**Instructor(s):** Ronald E. Cross

**Office Number:** ERB 549

**Office Telephone Number:** (817) 272-1728

**Email Address:** recross@uta.edu

**Faculty Profile: R.E. Cross -** https://mentis.uta.edu/public/#profile/profile/edit/id/16499/category/1

**Office Hours:** Tuesday from 12:30 to 1:50 pm, other times by appointment

**Section Information:** CSE 2440 Section 001

**Time and Place of Class Meetings:**

Section 005: PH 110, Tuesday & Thursday from 3:30 to 4:50 pm

Lab Section 002: ERB 126 Monday from 1:00 to 3:50pm

Lab Section 003: ERB 126 Wednesday from 1:00 to 3:50pm

**TA/Grader Contact Information:**  See BlackBoard Folder Labeled TA/Grader Information

**Objectives:**

This course covers the basic concepts of electric circuits and signals. Electric potential, current, power, energy will be discussed. Circuits will be introduced with Kirchoff’s laws; resistive circuits will be investigated. Circuits containing linear energy storage components (capacitors, inductors) will be investigated and their applications to filtering signals will be discussed. DC, AC, and general signals will be discussed. Semiconductors will be introduced (diodes and transistors). Operational amplifiers will be introduced and their properties and applications discussed.

An accompanying lab will be used to introduce students to instruments and measurement techniques. Labs will be used to explain hands-on circuits and to deepen students’ understanding of electric signal and circuits concepts.

**Outcomes:**

Students successfully completing this course will have gained a solid understanding of basic electronic circuit theory and application. They will gain a basic understanding of filtering principles and a basic understanding of electrical signals. This class provides the basics to a more advanced electronics class and thus forming and important basis for senior design projects and students’ acceptance in industry as computer engineers.

**Details of Curriculum:**

* Class meets Tuesday and Thursday 3:30 pm to 4:50pm in PH 110 (Preston Hall)
* Accompanying labs are held Monday (section 002) or Wednesday (section 003) 1:00 -3:50pm in ERB 126 (Engineering Research Building)
* Class Site for labs is merged with Lecture Section 001 on Blackboard
* We are using Blackboard for announcements and communications. (check it several times per week)
* Text Books:
  + - Required text book: P. Scherz and S. Monk, “Practical Electronics for Inventors,” Fourth Edition, McGraw Hill, ISBN:978-1259587542, 2016.
    - Recommended reference: G. Rizzoni, “Fundamentals of Electrical Engineering,” McGraw Hill Education, ISBN: 978-0073380377, 2008.
    - There are a wide range of books on this topic, all of which cover many of the topics covered in the course and can be used as references for the course.
* Required software:
  + - Students should have an account on <http://everycircuit.com> (cost is approximately $15)
* Lecture slides and notes will be placed Blackboard

**HANDOUTS –** will be placed on Blackboard, <https://elearn.uta.edu>

**Descriptions of grade assessment, major assignments and examinations:**

**GRADING:**

A: >= 90, B: 80 to < 90, C: 70 to < 80, D: 60 to < 70, F: <60 with points computed as follows:

Total Points System will be used where exams (100) will be worth more points than individual homework (20) and quizzes (30), labs will be worth 45 points plus 5 points for Lab Partner Appraisals. Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels; see “Student Support Services,” below. Final grade average will be rounded to the nearest unit: 89.4999 equals 89 where 89.5 equals 90.

**EXAMINATIONS:**

There will be two non-comprehensive exams given during this semester. An optional comprehensive final examination may be taken during finals week. This comprehensive final may be used to replace the lower of your first two exams. If you choose to take the comprehensive exam, it will replace the lower of your two regular exams no matter if it is higher or lower. See the lecture schedule for the dates. Examinations will be closed book and closed notes. Any class discussions, guest speaker presentation, and handouts in class or on the blackboard are testable content of this class. No make-up exams will be given without documented, critical and unavoidable reasons.

