



**Department of Engineering Technology**  
College of Science and Engineering Technology  
SAM HOUSTON STATE UNIVERSITY

**SAM HOUSTON STATE UNIVERSITY**  
**COLLEGE OF SCIENCE & ENGINEERING TECHNOLOGY**  
**DEPARTMENT OF ENGINEERING TECHNOLOGY**

**COURSE SYLLABUS**  
**ETEE 1340 ELECTRONICS TECHNOLOGY I**

**Spring 2018**

**Department:** Engineering Technology

**Course Name/ Title:** ETEE 1340 02 Electronics Technology I - 21452

**Semester:** Spring 2018

**Credit:** 3 Hours (2-2 Format)

**Location/Time:** Pirkle 220 (Lecture) and Pirkle 140 (Lab), Mon/Wed: 3:00pm – 4:50pm

**Instructor:** Iftekhar Ibne Basith

**Office:** Pirkle 420F

**Email:** iib002@shsu.edu

**Phone:** 936-294-4139

**Office Hours:** Mon/Wed 5pm - 6pm or by appointment

**Course Catalog Description:** This course is designed to provide a general knowledge of electrical and electronic applications. Emphasis is on *electrical safety, power generation, DC circuits, metering instruments, and circuit-use applications*. Laboratory experiences will include "hands-on" circuit construction and basic troubleshooting.

**Required Textbook:** Pearson Custom Electronics Technology, Sam Houston State University ETEE 1340 Electronics Technology I, Pearson Prentice Hall, 2011. ISBN: 13 978-1-256-20944-7. ISBN 10: 1-256-20944-9.

**Required Laboratory Workbook:** Experiments in Electronics Fundamentals and Electric Circuits Fundamentals, 8<sup>th</sup> edition. David M. Buchla, Pearson Prentice Hall, 2010. ISBN: 978-0-13-506327-9.

**Required Supplies:** A notebook, A Texas Instruments scientific/engineering type calculator.

**Course Objectives:** Circuit analysis that constitutes the main pillars of Electrical/Electronics Engineering and Technology is based on mathematical techniques and is used to show the behavior of the electrical circuit model and ideal circuit components. This course is designed to provide a general knowledge of electrical and electronic applications. Emphasis is on *electrical safety, power generation, DC circuits, metering instruments, and circuit-use applications*. Laboratory hands-on experiments will include *circuit construction, soldering, and basic troubleshooting*.

- Learn the fundamental concepts of DC circuit analysis to understand the behavior of each ideal DC circuit element in terms of V (voltage), I (current), and P (power).
- 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 programs.
- Troubleshoot a variety of basic DC (mostly) electronics circuits. You will also learn the knowledge of "The International System of Units" (SI).
- Learn how to use scientific notations to represent quantities while working with electrical units and metric prefixes. Recognize electrical hazards.
- Identify resistor values and select proper resistors for specific applications.
- Describe the nature of electricity and the force that moves current around a closed loop.
- Describe the relationship of voltage, current, and resistance. Demonstrate the application of OHM's law.
- Solve for missing voltage, current, resistance and power in series, parallel, and series-parallel circuits.
- Demonstrate knowledge of Kirchoff's law.
- Properly measure voltage, current, and resistance using analog and digital meters.
- Describe the basic theory of magnetism, AC voltage, and alternating current.

**Class Structure and Attendance:** This is an important fundamental class and your attendance is highly encouraged. *Lectures, in-class problems and discussions, laboratory experimental projects, and homework assignments* 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).

**Homework 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/missed homework assignments. The best two HW will be counted only on the condition that you submit all the HW on time and within deadline. If you miss any single deadline for HW submission, then the average of the HW will be considered for your grade.

**Blackboard Use:** Presentations, course syllabus, Lab/HW assignments will be available in blackboard system. All the HW assignments will be completed through Blackboard systems. Please pay attention to the due dates.

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

<b>Mid-term Test (Best of Two)</b>	<b>20%</b>
<b>Final Exam</b>	<b>20%</b>
<b>Laboratory Experiments</b>	<b>30%</b>
<b>Homework Assignments (Best Two of Minimum Five)</b>	<b>10%</b>
<b>Attendance, Observed performance, Attitude</b>	<b>10%</b>
<b>Project Presentation</b>	<b>10%</b>
<b>Total</b>	<b>100%</b>

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

**Classroom Rules of Conduct:** Students will avoid doing behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, obstructs the mission of the university. Cellular *telephones* and *paggers* must be turned off before class begins. Students are prohibited from *eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, or engaging in any other form of distraction*. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

