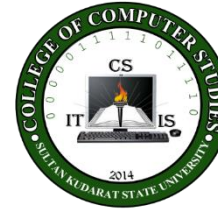Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
Isulan, Sultan Kudarat
College of Computer Studies
1st Semester S.Y. 2024 - 2025
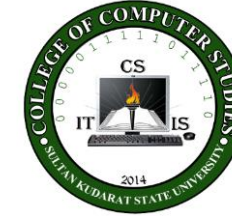
IT 111
Discrete Mathematics
Syllabus

1st Semester
School Year 2024 – 2025

UNIVERSITY VISION

A trailblazer in arts, science and technology in the region.

UNIVERSITY MISSION

The University shall primarily provide advance 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 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 Objectives and its relationship to University Goals:

PROGRAM OBJECTIVES (PO)	OBJECTIVES						
A graduate of BS in Information Technology (BSIT) can:	a	b	c	d	e	f	g
a. innovate technological concepts and ideas underpinning desired IT solutions;	√	√			√		√
b. administer competently the computer networks, systems development, software applications, hardware and maintenance;	√	√	√	√	√	√	√
c. design industry-based applications, infrastructures and technologies that will promote the advancement and development of the community;	√	√	√	√	√	√	√
d. demonstrate the code of conduct as well as the social and legal aspects of information technology.	√	√	√	√	√	√	√

1. Course Code : IT 111
2. Course Title : Discrete Mathematics
3. Prerequisite : None
4. Credits : 3 UNITS

5. Course Description:
This course is an introduction to Discrete Mathematics, which is concerned with the study of mathematics structures that are countable or distinct. The course will introduce different discrete mathematics structures and its applications on real-world problems. In particular, this course will cover topics on sets, relations and functions, logic, counting, and discrete probability.

6. Course Learning Outcomes and Relationships to Program Educational Objectives

Course Learning Outcomes	Program Objectives			
At the end of the semester, the students can:	a	b	c	d
a. Perform operations associated with sets, functions and relations, modular arithmetic.	√	√	√	√
b. Apply formal methods of symbolic prepositional and predicate logic, and discuss which kind of proof is best for a given problem.	√	√	√	√
c. Count objects using permutation, combinations;	√	√	√	√
d. Compute probabilities.	√	√	√	√

7. Course Content

Course Objectives, Topics, Time Allotment	Desired Student Learning Objectives	Outcome-Based Assessment (OBA) Activities	Evidence of Outcomes	Course Objectives	Program Outcomes	Values Integration
Topic: VGMO, Classroom Policies, Course Overview, Course Requirements, Grading System (3 hour)						
1. Discuss the VGMO of the University, Classroom Policies, scope of the course, course requirements, and grading system 2. Discuss main concepts of the subject matter; definition and relationship between probability and Statistics.	1. Students can be aware of the VGMO of the University, Classroom Policies, scope of the course, course requirements, and grading system 2. Students can compare and contrast the concept of Probability and Statistics as well as the relationship between the two.	➢ Online class orientation ➢ Orientation module through Google Form ➢ Individual consultation through SMS or other messaging apps	• Submitted Google form	a	a, c, d	Value of appreciation
Topic 1: Sets and Set Operations (12 hours)						
1. Discuss sets and subsets. 2. Discuss set operations and illustrate it using different set notations and diagrams. 3. Discuss ordered pairs and set product	• Students can define and distinguish sets subsets. • Students can apply set operations and illustrate it using different set notations and diagrams. • Students can define what is ordered pair as well as set product. • Students can distinguish between sets and ordered pair	➢ Online class lecture ➢ Module engagement ➢ Video viewing ➢ Workbook exercises ➢ Quiz	➢ Workbook scores ➢ Quiz scores	a, b	a, b, c, d	Value of Self-learning Value of participation Value of problem-solving

Topic 2: Functions and Relations (9 hours)						
1. Define functions and relations 2. Distinguish functions from relations.	• Students can explain what are functions, and relations. • Students can distinguish between functions from relations. • Students can graph common functions and relations	➢ Online class lecture ➢ Module engagement ➢ Video viewing ➢ Workbook exercises ➢ Quiz	➢ Workbook scores ➢ Quiz scores	a, b, d	a, b, c, d	Value of Self-learning Value of problem-solving
Topic 3: Logic (12 hours)						
1. Explain what is logic. 2. Discuss propositional logic. 3. Identify the Proposition, Conditional Propositions and Logical Equivalence and can apply the equivalent truth table. 4. Discuss the Arguments and Rules of Interference. 5. Evaluate the Quantifiers and its statements.	• Students can define the different properties of set. • Students can also identify and use the truth table to evaluate the proposition. • Student can understand the different rules and arguments. • Students can translate the statement into quantified statement.	➢ Online class lecture ➢ Module engagement ➢ Video viewing ➢ Workbook exercises ➢ Quiz	➢ Workbook scores ➢ Quiz scores	a, b, c	a, b, c, d	Value of Self-learning Value of problem-solving Value of using logical reasoning Value of self-evaluation using logic

Topic 4: Counting and Probability (15 hours)						
1. Discuss how to count objects or group of objects using permutation.	• Students can count groups of objects using permutation.	➤ Online class lecture		a, b, c	a, b, c, d	Value of Self-learning
2. Discuss how to count objects or group of objects using and combination.	• Students can count groups of objects using permutation.	➤ Module engagement ➤ Video viewing				Value of discovery and learning
3. Basic Probability	• Students can define and compute probability	➤ Workbook exercises	➤ Workbook scores			
4. Probability Distributions	• Students can define and simulate probability distributions	➤ Quiz	➤ Quiz scores			

TOTAL HOURS: 54 hours
   Class/Lecture (51 hours)
   Exams (3 hours)

8. Course Evaluation
   Course Requirements: Midterm and Final Exams
                                    At least 80% of Graded Activities/Quizzes
   Grading System:

Problem Sets/Exercises/Quizzes	50%
Midterm/Final Exam	50%
TOTAL	100%

➤ equivalent scores will be computing using the 0 = 0% base.

Textbook:
   • Johnsonbaugh, Richard. *Discrete Mathematics 8th ed*, Pearson Education, Inc. 2018

References:

1. Epp, Susanna, *Discrete Mathematics with Applications 4th ed.* Brooks/Cole Cengage Learning, 2011
2. Gallier, Jean, *Discrete Mathematics*, *2nd ed.* Springer, 2017
3. Leighman, Eric, et al, *Mathematics for Computer Science,* Creative Commons Attribution-ShareAlike 3.0 license, 2017
4. Rosen, Kenneth H, *Discrete Mathematics and Its Applications, 7th ed.* McGraw-Hill, 2012

Supplemental:

1. Discrete Math 1, YouTube Playlist, https://www.youtube.com/watch?v=tyDKR4FG3Yw&list=PLDDGPdw7e6Ag1EIznZ-m-qXu4XX3A0cIz
2. Four Basic Proof Techniques used in Mathematics, https://www.youtube.com/watch?v=V5tUc-J124s
3. Functions and Relations, https://www.youtube.com/watch?v=OxZ0JL4Bjzk
4. Introduction to Propositional Logic, https://www.youtube.com/watch?v=itrXYg41-V0
5. Set Operations, https://www.youtube.com/watch?v=nI7h8_7Cj_E

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