Project Title: 3D-Printing and Rapid Prototyping

Explain what you are requesting (3 lines max): This request is for (3) new 3D Printers and a classroom license for Rhinoceros 6 modeling and rendering software. This hardware and software would be accessible to all WWU students.

Principal Contact/Applicant
Name: Dipak Gupta
Email: guptad@wwu.edu
Phone: 415-601-0515
Dept/Org: THTR/DANC
Enter “student”, “faculty”, or “staff”: Faculty

Other Contact/Applicant
Name:
Email:
Phone:
Dept/Org:
Enter “student”, “faculty”, or “staff”:

Proposed Budget for Project

1. Equipment total $15310
2. Plus site preparation (not STF funded) + $0
3. Total Project Cost (budget total from part III of this form, “Project Budget”) = $
4. Less organization’s contribution – $
5. Less site preparation – $
6. STF Grant Request = $15310

IMPORTANT NOTES

1. Student Technology Fee Mission:
The Student Technology Fee (STF) provides Western students with adequate and innovative technology experiences by:
• Broadening/enhancing the quality of the academic experience,
• Providing additional student access to technology, and
• Increasing integration of technology into the curriculum.

2. THE STF Committee will accept only complete proposals by the announced deadline. Every section (I–VIII) and all items of this proposal form must be addressed.

3. Disallowed items: The following items generally would not qualify for STF Tech Initiatives funding:
• Computer lab upgrades
   (Existing computer labs are upgraded on a rolling schedule with a separate allocation of STF funds.)
• Software related to maintenance and/or serial payments
• Maintenance contracts on equipment or software
• Expendable supplies
• Equipment that will not be used directly by students, and/or non-computer equipment or furnishings that are part of the typical classroom environment (such as lighting, portable and fixed media equipment, furniture, chairs, etc.).

I. Relationship to STF Objectives / Impact on the Student Academic Experience

The STF Committee will use as its primary assessment criteria the three objectives—quality, access, and integration—defined in the STF mission (“Note 1” above). Given this criteria, describe your proposed project in detail.

1. Tell us—focusing on what the students would gain from the project—how the project would provide positive benefits to the student academic experience. Specifically, answer at least one of a, b and c below:

   a. How would this project broaden or enhance the quality of the student’s academic experience through the proposed technology?

      This project meets the 3 aspects of the STF Mission by enhancing the quality of WWU’s education, increasing access to technology, and deepening the integration of technology into the curriculum. Our students will benefit from being at the forefront of this technology and in design programs that pioneer the use of 3D-Printing and Rapid-Prototyping.

      This project would allow Western students to deepen their experience with digital technology. The emerging tools of digital media and digital modeling will be transformative for the creative professions.

      Rapid-prototyping (commonly called 3D-printing) is a fabrication technique in which a digital model is ‘printed’ in physical form by passing an arm over a surface and depositing thin layers of material with each pass. This is a filament based type of printer. Under this grant, WWU students would gain access at the Student Tech Center to a second type of 3D-printer, a resin based system, and therefore have access to the main 2 types of rapid-prototyping technology, filament and resin.

      3D-printing allows for the creation and realization of designs that have previously not been possible for technical and economic reasons. The artistic possibilities, speed, efficiency, and technical advantages of this modeling technology promise to transform entertainment design as well as all fields that use physical models.

   b. How would this project provide additional student access to technological resources?

      The 3D Printers would be housed in the Library’s Student Tech Center. They would therefore be available to all students, with a priority access to active courses. The Student Technology Center location makes this equipment easily accessible to all WWU’s arts and humanities students.
All Western students would benefit from access to these newer 3D filament printers which print with two filament materials (our current Tech Center Ultimakers print with a single material only). The resin-based printer would be a new technology available to Arts and Humanities students.

c. How would this project *increase integration* of technology into coursework?

I would offer interdisciplinary courses in AutoCad and Rhino software to Western students interested in design and modeling.

WWU is one of the first theater departments in the country with a sequence of courses in this emerging technology. My students are extremely enthusiastic about using 3D-printers for their course work and for set designs for department productions, and we are ready to take advantage of new hardware and software.

2. Would other departments be involved with this project? Enter “No” or “Yes.”

Yes

IF “Yes,” describe.

Design, Engineering, and other disciplines that work with digital and physical models can benefit from this technology. There is an opportunity here for interdisciplinary work and cross-listed courses.

3. Has any part of this project previously been funded by the Student Technology Fee? Enter “No” or “Yes.”

No

IF “Yes,” describe.

4. Is the proposed project a pilot project? Enter “No” or “Yes.”

No

IF “Yes,” describe.

II. Utilization

List the anticipated number of times and duration per each use—per quarter or per academic year—that students would use the proposed technology, along with the impact of that proposed technology on students. Note: applications are funded after careful consideration of both the number of students that will be impacted by the technology and the quality of that impact.

