BIOL 1401, Section 001
BIOLOGY OF PLANTS
Fall 2018

Lecturer: Dr. Nick Smith
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Office Hours: Mondays 11:00 – 12:00 (BIOL 215)

TAs: Nan Hu – nan.hu@ttu.edu
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Time: M/W/F 10:00 – 10:50
Location: Biology 101

Recommended Texts:
Stern's Introductory Plant Biology 14th Edition by Bidlack and S.H. Jansky.
A Photographic Atlas for the Botany Laboratory, 7th ed., Rushforth et al.

Lab Manual: Available at the west end of the basement, Biology. Your lab TA will explain how to obtain the lab manual.

Daily materials: Slides and lecture reviews will be posted on Blackboard.

Grades: Grades will be posted on Blackboard. See scoring breakdown below.

Tutorial Assistance: http://www.depts.ttu.edu/soar/LC/Index.php

Schedule of Topics

Date	**Lecture Topic** (**Chapter #**)
August	
27	Plant Biology and the Nature of Life (1, 2)
September	
3	**NO CLASS MONDAY**; Plant Cells and Tissues (3, 4); **Quiz #1 Fri.**
September	
10	Roots and Stems (5, 6) **Quiz #2 Fri.**
17	Leaves, Flowers, Fruits, and Seeds (7, 8); **Exam 1, Friday Sep. 21**
24	Water and Nutrients (9, 5); **Quiz #3 Fri.**
October	
1	Light Absorption (10); **Quiz #4 Fri.**
8	Carbon Acquisition and Respiration (10); **Quiz #5 Fri.**

15	Plant Growth (11); **Exam 2, Friday, Oct. 19**
22	Meiosis and Life Cycles (12); **Quiz #6 Fri.**
29	Genetics, Plant Breeding, and Evolution (13, 14, 15); **Quiz #7 Fri.**
November	
5	Seed-free Plant Diversity (20, 21); **Quiz #8 Fri.**
12	Seed Plant Diversity (22, 23); **Quiz #9 Fri.**
19	**Exam 3, Monday Nov. 19**
26	Plant Ecology (25, 26); **Quiz #10 Fri.**
December	
3	Environmental Stress and Global Change; Final Exam Review

FINAL EXAM (Comprehensive, <u>101 Biology</u>), 7:30-10:00, **Tuesday, December 11**.

PERMISSION TO TAKE THE FINAL EXAM AT ANY OTHER TIME WILL <u>NOT BE GRANTED</u>.

Attendance Policy: **Attendance is strongly recommended** to perform well in this course.

Missing a Friday Quiz or an Exam: If you have a <u>university function or *severe* illness</u> that will cause you to miss a Friday Quiz or exam, **contact Dr. Smith <u>before the quiz/exam</u> or <u>no later than 24 hours following the quiz/exam time</u>**. Make-up exams are usually short-answer/essay questions with some multiple-choice statements.

Expected Learning Outcomes:
Biology 1401 satisfies the requirements for a course in the Natural Sciences Core Education Curriculum. Students graduating from Texas Tech University should be able to explain some of the major concepts in the Natural Sciences and demonstrate an understanding of scientific approaches to problem solving, including ethics. In addition, it is expected that a student completing this class should be able to understand, construct, and evaluate relationships in plant science. Specifically, the student should understand:

1. the scientific method and how it is used in plant research
2. plant structure (anatomy) and its relationship to plant functions (physiology)
3. how basic plant functions are regulated by the plant
4. the diversity of plant life on Earth
5. plant interactions with environmental factors and how these factors influence agriculture and control plant distribution

Biol 1401 Is a Core Curriculum Course
Biol 1401 satisfies one-half of the Texas Tech University Life and Physical Science Core Curriculum requirement. The lecture and especially the laboratory portions of the course

satisfy many of the learning outcomes and methods of assessment required of a core curriculum course. The following Learning Outcomes, some from the Texas Higher Education Coordinating Board and some from Texas Tech University, must be included in all Life and Physical Science classes in the Core.

