Colonnade FOUNDATIONS Assessment 2021-2022	
Ogden College of Science and Engineering	*Department of Mathematics*
MATH 183	
Melanie Autin	

Please select the option(s) that best describe all sections of this course (you may select more than one):

☒ Taught 100% face to face

☐ Taught 100% online

☐ Mix of online and face to face

☐ Includes dual credit

Student Learning Outcome 1				
Student Learning Outcome	Students in MATH 183 learn to interpret information presented in mathematical and statistical forms by learning to interpret both graphical and numerical summaries of data.			
Measurement Instrument 1	Students completed a common final exam question. This question was evaluated using the "Interpretation" section of the attached (see last page) Quantitative Reasoning Proposed SLO Assessment Rubric.			
Criteria for Student Success	Student achieves at least Milestone level of achievement on the QR rubric. • 3: Provides accurate explanations of information presented in mathematical forms. • 2: Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units.			
Program Success Target for this Measurement	At least 70% of students scoring 2.5 or better.		**Percent of Program Achieving Target**	84% of students scored 2.5 or better.
Methods	Each MATH 183 instructor (spring 2022) randomly sampled 20% of their completed student responses, which resulted in 51 total artifacts. These artifacts were independently assessed by three members of the Department of Mathematics Statistics Education Committee. The median of the three scores was used as the student's score.			
Based on your results, highlight whether the program met the goal Student Learning Outcome 1.			☒ Met	☐ Not Met
Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)				

The Statistics Education Committee will discuss whether or not changes need to be made to the assessment question and the way in which individual instructors administered it (since some made it a bonus question rather than an actual exam question). The committee will also discuss whether or not the rubric needs to be changed or replaced to ease the grading process.

Student Learning Outcome 2			
Student Learning Outcome	Students will illustrate and communicate mathematical and/or statistical information symbolically, visually and/or numerically.		
Measurement Instrument 1	Students completed a common final exam question. This question was evaluated using the "Representation" section of the attached (see last page) Quantitative Reasoning Proposed SLO Assessment Rubric.		
Criteria for Student Success	Student achieves at least Milestone level of achievement on the QR rubric. • 3: Competently converts relevant information into an appropriate and desired mathematical portrayal. • 2: Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate		
Program Success Target for this Measurement	At least 70% of students scoring 2.5 or better.	**Percent of Program Achieving Target**	86% of students scored 2.5 or better.
Methods	Each MATH 183 instructor (spring 2022) randomly sampled 20% of their completed student responses, which resulted in 51 total artifacts. These artifacts were independently assessed by three members of the Department of Mathematics Statistics Education Committee. The median of the three scores was used as the student's score.		
Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.		☒ **Met**	☐ **Not Met**

Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)

The Statistics Education Committee will discuss whether or not changes need to be made to the assessment question and the way in which individual instructors administered it (since some made it a bonus question rather than an actual exam question). The committee will also discuss whether or not the rubric needs to be changed or replaced to ease the grading process.

Student Learning Outcome 3			
Student Learning Outcome	Students will determine when computations are needed and execute the appropriate computations.		
Measurement Instrument 1	Students completed a common final exam question. This question was evaluated using the "Calculation" section of the attached (see last page) Quantitative Reasoning Proposed SLO Assessment Rubric.		
Criteria for Student Success	Student achieves at least Milestone level of achievement on the QR rubric. • 3: Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. • 2: Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.		
Program Success Target for this Measurement	At least 70% of students scoring 2.5 or better.	**Percent of Program Achieving Target**	82% of students scored 2.5 or better.
Methods	Each MATH 183 instructor (spring 2022) randomly sampled 20% of their completed student responses, which resulted in 51 total artifacts. These artifacts were independently assessed by three members of the Department of Mathematics Statistics Education Committee. The median of the three scores was used as the student's score.		
Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.		☒ **Met**	☐ **Not Met**

Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)

The Statistics Education Committee will discuss whether or not changes need to be made to the assessment question and the way in which individual instructors administered it (since some made it a bonus question rather than an actual exam question). The committee will also discuss whether or not the rubric needs to be changed or replaced to ease the grading process.

