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

MS 312
Quantitative Methods (incldg Modelling and Simulation) Syllabus

1st Semester
School Year 2024 - 2025

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

CORE VALUES

P – Patriotism
R – Respect
I – Integrity
Z – Zeal
E – Excellence in Public Service

STRATEGIC GOALS

a. Deliver quality services 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 competence in personnel action and staffing.
f. Evaluate the efficiency and responsiveness of the University systems and processes.

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
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; and		√		√	√	√

1. Course Code : MS 312
2. Course Title : Quantitative Methods (incldg Modelling and Simulation)
3. Prerequisite : None
4. Credits : 3 UNITS

5. Course Description:
This course is focused on Descriptive Statistics and quantitative methods of research. It starts with a review of the basic concepts in Statistics and different kinds of data used in research as well as statistical measures of central location, variability, and association. This course focuses on in-depth discussions on different quantitative methods such as regression and model building, as well as time series analysis. This course also includes numerical analysis and simulation techniques.

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. Understand the basic concepts in quantitative methods of research;	√	√	√	√
b. identify different kinds of data and perform data cleaning procedures, and visualize the data into graphical presentations;	√	√	√	√
c. Perform regression analysis; and	√	√	√	√
d. Simulate real-world applications using probability distributions.	√	√	√	√

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 hours)						
1. Discuss the VGMO of the University, Classroom Policies, scope of the course, course requirements, and grading system	1. Students can be aware of the VGMO of the University, Classroom Policies, scope of the course, course requirements, and grading system	➢ Individual class participation in class discussion ➢ small-group discussion	➢ Signed Orientation Form ➢ Filled-up seat plan	a	a, c, d	Value of appreciation Value of Self-learning
Topic 1: Quantitative Methods and Descriptive Statistics (9 hours)						
1. Review concepts on Statistics a. Types of Data and Quantitative Methods b. Measures of Location c. Measures of Variability	• By the end of this topic, students can: ○ Understand the use of and compute different measures of central location ○ Understand the use of and compute different measures of variability	➢ Online class/video lecture ➢ Module engagement ➢ Video viewing ➢ Workbook exercises ➢ Problem Set ➢ Long Quiz	➢ Workbook scores ➢ Solutions to Problem Set ➢ Long Quiz scores	a, b	a, b, c, d	Value of Self-learning Value of public trust (correct information dissemination) Value of research Value of problem-solving Value of critical thinking

Topic 2: Data, Data Preparation, and Data Visualization (12 hours)						
1. Data Types 2. Data Preparation • Data encoding • Data clearing • Data integration • Data reduction • Data Transformation 3. Data Visualization	• By the end of this topic, students can: ○ Identify and distinguish different data types ○ Properly encode collected data ○ Perform data cleaning, integrate or reduce data when necessary; and transform and discretize data when needed. ○ visualize data using different visualization methods and techniques	➢ Online class/video lecture ➢ Video viewing ➢ Short quiz ➢ Activity ➢ Problem Set ➢ Long Quiz	➢ Quiz score ➢ Activity scores ➢ Solutions to Problem Set ➢ Long Quiz scores	a, b, d	a, b, c, d	Value of Self-learning Value of creativity Value of public trust (correct information dissemination) Value of research
Topic 3: Data Exploration (15 hours)						
1. Exploratory Data Analysis 2. Comparison and Correlation 3. Data Visualization	• By the end of this topic, students can: ▪ Perform exploratory data analysis ▪ Perform comparison and identify correlation of variables ▪ Visualize data	➢ Online class/video lecture ➢ Activity ➢ Modelling Project ➢ Long Quiz	➢ Activity Output ➢ Project score ➢ Long Quiz scores	a, b, d	a, b, c, d	Value of Self-learning Value of creativity Value of public trust (correct information dissemination) Value of research

Topic 4: Model Building using Regression (12 hours)						
4. Discuss simple modelling methods such as a. Simple Linear Regression Models b. Multiple Regression Models	• By the end of this topic, students can: o produce a reliable model and use it to predict new cases of data using ▪ simple linear regression models ▪ multiple linear regression models	➢ Online class/video lecture ➢ Video viewing ➢ Short Quiz ➢ Activity ➢ Simulation Project ➢ Long Quiz	➢ Short Quiz ➢ Activity Output ➢ Project score ➢ Long Quiz scores	a, b, d	a, b, c, d	Value of Self-learning Value of creativity Value of public trust (correct information dissemination) Value of research
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

Grading System:

Graded Activities (Long Quizzes, Problem Sets, and Projects)	40%
Midterm/Final Exam	60%
TOTAL	100%

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

References:

1. Békés, Gábor and Gábor Kézdi, “Data Analysis for Business, Economics, and Policy”. Cambridge University Press, 2021
2. Belorkar, A., Guntuku, SC., Hora, S., Kumar, A., Interactive Data Visualization with Python 2nd ed., Packt Publishing, 2020
3. Berinato, Scott. “Visualizations That Really Work.” Harvard Business Review, June 1, 2016.
4. Camm, et. al., Essentials of Business Analytics, Cengage Learning, 2015
5. Hechanova, Rolando F., Hechanova, Ruby S. Applied Parametric Statistics. 2012
6. Miller, J.D., Statistics for Data Science, Packt Publishing, 2017
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8. Stewart, Matthew. “The Power of Visualization - Towards Data Science.” Medium, May 15, 2019.
9. Wexler, Steve, The Big Picture: How to use Data Visualization to make better decisions – faster, Data Revelations LLC, 2021
10. Wexler, S, Shaffer J., Cotgreave, A., The Big Book of Dashboards: Visualizing your data using Real-World Business Scenarios, Wiley, 2021

Supplemental Materials:

1. Abraham, B. and Ledolter, J, Introduction to Regression Modeling. Duxbury Press, 2006.
2. Hand, D.J., Daly, F., Lunn, A.D., McConway, K.J., and Ostrowski, E., A Handbook of Small Data Sets, Chapman & Hall, 1994.
3. Hastie, T., Tibshirani, R., and Friedman, J., The Elements of Statistical Learning: Data Mining, Inference and Prediction 2nd ed, Springer, 2009.
4. Online Math Learning, Statistics Games, http://www.onlinemathlearning.com/statistics-games.html
5. Sage Publisher, Student Study Site for Statistics Alive, http://www.uk.sagepub.com/steinberg2e/study/modules.htm
6. StatSoft Electronic Statistics Textbook, http://www.statsoft.com/Textbook
7. Transum.org, Statistics Lesson Starters and Online Activities, http://www.transum.org/Software/SW/Starter_of_the_day/Similar.asp?ID_Topic=58

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