Proposal Title: Vacuum’s for Chemistry MVC

Originator and Position: Farah Firtha, Assistant Professor of Chemistry, Dept Chair of Physical Sciences

Area Dean: Michael Beckham

Campus: Menifee Valley

Area Vice President: Rudolph Besikof

Budget Account Code: Click here to enter text.

*Total Amount Requested: $4100

*Please complete all applicable portions of “Section VI - Projected Expense File” now to determine the “Total Amount Requested” above. If you have questions, please contact Paul Hert.

Please check:

| One-Time Funding: ☒ | On-Going Funding: ☐ | Safety: ☐ |

1.) For what are you asking?  2.) Why is the request timely and important?  3.) Where was the need identified? Please answer these three questions in 250 words or less. See instructions for further explanation.

1) Chemistry is requesting one-time funds to purchase 5 heavy duty vacuum pumps.

2) Currently we use running water to create a weak vacuum for laboratory procedures. As a result, there is much water wasted, and some labs take hours longer then they should (do to the weak vacuum).

It is estimated to take 9600 liters of water per experiment (usually 4-5 courses, therefore that experiment is ran 4-5 times). Varies experiments use vacuums, it is therefore estimated that MVC uses about 58000 liters per semester, which is about 46000 gallons per year of water.

This gross use of water is unnecessary and in fact goes against our college’s strategic plan. GOAL 5 of the strategic plan says “become a greener campus.”

3) This need was identified in the laboratory. It can also be found on page 17 of the 2015-2016 Chemistry APA.
Section I – Program Review and Learning Outcomes - 20 points possible

1.) Identify support from your 2014-15 Comprehensive Program Review (CPR) or 2015 – 16 Annual Program Assessment (APA) for this request (8 points). Link to Program Review

This RAP request for vacuums is supported by Chemistry’s 2015-2016 Annual Program Assessment in which average chemistry success rates drop below the program average rate by as much as 10.5% with an extreme low in SP2013 (CHEM107) that is 28% below that of the program rate. We attributed these lower success rates to a number of factors including technology limitations on page 17 of the APA, which states, “Teaching a new generation of community college students who have been engaged in active learning during elementary, middle, and high school academics requires updated equipment and facilities.” “Chemistry students need current educational technology in the form of usable vacuums for use in lab to enhance the speed of equipment.” On page 26 of the Chemistry APA, vacuums are identified as one of the greatest needs, “The need for currency of educational technology in chemistry is imperative.” “...it is impossible to teach scientific literacy in STEM without currency...” It would be IRRESPONSIBLE to start a project that involves water protection and testing, while the MVC chemistry lab wastes 46000 gallons of water a year.

Based on these determinants, Chemistry is submitting a RAP for vacuums for student use. Access to vacuums for students should ultimately lead to better success and retention rates across all chemistry course offerings, by allowing students more time in certain laboratory experiments, as well as demonstrating responsible sustainable practices in the laboratory. By supporting these needs, the administration will help Chemistry empower students and improve success.

2.) How will this request help improve student learning in the course and/or program (12 points)? Link to Learning Outcomes

ILOs
Scientific Awareness: The student will possess an awareness of the physical and biological principles related to science. – The equipment being requested above supports the investigation of physical principles through online resources and interactive computational programs.
Social Awareness: The student will demonstrate societal awareness. – The equipment will allow students to investigate real-world phenomena and the anthropogenic impacts on National resources.
Responsibility: The student will display personal and civic responsibility. – The equipment will connect student data to research objectives and associated data published by the EPA and USGS in the local area and across the Nation.

Chemistry PLOs
Demonstrate the ability to apply scientific inquiry to problem solving, including relationships between science and human activities. – The equipment will show students the proper and responsible way to use a vacuum. Vacuums are used often in scientific inquiry to purify substances. These purifications might include a purification of toxins in water. Allowing students to apply scientific inquiry to human activity.

Chemistry CLOs
Chem 100, 101, 102, and 107 CLOs identify chemical reactions and prediction of products and/or theoretical yields as important student outcomes, and this equipment would allow hands on opportunities to satisfy these learning outcomes by providing the ability to purify substances.

