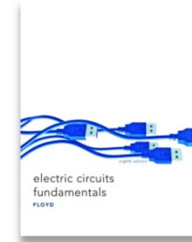


Semester: Summer 2017 (201716)
Course Title: AC Circuits
Course Number: ELCR 1020
Credit Hr / Min: 7 hr / 6750 min
Class Location: **RMTC Room 827**
Class Meets: **M-R, 8:00 to 11:30 a.m.**
CRN: 60044

Instructor: William Greene
Office Hrs: Mon – Thurs 11:30 am – Noon
4:30 pm – 6:00 pm
Office: RMTC Room 822, Vidalia Campus
E-mail: wgreene@southeasterntech.edu
Phone: 912-538-3102 **FAX:** 912-538-3106
Preferred contact method is e-mail

REQUIRED TEXTS: *Electric Circuit Fundamentals, 8th ed.*
by Thomas L. Floyd, published by Prentice Hall,
ISBN# 0-13-507293-X



REQUIRED SOFTWARES: IE 7 or higher or Mozilla Firefox 2.0 or higher

REQUIRED SUPPLIES: Engineering / Scientific Calculator, **TI-83 Plus Graphing Calculator.** **This calculator is required for the mathematics classes associated with the Electronics programs.**

COURSE DESCRIPTION: This course introduces the theory and application of varying sine wave voltages and current, and continues the development of AC concepts with emphasis on constructing, verifying, and troubleshooting reactive circuits using RLC theory and practical application. Topics include AC wave generation, frequency and phase relationship, impedance, admittance, and conductance power factors, reactive components simple RLC circuits, AC circuit resonance, passive filters, and non-sinusoidal wave forms.

PREREQUISITES: ELCR 1010

MAJOR COURSE COMPETENCIES / COURSE OUTLINE:

1. AC Wave Generation
2. Frequency and Phase Relationships
3. Impedance, Admittance, and Conductance, Power Factors
4. Reactive Components
5. Simple RLC Circuits
6. AC Circuit Resonance
7. Passive Filters
8. Non-sinusoidal Wave Forms

GENERAL EDUCATION CORE COMPETENCIES: STC has identified the following general education core competencies that graduates will attain:

1. The ability to utilize standard written English.
2. The ability to solve practical mathematical problems.
3. The ability to read, analyze, and interpret information.

STUDENT REQUIREMENTS: Students are expected to complete all tests and comprehensive problems by the due dates. A ten point penalty will be assessed for each day a comprehensive problem is late. There are no makeup tests. **Tests are made available for several days; therefore, there are no makeup tests. Students who miss a test will be assigned a grade of zero.** Students are responsible for policies and procedures included in the *STC E-Catalog*. **All students must** pledge that they have read and understand the *STC Online Orientation* within the first five days of class. **All students are responsible for checking e-mails and Blackboard announcements DAILY.**

ATTENDANCE GUIDELINES: Class attendance is a very important aspect of a student's success. Being absent from class prevents students from receiving the full benefit of a course and also interrupts the learning process. Southeastern Technical College considers both tardiness and leaving early as types of absenteeism. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is required for student success. Students will be expected to complete all work required by the instructor as described in the individual course syllabus.

Instructors have the right to give unannounced quizzes/assignments. Students who miss an unannounced quiz or assignment will receive a grade of 0. Students who stop attending class, but do not formally withdraw, may receive a grade of F and face financial aid repercussions in upcoming semesters.

Instructors are responsible for determining whether missed work may be made up and the content and dates for makeup work is at the discretion of the instructor.

Students will not be withdrawn by an instructor for attendance; however, all instructors will keep records of graded assignments and student participation in course activities. The completion dates of these activities will be used to determine a student's last date of attendance in the event a student withdraws, stops attending, or receives an F in a course.

SPECIFIC ABSENCES: Provisions for Instructional Time missed because of documented absences due to jury duty, military duty, court duty, or required job training will be made at the discretion of the instructor.

