



BIO 011: General Biology (with Lab)

Term: Summer, 2019

Time: Monday – Friday, 8 Weeks

Class Sessions per Week: 5

Class Session Length (minutes): 150

Total Contact Hours: 100

Equivalent U.S. System Credit Hours: 4

Course Description:

This 4-credit introductory course will explore biology from the biochemical level through the individual organism. This includes cells, tissues and organ systems; genetics, DNA and protein synthesis, life cycles and development; the internal workings of the cell, and the physiology of organisms from single celled bacteria through multi-cellular plants and animals. Students will investigate the properties of life that unite all living organisms: how they are constructed, reproduce, and function. The course will also highlight the interactions between organisms and their environment in explaining the principles of speciation and biodiversity. Additionally, the course will teach how the processes of scientific investigation can lead to new discoveries.

Learning Outcomes:

Students who successfully complete this course will be able to:

1. discover the patterns, principles, and dynamics of natural phenomena and relate them to issues in their lives as citizens;
2. comprehend scientific methodology and its limitations;
3. engage in the analysis of natural

Textbook(s):

Biology Today and Tomorrow, With Physiology, 3rd Edition or 4th, by Starr, Evers, and Starr (published in 2010 by Cengage). ISBN-10: 0495561576, ISBN-13: 9780495561576

Biological Science, 5th Edition, by Scott Freeman, Kim Quillin and Lizabeth Allison (published in 2013 by Pearson). ISBN-10: 0321743679, ISBN-13: 978-0321743671



Grading Policy

Laboratory Work	20%
Midterm Exams	30%
Final Exam	40%
Participation	10%
Total	100%

A: 90-100 A-: 85-89 B+: 82-84 B: 78-81 B-: 75-77 C+: 72-74 C: 68-71 C-: 64-67 D: 60-63
F: <60

Schedule

WEEK 1: Evolution

1. Introduction
2. What is life What is Evolution
An evolutionary framework for biology
3. History and origin of life
Fossil record, radiometric dating and key events in the history of life
RNA world
4. History of life on Earth
Speciation and extinction
Patterns of biological diversity through time

Lab 1.1 Introduction to lab and data analysis; Evolution week 1

WEEK 2: Evolution

6. Evolution
Natural selection
Evidence for evolution
7. Genetic variation
Hardy-Weinberg equilibrium
8. Human Evolution
Mutation, selection

Lab 1.2 Evolution week 2

WEEK 3: Ecology

9. Behavioral ecology
Foraging and predation
10. Population ecology I
Life history and population structure
11. Population ecology II
Population dynamics and regulation

Lab 2.1 Ecology and Human behavior week 1



WEEK 4:Ecology

12. Predation and keystone species
Predation, Parasitism and Mutualism

13. Ecosystem I
Food web and flow of energy

14. Ecosystem II
Human impacts

15. The Future of Planet Earth

Lab 2.2 Ecology and Animal behavior week 2

Midterm Exam

Week 5:Molecules

16. Biomolecules
Major classes of macromolecule

17. Cell structure
Membranes and transport
Endomembrane system

18. Energetics and enzymes
Catalysis, kinetics and enzymes
Membrane potential

19. Cellular respiration
Oxidation of food and Chemiosmosis

Lab 3.1 Molecules and enzymes

Week 6:Genetics

20. How Cells Divide: Cell Cycle, Mitosis and Meiosis

21. Human Genetics I
Chromosomes and cell division

22. Human Genetics II
Chromosome theory of inheritance

Lab 4.1 Cells and Human Genetics week 1

Week 7:Genetics

23. Mendelian genetics

24. DNA and the basis of inheritance

25. Gene expression
DNA to protein

Lab 4.2 Genetics and inheritance week 2



Week 8:Biomedicine

26. Immunology and infectious diseases

27. Human health and evolution

28. Course review

Lab 5.1 Discussion and Debate on Human health

Final exam



Policies

Exam and Attendance

No make up for missed exams. If legitimate absence, midterm exam can be excused.

Attending all class meetings is required. Students are responsible for missing class by any reason. We will be covering a lot of material quickly so it is detrimental to miss even a day.

Academic Honesty

Xihua University all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

Special needs

Students with disabilities and special needs should consult with the professor early in the semester. Recording of lectures is permitted.