

# UNIVERSITY OF LOUISIANA AT LAFAYETTE

STEP Committee

Technology Fee Application

Freshman Computer Engineering Teaching Lab Upgrade

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Title

**Dr. Magdy Bayoumi and Shelby A. Williams**

Name of Submitter  
*(Faculty or Staff Only)*

*Electrical and Computer Engineering Department*

Organization

Title: Freshman Computer Engr. Teaching Lab Upgrade Date: July 15, 2022  
Name (Contact Person): Dr. Magdy Bayoumi, EECE Department Head  
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Department/College/Org: Electrical Engineering / Engineering / UL Lafayette

**ABSTRACT (250 words or less):**

This is a proposal for the purchase and installation of thirty-five electronic trainers for the Freshman Computer Engineering Laboratory in the Electrical and Computer Engineering Department. This laboratory is located in Madison Hall, one of UL's College of Engineering buildings. Electrical Engineering, Engineering Technology, Computer Science and high school students use this laboratory every Spring, Summer and Fall semester. This laboratory gets more use than any other laboratory in department. This upgrade will not only increase the number of trainers, but will give each student a much better lab experience working on the newest equipment. As such, upgrading the laboratory trainers in this lab will have the greatest impact on any other student.

### **Purpose of Grant**

The overall goals of this grant are to increase the number of electronics trainers used in the Freshman's Digital Logic Laboratory. The upgrade of the Computer Engineering Lab is necessary for several important reasons.

- The impacted course, EECE 140 "Computer Engineering" is highly subscribed to, as it is the introductory computer hardware course required of all Electrical/Computer Engineering, Engineering Technology and Computer Science majors. Often students are delayed in taking this course due to lack of available seats.
- This laboratory is reviewed by the ABET (Accreditation Board for Engineering and Technology, Inc.) and SACS (Southern Association of Colleges and Schools Commission on Colleges) as part of the departmental accreditation processes.
- Students will be better able to run laboratory simulations and complete experiments with much less difficulty given more up-to-date trainers.
- Through the student evaluations of courses and senior students exit interviews, we receive consistent complaints about outdated equipment in this laboratory.

### **EECE Computer Engineering Lab**

EECE Digital Lab is housed in Madison Hall room 247 and supports a core course, EECE 140, taken by freshmen students majoring in Electrical/Computer Engineering, Computer Science, and Informatics. Each semester six sections of EECE 140 lab with 30 students each use this lab, resulting in nearly 360 students annually. The twenty trainers in this lab have not been upgraded since 2019. This lab, as its primary educational goal, plays a critical role in freshman orientation and retention. This lab houses the EECE 140 course which is an entry level course that the students can take during their early semesters while they get through their math and science courses. The EECE 140 hands-on lab keeps the students engaged with the department, and entuses them to continue and graduate in engineering. It also serves as a window of Electrical/Computer Engineering for Computer Science and Informatics students who take the course. Computer Science is one of the quickest growing majors at UL and exposure of students to Computer Hardware is critical. Thus, the upgrade and maintenance of the equipment in this lab has a far-reaching impact on student engagement, retention, and graduation. The proposal requests thirty-five trainers to replace as many twenty older ones currently in the lab.

### **Impact To Student Body As a Whole**

The proposed upgrade will have a direct impact on the all of the students majoring in Electrical/Computer Engineering, Computer Science, Informatics and indeed its impact is even broader. Both undergraduate and graduate students in EECE, and graduate students in computer engineering are required to take Electrical Engineering courses. This grant also will go along with the strong mandates of ABET Accreditation of the EECE department, necessary for attracting excellent engineering students to UL Lafayette.

### **Projected lifetime of enhancement**

The projected lifetime of equipment in this enhancement project is more than 5 years.

### **Person(s) responsible for implementation, installation, maintenance, operation and training**

The project directors listed below with their corresponding titles and department affiliation, are responsible for a timely installation of the proposed equipment and implantation of the

project. They will train students in the operation and maintenance of the equipment of the proposed project.

**Project Director and Co-project director:**

As the project director of this grant proposal, *Dr. Bayoumi* has been a faculty member in CACS since 1985. He received B.Sc. and M.Sc. degrees in Electrical Engineering from Cairo University, Egypt; M.Sc. degree in Computer Engineering from Washington University, St. Louis; and Ph.D. degree in Electrical Engineering from the University of Windsor, Canada. Dr. Bayoumi is the recipient of the 2009 IEEE Circuits and Systems Meritorious Service Award. Dr. Bayoumi is the recipient of the IEEE Circuits and Systems Society 2003 Education Award, and he is an IEEE Fellow. He was on the governor's commission for developing a comprehensive energy policy for the State of Louisiana. He represented the CAS Society on the IEEE National Committee on Engineering R&D policy, IEEE National Committee on Communication and Information Policy, and IEEE National Committee on Energy Policy. He is also active in the “Renewable & Green Energy” and “Globalization: Technology, Economic and Culture” fields. He was a free-lance columnist for Lafayette’s newspaper.

SHELBY WILLIAMS, M.S. Laboratory Manager, *Electrical and Computer Engineering Dept.*

MICHAEL A. PRATT, Ph.D. *Professor of Practice, Electrical and Computer Engineering Dept.*

The co-project director of this grant proposal, *Shelby Williams* serves as the Laboratory Manager in the Electrical and Computer Engineering Department. He has written several funded STEP proposals over the past 15 years for upgrading nearly all laboratories in the department. He has worked in his current capacity for the past 25 years.

*Dr. Michael A. Pratt*, is Professor of Practice in the Electrical and Computer Engineering Department. Dr. Pratt has been with the department for the past 9 years, and in College Academics for over 25 years. He is responsible for instruction in the primary course considered here, EECE 140 “Computer Engineering”.

## **Equipment List and Proposed Upgrades**

### **Proposed Upgrades**

35 Advanced Analog/Digital Electronic Design Trainer - Model PB-507 [\$1,049 each]



### **Existing Equipment**

20 Portable Logic Design Trainer – Model PB-501 [\$222 each]



## **Project Plan**

### **Previously funded STEP Projects:**

- MATLAB/Simulink on UCS System – July 1999
- Additional and Upgrade of for EECE Student Laboratory – July 1999
- EE Electronics Laboratory – January 2012
- EE Computational Upgrades – July 2014
- Test and Measurement Upgrades – January 2018

## **Budget**

The budget over a one-year period totals \$37,905. Mr. Shelby Williams will insure the timely purchase and installation of the equipment and all other activities proposed in this project. Every semester several graduate students are assigned from the department to the directors of this project that will be assisting in the implementation of this project.

## **Budget Proposal**

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<b>1.</b>	<b>Equipment</b>	<b>\$ 37,950 (includes \$1,190 for Freight)</b>
<b>2.</b>	<b>Software</b>	<b>\$</b>
<b>3.</b>	<b>Supplies</b>	<b>\$</b>
<b>4.</b>	<b>Maintenance</b>	<b>\$</b>
<b>5.</b>	<b>Personnel</b>	<b>\$</b>
<b>6.</b>	<b>Other</b>	<b>\$</b>

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**TOTAL:** **\$ 37,950**