SPECIAL NEEDS: Students with disabilities who believe that they may need accommodations in this class based on the impact of a disability are encouraged to contact Helen Thomas, 912-538-3126, hthomas@southeasterntech.edu, to coordinate reasonable accommodations.

PREGNANCY: Southeastern Technical College does not discriminate on the basis of pregnancy. However, we can offer accommodations to students who are pregnant that need special consideration to successfully complete the course. If you think you will need accommodations due to pregnancy, please advise me and make appropriate arrangements with Helen Thomas, (912) 538-3126, hthomas@southeasterntech.edu.

WITHDRAWAL PROCEDURE: Students wishing to officially withdraw from a course(s) or all courses after the drop/add period and prior to the 65% portion of the semester (date will be posted on the school calendar) must speak with a Career Counselor in Student Affairs and complete a Student Withdrawal Form. A grade of "W" is assigned when the student completes the withdrawal form from the course.

Students who are dropped from courses due to attendance (see your course syllabus for attendance policy) after drop/add until the 65% point of the semester will receive a "W" for the course. Abandoning a course(s) instead of following official withdrawal procedures may result in a grade of 'F' being assigned.

After the 65% portion of the semester, the student will receive a grade for the course. (Please note: A zero will be given for all missed assignments.)

There is no refund for partial reduction of hours. Withdrawals may affect students' eligibility for financial aid for the current semester and in the future, so a student must also speak with a representative of the Financial Aid Office to determine any financial penalties that may be assessed due to the withdrawal. All grades, including grades of 'W', will count in attempted hour calculations for the purpose of Financial Aid.

Remember - Informing your instructor that you will not return to his/her course does not satisfy the approved withdrawal procedure outlined above.

MAKEUP GUIDELINES (Tests, quizzes, homework, projects, etc...): Students are required to take all tests and complete all assignments scheduled during the semester. Failure to take Tests/Exam(s) and complete assignments **will result in a grade of zero.** **There will be no makeup of assignments or EXAMS.** If Internet or browser failure occurs, contact instructor immediately. A decision will be made at that time if the exam will be reset. Instructor reserves the right to deduct points from the exam scores for exceeding the scheduled time limit on the exam and/or requiring student to come to campus to take the final exam. **Note: If student notifies instructor about exam problems because of technical issues after the due date or on the last day of the semester, the student will NOT be allowed to make-up the exam. No**

exceptions! Assignments must be turned in on the assigned date and will not be accepted late, a grade of zero will be given. ALL Assignments are due according to the lesson plan.

ACADEMIC DISHONESTY POLICY: The STC Academic Dishonesty Policy states *All forms of academic dishonesty, including but not limited to cheating on tests, plagiarism, collusion, and falsification of information, will call for discipline.* The policy can also be found in the *STC Catalog and Student Handbook.*

Procedure for Academic Misconduct

The procedure for dealing with academic misconduct and dishonesty is as follows:

--First Offense--

Student will be assigned a grade of "0" for the test or assignment. Instructor keeps a record in course/program files and notes as first offense. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus. The Registrar will input the incident into Banner for tracking purposes.

--Second Offense--

Student is given a grade of "WF" for the course in which offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of second offense. The Registrar will input the incident into Banner for tracking purposes.

--Third Offense--

Student is given a grade of "WF" for the course in which the offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of second offense. The Vice President for Student Affairs, or designee, will notify the student of suspension from college for a specified period of time. The Registrar will input the incident into Banner for tracking purposes.

STATEMENT OF NON-DISCRIMINATION: The Technical College System of Georgia and its constituent Technical Colleges do not discriminate on the basis of race, color, creed, national or ethnic origin, sex, religion, disability, age, political affiliation or belief, genetic information, disabled veteran, veteran of the Vietnam Era, spouse of military member or citizenship status (except in those special circumstances permitted or mandated by law). This school is in compliance with Title VI of the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, or national origin; with the provisions of Title IX of the Educational Amendments of 1972, which prohibits discrimination on the basis of gender; with the provisions of Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination on the basis of handicap; and with the American with Disabilities Act (ADA).

