**STT101A**– *Foundation Course in Statistics  
 Prerequisite to:*

**Instructor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Consultation Hours: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Contact details: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Class Schedule and Room: \_\_\_\_\_\_\_\_**

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| **Course Description** |
| This is a course covering basic rules of probability, discrete and continuous probability distributions, and introduction to inferential statistics. |

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| **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) and the outcomes prescribed by the CHED Memorandum Order for the BS Statistics program.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ELGA | Learning Outcome | Program Outcome | | | | | | | | | | | | | | | Critical and Creative Thinker  Effective Communicator  Lifelong Learner | At the end of the course, the student will | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | apply appropriate statistical concepts, methodologies and technologies in organizing, analyzing and interpreting various real-world situations and in coming up with relevant decisions. | 🗸 | 🗸 | 🗸 | 🗸 | 🗸 | 🗸 |  |  | 🗸 |  | 🗸 | 🗸 | 🗸 | 🗸 | |

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| **Program Outcomes (BS Statistics)** |
| A graduate of the program should be able to |
| 1. Demonstrate broad and coherent knowledge and understanding of the core areas of statistical theory and statistical modeling. |
| 1. Apply critical and problem solving skills using the scientific method. |
| 1. Interpret scientific data and make judgments that include reflection on relevant scientific and ethical issues. |
| 1. Carry out basic mathematical and statistical computations and use appropriate technologies in (a) the analysis of data, and (b) in pattern recognition, generalization, abstraction, critical analysis and problem solving. |
| 1. Communicate information, ideas, problems and solutions, both orally and in writing, to other scientists, decision makers and the public. |
| 1. Relate science and mathematics with other disciplines. |
| 1. Design and perform safe and responsible techniques and procedures in laboratory or field practices. |
| 1. Critically evaluate input from others. |
| 1. Appreciate the limitations and implications of science in everyday life. |
| 1. Commit to the integrity of data. |
| 1. Demonstrate broad and coherent knowledge and understanding in the core areas of statistics, computing and mathematics. |
| 1. Generate information involving the conceptualization of a strategy for generating timely and accurate/reliable data, organizing a process for putting together or compiling the needed data, and transforming available data into relevant and useful forms. |
| 1. Translate real-life problems into statistical problems. |
| 1. Identify appropriate statistical tests and methods and their proper use for the given problems, select optimal solutions to problems and make decision in the face of uncertainty. |

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| **Final Course Output** |
| As evidence of attaining the above learning outcomes, the student is required to do and submit the following during the indicated date 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. | Statistical inference using real-life data | Week 13 | |

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| **Rubric for assessment** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | CRITERIA | Excellent (4) | Good (3) | Satisfactory (2) | Needs Improvement (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 Inferential Statistics (40%)** | Statistical analyses are appropriate, necessary, and sufficient which completely lead to the solution of the research problem. | Statistical analyses are appropriate and necessary which partially lead to the solution of the research problem. | Some statistical analyses are inappropriate and do not lead to the solution of the research problem. | Statistical analyses are inappropriate and do not lead to the solution of the research problem. | | **Depth of Analysis (35%)** | Interpretations and conclusions are correct and relevant with meaningful implications. | Interpretations and conclusions are correct and relevant | Some interpretations and conclusions are incorrect and irrelevant | Interpretations and conclusions are incorrect and irrelevant | | **Clarity and Organization of Report (15%)** | 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. | |

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| **Additional Requirements** |
| * 3 Quizzes * Final Exam * Computer Output * Skills Check * Inquiry Plan / Activities * Portfolio |