**Homework:**

Homework will be scheduled throughout the semester. Homework will not be graded but solutions will be placed on the blackboard after the students have had a chance to work through them on their own. Please note in order to do well in this class it is necessary for the student to stay current with their studies and work problems on their own in order to build an experience base from which to pull from once pop quiz or exams are given. Doing the recommended homework, working extra problems on your own, working through the tutorials and with a study group will be beneficial to the student in this class. The instructor may assign homework for grades as he or she deems necessary.

**POP QUIZZES:**

Pop quizzes may be given at various times during the semester to gauge your understanding of the lecture and reading materials. No make-up quizzes will be given without documented critical and unavoidable reasons. If greater than 3 quizzes are given then the lowest quiz will be dropped.

**Attendance:** At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

As your instructor the following attendance policy will be invoked for this class:

1. You are expected to attend class and attendance will be checked on a regular basis.
2. Each student is responsible for all class material covered and discussions held during class.
3. If it is not possible for you to attend class stay current on what is due by having a classmate take notes for you. Check the Blackboard frequently (several times per week).
4. If you miss a class with a quiz or homework assignment due there is no make up for any missed work without an acceptable and documented excuse.

**Other Requirements:** None

**Expectations for Out-of-Class Study**: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, and team meetings.

**Grade Grievances**: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog.

<http://catalog.uta.edu/academicregulations/grades/#undergraduatetext>; for graduate courses, see <http://catalog.uta.edu/academicregulations/grades/#graduatetext>. For student complaints, see <http://www.uta.edu/deanofstudents/student-complaints/index.php>.

**Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://wweb.uta.edu/aao/fao/>).

**Disability Accommodations:** UTArlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA),* and *Section 504 of the Rehabilitation Act.* All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD).Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

**The Office for Students with Disabilities, (OSD)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability).

**Counseling and Psychological Services, (CAPS)**: [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

**Non-Discrimination Policy**: The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit[*uta.edu/eos*](http://www.uta.edu/hr/eos/index.php)*.*

**Title IX Policy:** The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. For information regarding Title IX, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX) or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or [jmhood@uta.edu](file:///C:\Users\gotcherxx\Downloads\jmhood@uta.edu).

**Academic Integrity**: Students enrolled in UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

*I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents’ Rule* 50101, §2.2, suspected violations of university’s standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

**Lab Safety Training:** Note - Not applicable for this class since there is no lab requirement

**Electronic Communication:** UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

1. The professor of this class will not answer emails sent from accounts other than the student’s assigned university email
2. Always include in the “Subject” line the class name and section number
3. Be specific as to your question and use professional language/academic language

**Class BlackBoard** – You are responsible for checking the class’s blackboard several times during the week (once per day is recommended). I do make announcements from time to time and also post material to the blackboard that is relevant to the class. Please note I may make changes to the class schedule based upon the progress and needs of the class and available of speakers.

**Campus Carry:** Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

**Student Feedback Survey:** At the end of each term, students enrolled in face-to-face and online classes categorized as “lecture,” “seminar,” or “laboratory” are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent

directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback via the SFS database is aggregated with that of other students enrolled in the course. Students’ anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

**Final Review Week:** for semester-long courses**,** a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Please note this section is primarily addressing the Spring and Fall semesters.

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located to your right as you exit the class room around the corner and them immediately left down the stairs. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

You are encouraged to subscribe to the MavAlert system that will send information in case of an emergency to directly to your cell phones or email accounts. Anyone can subscribe at <https://mavalert.uta.edu/> or <https://mavalert.uta.edu/register.php>

**Student Support Services**:UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include [tutoring](http://www.uta.edu/universitycollege/current/academic-support/learning-center/tutoring/index.php), [major-based learning centers](http://www.uta.edu/universitycollege/resources/college-based-clinics-labs.php), developmental education, [advising and mentoring](http://www.uta.edu/universitycollege/resources/advising.php), personal counseling, and [federally funded programs](http://www.uta.edu/universitycollege/current/academic-support/mcnair/index.php). For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to

[resources@uta.edu](mailto:resources@uta.edu), or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

**The IDEAS Center** (2nd Floor of Central Library) offers free tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email [IDEAS@uta.edu](mailto:IDEAS@uta.edu) or call (817) 272-6593.