The following individuals have been designated to handle inquiries regarding the nondiscrimination policies:

| ADA/Section 504 - Equity- Title IX (Students) - OCR Compliance Officer | Title VI - Title IX (Employees) - EEOC Officer |
|---|--|
| Helen Thomas, Special Needs Specialist Vidalia Campus 3001 East 1 st Street, Vidalia Office 108 Phone: 912-538-3126 hthomas@southeasterntech.edu | Blythe Wilcox, Director of Human Resources Vidalia Campus 3001 East 1 st Street, Vidalia Office 138B Phone: 912-538-3147 bwilcox@southeasterntech.edu |

GRIEVANCE PROCEDURES: Grievance procedures can be found in the Catalog and Handbook located on STC's website.

ACCESS TO TECHNOLOGY: Students can now access Blackboard, Remote Lab Access, Student Email, Library Databases (Galileo), and BannerWeb via the mySTC portal or by clicking the Current Students link on the STC website at www.southeasterntech.edu.

TCSG GUARANTEE/WARRANTY STATEMENT:

The Technical College System of Georgia guarantees employers that graduates of State Technical Colleges shall possess skills and knowledge as prescribed by State Curriculum Standards. Should any graduate employee within two years of graduation be deemed lacking in said skills, that student shall be retrained in any State Technical College at no charge for instructional costs to either the student or the employer.

ELCR 1020 GRADING POLICY:

| | |
|---------------------|--------------|
| Exams | 30% |
| Labs | 20% |
| Homework | 10% |
| Study Guides | 5% |
| Final Exam | 35% * |
| | 100% |

GRADING SCALE:

| | |
|---|----------|
| A | (90-100) |
| B | (80-89) |
| C | (70-79) |
| D | (60-69) |
| F | (0-59) |

For **any** course to count as credit for graduation, student must make a C or higher in the course.

ELECTRONICS COMPETENCY EXAMS:

*** The ELCR 1020 Final Exam is the ESA Part II – AC Exam. The cost for taking this exam is \$35 payable to the STC Business Office before the last week of the quarter. Please plan for this cost to complete the AC series of classes successfully. A grade of 75 or higher on this exam will result in the student being awarded their ESA II certificate from the ISCET.**

No minimum grade is required for this exam; however, this exam will carry a 35% grading weight. Poor performance on this exam could result in a final class grade of <70 out of 100 which will require the student to retake ELCR 1020.

Upon successful completion of all four parts of the ESA exams (i.e. ≥75% on ESA I through IV exams), the student is awarded their Associate CET Certificate from the ISCET.

Students who wish to retake any ESA Exam in order to improve their grades to receive their Associate CET Certificate can do so at a cost of \$15 per exam within one year of the original purchase of their test voucher for that exam.

IMPORTANT REMINDERS CONCERNING ASSIGNMENTS: *(Students are responsible for all information contained in this lesson plan).*

- **Assignments:** This lesson plan is subject to change at instructor’s discretion. All assignments must be submitted and completed by the due dates listed above to receive credit.....so manage your time wisely each week. Missing assignments receive a grade of zero.
- **Study Guides:** For each Chapter within this course, there are online Study Guides (i.e. Practice Tests). You may take these Practice Tests as many times as you would like in order to prepare for the test. ***There are one to three Practice Tests for each Chapter: Multiple Choice, True / False, and Troubleshooting. You are required to complete all of these for each Chapter.*** You should refer to lesson plan information above for specific weeks when material is covered and when the Practice Tests are due for your grade.
- **Videos:** These videos contain useful supplemental information for the course. Links to download and view the videos are provided within the Blackboard system. A CD containing the Videos for each Chapter will be provided upon request for students with slow Internet links.

