chemistry, mathematics) and the sub-disciplines within biology that involve form, function, and change.

The introductory cell and molecular biology curriculum supports the Biology Program Objectives by:

Providing the foundation for all other courses in the majors program

Assessing laboratory skills and technical proficiency in the field of biology

Assessing communication skills in the presentation of data

Assessing integrative skills using mathematics and statistics within the context of data collection and analysis.

Course Objectives

Upon completion of this course students will have had the opportunity to:

- Apply scientific methods to explain natural phenomena
- Develop models for the major macromolecules of living organisms, demonstrate how polymers are assembled and disassembled in vivo and in vitro, and know the activities of functional groups
- Develop a systems approach to the understanding of cellular organization and function with particular regard to organelles, their molecular structures and their molecular interactions
- Trace the sun's energy through photosynthetic and heterotrophic organisms and explain the role of enzymes in biochemical pathways
- Explain life as a self-sustaining chemical process (through metabolism) capable of replication (by mitosis, meiosis and sexual reproduction) and evolution (by the inheritance of variation, in the form of mutations, between individuals in populations)
- Draw and describe the structure and function of DNA and explain why it is an information molecule whose information is digital and amenable to study in silico
- Explain Darwinism and contrast natural selection with other mechanisms of evolution
- Explain species and speciation in the context of "tree-thinking"
- Integrate knowledge and skills to solve problems in biology
- Use appropriate tools to measure and analyze data
- Improve writing and other communication skills for presenting scientific results
- Work effectively with class groups to study biology

Instructional Strategies

Case Analysis	X	Library and Internet Research	X
Debate		Practice/drill	X
Discovery/Independent Research		Problem solving	X

Discussion/Questioning/Interviewing	X	Reading assignments	X
Experiential Learning	X	Role playing/simulation games	X
Field Experience		Service Learning	
Group Presentation	X	Video/Audio Review and Critique	X
Laboratory Experiences		Other	
Lecture	X		

Methods of Assessment

Abstracts		Participation	X
Attendance	X	Peer Evaluation	
Capstone Project		Portfolio	
Case Study	X	Portfolio Lab Performance	
Exams	X	Presentations	
Group Projects		Professional Evaluation	
Homework Assignments	X	Quizzes	X
Internet Research	X	Research project	
Journaling		Other	
Lab Performance			
Oral/written review of literature	X		

Grading

Exam I =	100 pts	Divide the total pts earned by the total pts possible to obtain a percentage. See percentage grading scale, below.
Exam II =	100 pts	
Final Exam =	200 pts	
Quizzes =	100 pts	
Group Assignments =	<u>100 pts</u>	
Total pts =	600 pts	

Grading Scale/Distribution

A: 94 - 100 %	C-: 68-71.9 %
A- : 90 – 93.9 %	D+: 65-67.9 %
B+: 87 -88.9 %	D: 60-64.9
B : 83 – 86.9 %	D-: 57-59.9
B- : 80 – 82.9 %	F: <59.9
C+: 76-79.9 %	
C: 72-75.9 %	

Honor Code

I will not knowingly engage in any dishonorable behavior, cheat, steal, lie or commit any act of plagiarism during my academic work, course, or endeavor. If I observe an act which I believe violates the University's Honor Code, I may, in my discretion, report it to the appropriate personnel.

Course Policies and Assignments must be completed within one week, unless

Practices	otherwise noted (see #2, in Course Expectations, below).
Special Services	If you are a student with a disability, it is your responsibility to register with the Office of Disability Service and notify your instructor one week prior to any needed service so that reasonable accommodations can be made for you.
Course and Instructor Evaluation	Taken at midterm (self-evaluation peer/student reviewed) and at the end of course (student evaluation)
Additional Information	<p>Course Expectations:</p> <p>#1. Come prepared to discuss all assigned reading and answers to test your knowledge questions, assigned via Blackboard, prior to their discussion in class. The best learning occurs from thoroughly preparing in advance of discussion. Attendance will be taken every week.</p> <p>#2. Turn in written work on time; <u>late work will be accepted only by prior arrangement and with approval of the instructor.</u> Unexcused late work will be reduced initially by 10% , and an additional 10% each day, thereafter.</p> <p>#3. Only submit your original work:</p> <ul style="list-style-type: none"> A. For grading, all tests, quizzes, case studies reports become the property of the instructor. However, all materials except final exams will be returned. B. Anyone caught cheating, and/or plagiarizing on a quiz, questions or other assigned work will automatically receive a failing grade and could be dismissed from the course. Cheating includes taking information from another student or copying it from another source. Plagiarism is presenting information without giving credit to the author of the information. Work taken from another source must be cited. <p>#4. Please turn off cell phones; do not use them at any time in class, and NEVER let me hear them in class.</p> <p>#5. All work submitted for grading must be typed; handwritten answers or other graded work, except where otherwise indicated will not be accepted. Never submit work on paper torn out of a spiral notebook.</p> <p>#6. Invest in a personal stapler and use it, no paper clips, or dog-eared pages, please.</p> <p>#7. Exams must be taken on the days and times they are listed below in the course lecture outline. Exceptions rarely will be made, except in extreme emergencies, with prior approval of the instructor and with supporting documentation.</p>

Tentative Course Lecture Outline (Course outline is subject to change, with prior notice, throughout the semester)

Date	Lecture Title
What is life and how is it studied?	Chp 1
Matter, including life, is chemical.	Chp 2
Why is water essential for life?	Chp 3
Carbon-based molecules and the diversity of life	Chp 4
Macromolecules in living systems	Chp 5
Cell structures	Chp 6
Membrane structure and functions	Chp 7
Energy, thermodynamics and metabolism	Chp 8
Cellular respiration	Chp 9
Photosynthesis	Chp 10
Cell communication	Chp 11
The cell cycle	Chp 12
Meiosis and sexual life cycles	Chp 13
Mendelian genetics	Chp 14
Chromosomal basis of inheritance	Chp 15
Molecular basis of inheritance	Chp 16
Transcription and translation	Chp 17