ETEE 2320 01 Electronics Technology II (3 cr. Hrs, 4-contact Hrs.**)**
MW: 10:00 - 11:50 AM PETC 210C

Instructor: Dr. Reg Pecen, Quanta Endowed Professor
Office: PETC 420D @ 936-294-4137 e-mail: regpecen@shsu.edu
Office Hours: TTh: 11:00-11:50 AM and 3:00 – 4:50 PM
(*You can also call or e-mail me and arrange extra office hours by appointment*).

Textbook: Electronics Fundamentals: Circuits, Devices & Applications, 8/E by David M. Buchla, ISBN-10: 0135072956; ISBN-13: 9780135072950 Thomas L. Floyd, Pearson Learning. (This is the same textbook for ETEE 1340 Electronics Tech II).

Laboratory Manual: Electronics Fundamentals: Circuits, Devices & Applications, 8/E by David M. Buchla; ISBN-13: 9780135063279, Pearson Publishing.

Course Catalog Description: This course is an in-depth study of the electronic principles associated with AC circuits. Topics of study include network theorems, circuit analysis methods, resonance, filters and frequency responses of reactive circuits.
Prerequisite: ETEE 1340 or consent of instructor.

Course Learning Outcomes:
Circuit analysis that constitutes the main pillars of Electrical/Electronics/Computer Engineering Technology is based on mathematical techniques and is used to show the behavior of the electrical circuit model and ideal circuit components.

- The first objective of this course is to **learn the fundamental concepts of AC circuit analysis** to understand the behavior of each ideal circuit element in terms of voltage, current, and power.
- The second objective is to understand the **constraints imposed on the voltage and current** as a result of interconnecting the ideal circuit elements widely to design variety of circuits used in **electrical /electronics/computer engineering technology**.
- The third objective is to allow the engineering technology student **to complete the required work in advanced electric circuit analysis** as early as possible in his/her academic career with a minimum of prerequisites for future major courses that will use all the subject matters learned in circuit analysis.
- The last objective of the course will be **troubleshooting a variety of AC electrical/electronics** circuits. You will also develop your knowledge of "The International System of Units" (SI), and an excellent electrical/electronics circuit simulation program, "MultiSim" integrated with National Instruments.

Computer Software Tool: National Instruments (NI) MultiSim version 10.1 will be used for a variety of homework and laboratory assignments. Computers in the lab have NI MultiSim installed for your needs. *(If available, you may always use your own Edition of MultiSim on your Laptop/PC).*

Class Structure and Attendance: This is an important fundamental class and your attendance is highly encouraged. Lectures, laboratory experimental projects, homework assignments and a design project with a final report will constitute the structure of the course. The make-up labs and exams will be given only in the case of **documented physical illness** (**In this case, students must inform instructor at least 24 hours before the exam**). ***You will also be given pop-quizzes.*** *There will be no make-up option if you are not in the class during the pop-quiz time.*

Labs: There are regular scheduled labs for this course. All laboratory project assignments must be completed for your lab grading. You must attend and successfully complete the each lab to

pass the class. Lab reports will be due one week after the week of the lab done. Make sure you write clearly and neatly! Please use regular 8x11 papers to submit your printed lab report with appropriate and necessary tables, simulation results, and graphics. Every student must submit his/her lab report individually. Lap report assignments will be available through SHSU *Blackboard* and they will be automatically graded.

- Lab report grading will be based on a maximum grade of 20 (A). You must earn a **minimum of 14**/20 for a passing grade in lab activities.

Homework (HW) Assignments: Homework assignments will be available through SHSU Blackboard. The HW assignments will be automatically graded by *Blackboard* system and be available to students after completion of each HW assignment. The HW assignments will not be available to the students after the due dates. No credit will be given for late homework assignments (**except documented physical illness or family emergency cases**). Please submit your assignment ON TIME even if it is missing few problems.

- **Students are encouraged to work and discuss with others on the lab reports and homework assignments, however, submissions must consist of the students own work, in accordance with departmental policies.** Please work neatly, showing all calculations, manipulations, plots, and simulation program files (if any) required reaching your solution.

