EEM 231
Digital Electronics

Course Description

This course is a study of the logic elements, mathematics, components and circuits utilized in digital equipment. Emphasis is placed on the function and operation of digital integrated circuit devices.
There are no prerequisites.
3 Credits

Text and References


Course Goals

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

1. Convert Octal numbers to Hexadecimal numbers
2. Define Digital Electronics term
3. Learn the XNOR logic function
4. Learn the XOR logic function
5. Learn the NOR logic function
6. Learn the OR logic function
7. Learn the NAND logic function
8. Learn the AND logic function
9. Construct NOT logic circuit
10. Convert Hexadecimal numbers to Octal numbers
11. Construct OR logic circuit
12. Convert Binary numbers to Octal numbers
13. Learn Octal Number system
14. Convert Binary numbers to Hexadecimal numbers
15. Learn Transistor-to- Transistor logic
16. Learn Hexadecimal number system  
17. Convert Binary numbers to Decimal numbers  
18. Convert Decimal numbers to Binary numbers  
19. Learn Binary number system  
20. Learn Number Systems' structure  
21. Compare Analog to Digital electronics  
22. Learn the NOT logic function  
23. Learn digital clock construction  
24. Evaluate commercial Analog-to-Digital conversion systems  
25. Construct 8-Bit Analog-to-Digital circuit  
26. Learn Successive Approximation Analog-to-Digital technique  
27. Construct Multiplexer circuit  
28. Learn the operating characteristics of a Multiplexer  
29. Construct a combination Clock, Counter, and Encoder circuit  
30. Construct a clock and Counter circuit  
31. Construct AND logic circuit  
32. Construct a digital clock circuit  
33. Construct sequential logic circuits  
34. Construct Encoding circuits  
35. Construct 4-bit counter circuits  
36. Construct Data lockout circuit  
37. Learn Synchronous counter theory  
38. Learn J-K Flip-Flop Latch theory  
39. Learn Data Lockout Latch theory  
40. Learn Set-Reset Latch theory  
41. Construct Combination logic circuit  
42. Construct NOR logic circuit  
43. Analyze digital clock circuit  

STUDENT CONTRIBUTION

Each student will spend approximately 5-8 hours per week preparing for class and completing assignments to turn in weekly.

Each week students will turn in assignments as specified by the instructor. In addition, tests are to be completed as assigned. Students will also complete mid-term and 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:

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

Grading Policy

Exams 20%  
Final 20%  
Lab 20%  
Multisim 20%  
Homework 20%  

COURSE SCHEDULE
The class meets for 3 lecture/presentation 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 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, WLVH 101.1, WSOX 1230 AM, WAEV 97.3, WTCV TV, WTGS TV, WJWI TV, and WSAV TV. Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System.

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 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.

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
1. Hurricane
2. Tornado
3. Fire
4. Biochemical or Radiation Spill
5. Explosion/Bomb
6. Downed Aircraft (crash which directly impacts campus operations)
7. Utility Failures
8. Violent or criminal behavior
9. Psychological Crisis

Procedures

Active Shooter

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