



ET 321A – ELECTRICAL APPLIANCES REPAIR

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 BlntTech 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;	✓	✓		✓		✓	

c. 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 clienteles 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 ET 321

2 COURSE TITLE ELECTRICAL APPLIANCES
REPAIR

3 PREREQUISITE ET 221 INDUSTRIAL MOTOR
CONTROLLER

4 CREDITS 5 units

5 COURSE DESCRIPTION

This Course is designed to equip students with the skills and knowledge necessary to diagnose, repair, and maintain a variety of electrical appliances, including refrigeration and air conditioning systems.

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

Course Learning Outcomes (CLO)

At the end of the course, a student can:

	a	b	c	d	e
a. Understand SKSU-VGMO, Classroom Policies, Course Overview, Course Requirements and Grading System;	✓	✓	✓	✓	✓
b. Describe the basic components and functions of digital electronic circuits.	✓	✓	✓	✓	✓
c. Analyze and design combinational logic circuits using various logic gates, implement sequential logic circuits, and understand their timing diagrams.;	✓	✓	✓	✓	✓
d. Apply Boolean algebra to simplify digital circuits.	✓	✓	✓	✓	✓
e. Utilize number systems and codes in digital electronics.	✓	✓	✓	✓	✓
f. Design and troubleshoot digital circuits using simulation software.	✓	✓	✓	✓	✓
g. Demonstrate the functionality of basic digital devices, including multiplexers and flip-flops.	✓	✓	✓	✓	✓

Construct and analyze 7-segment display systems.

✓ ✓ ✓ ✓ ✓ ✓ ✓

COURSE CONTENTS

WEEK	CONTENT	INTENDED LEARNING OUTCOMES (ILOs)	TEACHING AND LEARNING ACTIVITIES (TLA)	OUTCOMES-BASED ASSESSMENT (OBA)	COURSE LEARNING OUTCOMES (CLOs)
1	Course Orientation 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	Introduction to Electrical Appliances a. Overview of Electrical Appliances b. Basic Electrical Concepts c. Safety Practices	At the end of the week, the students can: a. Identify different types of electrical appliances. b. Describe the function and purpose of major household appliances. c. Explain fundamental electrical concepts such as voltage and current. d. Differentiate between AC and DC systems. e. Apply safety standards and practices in appliance repair. f. Recognize hazards associated with electrical appliances.	a. Class discussion on current flow and bulb brightness. b. Demonstration of PPE c. Interactive lecture with diagrams and physical models of circuits. d. Hands-on activity where students wear and inspect PPE.	a. Group presents safety poster b. Practical exa c. m where students correctly identify and use PPE in a mock electrical task d. Group activity e. Reflection question	abcdefg
3	Tools and Equipment a. Hand Tools and Power Tools b. Diagnostic Equipment	At the end of the week, the students can: a. Use common tools effectively for appliance repair. b. Demonstrate proficiency in using diagnostic tools. c. Interpret diagnostic readings to identify issues.	a. PowerPoint or posters b. Demonstration of tools and materials c. Viewing safety procedure videos.	a. Short written quiz b. Practical test c. Practical performance task d. Observation checklist during practical activities	abcdefg
4	Troubleshooting Techniques a. Common Appliance Issues b. Step-by-Step Troubleshooting Process	At the end of the week, the students can: a. Apply a systematic approach to troubleshoot electrical appliances b. Diagnose common appliance issues based on symptoms. c. Differentiate between electrical and mechanical failures. d. Document troubleshooting steps and	a. Watch a short video demonstrating real-world raceway installations. b. Small group discussions c. Live demonstration d. Supervised hands-on installation of a simple raceway layout	a. Written or oral quiz b. Performance task c. Practical exam d. Practical installation project	abcdefg

