



## TECHNICAL COLLEGE OF THE LOWCOUNTRY

Technical College of the Lowcountry  
921 Ribaut Road  
Beaufort, SC 29901

Arts & Sciences Division  
Building 9, Room 102  
843-525-8281

### AGR 204

#### Introduction to Plant Sciences

##### Course Description

This course will present the fundamentals of plant sciences, including agronomic and horticultural crops of the major agricultural areas of the world. Emphasis will be given to crops of the Southeastern Region of the United States.

Prerequisites: ENG 100, MAT 101, RDG 100.

3.0 Cr (2.5 lect/pres, 1.5 lab, 0 other)

##### Course Focus

The purpose of this course is to enable the student to gain an appreciation and working knowledge of the basic principles of plant science from an applied/production perspective. Instruction will be divided between interactive lecture and hands-on lab.

##### Text and References

Bidlack, James. Stern's Introductory Plant Biology, 13<sup>th</sup> Edition. McGraw Hill. 2014. ISBN: 978-0-07-336944-0.

Bidlack, James, Shelley Jansky, & Kingsley Stern. Laboratory Manual: Stern's Introductory Plant Biology, 13<sup>th</sup> Edition. McGraw Hill. 2014. ISBN: 978-0-07-750878-4

##### Core Curriculum Competencies

This course develops critical thinking skills through instruction that emphasizes the understanding of chemical, physical, and biological concepts as they relate to the applied plant sciences. This understanding will be demonstrated by assessments on a series of graded projects and on the common final exam. The student will demonstrate the following critical thinking objectives:

- Following standard scientific method, students will interpret laboratory observations and data, and determine relevance of their findings to planning and observations outcomes.
- Students will recognize key chemical, physical, and biological assumptions and make inferences justified by data and observations.

## Course Goals

The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives. (\*designates a CRUCIAL goal)

1. Discuss the role of plant science in world economy and human society.
2. Describe why and how plants are cultivated for use by humans.
3. Describe how growing plants impacts energy use and our carbon footprint.
4. Discuss plant evolution and origins of major world crops. \*
5. Discuss major strategies for an Integrated Pest Management (IPM) system.\*
6. Differentiate among traditional, organic, and sustainable production practices.\*
7. Describe how environmental factor management applies to growing plants.
8. Discuss the basic principles of harvesting and post-harvest handling of crops for human use.
9. Describe the major forage and rangeland crops.
10. Explain the principles of hay and silage production, harvest, and storage.
11. List and discuss the major field crops grown in the southeastern US for food, fiber, fuel, and other uses.\*
12. Describe crop-specific cultural practices.
13. Discuss the differences between field and controlled-environment vegetable production.
14. Outline the basic steps in successful vegetable production.
15. Determine vegetable crops appropriate for the Lowcountry.\*
16. Describe the requirements for a successful fruit or nut production.
17. Discuss cultivar and rootstock selection.\*
18. Determine fruit and nut crops suitable for the Lowcountry.\*
19. Discuss site and crop selection for nursery production.
20. Explain the principles of field and container nursery crop production.
21. Explain the importance of growing media for container production.
22. Discuss pests and pest management for common nursery crops.\*
23. Determine nursery crops appropriate for the Lowcountry. \*
24. Describe basic greenhouse structure and components.
25. Explain how the greenhouse environment is manipulated to regulate plant growth and development.
26. Discuss pests and pest management for common greenhouse crops.
27. Discuss the principles of growing several greenhouse crops.
28. Define and use turfgrass terminology.
29. Explain the principles for establishing and maintaining turfgrasses.
30. Discuss pests, pest management, fertility management, and mowing practices for common turfgrasses.
31. Determine common turfgrasses appropriate for the Lowcountry.\*
32. Discuss how to choose, plant, and care for trees, shrubs, and herbaceous plants used in landscaping.
33. Discuss native plant communities, and native plants for landscapes.
34. Discuss how to identify and control invasive plants.
35. Determine common landscape plants appropriate for the Lowcountry.\*
36. Discuss the history of the constructed landscape.
37. Discuss landscape design and construction terminology.
38. Outline sustainable practices for landscaping in the Lowcountry.
39. Explain the interactions among climatic variables and how they affect plant growth.
40. Discuss difference between weather and climate, climate change, and microclimates. \*
41. Discuss soil ecology as a complex system with many components, both living and non-living.