**Section II – Alignment with Institutional Priorities via the Strategic Plan - 25 points possible**

1.) How is your request aligned to the strategic goals below? Check all (typically 2 – 6 goals total) that apply. Click [here](#) for the 2016-17 Prioritization Allocation Rubric (PAR) for points-weighting during scoring.

2014-17 Strategic Plan Goals

| ☒ 1. Reduce time to completion of student educational goals and increase degree, transfer and certificate completion. |
| ☒ 2. Drive institutional decision-making using internal and external data to inform planning and prioritize resources. |
| ☐ 3. Refine staffing plan and process |
| ☒ 4. Improve fiscal responsibility that is sustainable for the long term |
| ☒ 5. Identify sustainability strategies to improve efficiencies in processes district-wide |
| ☐ 6. Expand and improve student involvement in campus life |
| ☒ 7. Promote quality of institution through enhanced communication within the community (internal/external) |
| ☒ 8. Enhance the overall campus life experience |
| ☒ 9. In an effort to serve students build bridges between instructional services, student services and administrative services |
| ☒ 10. Increase the College’s visibility, value and recognition in the service area |

2.) Please describe the connections between the goals you checked and your proposal (200 words maximum):

By fostering innovation and promoting the scholarship of teaching and learning, this technology will provide greater access to up-to-date equipment par with four-year institutions and universities, improving success and transfer (Goal 1). This equipment will demonstrate proper use of resources (Goal 2). This RAP is fiscally sound because it encourages a large reduction in water usage (Goal 4). Funding this RAP also enhances communication within the community since students will no longer be wasting the communities water (Goal 5 & 7). Reduction in water will also enhance the campus life by demonstrating a responsibility use of resources (Goal 8). These vacuums “build bridges between instructional services” by reducing resource uses in STEM (Goal 9). The College’s visibility, reputation, and recognition will improve in the local community as a site that is responsible with its valuable natural resources (Goal 10).
Section III – Alignment with Institutional Plans - 15 points possible

Explain how your proposal is supported by the following plans: 2009-16 Educational Master Plan (4 points), Distance Education Plan (4 points), Technology Plan (4 points) and/or Facilities Master Plan (3 points). Link to Plans

Pages 294 and 295 of the Educational Master Plan define the need to keep up with the growing demands of laboratory-based courses. Funding of this RAP will further that goal. We seek to acquire high quality, vacuums for student use in our program that will meet the technology requirements of the College community as reflected in the Educational Master plan as well as the Technology plan. The administrative unit outcomes listed on the same page emphasize the need to support “a technology infrastructure that is conducive to student learning and College operations.” Outdated vacuums are no conducive to student learning. The Facilities Master Plan goals include creating “campuses that strongly support student learning and contribute to a high standard of student life” as well as creating “campuses and facilities that promote increased student-faculty interaction and interdisciplinary and collaborative learning.” In line with the Facilities Master Plan, this equipment strongly supports student learning and promotes increased student-faculty interactions and interdisciplinary collaborations in STEM as faculty will facilitate student learning by encouraging instructor-student interactions through up-to-date equipment.

Section IV – Goals and Measurable Outcomes – 30 points possible

1.) Describe your goal(s) for this project (10 points). How will this improve student learning or enhance institutional services? For a review of goals, see pp. 18 – 20 of a presentation via this link.

Goal 1 – Create a more equitable learning environment on SJC and MVC for chemistry students to access and utilize proper in-class technology. Goal 2 – Encourage student success by providing students with an active-learning environment in which they can access and evaluate real-world, real-time phenomena from the perspective of course-based knowledge; Goal 3 – Facilitate experiences in which SJC and MVC students can collaborate with each other and with transfer institutions by sharing knowledge and ideas; Goal 4 – Assess student interest throughout the process in real time to determine whether active participatory learning is happening to encourage student retention; Goal 5 – involve full-time and part-time faculty in regular communication regarding implementation of experiential learning methodologies in chemistry courses.

