

Angelina College
Division of Science and Mathematics
BIOL 1411 General Botany Instructional Syllabus

I. BASIC COURSE INFORMATION:

- A. Fundamental biological concepts relevant to plant physiology, evolutionary history, life cycle, growth and development, structure and function, and cellular and molecular metabolism. The role of plants in the environment, and phylogeny of major plant groups, algae, and fungi is also included. The laboratory portion of this course will reinforce fundamental biological concepts relevant to plant physiology, life cycle, growth and development, structure and function, and cellular and molecular metabolism. The role of plants in the environment, evolution, and phylogeny of major plant groups, algae, and fungi. This course is intended for science majors. Three lecture (online) and two lab hours each week. Lab fee.
- B. The intended audience is any student needing a freshman-level course in the natural sciences. It is a laboratory-based course designed for science majors, especially those pursuing a biology degree and/or pre-professional course work (i.e. pre-medical, pre-dental, pre-veterinary, etc.).
- C. Instructor: **Todd Farmer** Phone: **(936) 633-5365**
Office Location: **S106** E-mail Address: **tfarmer@angelina.edu**
Office Hrs: **MW 9:30-11:30; R 11-12:00**

II. INTENDED STUDENT OUTCOMES:

A. Core Objectives Required for this Course

- 1. Critical Thinking:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- 2. Communication:** to include effective development, interpretation and expression of ideas through written, oral and visual communication
- 3. Empirical and Quantitative Skills:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
- 4. Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

B. Course Learning Outcomes for all Sections

1. Compare and contrast the structures, reproduction, and characteristics of plants, algae, and fungi.
2. Describe the characteristics of life and the basic properties of substances needed for life.
3. Identify the principles of inheritance and solve classical genetic problems.
4. Describe phylogenetic relationships and classification schemes.
5. Identify the major phyla of life with an emphasis on plants, including the basis for classification, structural and physiological adaptations, evolutionary history, and ecological significance.
6. Identify the chemical structures synthesis, and regulation of nucleic acids and proteins.
7. Identify the substrates, products, and important chemical pathways in photosynthesis and respiration.
8. Describe the unity and diversity of plants and the evidence for evolution through natural selection.
9. Compare different sexual and asexual life cycles noting their adaptive advantages.
10. Describe the reasoning processes applied to scientific investigations and thinking.

III. ASSESSMENT MEASURES

A. Assessments for the Core Objectives

1. **Critical thinking:** Students will design a dichotomous key for use in identifying organisms. The key is based on an analysis of similarities and differences evident in multiple species. The AC Critical Thinking Rubric will be used to assess critical thinking skills.
2. **Communication:** Students will be introduced to concepts of scientific communication. Communication skills will be assessed through the development of a plant identification PowerPoint or video presentation. The AC Communication rubric will be used for assessment.
3. **Empirical and Quantitative Skills:** Empirical and quantitative skills applicable to biology will be introduced. Students will calculate outcomes of genetic crosses and/or answer questions about population dynamics. Empirical and quantitative skills will be assessed using the AC EQS rubric.
4. **Teamwork:** Teamwork skills are introduced. Students will work in teams to develop a plant identification presentation. Team members will work together to define the roles of each member and will collaborate to share information and draw conclusions. Team members will evaluate the performance of one another using standardized rubrics. The AC Teamwork rubric will be used to assess overall achievement of skills.