Texas Higher Education Coordinating Board and Texas Tech University Learning Outcomes and Methods of Assessment

Coordinating Board Objective 1. Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
Critical thinking involves the careful and thoughtful evaluation of an issue before forming an opinion. The lecture will often provide information about biological processes in a step-wise manner as examples of how conclusions are reached based on data gathered. In the lab, you will be required to develop an independent investigation of a question or problem that you pose involving plants.

Method of Assessment: Your critical thinking skills will be assessed in lecture by thought-based multiple-choice statements and short-answer questions. In the laboratory the assessment will be based on your presentation to the class of your research findings and on a written report.

Coordinating Board Objective 2. Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication
To be understood and effective in your career endeavors, you must learn and perfect effective oral, visual, and written communication skills.

Methods of Assessment: In lecture, these skills will be assessed through your interaction with the instructor, TAs, and fellow classmates. The BIOL 1401 laboratory provides the mechanism to assess your progress in perfecting communication through your oral and written presentation of your research project.

Coordinating Board Objective 3. Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
The analysis of information, such as data from an experiment, and the synthesis of that information into a clear prognosis are critical to be successful in an information-loaded world. In lecture, key topics offer an opportunity for the class to understand the interpretation of information. Also, your research project will require that you not only generate data but also that you must analyze those data and interpret your results.

Methods of Assessment: Key multiple-choice statements in exams and quizzes will test these skills. In the laboratory, weekly lab exercises will provide practice in this endeavor, so that you should have sufficient skills to analyze and interpret your research results.

Coordinating Board Objective 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

In the laboratory, you will work on weekly exercises and the research project as a member of a group. Thus, it is critical that you attend lab and work well with your fellow group members to accomplish the laboratory goals.

Methods of Assessment: You will be graded in the laboratory not only based on your knowledge of the experiment but on your ability to work with other members of the team. A portion of your grade, not to exceed 5% of your total lab grade, will be based on your participation within the group based on the group members' assessment.

TTU Student Learning Objective 1. Demonstrate knowledge of the scientific method and to contrast it with other ways of understanding the world

In lecture, key topics offer an opportunity for the class to understand the scientific method. Early exercises in the laboratory will address the fundamental process of the scientific investigation to gain new knowledge relative to simply knowing or "feeling" what that information might be. You will apply the methodology to your research project.

Methods of Assessment: Key questions/multiple-choice statements in lecture exams will test your understanding of the scientific method. Your research presentation and report will be used to assess your understanding in the laboratory.

TTU Student Learning Objective 2. Demonstrate knowledge of the tools and methods used by scientists to study the natural world

In lecture, key topics offer an opportunity for the class to understand the scientific methodology. In lab, you will use certain tools and methodologies, such as microscopy and some basic biochemical/biophysical analyses, to address some fundamental processes of plant biology.

Methods of Assessment: Your knowledge will be assessed based on key questions in lecture exams and quizzes as well as on your weekly lab reports and the research report.

TTU Student Learning Objective 3. Explain some of the major theories in the Natural Sciences

In Biol 1401 lecture and lab, you will be exposed to principles of cell and tissue structure/function relationships, the fundamental principle of the control of cellular activity by the genetic code, some basic principles of the control of the interaction of organisms and their environment, and principles of the evolution of species from pre-existing species.

Methods of Assessment: Lecture exams and quizzes focus on these basic principles of biology and their theories.

TTU Student Learning Objective 4. Describe how Natural Sciences research informs societal issues, including ethics

Specific lecture topics relate to how biological research affects people and their societies. Through the process of performing your research project, you will be expected to provide data that you and your group generated. Through this process, you will learn the importance of ethics in science to our ultimate understanding of the natural world. The importance of performing science honestly will not only be stressed but will become quite obvious as the project progresses.

Methods of Assessment: Lecture exams and quizzes focus on these basic principles, and the quality of your lab research report will assess how honest you and your group have been.

Specific Methods of Assessing Expected Learning Outcomes:
Student performance will be assessed by primarily multiple-choice tests in the lecture. Quizzes will be a combination of short-answer, fill-in-the-blanks, and multiple-choice. In the lecture, selected exam questions will assess for students' critical thinking ability and empirical and quantitative skills. Benchmark: 60% of students scoring correctly on each of those assessments.

