UNIVERSITY OF LOUISIANA AT LAFAYETTE

STEP COMMITTEE

Technology Fee Application

Implementing 3D printer and Document Camera Distance Learning and Engineering Week Demonstration

Title

Dr. G. H. Massiha

Submitter

Department of Industrial Technology

Organization

ABSTRACT PAGE

Title: Implementing 3D printer and Document Camera Distance Learning and Engineering Week Demonstration

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Dept/College: Departments of Electrical & Computer Engineering, Industrial Technology and Mechanical Engineering in the College of Engineering

Number of Faculty Impacted: 4

Number of Students Impacted: 400-600 (graduate and undergraduate)

Abstract

This proposal is being submitted to improve the CAD Laboratory in the Department of Industrial Technology (ITEC) in the College of Engineering. The courses offered in this laboratory serve over 400 students in the College of Engineering and Departments of Industrial, Mechanical, Civil, and general engineering programs. Funding this project will provide large pool of students' access to state-of-the-art hardware and visualize by students using Zoom or other distance learning methods intended to improve their productivity in areas of automation and control.

A. Purpose of Grant

Engineering and technology students are more engineering and technology application oriented than theory. Many ITEC, Civil and Mechanical classes could benefit form the addition of 3D printers and document camera in automation courses that are broad cast by Zoom. The requested equipment can easily be integrated to classes such as CAD - ITEC 270, 370 and 429 and MCHE 480 manufacturing. Document camera will show how the design is progressed and 3D printer.

In addition, we plan to use this set up during the Engineering-Technology Week and show case them to high school students who are visiting on campus. It is important to use these equipment throughout the calendar year and we believe graduate and undergraduate students can conduct direct research with these equipment.

The technology of 3D printers has made leaps and bounds in the past few years. Most 3D printers available to the consumer today are better than the printers that were available to industry 10 years ago. The price for a high-end printer can be less than $3000.00 per unit and the price for the filament is around $50.00 per K/g. Price of document cameras have increased 100% from March of 2020 once most universities started going fully online, but their quality also increased.

We believe this is a good investment for the college of engineering during these taxing period of quarantine and distance learning revolution. Multiple departments that include Industrial Technology (ITEC) and Mechanical Engineering (MCHE) can utilize this laboratory for instruction of automation application using 3D printers and document cameras.

Impact on Student Body

This initiative will impact students in the following ways:

1. Addition of two 3D printers and two document cameras helps large number of engineering and technology students interested in new technologies has increased rapidly.

2. The laboratory upgrade will also benefit the University as a whole, by supporting an energy management system hibernation, which the current computer systems do not support due to their age. **This will provide savings for the University in future years**.

B. The Projected Lifetime of Enhancement

This equipment will be an effective tool in student recruitment and retention that will last a minimum of 5 years.

C. Person(s) Responsible for Project

a. **Implementation**: Dr. G.H. Massiha, Department of Industrial Technology
b. **Installation**: Dr. Massiha and Mr. Harvey Ozbirn, College of Engineering
c. **Maintenance**: Dr. Massiha and his graduate students

d. **Operation**: College of Engineering faculty (Dr. Massiha as a supervisor)

e. **Training**: N/A

Qualifications:

Dr. G.H. Massiha is a professor in the college of engineering. He has more than twenty years of experience in teaching and research in automation and control. His research specialties include microprocessors, automation, advanced electronics control devices, robotics, and integrated circuits.

Harvey Ozbirn is the computer systems manager for the College of Engineering and is on the faculty of the Department of Industrial Technology. He holds MBA degree plus a master degree in Engineering Technology & Management from the University of Louisiana at Lafayette.

D. Budget Category Descriptions

Timeline:

Years 1:

Order all equipment. Set up equipment.

Year 1-5:

Maintenance & general upkeep

Previously Funded STEP Grants

Dr. Massiha did not have any funded STEP Grants in the past five years.

Budget Proposal

Length of Implementation (In years)	1	2	3	4	5
1. Equipment (two 3D Printers)	2 x $3,000	$0	$0	$0	$0
2. Two document Camera	2x$500	$0	$0	$0	$0
3. Supplies (3D filament)	$500	$0	$0	$0	$0
4. PC (2)	2 x $1500				
TOTAL:	***$10,500**	$0	$0	**$0**	$0