Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
Isulan, Sultan Kudarat
College of Industrial Technology
2nd Sem S.Y.2024-2025

ET 221A- LOGIC 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 field of study. It shall undertake research and extension services, and provide progressive leadership in its area of specialization.

UNIVERSITY GOAL

To produce graduates with excellence and dignity in arts, science and technology.

UNIVERSITY OBJECTIVES

a. Enhance competency development, commitment, professionalism, unity and true spirit of service for public accountability, transparency and delivery of quality services;
b. Provide relevant program and professional trainings that will respond to the development needs of the region;
c. Strengthen local and international collaborations and partnerships for borderless program;
d. Develop a research culture among faculty and student;
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 Objectives and its relationship to University Objectives:

PROGRAM OBJECTIVES (PO)	OBJECTIVES						
A graduate of Industrial Technology can:	a	b	c	d	e	f	g
a. Assume professional, technical, managerial and leadership roles in industrial organizations with the desired competence in the fields of practice such as Automotive, Architectural drafting, Civil, Electrical, Electronics, Food and its allied discipline	/	/					
b. Innovate explicit and modern technologies in the advancement of economy, society, technology and environmental sustainability	/	/	/		/	/	/
c. Generate research based information and technologies at par from international standards; and	/	/	/	/	/	/	/
d. Promote and transfer knowledge and technologies for effective and efficient school-industry partnership.	/	/	/		/	/	/

1. Course Code : ET 213
2. Course Title :LOGIC CIRCUIT CONTROLLER
3. Prerequisite :OCCUPATIONAL HEALTH & SAFETY (IT 111)
4. Credits : 3 UNITS

5. Course Description:
This course introduce foundation in digital design. Includes number system and codes, basic logic gates, device parameters, Boolean algebra, logic circuit simplification techniques, timing analysis, application of combinational logic devices, programmable logic devices, flip-flop, registers and/or counters.

6. Course Learning Outcomes and Relationships to Program Objectives

Course Learning Outcomes	Program Objectives			
Upon successful completion of this course, student will be able to:	a	b	c	d
1. Apply the principles of assessment in conceptualizing techniques for assessing authentic learning	/	/		
2. Design performance-based assessment tools	/		/	
3. Design assessment tools for effective learning	/	/	/	/
4. Develop E-Portfolio to assess ones learning	/			/
5. Demonstrate skills preparing and reporting grades	/		/	
6. Derive information from alternative forms of assessments in making instructional decisions	/	/	/	/

7. Course Content

Course Objectives, Topics, Time Allotment	Desired Student Learning Outcomes	Outcomes-Based Assessment (OBA) Activities	Evidence of Outcomes	Course Learning Outcomes	Program Objectives	Values Integration
Topic: SKSU VMGO, Classr oom Policies, Course Overview, Course Requirements, Grading System (1. 5 Hours)						
1.1 Discuss the VMGO of the university, classroom policies, scope of the course, course requirements and grading system	1.1 Student can be aware of and appreciate of the university VMGO, classroom policies, course overview, requirements and grading system.	Evaluation checklist	Group and individual discussions	g	d	Participation
Topic: Number System (6 H ours)						
2.1 Discuss the different number system and its uses.	2.1 Determine the different number system such as Decimal, Binary, Octal, and Hexadecimal. 2.2 Learn how to convert from Decimal number system to Binary and to Octal and to Hexadecimal.	Rubrics for showcase Evaluation checklist Quiz Observation instrument	Group and individual discussions	g	d	Participation Time management
Topic: Binary Math (6 Hour s)						
3.1 Discuss the binary math operation such as Addition, Subtractions, Multiplication and Division	3.1 Learn the binary math operation and its uses in computer operation.	Rubrics for showcase Evaluation checklist Quiz	Group and individual discussions	g	d	Participation Time management Safety awareness