1. In the lecture, learning outcomes will be assessed by the administration of three, hour exams, weekly quizzes, a comprehensive final exam, and participation.
2. In the laboratory, learning outcomes will be assessed by the the evaluation of a research report, an oral presentation, daily activity assessments, homework, lab reports, and class participation.

Grading Policy:

3 In-class Exams	= 15% each
Quizzes	= 10%
Laboratory	= 30%
Final Exam	= 15%

All quiz and exam scores will be posted on Blackboard

Friday Quizzes: Short quizzes will be given each week on Friday except when an exam is given (See the schedule, above). Quizzes will consist of a mix of multiple choice and short answer questions.

In-class Exams: Exams will consist of a mix of multiple choice and short-answer questions. The first three exams will cover material covered in lecture since the previous exam.

Final Exam: The final exam will consist of a mix of multiple choice and short-answer questions. The exam will be comprehensive, with roughly 50% of questions coming from material covered following the third in-class exam and 50% of questions coming from material covered prior to the third in-class exam.

Determining Your Letter Grade:

A = 100-90; B = 89.9-80; C = 79.9-70; D = 69.9-60; F = ≤ 59.9.

Receiving a Failing Score in the Laboratory Portion of the Course: Because BIOL 1401 can serve as partial fulfillment of the laboratory science requirement for the university, *if you receive a score in the laboratory of 55% or lower, you automatically receive a final course grade of F.*

ALL GRADES POSTED AT THE END OF THE COURSE **WILL BE FINAL**, unless an error has been made in their calculation.

Special Considerations

Disabling Condition: Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405.

Religious Holy Days:
1. "Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20.
2. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.
3. A student who is excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Civility in the Classroom
You are expected to conduct yourselves in such a way as to provide a good learning environment for yourself and other students. Therefore, **disruptions or behaviors that affect your ability to learn and that of other students will not be tolerated**. If you are being disruptive, you will be asked to leave. **If you have "better things to do" then please do not come to class.** Such disruptions/behaviors include, but are not limited to:

(1) **listening to music, watching videos, etc. during the lecture**
(2) **working on assignments for another course**
(3) **talking to neighbors**

Please, refer to the university's Operations Policy **(OP) 34.12** for further information.

Academic Integrity
As stated in the Texas Tech University catalog, "The attempt of any students to present as their own work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenses liable to serious consequences, possibly suspension." This statement applies to cheating in whatever manner on exams, quizzes, and plagiarism on reports and records kept in lab notebooks.

Policy on Copying on Quizzes and Exams
When it has been determined during a lecture quiz or exam that a student has been looking at the answers of another student, one warning to cease will be given. If it is determined that the student looks at another student's quiz/exam again during the examination period, the quiz/exam will be removed and the student will receive a grade of 0 for that exam.

TTU Resources for Discrimination, Harassment, and Sexual Violence
Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and/or sex discrimination of any kind. Sexual assault, discrimination, harassment, and other Title IX violations are not tolerated by the University. Report any incidents to the Office for Student Rights & Resolution, (806)-742-SAFE (7233) or file a report online at titleix.ttu.edu/students.

Faculty and staff members at TTU are committed to connecting you to resources on campus. Some of these available resources are:

- TTU Student Counseling Center, 806-742-3674, https://www.depts.ttu.edu/scc. Provides confidential support on campus.
- TTU 24-hour Crisis Helpline, 806-742-5555. Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.
- Voice of Hope Lubbock Rape Crisis Center, 806-763-7273, voiceofhopelubbock.org . 24-hour hotline that provides support for survivors of sexual violence.
- The Risk, Intervention, Safety and Education (RISE) Office, 806-742-2110, https://www.depts.ttu.edu/rise/. Provides a range of resources and support options focused on prevention education and student wellness.
- Texas Tech Police Department, 806-742-3931,http://www.depts.ttu.edu/ttpd/ . To report criminal activity that occurs on or near Texas Tech campus.

LGBTQIA
I identify as an ally to the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community, and I am available to listen and support you in an affirming manner. I can assist in connecting you with resources on campus to address problems you may face pertaining to sexual orientation and/or gender identity that could interfere with your success at Texas Tech. Please note that additional resources are available through the Office of LGBTQIA within the Center for Campus Life, Student Union Building Room 201, www.lgbtqia.ttu.edu, 806.742.5433.