		findings effectively.			
5	Repair Techniques for Major Appliances <ul style="list-style-type: none"> a. Refrigerators b. Washing Machines c. Ovens and Stoves 	<p>At the end of the week, the students can:</p> <ul style="list-style-type: none"> a. Understand the components and their functions within refrigerators. b. Troubleshoot and repair washing machines effectively. c. Identify common faults in washing machine components. d. Diagnose and repair issues in ovens and stoves. e. Understand the differences between gas and electric ovens. 	<ul style="list-style-type: none"> a. Lecture on the parts and functions of major appliances appliance b. Video Presentation c. Group activity d. Hands-on lab activity 	<ul style="list-style-type: none"> a. Short written quiz b. Group reporting c. Written assessment d. Practical assessment 	abcdefg
6		MIDTERM EXAM			
7	Small Appliances Repair <ul style="list-style-type: none"> a. House Appliances 	<p>At the end of the week, the students can:</p> <ul style="list-style-type: none"> a. Repair small kitchen appliances like microwaves, electric fans, flat iron, rice cookers, water heaters and blenders etc. b. Understand the common electrical components in small appliances. c. Troubleshoot and repair laundry appliances effectively. d. Identify electrical and mechanical issues of such appliances 	<ul style="list-style-type: none"> a. Lecture on the parts and functions of major appliances appliance b. Video Presentation c. Group activity d. Hands-on lab activity 	<ul style="list-style-type: none"> a. 	
8	Air Conditioning and Refrigeration Systems <ul style="list-style-type: none"> a. Refrigeration Basics b. Air Conditioning Systems c. Maintenance and Repair 	<p>At the end of the week, the students can:</p> <ul style="list-style-type: none"> a. Explain the principles of refrigeration and its components b. Identify common refrigerants and their properties. c. Troubleshoot common issues in various air conditioning units. d. Understand the operation of split, window, and central AC systems. e. Perform maintenance and repair on refrigeration and AC systems. 	<ul style="list-style-type: none"> a. Lecture on the parts and functions of major appliances appliance b. Video Presentation c. Group activity d. Hands-on lab activity 	<ul style="list-style-type: none"> b. Short quizzes c. Observation d. Practical assessment e. Evaluate students ability 	abcdefg

9	Emerging Technologies in Appliance Repair a. Smart Appliances b. Energy Efficiency Standards	At the end of the week, the students can: a. Integrate IoT technologies into appliance repair practices. b. Troubleshoot smart features and connectivity issues. c. Assess and improve the energy efficiency of appliances. d. Understand the impact of energy ratings on appliance selection.	a. Lecture on the parts and functions of major appliances appliance b. Video Presentation c. Group activity d. Hands-on lab activity	f. Short quizzes g. Observation h. Practical assessment i. Evaluate students ability	abcdefg
10				FINAL EXAMINATION	

Total No. of Hours : 54

8 COURSE REQUIREMENTS AND COURSE POLICIES

Each student is required to:

- COURSE REQUIREMENTS**
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
	Midterm Examination	50%	Final Term Examination	50%	Midterm Grade 50%
	Attendance/ Class Participation	5%	Attendance/Class Participation	5%	Final Term Grade 50%
	Quizzes	5%	Quizzes	5%	
	Recitation	5%	Recitation	5%	
	Activity	20%	Activity	20%	
	Report	15%	Report	15%	
	TOTAL	100%	TOTAL	100%	TOTAL 100%

Materials used:

Laptop, PowerPoint presentations, and video clips
Books, Magazines, Online slides, Teacher-made slides

References:

- *Electricity for Refrigeration, Heating, and Air Conditioning* by Russell E. Smith
- *Refrigeration and Air Conditioning* by W. F. Stoecker and J. W. Jones
- *Handbook of Air Conditioning and Refrigeration* by Shan K. Wang.
- *Introduction to Refrigeration and Air Conditioning Systems: Theory and Applications* by Allan T. Kirkpatrick
- *Audels Refrigeration and Air Conditioning Guide* by Edwin P. Anderson
- *The Complete HVACR Lab Manual* by various authors
- *2010 ASHRAE Handbook - Refrigeration* by ASHRAE
- *Refrigeration and Air Conditioning Technology* by Bill Whitman, Bob Johnson, and John Tomczyk
- *Modern Refrigeration and Air Conditioning* by Althouse, Turnquist, and Bracciano
- *Appliance Repair: A Complete Guide* by William H. Barlow
- *The Ultimate Guide to Home Repair and Improvement* by the Editors of Creative Homeowner
- Internet (YouTube.com , SlideShare.com, etc.)

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