		Observation instrument				
Topic: Boolean Algebra an d Logic Gates (6Hours)						
4.1 Discuss the Boolean algebra. 4.2 Discuss the different Gates and its truth table 4.3 Discuss the basic law and theorem on Boolean Algebra	4.1 Learn the different laws and theorem on Boolean Algebra. 4.2 Learn the different logoc gates that will be used in Boolean Algebra.	Rubrics for showcase Evaluation checklist Quiz Observation instrument	Group and individual discussions	g	d	Participation Time management Safety awareness
Topic: De Morgan's Theore m (3 Hours)						
5.1 Discuss De Morgan's Theorem	5.1 Learn the basic of De Morgan's Theorem.	Rubrics for showcase Evaluation checklist Quiz Observation instrument	Group and individual discussions	g	d	Participation Time management Safety awareness
Topic: Derivations of Boole ans Expression (6 Hours)						
6.1 Discuss the derivation of Boolean Expression, together with the sum of product and the product of sum.	6.1 Learn the basic of derivation of Boolean Expression which is necessary in the language of programming. .	Rubrics for showcase Evaluation checklist Quiz Observation instrument	Group and individual discussions	g	d	Participation Time management Safety awareness
Topic: Combinational Logic Analysis (6 Hours)						
7.1 Discuss the combinational and implementing logic circuits 7.2 Discuss Combinational	7.1 Demonstrate the combinational and implementation of combinational logic 7.2 Explain the	Rubrics for showcase Evaluation checklist Quiz	Group and individual discussions	g	d	Participation Time management Safety awareness

logic using NAND and NOR	combinational logic using NAND and NOR	Observation instrument				
Topic: Function of Combin ational Logic (7.5 Hours)						
8.1 Discuss the following • Basic Adder • Parallel Binary adder • Comparator • Decoder • Encoder • Multiplexers • Demultiplexers	**8.1** Explain the following topic • Basic Adder • Parallel Binary adder • Comparator • Decoder • Encoder • Multiplexers • Demultiplexers	Rubrics for showcase Evaluation checklist Quiz Observation instrument	Group and individual discussions	g	d	Participation Time management Safety awareness
Topic: Latch, Flip-flops, an d Timers (6 Hours)						
9.1 Discuss the following • Latch • Flip-flops • Timers	9.1 Explain the following • Latch • Flip-flops • Timers	Rubrics for showcase Evaluation checklist Quiz Observation instrument	Group and individual discussions	g	d	Participation Time management Safety awareness
Topic: Counters (6 Hours)						
10.1 Discuss the following • Asynchronous counter • Synchronous counter	10.0 Discuss the following • Asynchronous counter • Synchronous counter	Rubrics for showcase Evaluation checklist Quiz Observation instrument	Group and individual discussions	g	d	Participation Time management Safety awareness
Lecture	**= 51 Hours**					
Laboratory	**= 0 Hour**					
Examination	**= 3 Hours**					
Total No. of Hours	**= 54 Hours**					

8 Course requirements

Quizzes
Written Examination (Midterm and Final)
Reporting/Oral/activities/Conferences
Portfolio
Attendance

9 Course Evaluation

Grading System:

MIDTERM		FINAL TERM	
Exam	- 30%	Exam	- 30%
Course Requirement	- 40%	Course Requirement	- 40%
Attendance	- 5%	Attendance	- 5%
Quizzes	- 15%	Quizzes	- 15%
Participation	- 10%	Participation	- 10%

MTG+FTG/2=FG

Schedule of Examination:

Midterm -
Final -
Classes End -

References:

- *Floyd, T. (2006). Digital Fundamentals. New Jersey, USA, Pearson. Prentice Hall*
- *Digital Logic and Computer Design" by M. Morris Mano (2013)*
- *Logic Circuit Design" by David J. Comer (2013)*
- *Nelson, V.P. (1995). Digital Circuit Analysis and Design. New Jersey, USA. Prentice Hall*

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