

**Assurance of Student Learning
2018-2019**

Ogden College of Science and Engineering

School of Engineering and Applied Sciences

Scientific Data Analytics certificate 0496

Use this page to list learning outcomes, measurements, and summarize results for your program. Detailed information must be completed in the subsequent pages.

Student Learning Outcome 1: Write computer programs to utilize and analyze large datasets.

Instrument 1	Assignment 1 in CS 555
Instrument 2	Assignment 2 in CS 555
Instrument 3	

Based on your results, circle or highlight your conclusion regarding the program's goal of meeting Student Learning Outcome 1.	Met	Not Met
--	------------	---------

Student Learning Outcome 2: Understand the statistical approaches taken when dealing with large sample sizes.

Instrument 1	Problem 1 of Assignment 3 in CS 555
Instrument 2	Problem 2 of Assignment 3 in CS 555
Instrument 3	

Based on your results, circle or highlight your conclusion regarding the program's goal of meeting Student Learning Outcome 2.	Met	Not Met
--	------------	---------

Student Learning Outcome 3: Understand the statistical approaches taken when dealing with multiple variables.

Instrument 1	Assignment 4 in CS 555
Instrument 2	Assignment 5 in CS 555
Instrument 3	

Based on your results, circle or highlight your conclusion regarding the program's goal of meeting Student Learning Outcome 3.	Met	Not Met
--	------------	---------

Student Learning Outcome 4: Combine domain expertise with programming and statistical skills to analyze large domain-specific datasets.

Instrument 1	Project demonstration in CS 555
Instrument 2	Project documentation in CS 555
Instrument 3	

Based on your results, circle or highlight your conclusion regarding the program's goal of meeting Student Learning Outcome 4.	Met	Not Met
--	------------	---------

Program Summary (Briefly summarize the action and follow up items from your detailed responses on subsequent pages.)

Overall, the results from this assessment indicate that the program has reached and/or exceeded the self-reported assessment goals in each category. We will develop a rubric to

use in assessment this year .

Student Learning Outcome 1

Student Learning Outcome 1	Write computer programs to utilize and analyze large datasets.		
Measurement Instrument 1	Given a large dataset of movie rating, students were required to write python programs to count the number of users and movies, and check if any null and duplicate values in the dataset.		
Criteria for Student Success	Graduate students should score 80 out of 100 in homework assignment 1.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	Graduate students' programming assignments were collected in the course. All programs were run in the same python 3 environment, and the outputs of these programs were compared with correct answers. There are 5 graduate students in this class and all scored more than 80.		
Measurement Instrument 2	With the same movie rating dataset, students were required to write python programs to compute the average ratings, report the total movies reviewed by each user, compute the average rating by each user, and list the most popular movie based on the average rating.		
Criteria for Student Success	Graduate students should score 80 out of 100 in homework assignment 2.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	Graduate students' programming assignments were collected in the course. All programs were run in the same python 3 environment, and the outputs of these programs were compared with correct answers. There are 5 graduate students in this class and all scored more than 80.		
Measurement Instrument 3			
Criteria for Student Success			
Program Success Target for this Measurement		Percent of Program Achieving Target	
Methods			
Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 1.			Met
Actions (Describe the decision-making process and actions planned for program improvement. The actions should include a timeline.)			

We will develop a rubric to use in the assessment this year.

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

This program is in its first year, and there was no previous assessment.

