

**EQUIPMENT NEEDS ASSESSMENT APPLICATION**  
**Fall 2017**

Name of Person Submitting Request:	<b>Sheri Lillard</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>Spectrophotometers (10)</b>
Amount Requested:	<b>\$25,000 (\$1999 ea + tax, shipping, etc.)</b>
Strategic Initiatives Addressed:	Student Success <a href="#">Strategic Directions + Goals</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

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

Yes  NO

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

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

The equipment requested, **Vernier UV-Vis Spectrophotometer** (UV-Vis), is standard instrumentation for laboratory experiments in General Chemistry (CHEM 150 & 151), Organic Chemistry (CHEM 212 & 213), and Quantitative Analysis (CHEM 205). In other words, students use the technique of absorption measurements in 5 semesters of lab classes here at SBVC. Our current instruments are being phased out of support, and the cable that connects them to the laptop computers is already obsolete. We only have about 5 or 6 functioning cables at any one time, to use for one or two classes of 24 students. The software no longer functions, so when the students do take measurements with these instruments, they do not have the benefit of modern data-collection procedures. Finally, our existing instruments do not have deep-UV capability, as they can only measure down to 340 nm (compared to the requested instrument of 200 nm). The importance here is that being able to measure absorbance at 200 nm means that our students can analyze nearly any organic molecule that we have available, without spectral limitation. Our current instruments only reliability permit measurements of absorbance in the visible range.

Because of the deficiency in the number of spectrophotometers accessible to students, students are forced to perform laboratory experiments in partners due to lack of equipment. One of the measureable course objectives for CHEM 150 is to be able to record accurate measurements. When students are partnered often only one of the pair becomes proficient in this skill. In CHEM 151 one of the SLOs is "Given a lab with multi-step aqueous reactions, students will design a sequence of steps in order to collect the necessary information, analyze the experimental data using principles of equilibrium, and form conclusions based on data and calculations. Students will show evidence of the application of the scientific method in their conclusions and analyze

their results for sources of possible error.” If the students are not becoming sufficient in accurately collecting data at the CHEM 150 level due to a limited number of instruments available, then achieving this SLO for CHEM 151 becomes increasingly difficult.

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 main focus of the last efficacy report and current EMP is to increase the number of degrees awarded in Chemistry (which have doubled from 7 to 14, since 2014-15). As we have increased the offerings of majors’ prep courses over the years, in response to demand, the equipment utilized by this sequence of classes has undergone increased use, and is now beginning to break down.

Furthermore, we have had successful honors students rank highly at the Honors conference held each year at UC Irvine, as well as go on to undergraduate research opportunities when they transfer. These experiences will be enhanced and expanded by securing the requested equipment.

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 begin to replace these instruments, with those that include functioning software. (*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 these classes per semester. If we include the CHEM 212/213 students, this brings the total to 340 students per semester. We must begin phasing-in the purchase of new spectrophotometers, in order to continue to offer first-rate laboratory experiences.

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

None expected.

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

Without funding, the students will have to continue sharing the few fully-functioning setups we have or will need to record their measurements by hand. Performing a lab in partners will decrease the number of students who will test proficient in certain measurable course objectives and subsequently SLOs as they will not have sufficient enough practice in obtaining and recording accurate measurements.