****Disclaimer Statements****

- (1) Instructor reserves the right to change the syllabus and/or lesson plan as necessary.
- (2) The official copy of the syllabus is located inside the student’s online course shell or will be given to them during face to face class time the first day of the semester. The syllabus displayed in advance of the semester in a location other than the course you are enrolled in is for planning purposes only.

**ELCR-1020 – Alternating Current Circuits
LESSON PLAN
Summer Semester 2017 (60044)**

Color Codes: **Black** = Assignments & Information, **Blue** = Graded Assignments

| Date | Chapter / Lesson | Content | Assignments & Tests (Due Dates) | *Comp. Area |
|---------------|-------------------------|---|--|--------------------|
| WEEK 1 | | | | |
| May 17 | 7.1, 7.2 | Class Introduction – Syllabi, Outline, Work Ethics, Rules, and Regulations Coverage For any assigned reading, complete the Section Checkups at the end of each Section. It is a great way to review what you have read. Section 7.1 – The Magnetic Field Section 7.2 – Electromagnetism | Read Sections 7.1 & 7.2 [On BLACKBOARD] Read / Review START HERE information POST to appropriate Message Boards <u>Install / Test Out MultiSim Software</u> Read Sections 7.3 – 7.7 | 1,b,c |
| 18 | 7.3 – 7.7 | Section 7.3 – Electromagnetic Devices Section 7.4 – Magnetic Hysteresis Section 7.5 – Electromagnetic Induction Section 7.6 – DC Generators Section 7.7 – DC Motors | <u>Do Chapter 7 Homework Assignments</u> Watch All Chapter 7 Videos | 1,a,b,c |
| 22 | 7 | <u>LabVolt – Magnetism</u> Chapter 7 Review | <u>Do Chapter 7 Study Guides</u> Study for Chapter 7 Test | 1,a,b,c |
| 23 | 7 | <u>Chapter 7 Test</u> ISCET Material Review – Chapter 7 | <u>Take Chapter 7 Test</u> Read Sections 8.1 – 8.8 | 1,b,c |
| WEEK 2 | | | | |
| May 24 | 8.1 – 8.8 | Section 8.1 – The Sinusoidal Waveform Section 8.2 – Voltage & Current Values Section 8.3 – Angular Measurements Section 8.4 – Sine Wave Formula Section 8.5 – Analysis of AC Circuits Section 8.6 – Alternators (AC Generators) Section 8.7 – AC Motors Section 8.8 – Non-sinusoidal Waveforms | Read Section 8.9 Watch All Chapter 8 Videos | 1,2,3,8, b,c |
| 25 | 8.9 | Section 8.9 – The Oscilloscope <u>LabVolt – AC Waveform Generator</u> All Chapter 7 Assignments DUE | <u>Do Chapter 8 Homework Assignments</u> | 1,2,3,8, a,b,c |
| 29 | | HOLIDAY – Memorial Day | HOLIDAY – Memorial Day | |
| 30 | 8 | <u>LabVolt – AC Measurements</u> Chapter 8 Review | <u>Do Chapter 8 Study Guides</u> Study for Chapter 8 Test | 1,2,3,8, a,b,c |
| 31 | 8 | <u>Chapter 8 Test</u> ISCET Material Review – Chapter 8 | <u>Take Chapter 8 Test</u> Read Sections 9.1 – 9.6 | 1,2,3,8, b,c |