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| **Grading System** | |
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| **Learning Plan** |
| |  |  |  |  | | --- | --- | --- | --- | | **LEARNING**  **OUTCOME** | **TOPIC** | **WEEK NO.** | **LEARNING**  **ACTIVITIES\*** | | 1. 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 | **I. REVIEW OF**  **PROBABILITY**  **II. 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 Variance  **III. DISCRETE PROBABILITY DISTRIBUTIONS**  Uniform Distribution  Bernoulli and Binomial Distributions  Hypergeometric Distribution  Negative Binomial and Geometric Distributions  Poisson Distribution  **IV. CONTINUOUS PROBABILITY DISTRIBUTIONS**  Uniform Distribution  Normal Distribution  Areas under the Normal Curve | Weeks  1-4 | Computer Laboratory  Activity:  Applications of discrete  probability distributions to real-life problems  On-line active learning:  Simulating normal distribution  Applications of normal  distribution to real-life problems | |  | **V. ESTIMATION OF**  **PARAMETERS**  Types of Estimates  Estimating the Mean  Estimating the Difference Between Two Means  Estimating a Proportion  Estimating the Difference Between Two Proportions  Estimating the Variance  Estimating the Ratio of Two Variances  Sample Size Determination | Weeks 5-6 | Computer Laboratory  Activity:  Estimation of means,  proportions and variances in real-life problems | |  | **VI. HYPOTHESIS**  **TESTING**  Elements of a Statistical Test of Hypothesis  One-Tailed and Two-Tailed Tests and P-Value  Steps in Testing Hypotheses  Tests Concerning One Mean  Tests Concerning the Difference Between Two Means  Tests Concerning a Proportion  Tests Concerning the Difference Between Two Proportions  Tests Concerning the Variance  Tests Concerning the Ratio of Two Variances | Weeks  7-8 | Eliciting Prior Knowledge:  Formulating Hypotheses  Computer Laboratory  Activity:  Actual data analysis  involving z-test, t-test,  χ2 -test and F-test using  critical region approach and  p-value approach | |  | **VII. CHI-SQUARE**  **TESTS**  Test of Homogeneity of More Than Two Proportions  Testing for Independence  Goodness-of-Fit Test | Week 9 | Computer Laboratory  Activity:  Actual data analysis  involving chi-square tests | |  | **VIII. ANALYSIS OF**  **VARIANCE**  Assumptions of the Analysis of Variance  Test on the Equality of Several Variances  One-Way Analysis of Variance  Post Hoc Analysis: Tukey-Kramer Test  Two-Way Analysis of Variance | Weeks 10-11 | Computer Laboratory  Activity: Actual data  analysis involving ANOVA | |  | **IX. REGRESSION AND**  **CORRELATION**  Correlation Analysis  Pearson’s Correlation Coefficient  Test of Significance of ρ  Regression Analysis  Simple Linear Regression Model  Coefficient of Determination  Test of Significance of β1 | Week 12 | Computer Laboratory  Activity:  Actual data analysis  involving correlation and  regression analyses | |  | **LEARNING OUTPUT** | Week 13 | Statistical inference using real-life data | |  | **FINAL EXAMINATION** | Week 14 |  | |

\*Skills exercises/computer laboratory activities are given weekly and the students are expected to work on the solutions for their fourth hour activity. At the end of the term, the solutions to the problems will be compiled and submitted as one of the course outputs.

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| **References** |
| Albert(2007).***Basics Statistics for the Tertiary level.*** Manila: Rex Publishing Company.  Arcilla, R., Co, F., Ocampo, S. & Trevalles, R. (2012). ***Statistical Literacy for Lifelong Learning***. Manila: ABIVA Publishing House, Inc.  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. (2011). ***Introductory Statistics* (7th edition).** Hoboken, NJ: Wiley.  Mendenhall, Beaver & Beaver (2009). ***Introduction to Probability and Statistics*****(13th edition).** Belmont, CA: Thomson/Brooke/Cole.  Walpole, Myers, Myers and Ye (2011).***Probability and Statistics for Engineers and Scientists (9th edition).*** Singapore: Pearson Education (Asia). |

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| **Online Resources** |
| <http://www.census.gov.ph/>  <http://www/mathgoodies.com>  <http://www.ruf.rice.edu~lane/statsim/samplingdist/>  <http://www/statsoft.com>  <http://www.shodor.org> |

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| **Class Policies** |
| 1. There will be 3 quizzes and 1 final exam. No part of the final exam may be considered as one quiz. 2. Cancellation of the lowest quiz is not allowed. 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 4. approved absences (where the student concerned officially represented the University at some function or activity). 5. absences due to serious illness which require hospitalization, death in the family and other reasons which the faculty member deems meritorious. 6. If a student missed two (2) examinations, then he/she will be required to take a make up for the second missed examination. 7. 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. 8. 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. 9. Learning outputs are required and not optional to pass the course. 10. Mobile phones and other forms of communication devices should be on silent mode or turned off during class. 11. 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. 12. Sleeping, bringing in food and drinks, and wearing a cap and sunglasses in class are not allowed. 13. 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. 14. Students who are absent from the class for more than 5 meetings will get a final grade of 0.0 in the course. 15. Only students who are officially enrolled in the course are allowed to attend the class meetings. |

Approved by:  **DR. JOSE TRISTAN F. REYES**

Chair, Mathematics and Statistics Department

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*May 2019 / RArcilla*