Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
ACCESS, EJC Montilla, 9800 City of Tacurong
Province of Sultan Kudarat

ET112 – DC CIRCUITS

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

	INSTITUTIONAL OUTCOMES (IO)						
A graduate of Sultan Kudarat State University can:	a	b	c	d	e	f	g
a. Ability to analyze broadly defined industrial technology processes by using analytical tools that enhances creativity, innovativeness, and intellectual curiosity to improve methods, processes, and systems that meet the industry standards				✓	✓	✓	
b. Ability to 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. Ability to 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. Ability to 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. Ability to 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. Ability to 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	✓						

1 **COURSE CODE** ET 112
2 **COURSE TITLE** DC Circuits
3 **PREREQUISITE** None
4 **CREDITS** 3 units

5 **COURSE DESCRIPTION**
This course deals with electric and magnetic fields, that includes fundamentals of electrical and electronics laws, series and parallel circuits, including circuit theories and related problem-solving activities, maximum power transfer, and etc.

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

Course Learning Outcomes (CLO)	Program Outcomes						
At the end of the course, a student can:	a	b	c	d	e	f	g
a. Apply the principles of assessment in conceptualizing techniques for assessing authentic learning	✓	✓	✓	✓	✓	✓	✓
b. Design performance-based assessment tools	✓	✓	✓	✓	✓	✓	✓
c. Design assessment tools for effective learning	✓	✓	✓	✓	✓	✓	✓
d. Develop E-Portfolio to assess ones learning	✓	✓	✓	✓	✓	✓	✓
e. Demonstrate skills preparing and reporting grades	✓	✓	✓	✓	✓	✓	✓
f. Derive information from alternative forms of assessments in making instructional decisions	✓	✓	✓	✓	✓	✓	✓

7 **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 pre-service teacher (PST) 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		
2	**The language of electric and electronics** a. Basic Terminology (Voltage, Current, Resistance, Power) b. Circuit Symbols (Resistors, Capacitors, Inductors, Diodes, Transistors) c. Units and Notations (Volts, Amperes, Ohms, Watts) d. Abbreviations and Acronyms (DC, AC, PCB) e. Technical Vocabulary (Semiconductor, Conductor, Insulator).	At the end of the week, the pre-service teacher (PST) can: a. Define and apply fundamental electric and electronic terms. b. Identify and use standard circuit symbols. c. Use correct units and notations in electric and electronic contexts.	a. Lectures and discussions on basic terminology and circuit symbols. b. Interactive quizzes and games to reinforce learning. c. Group activities and problem-solving exercises. d. Laboratory exercises to apply theoretical knowledge.	a. Quizzes and exams to assess understanding of terminology and symbols. b. Assignments and projects that require application of correct units and notations. c. Practical assessments in the laboratory to evaluate ability to identify and use circuit components	a, b, and c
3	**Power of tens and scientific notations, unit prefixes and resistor color codes** a. Power of Tens: Understanding exponents and powers of 10. b. Scientific Notation: Expressing numbers in scientific notation (e.g., 1.2 x 10^3). c. Unit Prefixes: Familiarity with prefixes like kilo- (k), mega- (M), milli- (m), and micro- (μ).	At the end of the week, the pre-service teacher (PST) can: a. Express numbers using powers of 10 and scientific notation. b. Apply unit prefixes correctly in electric and electronic contexts. c. Determine resistor values using color codes.	a. Practice Exercises: Converting numbers to scientific notation and applying unit prefixes. b. Resistor Color Code Charts: Using charts to practice decoding resistor values. c. Interactive Quizzes: Online quizzes to reinforce understanding of powers of 10, scientific notation, and resistor color codes.	a. Quizzes and Exams: Assessing ability to express numbers in scientific notation and apply unit prefixes. b. Resistor Value Calculations: Evaluating ability to determine resistor values using color codes. c. Practical Exercises: Assessing ability to apply knowledge in practical contexts.	a, b, and c

	d. Resistor Color Codes: Understanding the color code system for resistors (e.g., 4-band and 5-band codes).				
3	**Ohms Law** a. Ohm's Law Formula: Understanding the relationship between voltage (V), current (I), and resistance (R): V = I x R. b. Applying Ohm's Law: Calculating voltage, current, or resistance when given two of the three values. c. Limitations of Ohm's Law: Understanding that Ohm's Law applies to linear, ohmic materials.	At the end of the week, the pre-service teacher (PST) should be able to: a. State and apply Ohm's Law to calculate voltage, current, or resistance. b. Solve problems involving Ohm's Law. c. Understand the limitations and applications of Ohm's Law.	a. Practice Problems: Solving problems involving Ohm's Law. b. Circuit Analysis: Analyzing simple circuits using Ohm's Law. c. Laboratory Experiments: Measuring voltage, current, and resistance to verify Ohm's Law.	a. Quizzes and Exams: Assessing ability to apply Ohm's Law. b. Problem-Solving Assignments: Evaluating ability to solve circuit problems using Ohm's Law. c. Laboratory Reports: Assessing ability to measure and analyze circuit parameters.	a, b, c
4	**Current and Volatge** a. Electric Current: Understanding the flow of electrons, units (amperes, A), and types (DC, AC). b. Voltage: Understanding electric potential difference, units (volts, V), and sources (batteries, generators)..	At the end of the week, the pre-service teacher (PST) can: a. Define and explain electric current and voltage. b. Calculate current and voltage in simple circuits. c. Understand the relationship between current and voltage.	a. Lectures and Discussions: Explaining current and voltage concepts. b. Practice Problems: Solving circuit problems involving current and voltage. c. Laboratory Experiments: Measuring current and voltage using multimeters.	a. Quizzes and Exams: Assessing understanding of current and voltage concepts. b. Circuit Analysis Assignments: Evaluating ability to calculate current and voltage. c. Lab Reports: Assessing ability to measure and analyze current and voltage.	a, b, c,
5	**Resistance and Power** a. Resistance: Understanding opposition to current flow, units (ohms, Ω), and factors affecting resistance. b. Resistors: Types (fixed, variable), applications, and characteristics.	At the end of the week, the pre-service teacher (PST) can: a. Define and explain resistance and its factors. b. Calculate power in electric circuits. c. Apply resistance and power concepts in circuit analysis.	a. Lectures and Discussions: Explaining resistance and power concepts. b. Practice Problems: Solving circuit problems involving resistance and power. c. Laboratory Experiments: Measuring resistance and power using multimeters and other equipment.	a. Quizzes and Exams: Assessing understanding of resistance and power concepts. b. Circuit Analysis Assignments: Evaluating ability to calculate resistance and power. c. Lab Reports: Assessing ability to measure and	a, b, c,

