



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

PHY 202

Physics II

Course Description

This course covers physics topics including mechanics, wave motion, sound, heat, electromagnetism, optics, and modern physics.

Prerequisite or Co requisite: PHY 201.

4.0 Cr (3 lect/pres, 3 lab, 0 other)

Course Focus

This algebra-trigonometry based course is modular in nature. It emphasizes a hands-on approach covering all the major concepts in physics. Modules introducing activities that are designed to enhance the student's conceptual understanding and ability to make connections to related fields are utilized. The philosophy of this curriculum is one of exploration and discovery.

Text and References

Cutnel, John D., Kenneth W. Johnson, David Young, & Shane Stadler. Physics, 10th Edition, Binder Ready Version. John Wiley & Sons, December 2014. ISBN: 978-1118651889.

Core Curriculum Competencies

All courses approved for the general education core curriculum helps students develop communication skills and/or critical thinking

- This course develops students communication skills and applies critical thinking skills by formulating appropriate questions and testable hypothesis for research; effectively collecting appropriate (empirical) evidence; applying and integrating principles and concepts to analyze problems within specific core areas; appropriately evaluating and interpreting claims, arguments, evidence and hypothesis; using the results of analysis to appropriately construct new arguments or alternate hypothesis and formulate new questions.

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. Identify the three fundamental units of measurement and be able to list their units in the metric system.
2. Use the fundamental units in combination to describe other physical qualities in the metric system and recognize the prefixes used with the units.
3. Use conversion factors if given enough information.
4. Convert standard numbers into scientific notation and back
5. Define a vector and a scalar quantity.
6. Determine the x and y components of a given vector by analytical or graphical methods
7. Find the resultant of two or more vectors, either graphically or vectorially.
8. Work right angle trigonometry problems.
9. Determine whether an object subject to simple forces is in translational and/or rotational equilibrium.
10. State whether the equilibrium of a known simple object is stable, unstable or neutral.
11. Find the torque due to a given force about any specified pivot point and the force due to a given torque.
12. Define the center of gravity and determine its location mathematically.
13. Use the five general equations of uniformly accelerated motion to solve physical problems for any one unknown variable.
14. Use the five free fall equations to solve for physical problems for anyone unknown variable.
15. Use all equations for projectile velocity to solve for any one unknown variable.
16. Determine the displacement of a projectile at any time when enough information is given.
17. Solve equations involving centripetal acceleration for any one unknown variable.
18. Write Newton's Laws of Motion from memory.
19. Determine the motion for an object under the influence of a net force.
20. Convert mass to weight and weight to mass when the value of the acceleration due to gravity is known.
21. Define and use all units associated with force, mass and acceleration in the metric or English system.
22. Determine the value of any unknown variable using the equation for the gravitational force equation between any two masses separate by a distance.
23. Compute the value of g at any altitude above the Earth's surface.
24. Distinguish the relationships between static friction, maximum static friction and kinetic friction and be able to solve for any unknown variable in the friction equations.
25. Determine the acceleration of an object on an incline of known angle, given the coefficient of friction.
26. Given the coefficient of friction, the student shall compute the acceleration of two objects connected by a string, such that one is on an incline and the other hangs freely.
27. Compute the work done by a force when given the magnitude of the force, the distance moved, and the angle between the force and the displacement.
28. Compute the gravitational potential energy and the kinetic energy of any object when given the appropriate information.
29. Solve physical problems using the laws of conservation of energy.
30. Solve for power or any unknown variable using the power equations.
31. Solve for any unknown variable in the impulse equations when given the other quantities.
32. State the law of conservation of momentum and use the law to solve for any unknown variable in a one-dimensional problem involving momentum.
33. Distinguish between elastic and inelastic collisions and that understanding to simple problems.
34. Convert from rotational motion to linear motion units and from linear motion to rotational motion units.

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35. Solve problems using the five equations for uniformly accelerated angular motion.
36. Determine the work done and kinetic energy of a rotating object in terms of the angular acceleration and speed.
37. Use the torque equations to solve for any unknown variable.
38. Solve problems using conservation of angular momentum and conservation of energy.

Student Contributions

For this course to run properly, the student is expected to be prepared for each class including, but not limited to, reading assignments and speaking assignments. Attendance is a great contributor to student success in public speaking.

Course Evaluation

- 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.
- Blackboard: lecture notes, handouts, podcasts, study hints, tutor information, syllabi, and other course information is available on the course blackboard page.
- 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.

GRADING SCALE:

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 3 lab hours per week.

STATEMENT OF NON-DISCRIMINATION

The Technical College of the Lowcountry is committed to a policy of equal opportunity for all qualified applicants for admissions or employment without regard to race, gender, national origin, age, religion, marital status, veteran status, disability, or political affiliation or belief.

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.

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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 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.

Approved/Revised/Updated: 07/08/2019

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 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, WWVW 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 cancelations via text messaging on their cell phones. Participants can also opt in to receive non-emergency news and announcements. Go to 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.

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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