Proposal Title: Water Purification System for MVC Biology and Chemistry

Originator and Position: Nick Reeves, Associate Professor and Chair, Biological Sciences

Area Dean: Michael Beckham, Interim Dean of Mathematics and Science

Campus: Menifee Valley Campus

Area Vice President: Brandon Moore, Interim Vice President of Instruction

Budget Account Code: Not sure – General Fund?

*Total Amount Requested: $36,610 (see breakdown below)

*Please complete all applicable portions of “Section VI - Projected Expense File” now to determine the “Total Amount Requested” above.

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.) We are asking for a Milli-Q Integral 15 Water Purification System ($21,610.00) and a five year maintenance plan for this system ($15,000). 2.) This request is timely and important because it is now more difficult to order the amount of purified water we need for our biology and chemistry lab experiments. 3.) The instructional aides for chemistry and biology have noted that it is particularly challenging to purchase water now because of a change in policy and procedure and this makes it more difficult to get the water need in time for our experiments.

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

2014-15 LA MASC CPR 2011-14 IIA. Planning and Resource Requirements – Goals: page 44 - Goal 3: Continue to grow our microbiology program in a sustainable and safe way; page 45 Goal 4: Continue to grow our Majors Biology program and make curriculum more inquiry based through authentic research experiences. 2015-16 LA MS APA: IIA. Planning and Resource Requirements – Goals: Goal 4: Replace, upgrade, and maintain equipment in an ongoing and sustainable way;
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 biological principles in the laboratory. - Biological Sciences DLOs - 1. Explain and appreciate how scientific knowledge is obtained and verified. - The equipment above will enable our department to offer a more relevant and up to date laboratory experience. Scientific knowledge is obtained using cutting edge technology that expands the limits of our senses and lets us observe and measure natural phenomena better. Scientific knowledge is verified through a rigorous scientific process that requires equipment and supplies to manipulate living systems. 2. Explore and appreciate the facts and principles concerning heredity, variation and diversity, the cell, evolution and natural selection. - To explore these fundamental concepts in biology students need a functional and safe laboratory space. The replacement/upgraded equipment and supplies described above will make it possible for us to provide a safe and fully functional laboratory experience. 3. Explain and appreciate the cycling of matter and the flow of energy in living systems. - To investigate this biological topic students need the appropriate equipment that will be funded by approval of this RAP. 4. Achieve basic literacy in the language of biology. - Basic literacy is gained through experiential learning. Students will be able to experience the concepts of biology and implement a rigorous scientific process in a safe environment using the equipment and supplies indicated above. - Additional Course Learning Outcomes specifically addressed by the items in this RAP proposal - BIOL-150 - General Biology I SLO 2: The student will be able to describe the energy transformations of glycolysis. - BIOL-151 - General Biology II - SLO 3: The student will relate the structures of animals to their functions. – BIOL-100 - CLO 1: The student will be able to identify major anatomical structures in the human model. - CLO 2: The student will be able to co-relate the major anatomical structure with its function in human body - BIOL-115 - Topics in Biology - SLO 2: The student will be able to identify the need for a control group and sufficient sample size in a scientific experiment. - BIOL-131 - Introduction to Biotechnology I - SLO 1: The student will demonstrate proficiency using micropipettes. - SLO 2: The student will relate the sequence of nucleotides in a DNA gene to the structure of the protein produced from this genetic information. - SLO 3: The student will consider the importance of recombinant DNA technology to the development of the biotechnology field. - BIOL-132 - Biotechnology II - SLO 1: The student will prepare and calculate formulas for different types of biological media. - SLO 2: The student will prepare and analyze buffers at different concentrations and pH levels. - SLO 3: The student will plan and assemble bacterial cultures of various types for growth and maintenance.
- BIOL-133 - Biotechnology III - SLO 1: The student will experiment with purification of plasmid DNA from cells. - SLO 2: The student will identify the use of DNA probes in various techniques that are used in biotechnology. - SLO 3: The student will set-up cell lines

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):

Goal 1: Objective 1.2 Increase face-to-face and online course completion and success rates leading to increase in transfers to four-year institutions – The equipment requested above supports student learning and provides a better learning environment that will lead to improved student retention and success. Subgoals addressed - Ensure all classrooms are smart rooms and update equipment regularly. Promote student success through focused and tactical advising, innovative learning strategies, and student education plan development. Update equipment will also drive institutional decision-making using data (Goal 2) since this technology will impact how department learning outcomes are taught and assessed. The use of new equipment will help the college achieve a more fiscally sound position (Goal 4)
because many of the biology experiments will be cheaper and faster to conduct in lab. The purchase of equipment will also promote enhanced communication within the community (Goal 7) since students will have opportunities to learn from each other within the classroom through a more collaborative, quantitative, and engaging experience. Equipment will also “enhance the overall campus life experience” (Goal 8) since they will meet the goal of “provid(ing) facilities that enhance student engagement” (Goal 8.1) “Improve the aesthetics of campuses to instill pride of ownership and creating a sense of place” Students enjoy and appreciate an active learning environment. Students are wowed by the use of modern technology in class and they understand the utility for their learning. (Goal 8.3) and will increase student awareness “of services and activities using...other technologies” (Goal 8.4). Equipment will “increase professional development” (Goal 9.1) opportunities and “think tank sessions” (Goal 9.3) through districtwide training opportunities for biology faculty. This technology will increase the College’s visibility, value, and recognition (Goal 10) since this will improve the reputation of the Menifee Valley Campus in the local community as a site that is at the forefront of technology and innovative teaching practices rather than a location of outdated equipment and classroom space.