| WEEK 3 | | | | |
|---------|-------------|--|---|-----------------|
| June 1 | 9.1 – 9.6 | Section 9.1 – The Basic Capacitor Section 9.2 – Types of Capacitors Section 9.3 – Series Capacitors Section 9.4 – Parallel Capacitors Section 9.5 – Capacitors in DC Circuits Section 9.6 – Capacitors in AC Circuits | Read Section 9.7 Watch Chapter 9 Videos | 2,3,4, b,c |
| 5 | 9.7 | Section 9.7 – Capacitor Applications All Chapter 8 Assignments DUE | Do Chapter 9 Homework Assignments | 2,3,4, a,b,c |
| 6 | 9 | LabVolt – Capacitance Chapter 9 Review | Do Chapter 9 Study Guides Study for Chapter 9 Test | 2,3,4, a,b,c |
| 7 | 9 | Chapter 9 Test ISCET Material Review – Chapter 9 | Take Chapter 9 Test Read Sections 11.1 – 11.5 | 2,3,4,b,c |
| WEEK 4 | | | | |
| June 8 | 11.1 – 11.5 | Section 11.1 – The Basic Inductor Section 11.2 – Types of Inductors Section 11.3 – Series & Parallel Inductors Section 11.4 – Inductors in DC Circuits Section 11.5 – Inductors in AC Circuits | Read Section 11.6 Watch Chapter 11 Videos | 2,3,4,b,c |
| 12 | 11.6 | Section 11.6 – Inductor Applications All Chapter 9 Assignments DUE | Do Chapter 11 Homework Assignments | 2,3,4, a,b,c |
| 13 | 11 | LabVolt – Inductance Chapter 11 Review | Do Chapter 11 Study Guides Study for Chapter 11 Test | 2,3,4, a,b,c |
| 14 | 11 | Chapter 11 Test ISCET Material Review – Chapter 11 | Take Chapter 11 Test Read Sections 14.1 – 14.5 | 2,3,4,b,c |
| WEEK 5 | | | | |
| June 15 | 14.1 – 14.5 | Section 14.1 – Mutual Inductance Section 14.2 – The Basic Transformer Section 14.3 – Step-Up & Step-Down Section 14.4 – Loading the Secondary Section 14.5 – Reflected Load | Read Sections 14.6 – 14.9 Watch Chapter 14 Videos | 2,3,4,b,c |
| 19 | 14.6 – 14.9 | Section 14.6 – Impedance Matching Section 14.7 – Transformer Ratings Section 14.8 – Tapped & Mult. Winding Section 14.9 – Troubleshooting All Chapter 11 Assignments DUE | Do Chapter 14 Homework Assignments | 2,3,4, a,b,c |
| 20 | 14 | LabVolt – Transformers Chapter 14 Review MIDTERM | Do Chapter 14 Study Guides Study for Chapter 14 Test MIDTERM | 2,3,4, a,b,c |
| 21 | 14 | Chapter 14 Test ISCET Material Review – Chapter 14 | Take Chapter 14 Test Read Sections 10.1 – 10.4 | 2,3,4,b,c |

| WEEK 6 | | | | |
|----------------------|------------------|---|--|--------------|
| June 22 | 10.1 – 10.4 | Section 10.1 – Sinusoidal Response of RC Circuits Section 10.2 – Impedance & Phase Angle of Series RC Circuits Section 10.3 – Analysis of Series RC Circuits Section 10.4 – Impedance & Phase Angle of Parallel RC Circuits | Read Sections 10.5 – 10.9 Watch All Chapter 10 Videos | 3,4,7,b,c |
| 26 | 10.5, 10.6 | Section 10.5 – Analysis of Parallel RC Circuits Section 10.6 – Analysis of Series-Parallel RC Circuits Section 10.7 – Power in RC Circuits Section 10.8 – Basic Applications Section 10.9 – Troubleshooting | Do Chapter 10 Homework Assignments | 3,4,7,b,c |
| 27 | 10 | LabVolt – Capacitive Reactance All Chapter 14 Assignments DUE | Do Chapter 10 Study Guides | 3,4,7, a,b,c |
| 28 | 10 | Chapter 10 Review | SUMMER ACTIVITY DAY | 3,4,7,b,c |
| WEEK 7 | | | | |
| June 29 65% Point | 10 | Chapter 10 Test ISCET Material Review – Chapter 10 | Take Chapter 10 Test Read Sections 12.1 – 12.6 | 3,4,7,b,c |
| | | JULY 4th HOLIDAY (July 3 – July 6) | JULY 4th HOLIDAY (July 3 – July 6) | |
| July 10 | 12.1 – 12.6 | Section 12.1 – Sinusoidal Response of RL Circuits Section 12.2 – Impedance & Phase Angle of Series RL Circuits Section 12.3 – Analysis of Series RL Circuits Section 12.4 – Impedance & Phase Angle of Parallel RL Circuits Section 12.5 – Analysis of Parallel RL Circuits Section 12.6 – Analysis of Series-Parallel RL Circuits | Read Sections 12.7, 12.8 & 12.9 Watch All Chapter 12 Videos | 3,4,7,b,c |
| 11 | 12.7, 12.8, 12.9 | Section 12.7 – Power in RL Circuits Section 12.8 – Basic Applications Section 12.9 – Troubleshooting All Chapter 10 Assignments DUE | Do Chapter 12 Homework Assignments Do Chapter 12 Study Guides | 3,4,7, a,b,c |
| 12 | 12 | LabVolt – Inductive Reactance | | 3,4,7, a,b,c |