Simulation /Design Project: All students are expected to complete a circuit design project based on their interest using the components available in the ECET laboratory. The project can be directed to a specific electrical/electronics/computer engineering technology circuit, device, assigned process or application. The project will involve a proposed solution with a demonstration of specific aspects of the process of the circuit.

- ***You must submit a proposal of the project*** *by* ***Monday, October 30, 2017****. All projects must be approved by Monday, November 6, 2017.*
- You will be expected to present and submit your project reports in the class on the last week of the semester **(Wednesday, November 29, 2017).** All the project reports should include the purpose of the project, technical details, schematic diagrams, simulation - practical design measurements, results, and conclusion.

Topics covered: General Introduction and Overall Review of Int to Circuits Class
Ch 8: Intro to AC and Voltage Ch 9: Capacitors Ch 10: RC Circuits Ch 11: Inductors Ch 12: RL Circuits Ch 13: R, L, C Elements, Circuits, Impedance Concept Ch 14: Transformers Ch 15: Time Response of Reactive Circuits, AC Series-Parallel Circuits Ch 16: Transformers & Coupled Circuits Ch 17: Methods of AC Analysis

Class/laboratory schedule: Two sessions per week with two hours per session

Why Electric/Electronics/Computer Circuits and Labs?

- *"ABET, national accrediting agency for schools of engineering and technology has indicated that knowledge of electricity is important for a well-balanced engineering/technology education and hence it is a component in all accredited engineering technology curricula."*
- *"Knowledge of electricity is simply a tool that you as a technically educated person about to enter the twenty-first century should have. Given the growth in things electrical over the past five decades, we can easily guess that the future will see a compounding of that problem. You definitely need this knowledge to deal with computers, electronics & communications, digital signal processing, and electrical power over a career of 40 +years."*

Contribution of the course to meet the requirement of ABET (General) Criterion 5:

- As a second course on circuits and systems (mostly covered AC concepts), this course provides the prerequisite foundation of knowledge necessary for understanding AC electrical circuits and

introduction to circuits and systems. Circuit analysis that constitutes the main pillars of Electrical/Electronics Engineering & Technology is based on mathematical techniques and is used to show the behavior of the electrical circuit model and ideal circuit components. Students will understand basic circuit analysis techniques, wire basic AC circuits, learn to use digital oscilloscopes, function generator, and other laboratory testing equipment. They also calculate and measure V, I, P parameters while using digital simulation tool, MultiSim.

Program Outcomes Supported by Course Objectives http://www.shsu.edu

Directly supported ECET program outcomes:

Analyze, design, and simulate electric circuits and systems (1).
Design and carry out experiments (5).
Collaborate in laboratory and classroom to work effectively in teams (9).

Indirectly supported ECET program outcomes:

Have knowledge of fundamental principles of science and mathematics and apply them to solve practical problems of engineering technology (6).
Produce clear, precise and effective technical documents and oral presentations with the help of modern information technologies (8).

Course Content: The tentative course content will include the topics shown on page 4. Depending upon extra handouts/simulations/homework assignment explanations, the tentative course content may be shifted slightly.

Lab Schedule: The tentative lab schedule includes the topics listed on page 4. Depending upon extra handouts/simulations/homework assignment explanations, the following tentative lab projects may be shifted slightly.

Grading: The final grade will be based on the following requirements.

Mid-term Exam	**25%**
Final Exam	**25%**
Laboratory Experimental Projects (10 Lab Sessions)	**15%**
Homework Assignments (10 assignments)	**15%**
Attendance, Participation, Attitude	**10%**
Quizzes (Min 8)	**10%**
Total	**100%**

Percentage Range	Letter Grade
90 – 100	A
80 – 89	B
70 – 79	C
60– 69	D
0-59	F

Course Content and Lab Schedule: The tentative course content and lab schedule will include the following topics. Depending upon extra handouts/simulations/homework assignment explanations, ***the following tentative course content may be shifted slightly***.