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

Goal 1: Objective 1.2 Increase face-to-face and online course completion and success rates leading to increase in transfers to four-year institutions – The equipment requested above supports student learning and provides a better learning environment that will lead to improved student retention and success. Subgoals addressed - Ensure all classrooms are smart rooms and update equipment regularly. Promote student success through focused and tactical advising, innovative learning strategies, and student education plan development. Update equipment will also drive institutional decision-making using data (Goal 2) since this technology will impact how department learning outcomes are taught and assessed. The use of new equipment will help the college achieve a more fiscally sound position (Goal 4) because many of the biology experiments will be cheaper and faster to conduct in lab. The purchase of equipment will also promote enhanced communication within the community (Goal 7) since students will have opportunities to learn from each other within the classroom through a more collaborative, quantitative, and engaging experience. Equipment will also “enhance the overall campus life experience” (Goal 8) since they will meet the goal of “provid(ing) facilities that enhance student engagement” (Goal 8.1) “Improve the aesthetics of campuses to instill pride of ownership and creating a sense of place” Students enjoy and appreciate an active learning environment. Students are wowed by the use of modern technology in class and they understand the utility for their learning. (Goal 8.3) and will increase student awareness “of services and activities using...other technologies” (Goal 8.4). Equipment will “increase professional development” (Goal 9.1) opportunities and “think tank sessions” (Goal 9.3) through districtwide training opportunities for biology faculty. This technology will increase the College’s visibility, value, and recognition (Goal 10) since this will improve the reputation of the
Menifee Valley Campus in the local community as a site that is at the forefront of technology and innovative teaching practices rather than a location of outdated equipment and classroom space.

**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 One: Create a more equitable and active learning environment and utilize in-class technology. Goal Two: Improve student success rates through the use of laboratory technology that demonstrates concepts better. Goal Three: Decrease withdrawal rates through the use of technology that demonstrates concepts better and engages students in learning more effectively. Goal Four: Create a more dynamic and innovative classroom experience for students to foster twenty-first century learning skills. Goal Five: Improve technology that supports easier assessment of Course Learning Outcomes. Goal Six: Provide professional development opportunities for biology faculty to enrich their teaching repertoire.

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 One: Purchase of new technology and equipment will improve the results of in-class lab activities and group projects. Measurable Outcome for Goal Two: Analyze institutional data of the success rates of history classes after implementation of new technology and equipment. Measurable Outcome for Goal Three: Analyze institutional data of the withdrawal rates of history classes after implementation of new technology and equipment. Measurable Outcome for Goal Four: Assess both the learning of the content as before but also the use of the technology and equipment. Measurable Outcome for Goal Five: Biology Department faculty will be trained on how to effectively incorporate equipment and technology into their laboratory exercises and develop more rigorous data analysis activities.

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

**ILOs - Scientific Awareness:** The student will possess an awareness of the physical and biological principles related to science. – [Goals 1, 4, 5 above](#); **Biological Sciences DLOs** - 1. Explain and appreciate how scientific knowledge is obtained and verified. – [Goals 1, 4, 5, 6 above](#). 2. Explore and appreciate the facts and principles concerning heredity, variation and diversity, the cell,
evolution and natural selection. – Goals 1, 4, 5, 6 above 3. Explain and appreciate the cycling of matter and the flow of energy in living systems. – Goals 1, 4, 5, 6 above 4. Achieve basic literacy in the language of biology. – Goals 2 and 3 above; Biological Sciences CLOs: For many of the CLOs mentioned in 2.) the students will successfully develop biology laboratory skills and Goals 1, 3, 4, and 5 above support those CLOs. For other CLOs mentioned in 2.) the students will gain an understanding of the scientific method and how it is used to develop new scientific knowledge and Goals 1, 3, and 5 above support those CLOs. Lastly, for other CLOs mentioned in 2.) the students will develop discipline specific knowledge and Goals 1, 2, 3, 4, and 5 support these CLOs.

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)? Nick Reeves and Jamie Marrs

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

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

We will collaborate with the Chemistry department and the facilities department

4.) When will the outcomes be measured (2 points)? Spring 2017 and Fall 2018

5.) How will you measure the desired outcomes (2 points)? Analysis of institutional data in our Annual Program Assessment, analysis of student learning outcome data in eLumen, Biological Science Department “think tank” sessions to share best practices

Section VI - Projected Expense Profile

For the object codes and titles below, please indicate the monetary amounts requested.

Object Code 4XXX
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.

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: 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.
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): Click here to enter text.

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? Click here to enter text.

Will requested equipment require maintenance agreements or support personnel? If so, what the projected costs? Click here to enter text.

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.

Fiscal Year: Click here to enter text.  Anticipated need: Click here to enter text.  Estimated amount: Click here to enter text.
Fiscal Year: Click here to enter text.  Anticipated need: Click here to enter text.  Estimated amount: Click here to enter text.
Fiscal Year: Click here to enter text.  Anticipated need: Click here to enter text.  Estimated amount: Click here to enter text.
Fiscal Year: Click here to enter text.  Anticipated need: Click here to enter text.  Estimated amount: Click here to enter text.