DE LA SALLE UNIVERSITY
College of Science
Department of Mathematics

PROBSTA – *Probability and Statistics*
Prerequisite: *Prerequisite to:*

Instructor:_____   Contact details:_____
Consultation Hours:_____   Class Schedule and Room:_____

Course Description

A first course in statistics that includes topics on the basic concepts and principles of descriptive and inferential statistics with varied applications

Learning Outcomes

On completion of this course, the student is expected to present the following learning outcomes in line with the Expected Lasallian Graduate Attributes (ELGA)

ELGA	Learning Outcome
Critical and Creative Thinker Effective Communicator Lifelong Learner Service-Driven Citizen	At the end of the course, the students will be able to apply appropriate statistical concepts, methodologies and technologies in organizing, analyzing and interpreting various real-world situations and in coming up with relevant decisions.

Final Course Output

As evidence of attaining the above learning outcomes, the student is required to submit the following during the indicated dates of the term.

Learning Outcome	Required Output	Due Date
At the end of the course, the students will be able to apply appropriate statistical concepts, methodologies and technologies in organizing, analyzing and interpreting various real-world situations and in coming up with relevant decisions.	Presentation of data analysis and real-life applications of probability concepts using computer software	Week 13

Rubric for assessment

CRITERIA	EXEMPLARY 4	SATISFACTORY 3	DEVELOPING 2	BEGINNING 1
Formulation of the Research Problem and Objectives (10%)	Research problem and objectives are clearly defined and significant; Demonstrates evidence that the research problem was researched and designed well.	Research problem and objectives are clearly defined and significant.	Research problem is clearly defined but some objectives are insignificant.	Research problem and objectives are vague and insignificant.
Applications of Probability Concepts (30%)	Appropriate probability concepts were used with correct interpretations.	Appropriate probability concepts were used.	Some probability concepts were inappropriately used.	Inappropriate probability concepts were used.
Appropriateness and Extensiveness of Descriptive Statistics (30%)	Data are presented accurately using all appropriate tables/graphs/numerical measures with proper labels/titles and correct interpretations.	Data are presented using appropriate tables/graphs/ numerical measures.	Some data are presented using inappropriate tables/graphs/ numerical measures.	Data are presented using inappropriate tables/graphs/n umerical measures.
Applications of Inferential Statistics (20%)	Statistical analyses are appropriate with correct interpretations and relevant conclusions.	Statistical analyses are appropriate with correct interpretations.	Some statistical analyses are inappropriate.	Statistical analyses are inappropriate
Clarity and Organization of Report (10%)	Report is organized logically and presented clearly with effective transitions.	Report is organized logically and presented clearly.	Report is organized and some discussions are not clear.	Report is not organized.

Additional Requirements

- Class Activities (Seatworks, Assignments, Cooperative learning, …)
- Computer Output
- Learning Output
- Quizzes (at least three)
- Final Examination

Grading System

	FOR EXEMPTED STUDENTS (w/out Final Exam)	FOR STUDENTS with FINAL EXAM	
		with no missed quiz	with one missed quiz
Average of quizzes	80%	50%	40%
Class Activities and Computer Outputs	10%	10%	10%
Learning Output	10%	10%	10%
Final examination		30%	40%

Scale:

95-100%	4.0
89-94%	3.5
83-88%	3.0
78-82%	2.5
72-77%	2.0
66-71%	1.5
60-65%	1.0
<60%	0.0

Learning Plan

LEARNING OUTCOME	Culminating Topics	WEEK NO.	Learning Activities
At the end of the course, the students will be able to apply appropriate statistical concepts, methodologies and technologies in organizing, analyzing and interpreting various real-world situations and in coming up with relevant decisions.	**INTRODUCTION** Importance of Statistics Descriptive and Inferential Statistics Population and Sample Overview of Random Sampling Procedures	Week 1	Eliciting Prior Knowledge Critiques on Use and Misuse of Statistics Data Collection Sampling from Actual Data On-line active learning: Uses of Descriptive statistics
	DESCRIPTIVE STATISTICS Descriptive Numerical Measures Measures of Central Tendency Measures of Variability Measures of Position Measure of Skewness Describing Data with Tables and Graphs FDT and Histograms Stem and Leaf Plot Box and Whiskers Plot	Weeks 2-3	Worksheets on Numerical Measures Exploratory Comparison of Two Actual Data Sets Computer Laboratory Activity: Generating and Interpreting Summary Measures Computer Laboratory Activity: Working on Microsoft Excel and PhStat2 in Generating Tables and Graphs
	PROBABILITY Experiments, Samples Spaces Computing Techniques Fundamental Principle in Counting Permutations and Combinations Probability of an Event Laws of Probability Union of Events Complement of Events Conditional Events Intersection of Events	Weeks 4-5	Cooperative Learning: Statistical Experiments Using Coins, Dice, Cards, and/or Balls Dice Problems/Monty Hall Problem/Birthday Problem/Recreational Probability Problems Journal Clippings on Applications of Probability Distributions On-line active learning: Simulating probabilities of real life processes