BIOLOGY OF PLANTS
BIOL 1401 - Laboratory Syllabus
Fall 2018

Location: Biology 015

Section Information

Sec	*Day*	*Time*	
502	Tuesday	11:00-12:50	Instructor: Nan Hun (nan.hu@ttu.edu)
503	Tuesday	14:00-15:50	Instructor: Evan Perkowski (evan.a.perkowski@ttu.edu)
507	Wednesday	11:00-12:50	Instructor: Risa McNellis (risa.mcnellis@ttu.edu)
508	Wednesday	14:00-15:50	Instructor: Risa McNellis (risa.mcnellis @ttu.edu)
511	Thursday	11:00-12:50	Instructor: Nan Hu (nan.hu@ttu.edu)
512	Thursday	14:00-15:50	Instructor: Evan Perkowski (evan.a.perkowski @ttu.edu)

Lab Coordinator: Nan Hu (nan.hu@ttu.edu)

Please contact them if you are unable to reach your TA or have any concerns about lab.

Instructor Office Hours: By appointment

Communication: Periodically, you will receive emails about important lab updates and reminders from your TA. These will be sent to your @ttu.edu email address. Please use this email address for all correspondence with your instructor.

Required Materials:

Lab manual: The Biology 1401 Lab Manual may be purchased from TTUAB in the Biology basement. **Lab Manuals are REQUIRED before LAB 1.**

Lab coat: Lab coats are required for all students taking any lab. Lab coats MUST be worn by all students during any such experiment. TTUAB (Biology basement) will be selling lab coats.

Attendance:

Attendance is the key factor to success in labs. Actively enquiring and participating in pursuit of your own education is what lab is all about. Labs may be very different from lecture, because students are expected to participate MORE than the instructor. Therefore, there are **strict attendance rules**. Unexcused absences may not be made up. Excused absences *can* be made up. Excused absences include religious days, a death in the family, illness, mandatory attendance at a university extra-curricular function, or other serious instances. **You must notify your lab instructor PRIOR** to a planned absence. **If you are suddenly ill, you must contact your instructor the day you become ill**. To be excused, you must present to your lab instructor required documentation from your doctor, coach, dean, counselor, minister, funeral director, etc. on official letterhead. To receive credit for the lab, you must make it up. Please coordinate with your instructor if you will need to make up that week's lab. Labs can only be made up during the Friday of the week the lab was given. Even if an absence is excused, IT MUST BE MADE UP!!

All assignments are due on the date assigned by your lab instructor. Late assignments can be submitted within one week of the original due date, but will only receive 50% credit. Assignments turned in after one week will

not receive any credit. If you have an excused absence, your lab instructor will assign a due date for the make-up material.

Special Needs:

Please notify your instructor if you need any special accommodations in class such as preferential seating, note taking, extra time on exams, etc. Students will need to present appropriate verification from Student Disability Services at 335 West Hall or 806-742-2405. Students will be granted an excused absence for any religious holiday, but you must contact your TA beforehand in order to make arrangements to make up any work.

Academic Honesty:

Dishonesty will not be tolerated. All students are expected to abide by the Code of Student Conduct (see your student handbook for the definition of cheating). As stated in the Texas Tech University catalog, 'The attempt of any students to present as their own work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offense liable to serious consequences, possibly suspension'. Only one warning will be given; a second incident will result in a zero for that activity, whether an exam or daily activity, and the student will be reported to the proper authorities.

Classroom regulations:

All students are expected to conduct themselves in a proper manner to provide a good learning environment for everyone. Any disruptions will not be tolerated. Such disruptions include but are not limited to: arriving late or leaving early; reading material not required for class; talking to neighbors or on phones; texting; eating or drinking; playing games on the computer or phone. Any disruptions will be dealt with immediately and reported to the proper authorities. Be respectful of your instructor, classmates, and the classroom. Put away personal electronic equipment unless it is authorized by Student Disability Services. **ABSOLUTELY NO FOOD, DRINKS OR TOBACCO IN THE LAB – THIS IS A UNIVERSITY POLICY! Also, NO FOOD, DRINK, or TOBACCO CONTAINERS in the WASTE BINS**. Your instructor will check the lab tables before and after class. If drink bottles or food wrappers are found at your table, all lab members will receive a penalty in that day's participation points. Although students will not be exposed to dangerous chemicals, they should **WEAR LONG PANTS AND CLOSED TOE SHOES** (no sandals) as required in all laboratories on campus. All students **MUST WEAR LAB COATS** for any lab.

