

**EQUIPMENT NEEDS ASSESSMENT APPLICATION**  
**Fall 2019**

|                                                              |                                                                                                                                                                                                                                             |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Person Submitting Request:                           | <b>Amy Avelar and Cassandra Thomas</b>                                                                                                                                                                                                      |
| Program or Service Area:                                     | <b>Chemistry</b>                                                                                                                                                                                                                            |
| Division:                                                    | <b>Science</b>                                                                                                                                                                                                                              |
| Date of Last Program Efficacy:                               | <b>2016</b>                                                                                                                                                                                                                                 |
| What rating was given?                                       | <b>Continuation</b>                                                                                                                                                                                                                         |
| Equipment Requested                                          | <b>Vernier Go Direct SpectroVis Plus Spectrophotometer</b>                                                                                                                                                                                  |
| Amount Requested:                                            | <b>56 (2 class sets) \$399 each, \$22,344 total plus tax and shipping</b>                                                                                                                                                                   |
| Strategic Initiatives Addressed:                             | <b>2. Promote Student Success</b>                                                                                                                                                                                                           |
| Needs Assessment Resources (includes Strategic Initiatives): | <a href="https://www.valleycollege.edu/about-sbvc/campus-committees/academic-senate/program-review/needs-assessment.php">https://www.valleycollege.edu/about-sbvc/campus-committees/academic-senate/program-review/needs-assessment.php</a> |

NOTE: To facilitate ranking by the committee, submit separate requests for each item; however, multiple items can be submitted as one request if it is required that the equipment is packaged together.

Replacement                      Additional ☒ X

Are there alternative funding sources? (for example, Department, Budget, Perkins, Grants, etc.)

Yes ☐                      NO ☒ X

If yes, what are they? \_\_\_\_\_

**1. Provide a rationale for your request. (Explain, in detail, the need for this equipment.)**

The chemistry program heavily utilizes spectroscopy as a part of our general chemistry laboratory curriculum. Currently, the instruments we use, Spec20D+'s, are antiquated, bulky and no longer available for purchase. These instruments are being phased out in education, research and industry so our students are learning skills that will no longer translate into the real world.

When an instrument goes down, we could spend between \$600 and \$1000 to repair each instrument. Preventative maintenance alone costs at minimum \$400.

Additionally, we have a logistical issue with the instruments. They are so bulky and heavy that we must house them in an adjacent room to our general chemistry labs. General chemistry courses are five-unit courses with two labs scheduled per week while all of our other courses only meet once a week. As a result, PS-312 and PS-315 have no available time slots to schedule additional labs and we are unable to grow in this area. If not for this Spec20D+ problem, we could offer more sections of general chemistry and use our space efficiently.

Our solution is a simple one. Replace all Spec20D+ instruments with new Vernier Go Direct SpectroVis Plus Spectrophotometers which are small, accurate, modern and can be replaced for less than the cost of servicing the old Spec20D+ instruments. Also, purchase additional spectrophotometers so that we have two full class sets. This would allow us to offer up to four general chemistry courses during the same time-frame. We would be able to house them in the

stockroom so they can be checked out/supplied as needed. This solution would allow us to fully utilize our space while giving the student experience with a modern spectrophotometer.

2. Indicate how the content of the department/program's latest Efficacy Report and/or current EMP supports this request and how the request is tied to program planning. (*Directly reference the relevant information from your latest Efficacy Report and/or current EMP in your discussion.*)

A goal of the last efficacy report and the current EMP is to increase the number of degrees awarded in Chemistry (which have increased to 12 – 14 in the past three years, compared to 7 – 8 in the two years prior). Spectrophotometers are widely used in General Chemistry instructional labs and an essential part of the curriculum. Our current set of Spectrophotometers are antiquated, bulky and no longer available for purchase. Transferring students need a modern instrumental experience that will be applicable in laboratory settings at the university level. Practicing laboratory skills with outdated equipment may hinder their academic progress inside the lab when working with modern instruments that their peers and instructors already have experience utilizing. Using modern spectrophotometers now will allow them to perform well in future classes that use the same type of modern instrument. These future transfer student's laboratory experiences will be enhanced and expanded by purchasing the Vernier instruments. If we are to continue to provide first-rate laboratory-based education, which is necessary for students to succeed in the competitive disciplines of science majors requiring Chemistry, we will need to purchase and use modern equipment. (*Efficacy report, page 34*).

3. Indicate any additional information you want the committee to consider (*for example, regulatory information, compliance, updated efficiency, student success data, planning, etc.*).

We currently run 7 sections of CHEM 150 and 3 sections of CHEM 151, for a maximum of 240 students in general chemistry labs per semester who use spectrophotometers in lab regularly. We have four general chemistry lab rooms and we are unable to schedule general chemistry in half of those rooms because of the Spec20D+ instruments.

4. Indicate any related costs (including any ongoing maintenance or updates) and department/program's plans to support those costs.

Instruments have a 5-year warranty and would be replaced rather than repaired if damaged. Maintenance is minimal and will be performed by the chemistry lab technician. Software updates have no cost.

5. What are the consequences of not funding this equipment?

Our students will continue to use antiquated equipment and lack essential experience with modern equipment. The quality of the laboratory experience when performing spectroscopy will be hindered. Students will continue performing spectroscopy labs in partners which will likely decrease the number of students who will test proficient in certain measurable course objectives and SLOs as they will not have sufficient enough practice in obtaining and recording accurate measurements. The labs will continue to be utilized inefficiently and the program will be unable to grow the number of general chemistry sections offered.