Teaching Effectiveness Liana Islam

Mid-semester Anonymous Student Survey

Course: CH118-5X: General Chemistry Laboratory: SP2021
Role: Teaching Assistant

Total number of student responses: 37 out of 38

Category	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Prefer not to answer
Is thorough in delivering information	26	7	2	1	1	
Pays attention to student concerns	15	9	6	5	2	
Answers most questions	20	12	3	1	2	
Time management	15	11	8		2	1
Creating an appropriate learning environment	22	5	7	2	1	
Inclusive	22	3	9	2	1	
Well prepared for class	26	6	3	1	1	
Clarity	13	9	9	5	1	

Reflections:
I need to pay more attention to individual students in the laboratory class. Also, I need to respond to emails on time. It may be a good idea to rehearse my lectures more before class to make sure most students understand me. I also need to pay attention to proper gender pronouns.

Hypothetical Syllabus for Course I intend to Teach

CH110: Introduction to Scientific Computing

Course Instructor: Liana Islam
Email: lislam1@uab.edu
Office hours: By appointment

Course Overview:
This 3-credit course aims to get the student comfortable in using UNIX and python to solve science problems with a focus on chemistry and physics. At the end of this course they should be able to adequately translate algorithms to programming languages, analyze data efficiently by automating calculations and plot beautiful graphs using Bokeh with python.

Class meetings:

Twice a week in a computer lab- 1.5 hours per class. Computers will be provided but students can choose to use their own systems as well (Linux and Mac preferrable).

Recommended books:
Google searches will provide a lot of information, so will StackExchange. The following books may help.

1. The Linux Command Line by William E. Shotts, Jr.
2. Python Cookbook: Recipes for Mastering Python 3

Expectations:
1. Attendance is required. Be on time. Only 2 absences allowed in the semester.
2. Homework is due by Friday evening.
3. Be professional in all interactions. I will do my best to be professional at all times.

Tentative Class Schedule:

	Classwork	Homework
Week 1 Class 1	Introduction to Unix and bash. Learn how to use the cp, mv, printf commands	
Week 1 Class 2	Logical operations and if-else statements with bash	Submit an online quiz answering on what outputs you get when you type commands in the terminal
Week 2 Class 1	Learn to write bash scripts. Loops with bash	
Week 2 Class 2	Loops with bash	Submit a script you wrote to print data from several files, move data from folder to folder etc.
Week 3 Class 1	How to do mathematical operations in bash	
Week 3 Class 2	How to extract essential information from data files using bash. Examples involve stopped-flow data, crystallographic data, spectroscopic data	Work with provided data sets to extract columns and rows of data.
Week 4 Class 1	Introduction to Python. Learn how to run python codes using the command line	
Week 4 Class 2	Logical operations and if-else statements with python	Submit homework involving printing patterns and messages using if-else statements.
Week 5 Class 1	Loops with python	

Week 5 Class 2	Loops with python	Submit homework involving printing patterns and messages using loops.
Week 6 Practice Exam	Will happen in person	
Week 6 Exam	In person	
Week 7 Class 1	How to do mathematical operations in python	
Week 7 Class 2	Using packages in python	Submit homework on how to find averages, standard deviations etc. using python
Week 8 Class 1	How to write python code to do calculations in physics and chemistry	
Week 8 Class 2	How to write python code to do calculations in physics and chemistry	Run loops to do calculations using common formulas in physics and chemistry ($M_1V_1=M_2V_2$, Coulomb's law etc.)
Week 9 Class 1	How to plot data using bokeh with python	
Week 9 Class 2	How to use widgets with bokeh in python	Pre-process data with provided formulas and make interactive plots
Week 10 Class 1	Choose a project as a group to address a problem you care about to solve by using UNIX and python	
Week 10 Class 2	Work on project in class- get help from Instructor	Work on project. Submit project results formatted as draft research article.
Week 11 Class 1	Work on project in class- get help from Instructor	
Week 11 Class 2	Work on project in class- get help from Instructor	Submit project results formatted as research article.
Week 12 Pre-exam Break	No class	No homework
Week 13 Practice Exam	In-person	
Week 13 Exam	In-person	

Example Lesson Plan:

Week 8 Class 1: How to write python code to do calculations in physics and chemistry

15 min: Show on a projector how to use a for loop to get series sums.
15 min: Ask students to write a similar code to use a for loop to get series products by changing the code I showed them.
15 min: Show on a projector how to write a script to read a formula and write it in a python script (M1V1=M2V2).
15 min: Ask students to change one line in the script I showed them and get a script that converts temperatures from Fahrenheit to degrees Celsius.
30 min: Show students how to extract a column of data from a file and loop over the column to use a formula and output in a new file another column of data. The will be calculating relative deviations in stopped-flow data.

The homework for this week will involve the students doing at home the same process I showed in the last 30 min of class but with spectroscopic data. They will be using a folumar to normalize the data.

Example Rubric:

Total points possible: 20

-10: If script does not run
+2: Writes the loops over the appropriate ranges
+5: The formula is formatted correctly
+5: The student is able to extract the appropriate column in the data file
+5: The student is able to get the correct output in another file
+3: The student comments the script

Teaching Videos:
To be included later. I have no evidence from the time I taught Computational Physics in Bangladesh. This will help make up for that