42. Describe the formation, chemical, and physical make-up of soil.
43. Discuss the procedures, interpretation and importance of soil testing. \*
44. Describe the forces that move and hold water in the soil.
45. Describe the forces that move water from the soil into plants and into the atmosphere.
46. Explain the functions of water in plants.
47. Discuss the importance of irrigation for crops and turf in the Lowcountry. \*
48. Explain how nutritional elements are taken into plants through the roots.
49. List the 14 essential mineral nutrients of plants and describe the roles they play in plant growth and development. \*
50. Describe the nitrogen cycle and its importance to life on Earth.
51. Discuss nutrient deficiency and recognize deficiency symptoms.
52. Discuss pH and pH manipulation. \*
53. Outline corrective measures for various nutrient deficiencies.
54. Explain techniques used to conserve soil and to improve degraded soil.
55. Discuss the basic types and components of irrigation and drainage systems.\*
56. Discuss plant nutrition management through soil fertility practices.
57. Discuss salt contaminated soils and remediation methods.\*
58. Discuss erosion and water run off.
59. Explain basic functions of plant cells, tissue, organs, and entire plants.
60. Differentiate between plant development and plant growth and describe how to measure each.
61. Describe the factors that affect plant growth and development and what their effects are.\*
62. Discuss how those factors can be modified and controlled to control plant growth and development.
63. Discuss the roles and manipulation of plant hormones to manage plant growth and development.
64. Explain the carbon cycle and its relationship to life on earth
65. Explain the process of photosynthesis and its role in converting radiant to chemical energy. \*
66. Explain the process of respiration and its role in using the chemical energy created during photosynthesis.
67. List and discuss the major biochemicals found in plants and how they affect plant growth and development.
68. Describe the roles of carbon, hydrogen, oxygen, nitrogen, phosphorous, and sulfur in plant growth and development. \*
69. Use scientific nomenclature and classification systems to identify plants. \*
70. Discuss the basic concepts of genetics as they relate to the production and use of plants.
71. Discuss how genetic engineering is used to modify plants for human use.
72. Explain the common methods of plant breeding and sexual and asexual propagation.\*
73. Propagate plants using various vegetative techniques.

### Student Contributions

Classes are designed to employ a variety of teaching techniques. In order to maximize learning, required readings should be done prior to a unit. If a student is falling behind in lab performance or academic achievement, it is imperative to seek immediate assistance from the instructors.

### Course Evaluation:

1. Student progress will be evaluated through a series of tests, quizzes in-class and out of class assignments and will be detailed in the attachment to this syllabus.
2. Blackboard: lecture notes, handouts, podcasts, study hints, tutor information, syllabi, and other course information is available on the course blackboard page.

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3. **Laboratory Component:** This course has a required lab component which supplements the information presented in lecture. The lab will be independently evaluated primarily through lab practicals, in class and out of class lab assignments (such as research papers). For specific details about lab evaluations, please refer to the attachment to this syllabus.

TCL's grading scale is:

90 - 100	=	A
80 - 89	=	B
70 - 79	=	C
60 - 69	=	D
Below 60	=	F

#### Course Schedule

The class meets for 2.5 lecture/presentation hours and 1.5 lab hours per week.

#### ADA STATEMENT

The Technical College of the Lowcountry provides access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation, contact the counselor for students with disabilities at (843) 525-8219 or (843) 525-8242 during the first ten business days of the academic term.

#### ACADEMIC MISCONDUCT

There is no tolerance at TCL for academic dishonesty and misconduct. The College expects all students to conduct themselves with dignity and to maintain high standards of responsible citizenship.

