



TECHNICAL COLLEGE  
OF THE LOWCOUNTRY

Technical College of the Lowcountry  
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**EGR 194**  
**Statics and Strength of Materials**

**Course Description**

This course covers external and internal forces in structures and/or machines, including conditions of equilibrium, systems of force, moments of inertia and friction. It also covers the stress and strain relationships in materials.

4 Cr (4 lec/pres, 0 lab, 0 other)

**Course Focus**

The course introduces the action and reaction of forces both within and outside of a body. Upon completion of this course, the student should have an understanding of, equilibrium, free-body diagrams, two- and three-dimensional force systems, stress-strain relationships, shear and moment diagrams, elementary truss and frame analysis, centroids and centers of gravity, friction, and moments of inertia. The purpose is to develop a fundamental understanding of engineering theory.

**Text and References**

Please visit the TCL Bookstore for the most recent textbook requirements.

**Course Goals**

The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives.

1. Discuss right angle trigonometry
2. Review the science of mechanics
3. Discuss units in mechanics
4. Understand the development of forces
5. Distinguish between scalars and vectors
6. Perform vector addition using trapezoid rule
7. Perform vector addition using triangle rule
8. Resolve vectors into rectangular components
9. Compute resultant of rectangular components
10. Compute moments
11. Analyze parallel force systems

12. Solve non-concurrent force systems
13. Review load paths
14. Review force couples
15. Understand equilibrium of a rigid body
16. Draw appropriate free body diagrams
17. Calculate reactions at supports
18. Perform truss force analysis with method of joints
19. Use method of sections in truss analysis
20. Find zero force truss members
21. Analyze frame forces
22. Calculate coulomb friction
23. Resolve friction forces at supports
24. Review wedge forces
25. Calculate the first moment of area of shapes
26. Resolve distributed forces into resultants
27. Calculate the second moment of area
28. Understand parallel axis theorem
29. Determine moment of inertia in composite bodies
30. Compute polar moments of inertia
31. Describe the radius of gyration
32. Compute normal stress
33. Compute shear stress
34. Review stress concentrations
35. Determine strain
36. Determine the modulus of elasticity
37. Study Poisson's ratio
38. Predict axial deformation
39. Report thermal stress
40. Determine the Bulk Modulus
41. Compute torsion
42. Determine torsional rotation
43. Find shaft power
44. Examine internal forces in beams
45. Compute beam shear force
46. Determine beam internal moments
47. Use graphical methods to determine shear diagrams
48. Use graphical methods to determine moment diagrams
49. Review shear and moment diagrams in continuous beams
50. Determine bending stresses in a shape
51. Compute shearing stresses in a shape
52. Calculate beam deflections with standard formulas
53. Review the effects of combined stresses

### **Student Contributions**

The student is expected to be prepared for class and to be in class on time. Test materials are weighed heavily in favor of lecture materials. The student will complete all assignments. The student is required to observe and practice all lab safety rules. All cell phones and pagers must be silenced during class.

## Course Evaluation

The grade scale is as follows:	90 – 100 =	A
	80 – 89 =	B
	70 – 79 =	C
	60 – 69 =	D
	Below 60 =	F

Course grades will be determined from the following weighting scheme:

Attendance/Notebook Review/Homework completion	20%
Quizzes	60%
Final	20%

## Course Schedule

The class meets for 4 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) 525-8228 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** communicate with 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 initiate and complete the necessary paperwork.** Withdrawing from class may have consequences associated with financial aid and time to completion.

- When a student exceeds the allowed absences, the student is in violation of the attendance policy. The instructor MUST withdrawal 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 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, WL VH 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. [www.tcl.edu/textalert.asp](http://www.tcl.edu/textalert.asp)

EXTRA:

### 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](http://www.tcl.edu). On the homepage, click on “emergency TextAlert at TCL” and fill out the form or go to [www.tcl.edu/textalert.asp](http://www.tcl.edu/textalert.asp)

## **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.

## Syllabus 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.

### Definition

**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

*Updated August 2019*