2.) What are the measurable outcomes for this RAP (10 points)? That is, how will progress toward meeting your goal(s) be identified and/or measured? Click here for learning outcome reference materials.

Measurable outcome for Goal 1 – Purchase 5 vacuum pumps for MVC. Measurable outcome for Goal 2 – set-up vacuum pumps for use in experiments. Measurable outcome for Goal 3 – reduction of time for
some chemistry experiments. **Measurable outcome for Goal 4** – reduction of water usage at MVC. **Measurable outcome for Goal 5** – Collaboratively design, develop and distribute new classroom, field, and laboratory activities that incorporate use of the new vacuums to full-time and part-time chemistry faculty.

3.) Explain how your outcomes are tied to your CLOs/PLOs/AUOs/SLOs (10 points).

**Outcome for Goal 1** (purchasing the vacuums) corresponds to ILOs for scientific awareness, social awareness, and responsibility, as well as the chemistry PLOs that site relationships between science and human activities since the equipment requested in this RAP supports investigation of physical principles through interactive online programs, which support real-world anthropogenic impacts to natural resources in the local area and across the Nation. **Outcome for Goal 2** vacuums will be working properly. The use of water vacuums will no longer take place. **Outcome for Goal 3** time reduction for some chemistry labs, most notably some for chemistry 102. **Outcome for Goal 4** corresponds to ILOs for scientific awareness, social awareness, and responsibility, as well as the chemistry PLOs that emphasize the ability of students to demonstrate application of scientific inquiry to problem solving and course-related CLOs. Student retention correlates to both cognitive and non-cognitive skill sets, including perseverance and a sense of community and personal support. **Outcome for Goal 5** relates to all aspects in which student-faculty-staff-administrative aspects of professional development affects outcomes.

**Section V – Implementation Plan – 10 points possible**

What are the steps that you will take or need to be taken to implement this proposal?

1.) Who is in charge of implementing the project (2 points)? The department chair and instruction aide

2.) What are the projected start and end dates (2 points)? Fall 2016

3.) What other departments will need to assist with the acquisition/implementation of the project (2 points)? Purchasing, Facilities

4.) When will the outcomes be measured (2 points)? Fall 2016

5.) How will you measure the desired outcomes (2 points)? assessments

Once you have completed this entire form, please mailto:programreview@msjc.edu

**Section VI - Projected Expense Profile**
For the object codes and titles below, please indicate the monetary amounts requested.

Object Code 4XXX
Supplies and Materials: Computers. Amount requested: $80,000
Supplies and Materials: Click here to enter text. Amount requested: Click here to enter text.
Supplies and Materials: Click here to enter text. Amount requested: Click here to enter text.

Object Code 5XXX
Services: Click here to enter text. Amount requested: Click here to enter text.
Services: Click here to enter text. Amount requested: Click here to enter text.
Services: Click here to enter text. Amount requested: Click here to enter text.

Object Code 6XXX
New Equipment/Building or Site Improvements: Amount requested:
New Equipment/Building or Site Improvements: Click here to enter text. Amount requested: Click here to enter text.
New Equipment/Building or Site Improvements: Click here to enter text. Amount requested: Click here to enter text.

(S2) Subtotal from Non-Personnel Requests: Click here to enter text.

Total Proposed Budget (sum subtotals (S1) and (S2) above): $80,000

3. Secondary Effects (if this proposal is approved)

If a Classified/Administrative Personnel Prioritization Request is being submitted in tandem with this RAP, what additional space, if any, is needed to accommodate this position: Click here to enter text.

For equipment and technology requests, will additional space be needed to accommodate the requested equipment? If so, where is the proposed location? No

Will requested equipment require maintenance agreements or support personnel? If so, what the projected costs? None

Please list future year anticipated needs and estimated financial needs. NOTE: This section refers to any anticipated funding not addressed by this RAP but required in the future. This will not be automatically funded. A new RAP must be completed in the future.
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Once you have completed this form in its entirety, please [mailto:programreview@msjc.edu](mailto:programreview@msjc.edu)