I offer serval courses each quarter that would make use of the 3D-Printers. We also have student designers who design department productions who would use this technology. These courses typically have an enrollment cap of 16. I offer one class a year, enrollment cap of 16, which would specifically focus on Rhino software.

This equipment would be housed in the Student Tech Center and therefore open to all WWU students.
III. Project Budget

This section details the estimated total cost of the project. Include costs that would be covered—by your department or another source—for ongoing costs such as personnel or operating expenses.

1. For assistance in preparing your budget, please consult with relevant campus support departments:
   - Academic Technology & User Services, x6538
   - Budget Office, x4762
   - Space Administration, x3222
   - Purchasing, x3340
   - How to Buy Software
   - How to Buy Computers
   - Lab/Special Supplies, etc.

2. Complete the Budget Estimate Table below. If you have more than seven line-item expenses, attach a separate Excel spreadsheet instead.

<table>
<thead>
<tr>
<th>Items to Purchase</th>
<th>Quantity</th>
<th>Item Cost</th>
<th>Item Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Form 3 Complete Package</td>
<td>1</td>
<td>$</td>
<td>$5000</td>
</tr>
<tr>
<td>2. Ultimaker S3 Dual Extrusion 3D Printer</td>
<td>2</td>
<td>$3850</td>
<td>$7700</td>
</tr>
<tr>
<td>3. 30-seat classroom license of 30-seats for Rhinoceros 6 software</td>
<td>1</td>
<td>$</td>
<td>$975</td>
</tr>
<tr>
<td>4.</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>N/A</td>
<td>N/A</td>
<td><strong>$13675</strong></td>
</tr>
<tr>
<td><strong>Allowance for price increases</strong> (3% of subtotal)</td>
<td>N/A</td>
<td>N/A</td>
<td><strong>$410</strong></td>
</tr>
<tr>
<td><strong>Shipping</strong> (taxable)</td>
<td>N/A</td>
<td>N/A</td>
<td><strong>$0</strong></td>
</tr>
<tr>
<td><strong>Tax</strong> (8.7%)</td>
<td>N/A</td>
<td>N/A</td>
<td><strong>$1225</strong></td>
</tr>
<tr>
<td><strong>Total</strong> This total (or your attached spreadsheet total) should match the projected budget figure on page 1 of this proposal. (See box on page 1, #3.)</td>
<td>N/A</td>
<td>N/A</td>
<td><strong>$15310</strong></td>
</tr>
</tbody>
</table>

Important Budget Notes from the STF Committee:

- We recognize your proposed budget as an estimate. Final funding for successful projects will be established after thorough technical review; some costs may need adjusting due to price changes.
- We may impose special conditions on a proposal before approval. See STF Proposal Guidelines, section V, Proposal Modifications.
- Funding is not provided directly to departments for purchases. All purchasing is done via the Office of the VPIT/CIO and savings are retained in the Student Technology Fee fund.

3. What funding or contributions are available from your department or other sources?

None
4. Could this project be divided into discrete elements that could be funded separately? Enter “No” or “Yes.”

   Yes

   IF “Yes,” summarize and prioritize project elements with cost estimate for each.

   Priority 1: (1) Ultimaker S3 Dual Extrusion 3D Printer @ $3850
   Priority 2: (1) Ultimaker S3 Dual Extrusion 3D Printer @ $3850
   Priority 3: (1) 30-seat classroom license of Rhinoceros 6 software @ $1000
   Priority 4: (1) Form 3 Complete Package @ $5000

   Note: A “no” response to question 4 creates an “all or nothing” proposal. That is, if the STF Committee decides against funding your entire proposal, it will not consider any elements for partial funding. If elements could be funded separately, the applicant is responsible for prioritizing them before submitting the proposal.

5. Are course or lab fees charged for any of the courses that will use this equipment? Enter “No” or “Yes.”

   Yes

   IF “Yes,” describe.

   A course fee of approximately $25 could be added to courses that use 3D printers to pay for expendable materials like filament. The course fee would not be used to purchase or replace equipment.

   Note: The total funding requested from the Student Technology Fee must reflect the amount collected from course fees for equipment replacement and/or equipment acquisition.

IV. Impact on Existing Resources

Your proposal must address the project’s potential impact on existing resources. Give special attention to the impact on data transmission networks (e.g., sources accessed, networking equipment, etc.), and personnel (e.g., staffing, administrative support, faculty support, etc.).

1. Describe how existing equipment is used. Contrast this to projected use if your project were funded.

   In consultation with ATUS staff, we have determined that the project’s impact on existing resources will be positive, with minimal if any need for increased resources.

2. Is similar equipment or technology available elsewhere on campus—such as the Student Technology Center, Classroom Services, Video Services, Western Libraries, a college lab? Enter “No” or “Yes.”