**The English Writing Center (411LIBR):** The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at http://uta.mywconline.com. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see [www.uta.edu/owl](http://www.uta.edu/owl) for detailed information on all our programs and services.

The Library’s 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library’s hours of operation. <http://library.uta.edu/academic-plaza>

**Librarian to Contact: Contact information** – look up here: <http://www.uta.edu/library/help/subject-librarians.php> [See the end of this document for additional information about library links that might be embedded in your syllabus or other course materials.]

Class Schedule on next page

**Course Schedule**

*As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the*

*educational needs of the students enrolled in this course. – R. E. Cross.*

**Lecture Schedule:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Class #** | **Class Activities/Lecture** | **Source of Material** |
| Week 1: 1/15/19 | 1 | Class Management - Syllabus & Schedule Review; Course Overview; Statements and Symbolic Representation | Lecture 0.1 on Blackboard, Basics of electronics, U, I, P, E, R (finish with P, E) |
| Week 1: 1/17/19 | 2 | Some resistors, Resistive networks | Lecture 1: Resistive networks finishing before node method. |
| Week 2: 1/22/19 | 3 | Res. Networks. Node and Mesh Methods. | Lecture 1: Res networks. Super-position |
| Week 2: 1/24/19 | 4 |
| Week 3: 1/29/19 | 5 | Thevenin’s Equivalent Circuit | Lecture 1: Thevenin’s Equivalent Circuit |
| Week 3: 1/31/19 | 6 | Norton’s Equivalent Circuit | Lecture 1: Norton’s Equivalent Circuit |
| Week 4: 2/5/19 | 7 | Periodic Signals | Lecture 2: Investigating periodic signals |
| Week 4: 2/7/19 | 8 | Aperiodic Signals; Investigating Aperiodic Signals | Lecture 2: Investigating aperiodic Signals |
| Week 5: 2/12/19 | 9 | Capacitors | Lecture 3: Capcitors |
| Week 5: 2/14/19 | 10 |
| Week 6: 2/19/19 | 11 | Inductors | Lecture 3: Inductors |
| Week 6: 2/21/19 | 12 | Exam #1 | |

**Course Schedule, *continued***

*As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the*

*educational needs of the students enrolled in this course. – R. E. Cross.*

**Lecture Schedule:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Class Date** | **Class #** | **Class Activities/Lecture** | **Source of Material** |
| Week 7: 2/26/19 | 13 | Review of Exam #1 Results |  |
| Week 7: 2/28/19 | 14 | Capacitive and Inductive Circuits | Lecture 3: Lecture on Blackboard |
| Week 8: 3/5/19 | 15 |
| Week 8: 3/7/19 | 16 |
| Week 10: 3/12/19 | N/A | Spring Break | |
| Week 10: 3/14/19 | N/A |
| Week 9: 3/19/19 | 17 | Operational Amp applications | Lecture 4: Op-Amp Applications on Blackboard |
| Week 10: 3/21/19 | 18 |
| Week 10: 3/26/19 | 19 |
| Week 11: 3/28/19 | 20 | Semiconductors – Diodes, continued | Lecture 5: Semiconductor – Diodes on Blackboard |
| Week 11: 4/2/19 | 21 |
| Week 12: 4/4/19 | 22 |
| Week 12: 4/9/19 | 23 | Semiconductors - Transistor | Lecture 5: Semiconductors- Transistors – On Blackboard |
| Week 13: 4/11/19 | 24 |
| Week 13: 4/16/19 | 25 |
| Week 14: 4/18/19 | 26 |
| Week 14: 4/23/19 | 27 | Transistors – Darlington Pair (On Blackboard) | |
| Week 15: 4/25/19 | 28 | Exam #2 | |
| Week 15: 4/30/19 | 29 | Review of Exam #2 Results | |
| Week 16: 5/2/19 | 30 | Wrap up & Review for Comprehensive | |
| Week 17: 5/9/19 | 31 | Optional Comprehensive Final Exam – See Academic Schedule for Finals (2:00 to 4:30pm) | Remember you must elect to take the optional comprehensive final exam |