		PROBABILITY DISTRIBUTIONS Concept of a Random Variable Concept of a Probability Distribution Types of Probability Distributions Mean of a Discrete Random Variable Variance of a Discrete Random Variable Properties of the Mean and the Variance	Week 6	Journal Clippings on Applications of Probability Distributions On-line active learning: Simulating random variables and their probability distributions Inquiry approach: To gamble or not to gamble.
		DISCRETE PROBABILITY DISTRIBUTIONS Uniform Distribution Binomial Distribution Hypergeometric Distribution Negative Binomial and Geometric Distribution Poisson Distribution	Week 7	Journal Clippings on Applications of Discrete Probability Distributions Computer Laboratory Activity: Probability and Probability Distributions
		CONTINUOUS PROBABILITY DISTRIBUTIONS Uniform Distribution Normal Distribution (Areas under the Normal Curve)	Week 8	Journal Clippings on Applications of Continuous Probability Distributions Computer Laboratory Activity: Simulating Normal Probability Distribution
		SAMPLING DISTRIBUTIONS Sampling Distribution of the Mean The Central Limit Theorem The t-distribution	Week 9	Cooperative Learning: Statistical Experiments - Generating Sampling Distribution of the Sample Mean Inquiry approach: Expectation and variance of the sample mean – possible applications.
		ESTIMATION OF PARAMETERS Estimating the Mean and Proportion Error of Estimation Sample Size Determination	Weeks 10	Cooperative Learning: Statistical Experiments - Generating Sampling Distribution of the Sample Mean and its role in the estimation of the sample mean: unbiasedness and precision Inquiry approach: Poll Surveys – are they giving us the correct figures?
		TESTS OF HYPOTHESES Testing Hypotheses and Errors in Testing Hypotheses 1-Tailed and 2-Tailed Tests Steps in Testing Hypotheses Tests Concerning the Mean and Proportion - One Population	Weeks 11 – 12	Computer Laboratory Activity: Hypothesis Testing
		LEARNING OUTPUT	Week 13	Presentation of data analysis and real-life applications of probability concepts using computer software
		FINAL EXAMINATION	Week 14	

References

Albert *(2007),* Basics Statistics for the Tertiary Level

Arcilla, Co, Ocampo & Tresvalles (2012). *Statistical Literacy*. Manila: ABIVA Publishing House, Inc.

Berenson, Levine, & Krehbiel. (2006). *Basic Business Statistics: Concepts and Applications (10th ed.)*.Upper Saddle River, NJ: Pearson/Prentice Hall.

Downie and Heath (1984). *Basic Statistical Methods (5th Edition).* Manila: National Bookstore.

Hayter, A. (2002). *Probability and Statistics for Engineers and Scientists (2nd edition)***.** CA: Duxbury.

Levine, Berenson & Stephan (2002). *Statistics for Managers Using Microsoft Excel* (3rd edition). Upper Saddle River, NJ: Prentice Hall.

Mann (2007). *Introductory Statistics (6th edition).* Hoboken, N.J.; Wiley

Mendenhall/Beaver/Beaver (2006), *Introduction to Probability and Statistics (12th edition)*

Ocampo (2006) *Transformative Learning Modules for Statistical Literacy*

Taylor. (2007). *Business Statistics for Non-mathematicians*. Basingstoke: Palgrave Macmillan.

Walpole, Myers, Myers & Ye (2005). *Probability and Statistics for Engineers and Scientists (7th edition).* Singapore: Pearson Education (Asia).

Williams, Sweeney, & Anderson. (2009). *Contemporary Business Statistics (3rd ed.).* Cincinnati, OH: South-Western/Thomson Learning.

Online Resources

National Statistic Office. Accessed October 15, 2012 from: http://www.census.gov.ph/

Math Goodies. Accessed October 15, 2012 from: http://www/mathgoodies.com

http://www.ruf.rice.edu~lane/statsim/samplingdist/

Big Data Analytics, Enterprise Analytics, Data Mining Software, Statistical Analysis, Predictive Analtyics. Accessed October 15, 2012 from:http://www/statsoft.com

Shodor: a National Resource for Computational Science Education. Accessed October 15, 2012 fom: http://www.shodor.org

Class Policies

1. The required minimum number of quizzes for a 3-unit course is 3, and 4 for 4-unit course. No part of the final exam may be considered as one quiz.
2. Cancellation of the lowest quiz is not allowed even if the number of quizzes exceeds the required minimum number of quizzes.
3. As a general policy, no special or make-up tests for missed exams other than the final examination will be given. However, a faculty member may give special exams for
   A. approved absences (where the student concerned officially represented the University at some function or activity).
   B. absences due to serious illness which require hospitalization, death in the family and other reasons which the faculty member deems meritorious.
4. If a student missed two (2) examinations, then he/she will be required to take a make up for the second missed examination.
5. If the student has no valid reason for missing an exam (for example, the student was not prepared to take the exam) then the student receives 0% for the missed quiz.
6. Students who get at least 89% in every quiz are exempted from taking the final examination. Their final grade will be based on the average of their quizzes and other prefinal course requirements. The final grade of exempted students who opt to take the final examination will be based on the prescribed computation of final grades inclusive of a final examination. Students who missed and/or took any special/make-up quiz will not be eligible for exemption.
7. Learning outputs are required and not optional to pass the course.
8. Mobile phones and other forms of communication devices should be on silent mode or turned off during class.
9. Students are expected to be attentive and exhibit the behavior of a mature and responsible individual during class. They are also expected to come to class on time and prepared.
10. Sleeping, bringing in food and drinks, and wearing a cap and sunglasses in class are not allowed.
11. Students who wish to go to the washroom must politely ask permission and, if given such, they should be back in class within 5 minutes. Only one student at a time may be allowed to leave the classroom for this purpose.
12. Students who are absent from the class for more than 5 meetings will get a final grade of 0.0 in the course.
13. Only students who are officially enrolled in the course are allowed to attend the class meetings.

Approved by:

DR. ARTURO Y. PACIFICADOR, JR.
Chair, Department of Mathematics

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