		ETEE 2320 - Fall 2017	
Week	**Date**	**Subject**	**Readings- Assignments- Resources**
1	8/23	Introduction to the course; Syllabus Review, A brief Review of ETEE 1340, Lab Equipment Safety Review	Handouts
2	8/28 – 8/30	Ch 8: Intro to Alternative Current & Volt.(HW#1: Due 9/6)	Textbook pp. 327-387
3	**9/4** – 9/6	Monday: Labor day Holiday NO Classes Wednesday: Lab #15; Due 9/6 AND Lab#16; Due 9/6	Workbook pp 129-134 Workbook pp 129-143
4	9/11 - 9/13	Ch 9: Capacitors HW#2; Due 9/20	Textbook 388-442
5	9/18 - 9/20	Ch 10: RC Circuits HW#3; Due 9/25 Lab#18; Due 9/20	Textbook pp 443-498 Workbook pp 149-162
6	9/25 - 9/27	Lab #20 (Due 9/25) Ch. 11 Inductors HW#4; Due 10/4	Workbook pp 167-177 Textbook pp 499-536
7	10/2 – 10/4	Lab#22; Due 10/2 Lab#23; Due 10/4	Workbook pp. 183-191 Workbook pp. 183-191
8	10/9 – 10/11	*Mid-Term Test (Chapters 8,9,10,11)* Ch. 12 RL Circuits HW#5; Due 10/18	**Midterm Test, Monday, October 9** pp. 537-580
9	10/16 – 10/18	Lab #24; Due 10/16 Lab #25; Due 10/18	Workbook pp. 197-207 Workbook pp. 197-207
10	10/23 – 10/25	Ch. 13 RLC Circuits HW#6; Due 11/1 Lab #26; Due 10/25	Textbook pp. 581-635 Workbook pp. 213-218
11	10/30 – 11/1	Ch. 14 Transformers HW#7; Due 11/6 Lab #27; Due 11/1	**Project Proposals Due** Textbook pp. 636-674 Workbook pp. 219-231
12	11/6 – 11/8	Ch. 15 Time Response of Reactive Circuits HW#8 (Due 11/15) Lab #29 (Due 11/8)	Textbook pp. 675-716 Workbook pp. 237-241
13	11/13 – 11/15	Ch.15 cont. Lab #30 (Due 11/15)	Workbook pp. 247-251
14	11/20 – **11/22**	Ch. 16 Transformers and Coupled Circuits Ch 17: Methods of AC Analysis ***Thanksgiving Holiday- No Class on Nov 22, 2017***	
15	11/27 – 11/29	Final Exam Review & Design Project Presentations	**Design Project Presentations; Nov 29**
16	12/4 – 12/7 Finals Week	**Final Exam; Monday, December 4, 2017 @10:30 am – 12:30 pm Ch.:12, 13, 14, 15, 16, 17**	*Wishes best luck*

Laboratory Assignments: There are regular labs will be announced by the instructor during the lectures for this course. All laboratory project assignments must be completed for your lab grading. You must obey departmental laboratory safety rules & policies. ***You must attend and successfully complete the each lab.*** Lab reports due dates are provided in the tentative schedule. Make sure you write clearly and neatly! Student misses the lab section of the class should submit lab report individually if a specific reason for the absence is provided to instructor. ***Tear off the related pages of lab project from the laboratory workbook and staple them together before submitting to the instructor.***
Note: *It is the student's responsibility to arrange make-up labs with the instructor. Make-up labs may be considered with a report proven medical reason.*

Lab Submission Procedure:
Tear off the related pages from the laboratory workbook and staple them together before submitting to the instructor. When staple the lab experiments please staple each lab separately.

Rules and Recommendations for Effective and Safe Use of the Laboratory and Work Benches in PETC 210C Laboratory

1. ***DO NOT turn on the power before the instructor checks your circuit!***

2. Use the coat racks for neat laboratory appearance as well as safety. Do not place coats or book bags on workbenches.

3. Refrain from drinking beverages in the laboratory. The hall may be used for intervals of relaxation.

4. ***The lab bench must be cleaned and all wires must be returned to the hooks provided in the lab room before leaving the room.***

5. Report all component and equipment failures to your Instructor lab TA. Neglecting to report faulty equipment causes problems for the next group that uses the bench and may result in injuries.

6. When using the instruments ***DO NOT STACK THEM,*** as the combined heat may cause component failure.

7. Place all of the trainer units, transformers, motors, DMMs, resistors, inductors, capacitors, etc., back to their original places and/or *original rated* boxes after you are done with the laboratory.

