#7

COMPLETE

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Page 1: Please review the following:

Q1

Contact Person:

Name	**Keenan Murray**
Email Address	**keenan.murray@gcccd.edu**

Q2

Department:

Engineering

Q3

Title of Request:

Supply Budget Augmentation

Q4

Location of Request:

Cuyamaca College

Q5

Type of Request (Select one):

Supplies: A material item of an expendable nature that is consumed, wears out, or deteriorates in use; or one thatloses its identity through fabrication or incorporation into a different or more complex unit or substance

Q6

Description of Request:Please provide a description of the supplies, equipment, furniture or other request. When making your request, please be as specific as possible and include information such as make, model, manufacturer, color, quantity, etc.

We request a $7,000 increase in our supply budget, raising it from $3,000 to $10,000. The additional funds will cover maintenance and repair expenses for six Raise3D Pro2 Plus 3D printers and provide essential supplies for our project-based learning and hands-on curriculum. The 3D printers are heavily utilized, with a cumulative print time of 341 days in a single semester, leading to wear and tear. Replacing build surfaces, plates, and hot ends, which costs approximately $2,400 annually, is necessary to sustain their operation. Additional funds will also enable the purchase of materials for electrical and mechanical engineering projects to support innovative and engaging course content.

Q7 **Respondent skipped this question**

Estimated Cost:

Q8 **Respondent skipped this question**

Please attach quote, if available

Q9

Total Cost of Ownership:Your requested item may incur ongoing expenses.What are the ongoing expenses associated with your request? If there are ongoing expenses, please detail how you plan to support these costs with your existing budget by completing the text boxes below.

Initial Cost of Item	**$7,000**
Amount available in departmentbudget to support this requestSmarkey:	**0**
Remaining requested amount	**$7,000**

Q10

Justification of Request:The justification of the request is a key area to focus on. The ROC encourages you to strengthen your request by providing a robust rationale detailing all relevant criteria. When writing the rationale, keep in mind that those reviewing the justification may not be familiar with your department and needs. Providing detailed information and context can help clarify the need for your request.Please select the applicable criteria(s) and provide the details of how the criteria(s) relate to your request.

Critical need,

Program expansion,

Impact on student success and access,

Equity and Antiracism,

Provided details::

The engineering program's current supply budget of $3,000 is significantly lower than those of other STEM fields, which range from $6,036 to $51,979. This disparity is even more pronounced when compared to other engineering programs, despite our position as the second-largest feeder of transfer engineering students to SDSU. To maintain and enhance our program's quality, we are seeking additional financial support to sustain innovation in our curriculum, encourage student enrollment and engagement, and to support our expanded course offerings instrumental to our well-articulated pathways for our students. Since the pandemic, we have introduced two new laboratory courses, ENGR 260 (Materials Laboratory) and ENGR 230 (Mechatronics). These additions, combined with our regularly offered lab courses, bring us to a total of eight lab sections scheduled for Spring 2025—the highest number of lab courses in the history of the engineering program. To illustrate the financial strain, if we were to allocate our entire yearly budget solely to support these eight lab courses for one semester, each lab would receive just $375. With full enrollment of 30 students per lab, this equates to only $12.50 per student for the semester. This stark disparity highlights the critical need for increased financial support to sustain our expanded course and lab offerings, ensuring we can continue to provide high-quality, hands-on learning experiences for our students. Over the past few years, we have focused on implementing project-based learning and hands-on experiences, hypothesizing that these approaches would help close enrollment and success equity gaps. Our efforts have been successful in eliminating race and ethnicity access equity gaps, but we still have work to do to address success equity gaps. Continued investment is essential to sustain this progress and fully realize the potential of our curriculum improvements. The development of our project-based curriculum has significantly strained our limited supply budget. For example, a faculty member proposed integrating electrical engineering projects into his courses, requiring over $6,000 in supplies. Unfortunately, we were only able to fund a portion of his request due to budget constraints. Additionally, our six Raise3D Pro2 Plus 3D printers, which are critical for projects like ENGR-100's derby car races and structural reproductions, logged a combined total of 341 days of print time in a single

semester. This extensive use has led to wear and tear, necessitating regular maintenance and replacement of parts such as print surfaces, plates, and hot ends. Maintaining the printers at optimal functionality costs approximately $2,400 annually. To continue providing students with the hands-on, project-based experiences that drive engagement and success, we urgently need an increase in our supply budget. This financial support will ensure we can sustain our equipment, meet the growing demands of our curriculum, and continue closing equity gaps while preparing students for academic and professional success.

Q11

Program Goal:Please identify the program goal(s), as stated in your current annual or comprehensive program review, that this request would help your program achieve. Provide a brief explanation of how it would do so.

Goal 1: Increase student success in sophomore-level engineering courses by providing enhanced support for ENGR-100 and all other lab-based classes.

Goal 2: Develop and sustain a Makerspace to support labs, student projects, the engineering club, and national competition teams.

Our 3D printers play a critical role in ENGR-100 (Introduction to Engineering & Design), supporting hands-on, project-based learning experiences. Students use these printers for innovative projects such as derby car races, reproductions of historical structures, and designing custom cell phone holders. These projects are more than just academic exercises; they help students build foundational knowledge and confidence, setting them up for success in more advanced engineering courses.

We hypothesized that integrating project-based learning into our introductory course would enhance student engagement and retention, while also closing access and success equity gaps. This hypothesis has proven effective, as our program has successfully eliminated race and ethnicity access equity gaps. However, we recognize there is still significant work to be done to address success equity gaps, particularly in supporting students through their entire academic journey.

To continue advancing these goals, we are requesting a supply budget augmentation to cover the maintenance and repair costs of our six Raise3D Pro2 Plus 3D printers. These printers are heavily utilized, with a cumulative print time of 341 days in a single semester. Regular maintenance, including replacing build surfaces, plates, and hot ends, is essential to ensure the printers remain functional for student projects. This funding will also allow us to expand the implementation of project-based learning across our curriculum, providing students with the tools and resources necessary for both academic and professional success.