Student Learning Outcome 2

Student Learning Outcome 2	Understand the statistical approaches taken when dealing with large sample sizes.		
Measurement Instrument 1	Given a large dataset of financial credit risk, students used linear regression methods to analyze continuous variables. Student should write python program to call statistical functions in scipy library, train regression models, and predict the credit approval results.		
Criteria for Student Success	Graduate students should score 80 out of 100 in problem 1 of homework assignment 3.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	Graduate students' assignments were collected. All programs were run in the same python 3 environment, and the outputs of these programs were compared with correct answers. There are 5 graduate students in this class and all scored more than 80.		
Measurement Instrument 2	Given a large dataset of financial credit risk, students used logistic regression methods to analyze category variables. Student should write python program to call statistical functions in scipy library, train regression models, and predict the credit approval results.		
Criteria for Student Success	Graduate students should score 80 out of 100 in problem 2 of homework assignment 3.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	Graduate students' assignments were collected. All programs were run in the same python 3 environment, and the outputs of these programs were compared with correct answers. There are 5 graduate students in this class, and all scored more than 80.		
Measurement Instrument 3			
Criteria for Student Success			
Program Success Target for this Measurement		Percent of Program Achieving Target	
Methods			
Based on the results above, circle or highlight your conclusion regarding the program's goal of meeting Student Learning Outcome 2.			Met
Actions (Describe the decision-making process and actions planned for program improvement. The actions should include a timeline.) We will develop a rubric to use in the assessment this year.			
Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.) This program is in its first year, and there was no previous assessment.			

Student Learning Outcome 3

Student Learning Outcome	Understand the statistical approaches taken when dealing with multiple variables.		
Measurement Instrument 1	Based on the dataset of financial credit risk, students should use statistical functions in scipy library to analyze the correlation between multiple variables, such as income, age, occupation, debt, etc. Also, students were required to use LASSO and decision tree to analyze the dataset and predict applicants' credit risks.		
Criteria for Student Success	Graduate students should score 80 out of 100 in homework assignment 4.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	Graduate students' assignments were collected. All programs were run in the same python 3 environment, and the outputs of these programs were compared with correct answers. There are 5 graduate students in this class, and all scored more than 80.		
Measurement Instrument 2	Based on the dataset of financial credit risk, students were required to use SVM, Bayes, bagging, boosting, and random forest tree to analyze the dataset and predict applicants' credit risks.		
Criteria for Student Success	Graduate students should score 80 out of 100 in homework assignment 5.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	Graduate students' assignments were collected. All programs were run in the same python 3 environment, and the outputs of these programs were compared with correct answers. There are 5 graduate students in this class, and all scored more than 80.		
Measurement Instrument 3			
Criteria for Student Success			
Program Success Target for this Measurement		Percent of Program Achieving Target	
Methods			
Based on the results above, circle or highlight your conclusion regarding the program's goal of meeting Student Learning Outcome 3.		Met	Not Met
Actions (Describe the decision-making process and actions planned for program improvement. The actions should include a timeline.) We will develop a rubric to use in the assessment this year.			
Follow-Up (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
This program is in its first year, and there was no previous assessment.			

Student Learning Outcome 4

Student Learning Outcome	Combine domain expertise with programming and statistical skills to analyze large domain-specific datasets.		
Measurement Instrument 1	Students were given a term project that required them to process a large dataset using python and analyze the data with different statistical methods. Students should be able to show their solutions to meet the goals, explain the chosen statistical approaches in the projects, and analyze the results derived from the datasets.		
Criteria for Student Success	Graduate students should score 80 out of 100 in the demonstration of their projects.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	All students were required to demonstrate their programs and present the results in the classroom. All graduate students scored more than 80.		
Measurement Instrument 2	Student were required to submit project by the end of the semester. Four components must be included in the report: background, objective, methodology, result analysis, and discussion. For assessment, students were asked to analyze sample data, build learning models, and derive their conclusions.		
Criteria for Student Success	Graduate students should score 80 out of 100 in the demonstration of their projects.		
Program Success Target for this Measurement	80%	Percent of Program Achieving Target	100%
Methods	Instructor read all project reports and graded them based on the grading policy. There are five components in the report:: background, objective, methodology, result analysis, and discussion, and each component has 20 points. All graduate students scored more than 80.		
Measurement Instrument 3			
Criteria for Student Success			
Program Success Target for this Measurement		Percent of Program Achieving Target	
Methods			
Based on the results above, circle or highlight your conclusion regarding the program's goal of meeting Student Learning Outcome 3.			Met
Actions (Describe the decision-making process and actions planned for program improvement. The actions should include a timeline.)			Not Met

We will develop a rubric to use in the assessment this year.

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

This program is in its first year, and there was no previous assessment.