**See Next Page for Lab Schedules**

**Lab Schedule:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Circuits & Signals Lab Schdule & Due Dates** | | | | | |
| **LAB Event Section 002 (Monday Lab)** |  | **Start** | **Complete** | **Individual Lab Report Due** | **Peer Evaluation Due (Attached to Lab Report as Last Page)** |
| Lab #1 |  | 1/28/19 | 1/28/19 | 2/4/19 | 2/4/19 |
| Lab #2 |  | 2/4/19 | 2/11/19 | 2/18/19 | 2/18/19 |
| Lab #3 |  | 2/18/19 | 2/25/19 | 3/4/19 | 3/14/19 |
| Lab #4 |  | 3/4/19 | 3/18/19 | 3/11/19 | 3/11/19 |
| **Spring Break** |  | **3/11/19** | **3/15/19** | **3/25/19** | **3/25/19** |
| Lab #5 |  | 3/25/19 | 4/1/19 | 4/8/19 | 4/8/19 |
| Lab #6 |  | 4/8/19 | 4/15/19 | 4/22/19 | 4/22/19 |
| Lab #7 |  | 4/22/19 | 4/29/19 | 5/1/19 | 5/1/19 |
|  | | | | | |
|
| **LAB Event Section 003 (Wednesday Lab)** |  | **Start** | **Complete** | **Lab Report Due** | **Peer Evaluation Due (Attached to Lab Report as Last Page)** |
| Lab #1 |  | 1/24/19 | 1/24/19 | 1/31/19 | 1/31/19 |
| Lab #2 |  | 1/31/19 | 2/6/19 | 2/13/19 | 2/13/19 |
| Lab #3 |  | 2/13/19 | 2/20/19 | 2/27/19 | 2/27/19 |
| Lab #4 |  | 2/27/19 | 3/6/19 | 3/11/19 | 3/11/19 |
| **Spring Break** |  | **3/11/19** | **3/15/19** | **3/20/19** | **3/20/19** |
| Lab #5 |  | 3/20/19 | 3/27/19 | 4/3/19 | 4/3/19 |
| Lab #6 |  | 4/3/19 | 4/10/19 | 4/17/19 | 4/17/19 |
| Lab #7 |  | 4/17/19 | 4/24/19 | 5/1/19 | 5/1/19 |
|  |  |  |  |  |  |

**Emergency Phone Numbers**: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381

**RESOURCES FOR STUDENTS**

**Research or General Library Help**

**Academic Plaza Consultation Services**[**library.uta.edu/academic-plaza**](http://library.uta.edu/academic-plaza)

**Ask Us**[**ask.uta.edu/**](http://ask.uta.edu/)

**Library Tutorials**[**library.uta.edu/how-to**](http://library.uta.edu/how-to)

**Subject and Course Research Guides**[**libguides.uta.edu**](http://libguides.uta.edu/)

**Librarians by Subject**[**library.uta.edu/subject-librarians**](http://library.uta.edu/subject-librarians)

**Research Coaches** [**http://libguides.uta.edu/researchcoach**](http://libguides.uta.edu/researchcoach)

**Resources**

**A to Z List of Library Databases**[**libguides.uta.edu/az.php**](http://libguides.uta.edu/az.php)

**Course Reserves**[**pulse.uta.edu/vwebv/enterCourseReserve.do**](http://pulse.uta.edu/vwebv/enterCourseReserve.do)

**Study Room Reservations**[**openroom.uta.edu/**](http://openroom.uta.edu/)