

Statistics Semester Project Rubric

The rubric reflects the student learning outcomes for the course that are listed in the syllabus and here:

Course Student Learning Outcomes

1. Students will determine descriptive measures of central tendency and dispersion for data sets and explain what they mean.
2. Students will demonstrate understanding of the concept of probability by defining and explaining what a p-value is and what it means when applied to a statistical test of significance.
3. Students will set up and execute statistical tests for differences, similarities, correlations, and the general linear model and explain what they mean (parametric and non-parametric).
4. Students will determine whether their data set requires a parametric or non-parametric statistical test.
5. Students will explain the concepts of estimation and confidence intervals and use them to determine whether the sample size of their data sets is adequate to measure a statistical outcome.
6. Students will apply sampling techniques through the extraction of data subset from a large database for analysis.
7. Students will use data visualization techniques to explain their findings.
8. Students will demonstrate mastery of the hardware and software required to complete the course.

Rubric for Final Semester Project

The final project which consists of the paper, poster, and presentation will be evaluated on the following rubric:

Area	Superior 4	Very Good 3	Adequate 2	Baseline 1
Topic selection	The student Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.	The student Identifies a focused and manageable/ doable topic that appropriately addresses relevant aspects of the topic.	The student Identifies a topic that while manageable/ doable, is too narrowly focused and leaves out relevant aspects of the topic.	The student Identifies a topic that is far too general and wide-ranging as to be manageable and doable.

Area	Superior 4	Very Good 3	Adequate 2	Baseline 1
Hypothesis Definition	The student Proposes hypotheses that indicates a deep comprehension of the problem. Hypotheses are sensitive to contextual factors as well as all of the following: ethical, logical, and cultural dimensions of the problem.	The student Proposes one or more hypotheses that indicates comprehension of the problem. Hypotheses are sensitive to contextual factors as well as the one of the following: ethical, logical, or cultural dimensions of the problem.	The student Proposes one hypothesis that is formulaic or generic rather than individually designed to address the specific contextual factors of the problem.	The student Proposes a hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.
Descriptive Statistics	Student will use an appropriate range of descriptive statistics is listed with sound and deeper explanation about their meaning.	Students will use an appropriate range of descriptive statistics along with an with adequate explanation about their meaning.	Student will use an appropriate range of descriptive statistics is listed.	Student will use some descriptive statistics
Data Visualization	Student creates a set of graphs and charts that explain the data more clearly. The visualizations explain the “story of the data.” The graphs and visualizations are also elegantly designed.	Student is able to create a set of graphs and charts that explain the data clearly. The visualizations also explain the “story of the data.”	Student is able to create a set of graphs and charts that somewhat explain the data.	Student is able to create a graph or chart of the data.

Area	Superior 4	Very Good 3	Adequate 2	Baseline 1
Inferential Statistical Tests Selected	<p>Student selects appropriate statistical tests and forms a methodology that is skillfully developed and executed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant sub disciplines. Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)</p>	<p>Student successfully selects and executes statistical tests and the methodology or theoretical framework is appropriately developed; however, more subtle elements are ignored or unaccounted for. Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.</p>	<p>Student selects an appropriate statistical test but the methodology or theoretical framework are missing, incorrectly developed, or unfocused. Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.</p>	<p>Student selects tests that are inappropriate for the problem in question. Design demonstrates a misunderstanding of the theoretical framework. Calculations attempted are unsuccessful and not comprehensive</p>

Area	Superior 4	Very Good 3	Adequate 2	Baseline 1
Analysis of Inferential Statistics	<p>Student is able to report the test statistic results and relate them to the hypotheses. Student continues to explain the meaning of the results along with the larger context of the problem. Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work</p>	<p>Student is able to report the test statistic results and relate them to the hypotheses. Student is able to explain the results. Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.</p>	<p>Student is able to report the test statistic results and relate them to the hypotheses. Uses the quantitative analysis of data as the basis for judgement (without inspiration, nuance, or ordinary drawing plausible conclusions from this work.</p>	<p>Student is able to report the test statistic results Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.</p>

Area	Superior 4	Very Good 3	Adequate 2	Baseline 1
Conclusions and Communication	<p>Student states a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings. The student uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven. The student insightfully discusses in detail relevant ideas and supported limitations and implications.</p>	<p>Student states a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings. The student uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven. Student discusses relevant and supported limitations and implications.</p>	<p>Student states a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings. Student uses quantitative information, but does not effectively connect it to the argument or purpose of the work. The student presents relevant and supported limitations and implications.</p>	<p>Student states an ambiguous, illogical, or unsupported conclusion from inquiry findings. Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.) The student presents limitations and implications, but they are possibly irrelevant and unsupported.</p>

Rubric adapted from Liberal Education & America's Promise Value Rubrics, Association of American Colleges and Universities, 2010