| WEEK 8 | | | | |
|-------------|---------------------------------|---|--|-------------------|
| July 13 | 12 | LabVolt – Power in AC Circuits Chapter 12 – Review | Study for Chapter 12 Test | 3,4,7, a,b,c |
| 17 | 12 | Chapter 12 Test ISCET Material Review – Chapter 12 | Take Chapter 12 Test Read Sections 13.1, 13.2, 13.3, 13.4 | 3,4,7,b,c |
| 18 | 13.1, 13.2, 13.3, 13.4 | Section 13.1 – Impedance & Phase Angle of Series RLC Circuits Section 13.2 – Analysis of Series RLC Circuits Section 13.3 – Series Resonance Section 13.4 – Series Resonant Filters | Watch All Chapter 13 Videos Begin Chapter 13 Homework | 3,5,6,7, a,b,c |
| 19 | 13 | LabVolt – RLC Circuits (Series) LabVolt – Series Resonance | Read Sections 13.5, 13.6, 13.7, 13.8 | 3,5,6,7, a,b,c |
| WEEK 9 | | | | |
| July 20 | 13.5, 13.6, 13.7, 13.8 | Section 13.5 – Parallel RLC Circuits Section 13.6 – Parallel Resonance Section 13.7 – Parallel Resonant Filters Section 13.8 – Applications All Chapter 12 Assignments DUE | Complete Chapter 13 Homework | 3,5,6,7, a,b,c |
| 24 | 13 | LabVolt – RLC Circuits (Parallel) LabVolt – Parallel Resonance | Do Chapter 13 Study Guides | 3,5,6,7, a,b,c |
| 25 | 13 | Chapter 13 – Review | Study for Chapter 13 Test | 3,5,6,7, a,b,c |
| 26 | 13 | Chapter 13 Test ISCET ESA Exam Review All Chapter 13 Assignments DUE Semester Classes End | Take Chapter 13 Test Study for Final Exam | 1-8,b,c |
| FINALS WEEK | | | | |
| July 31 | 7 – 14 | AC Circuits Final Exam [Proctored] | ESA Level 2 Exam | 1 – 8, b,c |
| Aug 1 | 7 – 14 | AC Circuits Final Exam [Proctored] | ESA Level 2 Exam | 1 – 8, b,c |

*** Competency Areas:**

Electronics Technology Competency Areas:

- | | |
|--|------------------------------|
| 1. AC Wave Generation | 5. Simple RLC Circuits |
| 2. Frequency and Phase Relationships | 6. AC Circuit Resonance |
| 3. Impedance, Admittance, and Conductance, Power Factors | 7. Passive Filters |
| 4. Reactive Components | 8. Non-sinusoidal Wave Forms |

General Core Competency Areas:

- | | |
|---|---|
| a. The ability to utilize standard written English. | mathematical problems. |
| b. The ability to solve practical | c. The ability to read, analyze, and interpret information. |