It is the student's responsibility to address any questions regarding what might constitute academic misconduct to the course instructor for further clarification.

The College adheres to the Student Code for the South Carolina Technical College System. Copies of the Student Code and Grievance Procedure are provided in the *TCL Student Handbook*, the Division Office, and the Learning Resources Center.

#### ATTENDANCE

The College's statement of policy indicates that students must attend ninety percent of total class hours or they will be in violation of the attendance policy.

- Students not physically attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
- Students taking an online/internet class must sign in **and** complete an assignment designated by the instructor within the first ten calendar days from the start of the semester to indicate attendance in the class. Students not attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
- Reinstatement requires the signature of the division dean.
- In the event it becomes necessary for a student to withdraw from the course **OR if a student stops attending class, it is the student's responsibility to contact the instructor via e-mail requesting to be withdrawn from the class.** Withdrawing from class may have consequences associated with financial aid

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and time to completion. Students are strongly encouraged to consult with Financial Aid prior to withdrawing from any class, particularly if the student is currently on a warning or probation status.

- When a student exceeds the allowed absences, the student is in violation of the attendance policy. The instructor MUST withdraw the student with a grade of “W”, “WP”, or “WF” depending on the date the student exceeded the allowed absences and the student’s progress up to the last date of attendance

*or*

- Under extenuating circumstances and at the discretion of the faculty member teaching the class, allow the student to continue in the class and make-up the work. This exception must be documented at the time the allowed absences are exceeded.
- Absences are counted from the first day of class. There are no "excused" absences. All absences are counted, regardless of the reason for the absence.
- A student must take the final exam or be excused from the final exam in order to earn a non-withdrawal grade.
- A copy of TCL’s **STATEMENT OF POLICY NUMBER: 3-1-307 CLASS ATTENDANCE (WITHDRAWAL)** is on file in the Division Office and in the Learning Resources Center.

### **ONLINE ATTENDANCE PROCEDURE**

For all online courses, students must complete an assignment designated by the instructor during the first week of classes. The instructor will drop the student from the course if the initial assignment is not completed.

Instructors will withdraw students from the class when 90% attendance is not maintained. Attendance in an online course is defined by regular course access and by timely completion of assignments as required by the instructor. Each student will be expected to access the web class at least once a week and complete 90% of assignments on time. Additional access is encouraged and may be necessary for successful completion of classes.

Failure to log in and complete assignments will result in the student being withdrawn from the course. The instructor will assign a grade of “W,” “WP,” or “WF” based upon the student’s academic standing as the last date of attendance, which is the last login. Students are responsible for any financial matters associated with an administrative withdrawal. If a student fails to email the instructor (using the my.tcl.edu email account) requesting to be dropped from the course and has not submitted the initial assignment required during the first week of class, the instructor will assign a “Never Attended” code in the student information system (web-advisor) no later than ten calendar days after the first day of the class. Students who are dropped as a result of never attending the course are still responsible for all fees associated with the course.

### **HAZARDOUS WEATHER**

In case weather conditions are so severe that operation of the College may clearly pose a hardship on students and staff traveling to the College, notification of closing will be made through the following radio and television stations: WYKZ 98.7, WGCO 98.3, WGZO 103.1, WFXH 106.1, WWVV 106.9, WLOW 107.9, WGZR 104.9, WFXH 1130 AM, WLVH 101.1, WSOK 1230 AM, WAEV 97.3, WTOC TV, WTGS TV, WJWJ TV, and WSAV TV. Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. <http://www.tcl.edu/current-students/text-alert>

### **EMERGENCY TEXT MESSAGE ALERT**

Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. Participants receive immediate notification of emergency events and weather cancellations via text messaging

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on their cell phones. Participants can also opt in to receive non-emergency news and announcements. Go to [www.tcl.edu](http://www.tcl.edu). On the homepage, click on "emergency TextAlert at TCL" and fill out the form or go to <http://www.tcl.edu/current-students/text-alert>

## **GRADING METHODOLOGY**

The final grade must be 70 or more (a grade "C" or better) in order to pass the course and progress to the next course. Students absent from an examination or presentation will receive a "0" grade for the examination unless other arrangements are made with the individual instructor prior to the examination or presentation day or on the examination or presentation day before the test/presentation is scheduled to be given.