	c. Power: Understanding electric power, units (watts, W), and calculations (P = VI, P = I^2R, P = V^2/R).			analyze resistance and power.	
6	**Series resistive circuit** 1. Series Circuit Characteristics: Understanding current, voltage, and resistance in series circuits. 2. Total Resistance: Calculating total resistance (Rt = R1 + R2 + ... + Rn). 3. Voltage Division: Understanding voltage division and calculating voltage drops across each resistor.	At the end of the week, the pre-service teacher (PST) can: a. Analyze series resistive circuits. b. Calculate total resistance, current, and voltage drops. c. Apply series circuit principles to solve problems.	a. Lectures and Discussions: Explaining series circuit concepts. b. Practice Problems: Solving series circuit problems. c. Laboratory Experiments: Measuring current, voltage, and resistance in series circuits.	a. Quizzes and Exams: Assessing understanding of series circuit concepts. b. Circuit Analysis Assignments: Evaluating ability to calculate current, voltage, and resistance. c. Lab Reports: Assessing ability to measure and analyze series circuits.	a, b, c
7	**Parallel and series parallel resistive circuit** 1. Parallel Circuit Characteristics: Understanding current, voltage, and resistance in parallel circuits. 2. Total Resistance: Calculating total resistance (1/Rt = 1/R1 + 1/R2 + ... + 1/Rn). 3. Current Division: Understanding current division and calculating branch currents. Series-Parallel Circuits 1. Series-Parallel Circuit Analysis: Breaking down	At the end of the week, the pre-service teacher (PST) can: a. Analyze parallel and series-parallel resistive circuits. b. Calculate total resistance, current, and voltage in parallel and series-parallel circuits. c. Apply circuit principles to solve complex circuit problems.	a. Lectures and Discussions: Explaining parallel and series-parallel circuit concepts. b. Practice Problems: Solving parallel and series-parallel circuit problems. c. Laboratory Experiments: Measuring current, voltage, and resistance in parallel and series-parallel circuits.	a. Quizzes and Exams: Assessing understanding of parallel and series-parallel circuit concepts. b. Circuit Analysis Assignments: Evaluating ability to calculate current, voltage, and resistance. c. Lab Reports: Assessing ability to measure and analyze parallel and series-parallel circuits.	a, b, c

	complex circuits into series and parallel sections. 2. Total Resistance: Calculating total resistance in series-parallel circuits. 3. Current and Voltage Calculations: Calculating current and voltage in series-parallel circuits.				
8	FINAL EXAMINATION				

Total No. of Hours : 54

8 COURSE REQUIREMENTS AND COURSE POLICIES

COURSE REQUIREMENTS

Each student is required to:

1. *submit accomplished assignments, problem sets and a mini-research project;*
2. *prepare a comprehensive lecture notebook;*
3. *make a PowerPoint presentation, and a written summary of the assigned report;*
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	
Written Examination	30%
Course requirement	40%
Attendance	5%
Quizzes	15%
Participation	10%
TOTAL	100%

Final Term Grade	
Written Examination	30%
Course requirement	40%
Attendance	5%
Quizzes	15%
Participation	10%
TOTAL	100%

FINAL GRADE	
Midterm Grade	50%
Final Term Grade	50%
TOTAL	**100%**

10 REFERENCES

Textbooks

"Electric Circuits" by James W. Nilsson and Susan A. Riedel: A comprehensive textbook on electric circuits.
"Fundamentals of Electric Circuits" by Charles K. Alexander and Matthew N.O. Sadiku: A textbook covering fundamental concepts of electric circuits.
Floyd, T. L. (2019). Principles of Electric Circuits. Pearson Education.
Theraja, B. L. (2018). Electrical Technology. S. Chand & Company.
Online resources like All About Circuits or Electronics Tutorials.

Online References

Revising Electronics & Electrical Principles 1 - Year 1 Module
Ohms Law - Revising Electronics & Electrical Principles 1
Combining Voltage & Current Sources Series/Parallel - Revising Electronics & Electrical Principles 1

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