B. Assessments for Course Learning Outcomes

1. Students will compare and contrast the structures, reproduction, and characteristics of plants, algae, and fungi by answering directed questions in lecture and lab activities and on exams.
2. Students will identify and describe the characteristics of life and the basic properties of substances needed for life.
3. Students will identify the principles of inheritance, including Mendelian and non-Mendelian genetics. Students will solve classical genetic problems using Punnett Squares and other tools as appropriate.
4. Students will describe phylogenetic relationships and classification schemes. Students will construct dichotomous keys and cladograms and interpret both in lab and lecture activities and/or assessments.
5. Students will identify the major phyla of life with an emphasis on plants, including the basis for classification, structural and physiological adaptations, evolutionary history, and ecological significance.
6. Students will identify the chemical structures synthesis and regulation of nucleic acids and proteins, including DNA replication, transcription, and translation. Students performance will be assess through in-class assignments and exam questions.
7. Students will identify the substrates, products, and important chemical pathways in photosynthesis and respiration. Assessments will include in-class activities and exam questions.
8. Students will describe the unity and diversity of plants and the evidence for evolution through natural selection. Students will correctly describe the evolutionary history of plants based on the scientific evidence currently available.
9. Students will compare different sexual and asexual life cycles noting their adaptive advantages. Students will complete and/or life cycle diagrams for each of the major groups of plants and compare the adaptations in each.

10. Students will describe the reasoning processes applied to scientific investigations and thinking. Scientific reasoning will be assessed through analysis of scientific reports and/or lab studies.

IV. INSTRUCTIONAL PROCEDURES:

This course will be taught using a combination of online video lectures and in-person laboratory exercises that complement and supplement lecture material. Audio-visual materials, models, and observation of specimens will be employed to enhance lecture and laboratory presentations.

V. COURSE REQUIREMENTS AND POLICIES:

A. Required Textbooks and Recommended Readings, Materials and Equipment

1. Raven Biology of Plants by Evert & Eichhorn (Freeman) 8th Edition
2. Botany: A Laboratory Manual by Pfluger (Jones and Bartlett Publishers)
4. Access to blackboard (www.angelina.blackboard.com)
5. Scantrons (form 882-E) for exams

B. Course Policies – This course conforms to the policies of Angelina College as stated in the Angelina College Handbook.

1. **Academic Assistance** – If you have a disability (as cited in Section 504 of the Rehabilitation Act of 1973 or Title II of the Americans with Disabilities Act of 1990) that may affect your participation in this class, you should see Karen Bowser, Room 208 of the Student Center. At a post-secondary institution, you must self-identify as a person with a disability; Ms. Bowser will assist you with the necessary information to do so. To report any complaints of discrimination related to disability, you should contact Mr. Steve Hudman, Student Center, Room 205-B or 936-633-5292.
2. **Attendance** – Attendance is required as per Angelina College Policy and will be recorded every day. Any student with three (3) consecutive absences or four (4) cumulative absences may be dropped from the class. Records will be turned in to the academic dean at the end of the semester. Do not assume that non-attendance in class will always result in an instructor drop. **You must officially drop a class or risk receiving an F.** This is official Angelina College Policy.
3. **Additional Policies Established by the Instructor**
 - **STUDENT CONDUCT:** A positive environment for learning will be maintained by students being courteous to each other and to the instructor. Eating, drinking, sleeping, and distracting conversations during lecture will not be allowed. Regular attendance is also expected as per college policy.
 - There is no excuse for tardiness as it is rude to the instructor and to students. Be in class on time.
 - Cheating on tests is not tolerated as per Angelina College policy and may result in expulsion from the course. Plagiarism is not tolerated and will result in a zero for any assignment in which it is detected.
 - **CELL PHONES: Cell phones must be turned off or on the silent mode.** Students may not have access to cell phones during quizzes and/or tests.