Expected Learning Outcomes:
It is expected that a student completing this class should be able to understand:

- plant importance in the environment
- plant structure and its relationship to plant function
- requirements for plant growth and development
- the scientific approach to developing knowledge through experimentation and analysis

Methods of Assessing Expected Learning Outcomes:
Learning outcomes will be assessed by the following (percentages reflect percentage of total lab score):

• Pre-lab activities	10%
• In-lab activities	50%
• In-lab participation	5%
• Plant observations	5%
• Independent Investigation: Report Draft	5%
• Independent Investigation: Final Report	10%
• Independent Investigation: Presentation	10%
• Independent Investigation: Peer Evaluation	5%

Assessment notes:

1. Pre-lab and in-lab activities will be assessed via written answers to questions in the lab manual.
2. In-lab participation will be assessed by the TA. The TA will assume full marks at the beginning of each lab, but will deduct points for items including, but not limited to tardiness, classroom disruption, lack of participation in group work, or failure to follow lab guidelines.
3. Plant observations will begin on week 1 and last through week 6. Students will be evaluated on the thoroughness of their observations. Students will be in charge of keeping plants watered during the week. If your plant dies before the end of the 6-week observation period, please see your TA.
4. All aspects of the independent investigation are a group effort. However, if issues arise within the group, members may take up complaints with the TA. A peer evaluation following the end of the report will allow members to grade their peers in an effort to ensure full group participation. Prior to the submission of a final report, a draft report will be submitted (see schedule). Presentations will be given on the week before Thanksgiving (see schedule). Final reports are due the week after Thanksgiving (see schedule).
5. The lab is a core requirement. As such, **if you receive a grade of 55% or below for the lab, you will be given an "F" for the entire course.**

Laboratory Schedule-Fall 2017

Week	Dates	Laboratory Topic
1	Aug 27-31	Lab 0 – TA and lab introduction **Assignment** – Buy lab manual and lab coat; Read Lab 1 and complete Pre-Lab questions
2	Sep 3-7	Lab 1 – Introduction and Research Methods (**manual required**); **begin plant obs.** **Assignment** – Read Lab 2 and complete Pre-Lab questions
3	Sep 10-14	Lab 2 – Independent Investigations **Assignment** – Read Lab 3 and complete Pre-Lab questions
4	Sep 17-21	Lab 3 – Plant Structure and Function; Independent Investigations continued **Assignment** – Read Lab 4 and complete Pre-Lab questions
5	Sep 24-28	Lab 4 – Microscopes and Plant Tissues; Independent Investigations continued **Assignment** – Read Lab 5 and complete Pre-Lab questions
6	Oct 1-5	Lab 5 – Plant Cells and Tissues; Independent Investigations continued **Assignment** – Read Lab 6 and complete Pre-Lab questions
7	Oct 8-12	Lab 6 – Water and Plants**; end plant obs.** **Assignment** – Read Lab 7 and complete Pre-Lab questions
8	Oct 15-19	Lab 7 – Enzymes; **Independent Investigations completed** **Assignment** –work on draft of research papers
9	Oct 22-26	Research report and presentation workshop **Assignment** – Read Lab 8 and complete Pre-Lab questions; work on draft of research papers
10	Oct 29-Nov 2	Lab 8 – Plant Propagation; **DRAFT 1 OF RESEARCH REPORT DUE** **Assignment** – Read Lab 9 and complete Pre-Lab questions
11	Nov 5-9	Lab 9 – The Central Dogma; Drafts of research reports returned **Assignment** –Work on research paper and presentations
12	Nov 12-16	**Group Presentations** and Discussion; Propagation evaluations **Assignment** – Read Lab 10 and complete Pre-Lab questions
13	Nov 19-23	****NO LAB, THANKSGIVING BREAK****
14	Nov 26-30	Lab 10 – Diversity of Plants; lab cleanup; **Final Reports Due**