The student is responsible for notifying the instructor for the reason of the absence. It is also the responsibility of the student to contact the appropriate instructor to arrange to make up the examination. Arrangements may be completed by telephone.

If the instructor is not available, a message should be left on the instructor's voice mail AND with another member of the faculty or administrative assistant. The make-up exam will be scheduled and the instructor will decide the method of examination. Messages sent by other students are unacceptable.

## **SAFETY ADDENDUM**

### **Purpose.**

The purpose of this safety addendum is to provide each student with safety guidelines during an incident, emergency, or disaster at TCL. In addition, it provides students guidelines for lockdown procedures, evacuation procedures, and active shooter.

### **Definitions**

**An incident** is any event, potential or actual, that may impact normal operations but has no immediate health or life threatening consideration or serious effect on the overall functional capacity of the College. An event of this nature should be reported to the Office of the Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

**An emergency** is any incident, potential or actual, which may endanger life or health or which affects an entire building or buildings, and will disrupt the overall operations of the College. Outside emergency services will probably be required, as well as major efforts from campus support services. Major policy considerations and decisions will usually be required from the college administration during times of crises. An emergency should be reported immediately by directly using **911** if life or health/injury considerations exist and then to the Office of the President or Vice President for Administrative Services as quickly as possible. Also notify the off-site campus administrator if applicable.

**A disaster** is any event or occurrence that has taken place and has seriously impaired or halted the operations of the College. In some cases, mass personnel casualties and severe property damage may be sustained. A coordinated effort of all campus-wide resources is required to effectively control the situation. Outside emergency services will be essential. In all cases of disaster, an Emergency Control Center will be activated, and the appropriate support and operational plans will be executed. The disaster should be immediately reported, first by calling **911** and then to the Office of the President or Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

## **Types of Emergencies**

- Hurricane
- Tornado
- Fire
- Biochemical or Radiation Spill
- Explosion/Bomb
- Downed Aircraft (crash which directly impacts campus operations)
- Utility Failures
- Violent or criminal behavior
- Psychological Crisis

## **Procedures**

### **Active Shooter**

Run/hide/fight (<http://www.fbi.gov/about-us/cirg/active-shooter-and-mass-casualty-incidents/run-hide-fight-video>)

### **Building Evacuation**

1. Building evacuations occur when an alarm sounds and/or upon notification by Security or the Emergency Director.
2. When the building evacuation alarm is activated during an emergency, individuals should exit according to the building evacuation plan and alert others to do the same.
3. Once outside, individuals should proceed to a clear area that is at least 500 feet away from the affected building. Streets, fire lanes, hydrant areas and walkways should be kept clear for emergency vehicles and personnel.
4. Individuals should not return to an evacuated building unless told to do so by Security or the Emergency Director.
5. Individuals should assist persons with disabilities in exiting the building. Elevators are reserved for disabled persons

### **Campus Evacuation**

1. A uniformed Security Guard, the Emergency Director, or an Emergency Resource Team member will announce evacuation of all or part of the campus grounds.
2. All persons (students and staff) are to immediately vacate the campus, or in the case of a partial evacuation relocate to another part of the campus grounds as directed.

### **Lockdown**

1. Clear the halls
2. Report to the nearest classroom/office
3. Assist those needing special assistance
4. Ensure classroom/office doors are closed and locked
5. Turn off lights
6. Stay away from doors and windows (out of the line of sight)
7. BE QUIET and follow instructor's directions
8. Silence cell phones
9. Wait for the "All Clear" before leaving