### Why Electric/Electronics 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.”

**ETEE 1340 02 Electronics Technology I**

<b>Week</b>	<b>Date</b>	<b>Subject</b>	<b>Reading References</b>
<b>1</b>	1/17	Introduction to the Course Syllabus and LAB	
<b>2</b>	1/22	<b>Ch 1.</b> Quantities and Units <b>HW#1 (Due Following Week)</b> – ONLINE	Textbook pp. 4-22
	1/24	<b>Ch 2.</b> Voltage, Current, and Resistance	Textbook pp. 24-74
<b>3</b>	1/29	<b>Ch 2.</b> Continue <b>HW#2 (Due Following Week)</b> – ONLINE <b>Ch 3.</b> Ohm's law, Energy, and Power <b>Ch 3.</b> Continue <b>HW#3 (Due Following Week)</b> – ONLINE Introduction to Testing Equipment, Breadboard (Prototype Board), Digital/Analog Multimeters and Power Supply	Textbook pp. 76-114
	1/31		
<b>4</b>	2/5	Lab #1 ( <b>Due Following Week</b> )	Workbook pp. 19-38
	2/7	Lab #2 ( <b>Due Following Week</b> )	
<b>5</b>	2/12	Lab #3 ( <b>Due Following Week</b> )	Workbook pp. 39-46
	2/14	Lab #4 ( <b>Due Following Week</b> )	
<b>6</b>	2/19	<b>Exam # 1 (Chapter 1, 2 and 3)</b>	Best of Luck
	2/21	<b>Project Mid-Presentation</b>	
<b>7</b>	2/26	<b>Ch 4.</b> Series Circuits <b>HW#4 (Due Following Week)</b> – ONLINE <b>Ch 5.</b> Parallel Circuits <b>HW#5 (Due Following Week)</b> – ONLINE	Textbook pp. 116-169 Textbook pp. 171-218
	2/28		
<b>8</b>	3/5	Lab #5 ( <b>Due Following Week</b> )	Workbook pp. 51-60
	3/7	Lab #6 ( <b>Due Following Week</b> )	Workbook pp. 51-60
<b>9</b>	<b>3/12 – 3/16</b>	<b>MARCH BREAK</b>	
<b>10</b>	3/19 - 3/21	<b>Ch 6.</b> Series Parallel Circuits <b>HW#6 (Due Following Week)</b> – ONLINE	Textbook pp. 220-283
<b>11</b>	3/26	Lab #7 ( <b>Due Following Week</b> )	Workbook pp. 65-75
	3/28	<b>Ch 7.</b> Magnetism & Electromagnetism <b>HW#7 (Due Following Week)</b> – ONLINE	Textbook pp. 285-313
<b>12</b>	4/2	Lab #8 ( <b>Due Following Week</b> )	Workbook pp. 65-75
	4/4	Lab #9 ( <b>Due Following Week</b> )	Workbook pp. 81-85
<b>13</b>	4/9	<b>Exam # 2 (Chapter 4, 5 and 6)</b>	Best of Luck
	4/11	<b>Ch. 8</b> Introduction to Alternating Current and Voltage <b>HW#8 (Due Following Week)</b>	Lectures to be uploaded in blackboard
<b>14</b>	4/16	Power and Energy (DC vs. AC) <b>HW#9 (Due Following Week)</b> Lab #10 ( <b>Due Following Week</b> )	Lectures to be uploaded in blackboard Workbook pp. 91-96
	4/18		
<b>15</b>	4/23	Lab #11 ( <b>Due Following Week</b> )	Workbook pp. 97-102
	4/25	Lab #12 ( <b>Due Following Week</b> )	Workbook pp. 103-108
<b>16</b>	<b>4/30</b> <b>5/2</b>	Lab #13 ( <b>Due Following Lecture</b> ) Final Project Presentation	Workbook pp. 109-118
<b>17</b>	<b>5/9</b>	<b>FINALS (Chapters 7, 8 and Last Lecture)</b> <b>5 pm – 7 pm</b>	Best of Luck

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

## Laboratory Instructions

**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 each lab. Before each Lab, please prepare yourself enough by reading the objective, procedure and theory from the required workbook pages.** LAB reports due dates are provided in the tentative schedule. Make sure you write clearly and neatly! If you miss any LAB you will lose points (30) for that corresponding LAB. **Make up labs are only allowed in case of documented illness and within one week of the missed deadline. After one week of the deadline, you won't be allowed to make up for the LABS you missed and receive a grade of "ZERO" for the corresponding LAB.**

*Note: It is the student's responsibility to arrange make-up labs with the instructor/TA. Make-up labs may be considered with a report proven medical reason.*

### Rules and Recommendations for Effective and Safe Use of the Laboratory and Work Benches in Pirkle 140 (Electronics Lab)

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 Instruct or 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.

