



TECHNICAL COLLEGE OF THE LOWCOUNTRY

Business & Industrial Technologies Division

Technical College of the Lowcountry
921 Ribaut Rd.
Beaufort, SC 29901

Industrial Technology Division
Building 14, Room 112

EGT 282 RAPID PROTOTYPING I

COURSE DESCRIPTION

This course includes a series of problems and exercises utilizing additive and subtractive prototyping technologies and 3-D modeling applications to produce working prototypes.

4 Cr (2 lect. /pres., 0 labs, 2 others)

COURSE FOCUS

Involve the student with product design using 3-Dimensional solid modeling and Rapid Prototyping techniques. Students will design a product, prepare it for rapid prototyping machine and produce it on a 3-D printer.

TEXT AND REFERENCES

Please refer to the TCL bookstore for the current required textbook. <https://www.tcl.edu/bookstore/>

COURSE GOALS

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

1. create understanding awareness
2. define rapid prototyping
3. examine technology description
4. understand shades of gray
5. use tool change
6. execute informed decision
7. examine rapid prototyping
8. understand rapid prototyping history
9. understand rapid prototype (RP) benefits
10. grasp RP application
11. understand RP system classification
12. explain rapid tooling
13. explain rapid manufacturing
14. examine RP future
15. determine RP process
16. examine process detail
17. demonstrate process strength
18. demonstrate process limitation
19. describe 3D printers

20. examine enterprise prototyping centers
21. evaluate direct digital manufacturing
22. understand system classification
23. understand specialize purposes
24. describe RP applications
25. demonstrate RP benefits
26. conclude RP profitability
27. compare RP vs. CNC machining
28. evaluate pragmatic decision
29. execute process comparison
30. summarize process differences
31. list available RP systems
32. examine process overview
33. evaluate process detail
34. compare RP properties
35. compare operational properties
36. compare RP applications
37. compare in house operation
38. examine service bureaus
39. establish economic justification
40. explore hidden cost
41. understand additional consideration
42. examine implementation challenges
43. define realistic needs
44. understand evaluating systems
45. specify implementation process
46. summarize evaluation implementation
47. define rapid tooling
48. define rapid manufacturing
49. explain limited use
50. evaluate rapid tooling
51. evaluate rapid manufacturing
52. examine growth barriers
53. explore future development
54. exhibit smoother pilot test
55. examine fast track snowshoe design
56. examine 3D printing finite element analysis
57. examine Greek statue reproduction
58. examine Boost aging product innovation
59. examine Chevy SSR
60. examine bimolecular models

STUDENT CONTRIBUTION

Each student will spend approximately 8 hours per week preparing for class and completing assignments to turn in weekly. This is a hybrid class with half of it being covered via online. Each week students will turn in assignments as specified on Blackboard. Students will also complete a final exam/project to demonstrate their knowledge of the material.

Student Attendance Policy: See student handbook within the TCL Catalog.

COURSE EVALUATION

The grading scale is as follows:

Assignments and class work = 70%, Midterm Exam = 15%, and Final Exam = 15%.

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

COURSE SCHEDULE

The class meets for 2 lecture/presentation hours per week. Course content will be taught in the order that the content goals are presented in the syllabus.

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. Reinstatement requires the signature of the division dean.
- 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** 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 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, WLVA 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

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 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 Text Alert at TCL" and fill out the form or go to www.tcl.edu/textalert.asp

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

Developed/Revised: June 2019