   Not to my knowledge

   IF “Yes,” describe why existing equipment does not meet the needs outlined in this proposal.

3. If this project involves the replacement of equipment, including computers:
a. Describe the “before and after” configuration changes. (A spreadsheet reflecting these changes may be attached.) Or, write “N/A.”

b. Describe the costs and benefits of replacing vs. upgrading. Or, write “N/A.”

4. Would this equipment be available to students outside of your department? Enter “No” or “Yes.”

Yes

IF “Yes,” describe the following:
  a. How students would gain access
  b. How equipment availability would be publicized
  c. The hours/week when equipment would be available
  d. Any costs that would result from a-c

The equipment will be housed in the Library’s Student Tech Center

5. Does this project involve the check-out of equipment to students? Enter “No” or “Yes.”

No

IF “Yes,” discuss whether the Student Technology Center/ATUS Loan Pool could be assigned this task.

6. Does the department have adequate operating funds to provide ongoing maintenance and support? Enter “No” or “Yes.”

Yes

IF “Yes,” describe.

Course fees will cover classroom expendable materials. We have production budgets which cover design material costs.

7. Does the department have adequate personnel funds to provide ongoing staff support for the project? Enter “No” or “Yes.”

ATUS has agreed to manage this equipment.

IF “Yes,” describe.

V. Space and Site Information

This section addresses any space alteration or site preparation necessary for the proposed project. Site alterations include painting, holes in walls, security systems, carpeting, construction, lighting changes, or conversion of a lab or office.

1. Location for installation of equipment or technology:

Haggard Hall, Library, Student Tech Center
2. Would site modification be required? Enter “No” or “Yes.”

   **Do not know**

   IF “Yes,” describe the modifications (e.g., electrical, air, painting, lighting, security, network access, etc.).

3. Would this project use space not currently assigned to your department or area? Enter “No” or “Yes.”

   **Yes**

   IF “Yes,” describe.

   **Haggard Hall, Library, Student Tech Center**

   **Conditional** If this project would require any site preparation, or if this project would use any space not currently under your department’s control:

   a. You must submit a draft proposal to Space Administration by **March 9, 2020**.

   b. Space Administration and Facilities Management will then conduct a site survey and respond to you by **March 20, 2020** about project feasibility, cost and schedule.

   c. You must include the site survey response with your final proposal.

   **VI. Project Schedule**

   Describe your overall implementation schedule. Note that project awards are announced during spring quarter, and that projects are to be substantially completed by the end of the calendar year.

   If any site preparation is involved (see section V above), align your project schedule with the schedule provided by Space Administration and Facilities Management.

   **This equipment and software will be used as soon as it is available for department theatre productions. Coursework using the equipment and software would begin Fall 20.**

   **VII. Constraints**

   List or describe any external or internal factors/constraints that could affect your project schedule, project objectives, or the project budget (e.g., if external approval is required for curricular changes, or if funding must be received by a certain date).

   **The global pandemic could affect implementation.**

   **VIII. Submitting the Proposal**

   1. Ensure your proposal does not exceed 14 pages (not including Tech Initiatives Summary Sheet).

   2. Complete top portion of **2020 Tech Initiatives Proposal Summary Sheet**.

   3. Electronically submit the proposal and the summary sheet per appropriate substep below.

   a. **For student proposals:** Email proposal and summary sheet by April 1 to AS Senate Pro Tempore at AS.Senateprotempore@wwu.edu. Both the proposal and summary sheet should be Word format.
b. **For employee proposals:** Email proposal and summary sheet by internal due date, per your unit’s process [which must be before proposal due date (to STF Committee) of April 2]. Both the proposal and summary sheet should be Word format.

**Note:** Step 4 is for the positions gathering and/or prioritizing the submitted proposals.

4. Process the proposals per the appropriate position substeps below (a, b, or c).

a. **AS Senate Pro Tempore (for student proposals):**
   i. Prioritize the student proposals. Indicate priority on summary sheets, and sign the sheets.
   ii. Email proposals (Word format) and summary sheets (PDF format) to batemad@wwu.edu (the STF Committee secretary) no later than April 2.

b. **Dept Chair / equivalent (for employee proposals):**
   i. Sign summary sheet(s) on “department chair” line.
   ii. Email proposals (Word format) and signed summary sheets (PDF format) to college dean/unit head to meet internal deadline.

c. **College Dean / unit head (for employee proposals):**
   i. Prioritize the employee proposals. Indicate priority on summary sheets, and sign the sheets.
   ii. Email proposals (Word format) and completed summary sheets (PDF format) to batemad@wwu.edu (the STF Committee secretary) no later than April 2.

**Note:** Please do not send paper copies of proposals to the STF Committee.