



Republic of the Philippines  
SULTAN KUDARAT STATE UNIVERSITY  
Isulan Campus, Isulan Sultan Kudarat  
College of Industrial Technology



ELX 111- ELECTRONIC DEVICES 1

**UNIVERSITY VISION**

A leading University in advancing scholarly innovation, multi-cultural convergence, and responsive public service in a borderless Region.

**UNIVERSITY MISSION**

The University shall primarily provide advanced instruction and professional training in science and technology, agriculture, fisheries, education and other related fields of study. It shall also undertake research and extension services, and provide progressive leadership in its areas of specialization.

**UNIVERSITY STRATEGIC GOALS**

- a. Deliver quality service to stakeholders to address current and future needs in instruction, research, extension, and production
- b. Observe strict implementation of the laws as well as the policies and regulations of the University
- c. Acquire with urgency state-of-the-art resources for its service areas
- d. Bolster the relationship of the University with its local and international customers and partners
- e. Leverage the qualifications and competences in personnel action and staffing
- f. Evaluate the efficiency and responsiveness of the University systems and processes

**INSTITUTIONAL OUTCOMES (IO)**

- a. Enhance competency development, commitment, professionalism, unity and true spirit of service for public accountability, transparency and delivery of quality services
- b. Provide relevant programs and professional trainings that will respond to the development needs of the region
- c. Strengthen local and international collaborations and partnerships for borderless programs
- d. Develop a research culture among faculty and students
- e. Develop and promote environmentally-sound and market-driven knowledge and technologies at par with international standards
- f. Promote research-based information and technologies for sustainable development
- g. Enhance resource generation and mobilization to sustain financial viability of the university

**PROGRAM OUTCOMES (PO) COMMON TO ALL PROGRAMS AND ITS RELATIONSHIPS TO INSTITUTIONAL OUTCOMES**

A graduate of the BlndTech program can:

	INSTITUTIONAL OUTCOMES (IO)						
	a	b	c	d	e	f	g
a. Analyze broadly defined industrial technology processes by using analytical tools that enhance creativity, innovativeness, and intellectual curiosity to improve methods, processes, and systems that meet the industry standards;	✓	✓				✓	
b. Design and implement broadly defined industrial systems, components, products, or processes to meet specific industry needs with proficiency and flexibility in the area of specialization in accordance with global standards;	✓	✓		✓		✓	

Apply appropriate techniques, resources, and state-of-the-art industrial technology tools to meet current industry needs and use these modern tools and processes to improve and increase entrepreneurial activities upholding the safety and health standards of business and industry;	✓		✓	✓	✓		
d. Communicate with diverse groups of clientele the appropriate cultural language with clarity and persuasion, in both oral and written forms, including understanding and giving of clear instructions, high comprehension level, effectiveness in delivering presentations and writing documents, and articulating technological innovation outputs;	✓	✓	✓	✓	✓		
e. Develop leadership and management skills in a team-based environment by making informed decisions, keeping the team motivated, acting and delegating responsibility, and inspiring positive changes in the organization by exercising responsibility with integrity and accountability in the practice of one's profession;	✓	✓	✓	✓	✓		
f. Practice the moral responsibilities of an industrial technologist to manage and balance wider public interest and uphold the norms and safety standards of the industrial technology profession;				✓	✓	✓	✓
g. Demonstrate enthusiasm and passion for continuous personal and professional development in broadly defined industrial technology and effecting positive changes in the entrepreneurial and industrial endeavor; and	✓	✓	✓	✓	✓	✓	✓
h. Recognize the need for, and an ability to engage in lifelong learning.	✓	✓	✓	✓	✓	✓	✓

1 COURSE CODE ELX 111

2 COURSE TITLE Electronic Devices 1

3 PREREQUISITE None

4 CREDITS 5 units

#### 5 COURSE DESCRIPTION

This course includes an introduction to theories and applications of passive electronic devices involving electronic accessories, tools and instruments. It also covers the principles governing electrical quantities which include Ohm's Law and other fundamental basic electronic circuit analysis..

#### 6 COURSE LEARNING OUTCOMES (CLO) AND ITS RELATIONSHIPS TO PROGRAM OUTCOMES

Course Learning Outcomes (CLO)	Program Outcomes						
	a	b	c	d	e	f	g
At the end of the course, a student can:							
a. Understand SKSU-VGMO, Classroom Policies, Course Overview, Course Requirements and Grading System;	✓	✓	✓	✓	✓	✓	✓
b. Explain the Principles of electricity and electronics.	✓	✓	✓	✓	✓	✓	✓
c. Demonstrate the usage of tools, instruments, shop equipment commonly used in electronics technology.	✓	✓	✓	✓	✓	✓	✓
d. Interpret and analyze electronics circuits.	✓	✓	✓	✓	✓	✓	✓
e. Understand the different application of passive components in a circuit.	✓	✓	✓	✓	✓	✓	✓
f. Understand the relationship of ohm's law	✓	✓	✓	✓	✓	✓	✓
g. Perform the testing method of the individual components.	✓	✓	✓	✓	✓	✓	✓
h. Design an assemble electronic circuit.	✓	✓	✓	✓	✓	✓	✓