VI. COURSE OUTLINE: Description of the Course Activities including due dates, schedules, and deadlines.

<u>Week</u>	<u>Date</u>	<u>Topic</u>
1	16-Jan 17-Jan	Campus: Campus Closed (MLK day) Online: Introduction (Ch 1); Biochemistry (Ch 2)
2	23-Jan 24-Jan	Campus: Quiz 1, Lab 1 – Introduction to botany, microscope Online: The Plant Cell (Ch 3); Movement (Ch 4)
3	30-Jan 31-Jan	Campus: Quiz 2, Lab 2 & 3 – Plant cells, cell division Online: Respiration (Ch 6); Photosynthesis (Ch 7)
4	6-Feb 7-Feb	Campus: Lecture Exam I , Lab 8 – Photosynthesis Online: Reproduction & Heredity; (Ch 8) Evolution (Ch 11)
5	13-Feb 14-Feb	Campus: Quiz 3, Lab 13 & 14 – Genetics, Inheritance, NS, Systematics Online: Biodiversity (Ch 12); Prokaryotes & Viruses (Ch 13)
6	20-Feb 21-Feb	Campus: Quiz 4, Lab 15 & 22 – Prokaryotes, Algae Online: Fungi (Ch 14); Protists (Ch 15)
7	27-Feb 28-Feb	Campus: Quiz 5, Lab 16 & 21 – Nonvascular Plants, Fungi Online: Bryophytes (Ch 16); Seedless Vascular Plants (Ch 17)
8	6-Mar 7-Mar	Campus: Lecture Exam II; Lab Exam I Online: Gymnosperms (Ch 18); Angiosperms (Ch 19; 20)
9	13-Mar 14-Mar	Campus: No Lab (Spring Break) Online: No Lecture (Spring Break)
10	20-Mar 21-Mar	Campus: Quiz 6, Lab 17 & 18 – Seedless Vascular plants, Gymnosperms Online: Economic Botany (Ch 21); Development (Ch 22)
11	27-Mar 28-Mar	Campus: Quiz 7, Lab 19 & 20 – Angiosperms Online: Cells & Tissues (Ch 23); Roots (Ch 24)
12	3-Apr 4-Apr	Campus: Lecture Exam III , Lab 4 & 5 – Tissues, stems, leaves Online: Shoots (Ch 25); Secondary Growth (Ch 26)
13	10-Apr 11-Apr	Campus: Quiz 8, Lab 6 & 7 – Roots, 2 ^o Meristems, Woody Growth Online: Plant hormones (Ch 27); External Factors (Ch 28)
14	17-Apr 18-Apr	Campus: Quiz 9, Lab 10 – Water Pollution Online: Nutrition, Soil (Ch 29); Movement of Water, Solutes (Ch 30)
15	24-Apr 25-Apr	Campus: Quiz 10, Lab 11 – Mineral Nutrition Online: Communities/Ecosystems (Ch 31); Global Ecology (Ch 32)
16	1-May 2-May	Campus: Lecture Exam IV; Lab Exam II Online: No Lecture
17	8-May	Campus: Final Exam (5:00 - 7:00pm; S111)

VII. EVALUATION AND GRADING:

A. Grading Criteria: Lecture and lab grades will be combined to give one grade for the course. The percentage of lecture points earned is worth 67% of the total course grade; the percentage of lab points earned is worth 33% of the total course grade.

The lecture grade will be calculated based on the points shown below.

4 regular exams	400 points
Final exam	100 points
Assignments /Quizzes	75 points
<u>Group Project</u>	<u>25 points</u>
	600 points

The lab grade will be calculated based on the points shown below.

2 regular exams	200 points
<u>Lab Assignments</u>	<u>50 points</u>
	250 points

To calculate your course grade, use the following:

$$\text{Percentage of points from lecture} \times 0.67 = \underline{\hspace{2cm}}$$

$$\text{Percentage of points from lab} \times 0.33 = \underline{\hspace{2cm}}$$

$$\text{Sum of above} = \underline{\hspace{2cm}} = \text{course grade}$$

Letter grades will be assigned based on the course grade as calculated above.

90 or above = A

80 – 89 = B

70 – 79 = C

60 – 69 = D

59 or below = F

B. Lecture Exams: There will be four regular lecture exams given as shown on the class schedule. The final exam is comprehensive. The grade on the final exam may replace the single lowest grade on the regular lecture exams. No make-up exams will be given. If you miss an exam, the final exam grade will replace the grade of that missed exam.

C. Homework/Quizzes: Homework assignments and/or quizzes must be completed on time and as instructed.

D. Lab Exams: Two lab exams will be given as shown on the schedule. No make-up exams are allowed unless preapproved by the instructor

Extra Credit may be offered at the discretion of the instructor; however, extra credit points shall equal no more than 10% of the total course grade.

The instructor may modify the provisions of the syllabus to meet individual class needs by informing the class in advance as to the changes being made.