## **Laboratory Experiments**

**Lab 1:** Metric Prefixes, Scientific Notation, and Graphing. (pp. 19-26)

**Procedure:** Fill out blanks and tables 1-7

**Evaluation and Review Questions:** Answer the questions 1-6

**Lab 2:** Laboratory Meters and Power Supply. (pp. 31-38)

**Procedure:** Fill out blanks and tables 1-11

**Evaluation and Review Questions:** Answer the questions 1-6

**Lab 3:** Measurement of Resistance. (pp. 39-42)

**Procedure:** Fill out blanks and tables 1- 6

**Evaluation and Review Questions:** Answer the questions 1-6

**Lab 4:** Voltage Measurement & Reference Ground. (pp. 43-46)

**Procedure:** Fill out blanks and tables 1- 6

**Evaluation and Review Questions:** Answer the questions 1- 5

**Lab 5:** Ohm's Law (pp. 51-54)

**Procedure:** Answer questions 1 - 7

**Evaluation and Review Questions:** Answer the questions 1- 5

**Lab 6:** Power in DC Circuits. (pp. 57-60)

**Procedure:** Answer questions 1 - 6

**Evaluation and Review Questions:** Answer the questions 1-6

**Lab 7:** Series Circuits (pp. 65-68)

**Procedure:** Answer questions 1 – 9

**Evaluation and Review Questions:** Answer the questions 1- 5

**Lab 8:** The Voltage Divider (pp. 71-75)

**Procedure:** Answer questions 1-10

**Evaluation and Review Questions:** Answer the questions 1-5

**Lab 9:** Parallel Circuits (pp. 81-85)

**Procedure:** Answer questions 1 – 9

**Evaluation and Review Questions:** Answer the questions 1- 5

**Lab 10:** Series - Parallel Combination Circuits (pp. 91- 96)

**Procedure:** Answer questions 1 – 12

**Evaluation and Review Questions:** Answer the questions 1- 5

**Lab 11:** The Superposition Theorem (pp. 97- 102)

**Procedure:** Answer questions 1 – 10

**Evaluation and Review Questions:** Answer the questions 1- 5

**Lab 12:** Thevenin's Theorem (pp. 103- 107)

**Procedure:** Answer questions 1 – 11

**Evaluation and Review Questions:** Answer the questions 1- 5

**Lab 13:** The Wheatstone Bridge (pp. 108 - 113)

**Procedure:** Answer questions 1 – 9

**Evaluation and Review Questions:** Answer the questions 1- 5

## **Lab Submission Procedure**

*Take a picture of the workbook pages after the lab is completed, review questions answered and signed by the instructor/ TA; convert this to single page pdf; write separate LAB report and convert to pdf; **merge both files into ONE SINGLE pdf file**; name the file as “**ETEE 1340\_02\_LABNUMBER\_LASTNAME\_SAMID\_SPRING2018**” and upload in the blackboard. **NO email submission** is accepted. Only one **single pdf** file is accepted; **no picture files**, **no multiple** files; you will receive a grade of “**ZERO**” for not following the format and/or instruction given. You can use the app “**CamScanner**” for this purpose. Download it free from app store and use it.*

*In case of documented illness, and make up LABs, follow the same procedure and make one single pdf file. Name it as name the file as “**ETEE 1340\_02\_MAKEUP\_LABNUMBER\_LASTNAME\_SAMID\_SPRING2018**” and email instructor the file.*

<b>General Safety Procedures – Introduced by the instructor</b>	
I. Introduction: How Electricity Works <ul style="list-style-type: none"><li>a. Conductors</li><li>b. Insulators</li><li>c. Grounding</li></ul>	II. Hazards of Electricity <ul style="list-style-type: none"><li>a. Electrical shock</li><li>b. Electrical burns</li><li>c. Electrical fires</li><li>d. Case Studies of Electrical Accidents</li></ul>
III. Types of Electrical Hazards <ul style="list-style-type: none"><li>a. Working on energized (hot) circuits</li><li>b. Loose connections</li><li>c. Frayed or missing insulation</li><li>d. Missing ground prongs on plugs</li><li>e. Water and electricity don't mix</li><li>f. Damaged power tools</li><li>g. Ungrounded equipment</li><li>h. Improper use of extension cords</li></ul>	IV. How to Protect Yourself from Electricity <ul style="list-style-type: none"><li>a. General electrical safety rules</li><li>b. Properly grounded electrical circuits</li><li>c. Ground fault protection near water sources</li><li>d. Insulated power tools</li><li>e. Proper housekeeping</li><li>f. Don't overload circuits</li></ul>
V. Soldering Hazards <ul style="list-style-type: none"><li>a. General soldering safety rules</li><li>b. Proper handling of soldering equipment</li></ul>	

**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.

**Disabled Student Policy:** 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](mailto: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 Sam Houston State University 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.”***

**SHSU Blackboard:** Please see below. All the course documents are located under “Course Documents” tab.



Technical Support

Course Documents

Spring 2016 ETEE 1340 Online Electronics I

Course Documents

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Course Information

Help & How-To

Course Documents

Chapter's

Home Work

Students

Students

Students

Students