COURSE CONTENTS

WEEK	CONTENT	INTENDED LEARNING OUTCOMES( ILOs)	TEACHING AND LEARNING ACTIVITIES (TLA)	OUTCOMES-BASED ASSESSMENT (OBA)	COURSE LEARNING OUTCOME S (CLOS)
1	<b>Course Orientation</b> SKSU VMGO, Classroom Policies, Course Overview, Course Requirements, Grading System	At the end of the week, the student can: a. Discuss the University's VMGO, classroom policies, course overview, requirements and grading system	Discuss the VMGO of the University, the classroom policies, scope of the course, course requirements and grading system	a. Participation in discussions	abcdefg
2	<b>Theories, principles, and nature of Electricity and Electronics</b>	At the end of the week, the students can: a. Explained the operating principles of electrical and electronics system, their components parts and functions. b. Discussed the various procedure in serving electronics electrical system components used the most appropriate measuring tools / instruments. c. Describe the principles of electronic components such as resistors, capacitors, inductors; d. Performed the different operation involved in various measuring tools instruments	a. Video/power point presentation b. Individual participation in discussions c. Quiz d. Activity/ Measuring tools instruments	a. Quiz b. participation c. activity outputs	abcdefg
3	<b>Fundamentals of Electricity and Magnetism</b> a. Atomic structure and conductivity b. Electrical conductors and insulators c. Electrical circuits d. electrical values e. electrical measurement f. magnetism and electromagnetism g. Basic electrical component	At the end of the week, the students can: a. explained and discussed atomic structures b. explained and discussed electrical conductors and insulators c. identified electrical circuits d. explained electrical values e. discussed and compute electrical measurement f. discussed magnetism and electromagnetism g. identified electrical symbols	a. Quiz b. Video/power point presentation c. Individual participation in class discussions d. Activity 2.1 Symbol identification	a. Quiz b. participation c. activity outputs	abcdefg

		h. identified basic electrical components			
4	<b>Ohms Law</b>  a. the relationship of voltage, current and resistance b. unit of measurement c. factors affecting resistance d. circuit analysis e. series and parallel circuits f. voltage, current and resistance measurement	At the end of the week, the students can:  a. Explain the relationship of voltage current and resistance b. explain the statement of ohms law c. Explain the significance of Ohm's Law in analyzing electrical circuits d. Describe the units of measurement for voltage (volts), current (amperes), and resistance (ohms) d. Understand the factors affecting resistance, including material, length, cross-sectional area, and temperature e. Apply Ohm's Law to calculate voltage, current, or resistance in simple circuits f. Analyze series and parallel circuits using Ohm's Law g. Execute how to measure voltage current and resistance.	a. Students participation in discussions. b. PowerPoint and video presentation. c. Quiz d. Activity/ voltage, current and resistance measurement using multimeter	a. Quiz b. participation c. activity outputs	abcdefg
5	<b>MIDTERM EXAM</b>				
6	<b>Passive Components</b>  a. How passive components differ from active components. b. Function of resistors, capacitors, and inductors and its characteristics c. How passive components affect electrical signals d. Types and application	At the end of the week, the students can:  a. Define passive components and distinguish them from active components b. Describe the characteristics and functions of resistors, capacitors, and inductors in electronic circuits. c. Explain how resistance, capacitance, and inductance affect electrical signals in AC and DC circuits. d. Identify different types of resistors, capacitors, and inductors based on their	a. Students participation in discussions. b. PowerPoint and video presentation. c. Quiz d. Activity Troubleshoot incorrect values in passive components	a. Quiz b. participation c. activity outputs	abcdefg

	e. How to measure passive components using multimeter f. Diagnose fault and troubleshoot.	specifications and applications e. Measure resistance, capacitance, and inductance using appropriate instruments f. Troubleshoot common issues in passive component circuits, such as open/short circuits and incorrect values			
7	<b>Transformers</b>  a. function of transformer in electronic circuit b. How transformer works c. Difference of step up and step up transformer d. relationship of primary and secondary winding e. voltage measurement f. transformer faults, how to diagnose.	At the end of the week, the students can:  a. Define transformers and explain their role in electrical and electronic systems. b. Describe the working principle of transformers based on Faraday's Law of Electromagnetic Induction c. Differentiate between step-up and step-down transformers based on their voltage transformation d. Explain the relationship between primary and secondary windings, voltage, current, and turns ratio e. Measure primary and secondary voltage and current using appropriate measuring instruments f. Troubleshoot common transformer faults, such as overheating, short circuits, and insulation failure.	a. Students participation in discussions. b. PowerPoint and video presentation. c. Quiz d. Hands on	a. Quiz b. participation c. activity outputs	abcdefg
8	<b>PCB Designing</b>  a. Definition and purpose of PCBs b. Evolution and history of PCB technology c. Advantages of PCBs over traditional wiring d. Types of PCB's e. PCB Materials & Components Substrate materials Copper cladding and	At the end of the week, the students can:  a. Explain the role of PCB in an electronic circuit. b. Describe the types of PCB c. Explain the basic materials used in PCB manufacturing d. Understand the PCB design process, including schematic creation, layout design, and fabrication. e. Identify common PCB components and their placement techniques	a. Students participation in discussions. b. PowerPoint and video presentation. c. Quiz d. Activity -Design and lay-out PCB .	a. Written Assignments: Students will write short essays discussing how food symbolizes cultural identity and the impact of acculturation. b. Group Presentation: Groups will present cultural food habits, including core and complementary food models.	abcdefg