Student Learning Outcome 4		
Student Learning Outcome	Students will apply an appropriate model to the problem to be solved.	
Measurement Instrument 1	Students completed a common final exam question. This question was evaluated using the "Proposes Solutions/Hypotheses" section of the attached (see last page) Quantitative Reasoning Proposed SLO Assessment Rubric.	
Criteria for Student Success	Student achieves at least Milestone level of achievement on the QR rubric. • 3: Proposes one or more solutions/hypotheses that indicate comprehension of the problem. Solutions/hypotheses are sensitive to contextual factors. • 2: Proposes one solution/hypothesis that is "off the shelf" rather than individually designed to address the specific contextual factors of the problem.	
Program Success Target for this Measurement	At least 70% of students scoring 2.5 or better.	**Percent of Program Achieving Target**	80% of students scored 2.5 or better.
Methods	Each MATH 183 instructor (spring 2022) randomly sampled 20% of their completed student responses, which resulted in 51 total artifacts. These artifacts were independently assessed by three members of the Department of Mathematics Statistics Education Committee. The median of the three scores was used as the student's score.	
Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 4.	☒ **Met**	☐ **Not Met**

Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)

The Statistics Education Committee will discuss whether or not changes need to be made to the assessment question and the way in which individual instructors administered it (since some made it a bonus question rather than an actual exam question). The committee will also discuss whether or not the rubric needs to be changed or replaced to ease the grading process.

Student Learning Outcome 5		
Student Learning Outcome	Students will make inferences, evaluate assumptions, and assess limitations in estimation modeling and/or statistical analysis.	
Measurement Instrument 1	Students completed a common final exam question. This question was evaluated using the "Application/Analysis/Assumptions" section of the attached (see last page) Quantitative Reasoning Proposed SLO Assessment Rubric.	
Criteria for Student Success	Student achieves at least Milestone level of achievement on the QR rubric. • 3: Uses the quantitative analysis of data as the basis for drawing reasonable conclusions. Explicitly describes assumptions. • 2: Uses the quantitative analysis of data as the basis for drawing conclusions that are plausible but without inspiration or nuance. Explicitly describes assumptions	
Program Success Target for this Measurement	At least 70% of students scoring 2.5 or better.	**Percent of Program Achieving Target**	69% of students scored 2.5 or better.

Methods	Each MATH 183 instructor (spring 2022) randomly sampled 20% of their completed student responses, which resulted in 51 total artifacts. These artifacts were independently assessed by three members of the Department of Mathematics Statistics Education Committee. The median of the three scores was used as the student's score.		
Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 5.		☐ **Met**	☒ **Not Met**
Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
The Statistics Education Committee will discuss whether or not changes need to be made to the assessment question and the way in which individual instructors administered it (since some made it a bonus question rather than an actual exam question). The committee will also discuss whether or not the rubric needs to be changed or replaced to ease the grading process.			

QUANTITATIVE REASONING (QR)
PROPOSED SLO ASSESSMENT RUBRIC
Adapted from AAC&U LEAP VALUE Rubrics (Quantitative Literacy, Problem Solving)

Students will demonstrate the ability to interpret information in mathematical and/or statistical forms.				
	Capstone (4)	**Milestone (3)**	**Milestone (2)**	**Benchmark (1)**
Interpretation	Provides accurate explanations of information presented in statistical forms. Makes appropriate inferences based on that information.	Provides accurate explanations of information presented in mathematical forms.	Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units.	Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means.
Students will demonstrate the ability to illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically.				
	Capstone (4)	**Milestone (3)**	**Milestone (2)**	**Benchmark (1)**
Representation	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.
Students will demonstrate the ability to determine when computations are needed and to execute the appropriate computations.				
	Capstone (4)	**Milestone (3)**	**Milestone (2)**	**Benchmark (1)**
Calculation	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly.	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are both unsuccessful and are not comprehensive.
Students will demonstrate the ability to apply an appropriate model to the problem to be solved.				
	Capstone (4)	**Milestone (3)**	**Milestone (2)**	**Benchmark (1)**
Proposes Solutions/Hypotheses	Proposes one or more solutions/hypotheses that indicate a deep comprehension of the problem. Solution/hypotheses are sensitive to contextual factors.	Proposes one or more solutions/hypotheses that indicate comprehension of the problem. Solutions/hypotheses are sensitive to contextual factors.	Proposes one solution/hypothesis that is "off the shelf" rather than individually designed to address the specific contextual factors of the problem.	Proposes a solution/hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.
Students will demonstrate the ability to make inferences, evaluate assumptions, and address limitations in estimation modeling and/or statistical analysis.				
	Capstone (4)	**Milestone (3)**	**Milestone (2)**	**Benchmark (1)**
Application/Analysis/Assumptions	Uses the quantitative analysis of data as the basis for drawing insightful conclusions. Explicitly describes appropriate assumptions and shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Uses the quantitative analysis of data as the basis for drawing reasonable conclusions. Explicitly describes assumptions.	Uses the quantitative analysis of data as the basis for drawing conclusions that are plausible but without inspiration or nuance. Explicitly describes assumptions	Uses the quantitative analysis of data as the basis for tentative or uncertain conclusions. Attempts to describe assumptions.

Evaluators are encouraged to assign a zero to any work that does not meet the benchmark-level performance.