8. ***All power switches should be turned off before leaving the lab bench.***

9. Rings and other jewelry, which may cause a potential hazard, must be removed before working in the laboratory.

10. No individual should operate equipment in the laboratory until the appropriate examinations are passed and/or demonstrations by instructor are safely observed.

Week	Lab #	(1) Subject & Procedure	**(2) Conclusion:** For each Lab summarize what you have learned from this lab experiment briefly; show supporting evidence such as circuit diagram & Math equations for both Conclusion AND Evaluation/Review Questions as needed. **(3) Evaluation & Review Questions**:
3	**Lab 15** **Lab16**	The Oscilloscope Fill out blanks and tables 1- 7. Sine Wave Measurements Fill out blanks and Tables 1-3.	Answer the questions 1- 6. Answer the questions 1-5.
5	**Lab 18**	Capacitors. Fill out blanks and tables 1- 10	Answer the questions 1- 5.
6	**Lab 20**	Series RC Circuits. Answer questions 1 – 10.	Answer the questions 1- 5.
7	**Lab 22**	Inductors. Answer questions 1-5.	Answer the questions 1- 5.
9	**Lab 24** **Lab 25**	Series RL Circuits. Answer questions 1 – 9. Parallel RL Circuits. Answer questions 1 – 9.	Answer the questions 1- 5. Answer the questions 1- 5.
10	**Lab 26**	Series Resonance. Answer questions 1 – 12.	Answer the questions 1- 5.
11	**Lab 27**	Parallel Resonance. Answer questions 1 – 12.	Answer the questions 1- 5.
12	**Lab 29**	Transformers. Answer questions 1-9.	Answer the questions 1- 5.
13	**Lab 30**	Integrating and Differentiating Circuits. Answer questions 1 – 8.	Answer the questions 1- 5.

I encourage you to utilize the Professional and Academic Center for Excellence (PACE)'s **free assistance with writing, math, science, reading, and learning strategies**. The PACE is dedicated to providing professional development for administration, faculty, staff, and students. Using programs and services founded on evidence-based teaching and leadership strategies, our ultimate goal is effective student learning and development. Please contact; CHSS Room C002 or e-mail: PACE@shsu.edu; Tel: 936-294-2688

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General Safety Procedures – Introduced by the instructor	
I. Introduction: How Electricity Works a. Conductors b. Insulators c. Grounding	**II. Hazards of Electricity** a. Electrical shock b. Electrical burns c. Electrical fires d. Case Studies of Electrical Accidents
III. Types of Electrical Hazards a. Working on energized (hot) circuits b. Loose connections	**IV. How to Protect Yourself from Electricity** a. General electrical safety rules

c. Frayed or missing insulation d. Missing ground prongs on plugs e. Water and electricity don't mix f. Damaged power tools g. Ungrounded equipment h. Improper use of extension cords	b. Properly grounded electrical circuits c. Ground fault protection near water sources d. Insulated power tools e. Proper housekeeping f. Don't overload circuits
V. Soldering Hazards a. General soldering safety rules b. Proper handling of soldering equipment	

Academic Dishonesty: All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

Student Absences on Religious Holy Days Policy: Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student who is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first fifteen days of the semester or the first seven days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

Services for Students with Disability (SSD): The mission of the Services for Students with Disabilities (SSD) is **to promote full and equal access on the part of students** with disabilities to educational and extracurricular programs and activities at SHSU.It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a

disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see: http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

Tobacco Policy: In order to promote a healthy, safe, and aesthetically pleasing work, educational, and living environment, Sam Houston State University (SHSU) will endorse a smoke-free and tobacco-free environment. The primary purpose of this policy is to establish guidelines prohibiting smoking and the use of all tobacco products. Tobacco products include cigarettes, cigars, pipes, smokeless tobacco, and all other tobacco products. This policy applies to all faculty, staff, students, employees of contractors, and visitors of SHSU on the premises of the university.

Visitors in the Classroom: Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

"The above schedule, policies, and assignments in this course are subject to change in the event of extenuating circumstances or by mutual agreement between the instructor and the students."

Please do not hesitate to ask help from instructor.