	Solder mask, f. Common electronic components used in PCBs g. PCB Design & Layout, Process h. PCB fabrication steps (etching, drilling, plating, solder mask application) i. Soldering techniques:			
9		FINAL EXAMINATION		

Total No. of Hours : 54

## 8 COURSE REQUIREMENTS AND COURSE POLICIES

### COURSE REQUIREMENTS

Each student is required to:

1. submit accomplished assignments, and activities;
2. make a PowerPoint presentation, and a written summary of the assigned report;
3. participate actively in all discussion;
4. discuss an assigned topic to report and participate in class discussions; and
5. pass the major exams (midterm and final)

### COURSE POLICIES

**Attendance:** A student will be marked late if he/she enters the class 5 minutes after start of class period. Any student who comes to class 15 minutes after the scheduled time or always late for three consecutive meetings shall be marked absent.

**Missed work or exam:** Any student who missed to submit a work assignment or to take a test should consult the concerned instructor for immediate compliance

**Cheating and Plagiarism:** Any student who committed any form of academic dishonesty (e.g., copy-paste plagiarism) shall be given disciplinary action provided in the SKSU Student's Handbook

**Use of Technology:** Cell phones should be turned off while the session is in progress. Using laptops, notebook PCs, smart phones, and tablets shall be allowed only when needed. A scientific calculator (e.g. Casio fx-991ES) shall be utilized in solving.

## 9 GRADING SYSTEM AND RUBRICS FOR GRADING

GRADING SYSTEM	Midterm Grade		Final Term Grade		FINAL
	GRADE	PERCENTAGE	GRADE	PERCENTAGE	
	Midterm Examination	50%	Final Term Examination	50%	Midterm Grade
	Attendance/ Class Participation	5%	Attendance/Class Participation	5%	<u>Final Term Grade</u>
	Quizzes	5%	Quizzes	5%	
	Recitation	5%	Recitation	5%	
	Activity	20%	Activity	20%	
	Report	15%	Report	15%	
	TOTAL	100%	TOTAL	100%	<b>TOTAL</b>

**Materials used:** Laptop, Powerpoint presentations and video clips  
Books, Magazines, Online slides, Teacher-made slides

#### References:

- Grob, Bernard. Basic Electronics, 1<sup>st</sup> edition, Mc. Graw Hill Book Co.  
Benedict, Ralf and Weiner, Nathan. Industrial Electronics Circuits and Application. Prentice Hall Inc.  
Tan, Michael Q., Gantala, Fred T., Lasala, Rommel M. Simple Electronics; Andes Mountain Printers: 2004  
Grob, Bernard. Basic Electronics  
Cardenas, Elpidio. Fundamentals of Electronics,  
Tom, Henry. ELECTRICAL & ELECTRONICS THEORY; Henry publication, copyright 1999  
Pagarigan and Bandi. Practical Electronics I  
Electrical and electronic principles and technology Third Edition John Bird Copyright © 2000, 2003, 2007, John Bird. Published by Elsevier Ltd. All rights reserved  
Fundamentals of Electric Circuits Charles K. Alexander | Matthew n. o. Sadiku Copyright © 2013 by The McGraw-Hill Companies, Inc.  
Testing Electronic Components Jestine Yong

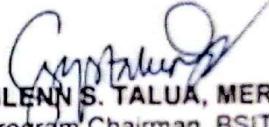
#### Internet websites:

- <http://users.isr.ist.utl.pt/~jag/courses/api1213/api1213.html>  
<http://www.electronics components.biz/?gclid=CjwKCAjw8NfrBRA7EiwAfiV>  
[http://en.m.wikipedia.org/\\_basic\\_electronics](http://en.m.wikipedia.org/_basic_electronics)  
[http://www.allaboutcircuits.com/textbook/digital/chaptr-6/electronics\\_hobbies](http://www.allaboutcircuits.com/textbook/digital/chaptr-6/electronics_hobbies)  
<http://www.TestingElectronicsComponents.com>

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