**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 Mathematics program.

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| ELGA | Learning Outcome |  Program Outcome |
| Critical and Creative ThinkerEffective CommunicatorLifelong Learner | At the end of the course, the student will  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 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 Mathematics)** |
| A graduate of the program should be able to |
| 1. Apply analytical, critical and problem solving skills using the scientific method.
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| 1. Carry out basic mathematical and/or statistical computations and use appropriate technologies in the analysis of data, and in pattern recognition, generalization, abstraction, critical analysis, and problem solving.
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| 1. Gain mastery in the core areas of mathematics: algebra, analysis and geometry
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| 1. Demonstrate skills in pattern recognition, generalization, abstraction, critical analysis, problem-solving and rigorous argument.
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| 1. Develop an enhanced perception of the vitality and importance of mathematics in the modern world, including the interrelationships within mathematics and its connection to other disciplines
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| 1. Appreciate the concept and role of proof and reasoning and demonstrate knowledge in reading and writing mathematical proofs.
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| 1. Make and evaluate mathematical conjectures and arguments and validate their own mathematical thinking
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| 1. Communicate mathematical ideas orally and in writing using clear and precise language
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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.

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| 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** |
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| 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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|  | **FOR EXEMPTED STUDENTS** **(w/out Final Exam)** | **FOR STUDENTS with FINAL EXAM** |
| *with* *no missed quizzes* | *with* *one missed quiz* |
| Average of quizzes | 85% | 55% | 45% |
| Class Activities and Computer Outputs | 5% | 5% | 5% |
| Learning Output | 10% | 10% | 10% |
| Final Examination | -- | 30% | 40% |

 | **Scale:**95-100% 4.089-94% 3.583-88% 3.078-82% 2.572-77% 2.066-71% 1.560-65% 1.0<60% 0.0 |

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| **Learning Plan** |
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| **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 VariableConcept of a Probability DistributionTypes of Probability DistributionsMean of a Discrete Random VariableVariance of a Discrete Random VariableProperties of the Mean and Variance**III. DISCRETE PROBABILITY DISTRIBUTIONS**Uniform DistributionBernoulli and Binomial DistributionsHypergeometric DistributionNegative Binomial and Geometric DistributionsPoisson Distribution**IV. CONTINUOUS PROBABILITY DISTRIBUTIONS**Uniform DistributionNormal DistributionAreas under the Normal Curve | Weeks1-4 | Computer Laboratory Activity: Applications of discrete probability distributions to real-life problemsOn-line active learning: Simulating normal distributionApplications of normal distribution to real-life problems |
|  | **V. ESTIMATION OF**  **PARAMETERS** Types of EstimatesEstimating the MeanEstimating the Difference Between Two MeansEstimating a ProportionEstimating the Difference Between Two ProportionsEstimating the VarianceEstimating the Ratio of Two VariancesSample 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 HypothesisOne-Tailed and Two-Tailed Tests and P-ValueSteps in Testing HypothesesTests Concerning One MeanTests Concerning the Difference Between Two MeansTests Concerning a ProportionTests Concerning the Difference Between Two ProportionsTests Concerning the VarianceTests Concerning the Ratio of Two Variances | Weeks7-8 | Eliciting Prior Knowledge: Formulating HypothesesComputer Laboratory Activity: Actual data analysisinvolving z-test, t-test, χ2 -test and F-test usingcritical region approach andp-value approach |
|  | **VII. CHI-SQUARE**  **TESTS** Test of Homogeneity of More Than Two ProportionsTesting for IndependenceGoodness-of-Fit Test | Week 9 | Computer Laboratory Activity: Actual data analysisinvolving chi-square tests |
|  | **VIII. ANALYSIS OF**  **VARIANCE** Assumptions of the Analysis of VarianceTest on the Equality of Several VariancesOne-Way Analysis of VariancePost Hoc Analysis: Tukey-Kramer TestTwo-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 ρRegression AnalysisSimple Linear Regression ModelCoefficient of DeterminationTest 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 |  |

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\*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 HallMann. (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.
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Approved by:  **DR. JOSE TRISTAN F. REYES**

Chair, Mathematics and Statistics Department

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