

Engineering Student Technology Committee

<http://www.engr.colostate.edu/ESTC>

College of Engineering

Colorado State University

The Engineering Student Technology (ESTC) invites proposals from students, faculty, and staff for technology related equipment to enhance the student educational environment in the College of Engineering. Each year, the ESTC allocates funding for strategic projects that will have a near-term benefit to students. This year, the committee is soliciting proposals in the \$5K - \$40K range. Proposals must be primarily for equipment and have a direct benefit to the educational mission of the college. Please review the Charge for Technology (CFT) manual for permissible use of CFT funds: <http://ucft.colostate.edu/asp/www.ucft/pdf/cftmanual.pdf>.

Partnerships with the ESTC that fund projects beyond the limitations of the CFT are especially compelling. Note that the committee is not, in general, interested in funding projects that are specific to a particular research group. To submit a project proposal, please complete this form and send it as an e-mail attachment to estc@engr.colostate.edu by April 30 for full consideration.

1. Title of Proposal: *Modernizing Conceptual Understanding of ECE Through the use of The Analog Discovery Multifunction Device*

2. Proposal Participants:

Primary Contact for Proposal

Name: Stephen Milton E-Mail: milton@engr.colostate.edu

Department/Major: Electrical and Computer Engineering _____

Circle One: Undergraduate Student Graduate Student **Faculty** Staff

Additional proposal participants

Name: Mario Marconi E-Mail: marconi@engr.colostate.edu

Department/Major: _____

Circle One: Undergraduate Student Graduate Student **Faculty** Staff

Name: Anthony Maciejewski E-Mail: aam@engr.colostate.edu

Department/Major: _____

Circle One: Undergraduate Student Graduate Student **Faculty** Staff

3. Proposal Abstract (limit to 100 words):

The goal of this proposal is to acquire the necessary elements to implement the use of a new low-cost USB-driven Oscilloscope/Multifunction instrument into the current ECE103 course. Such a device will allow students to gain a much deeper understanding of the basics of electrical and computer engineering as well as allow them to expand upon their knowledge through self experimentation at levels well beyond what is traditionally taught in ECE 103. We would like to purchase a number of these for checkout and distribution to enhance the ECE103 experience, but to also allow for its use throughout the entire ECE undergraduate program.

4. Proposal Budget

List of items to be purchased and cost.

The description of the requested equipment is based on the products offered by PASCO (<http://www.pasco.com>). There are other options in the market that will be explored if this proposal is funded. The table below indicates the list of equipment and estimated dollar amount.

Equipment	Price
Analog Discovery USB Oscilloscope/Multi function instrument (x100)	15,900
NI Multisim and Ultiboard (NI Circuit Design Suite) (x100)	4,000
Analog Parts Kit (x100)	6,500
Mini grabber test hooks (x100)	1,500
Solderless breadboard kit (x100)	800
Total	28,700

Dollar or percentage amount requested from ESTC: We are requesting 100% of the budget, but the ECE Dept. is willing to provide some cost sharing to be negotiated with Tony M.

Dollar or percentage amount(s) to be provided by other fund(s): ECE Dept. is willing to provide some cost sharing to be negotiated with Tony M.

5. Full description of proposal:

specifically address:

- student group(s) that will benefit from this proposal
- explanation of why the project is a valid use of CFT funds
- financial partnerships that leverage use of CFT funds for greater impact

If granted, this proposal will allow the acquisition of the necessary elements to implement within ECE103 a series of in class demonstration and laboratory experiments that will be far superior to the existing set of laboratory experiments. Students will be checked out a complete kit at the beginning of the course and will be allowed to use this to complete homework and in lab experiments. The device is very capable, well beyond that needed in ECE 103 and so it is the hope that the students will use the devices to self learn beyond what is commonly taught in class. Students, should they wish, may be able to purchase their own device for \$99. This they can carry through with them over their entire career, and we see it as one of their early on "go to" tools, to basic development.

The budget includes a number of additions to the basic device that we feel will make the devices much more immediate use to the students and well as the instructors so that all barriers for use are removed. We chose the Analog Discovery as it is robust and was made specifically for instruction. This includes training links on the Analog Discovery website that the students can use to expand their knowledge even further.

The main goal is to expand the learning experience to the students. It is our hope that by use of such a “modern” piece of equipment that they can use throughout the year that they learn more and with a deeper understanding, and that the retention rate is higher. We also see the device being incorporated into course beyond ECE 103 and through their entire ECE career at CSU. We wish to purchase enough equipment to cover the entire ECE 103 class. While the devices themselves are relatively cheap and the students can certainly buy them on their own, we instead feel that it is better in an introductory course to purchase this piece of equipment. Should a student decide to continue in ECE they can then go and purchase their own. If they decide that ECE is not their final major then they will not be left with a piece of equipment that they will never use.

The list of requested material is in accordance with the allowable expenditures described in the CFT manual.

For further information regarding the device, one can look at the following website.

<http://www.digilentinc.com/Products/Detail.cfm?NavPath=2,842,1018&Prod=ANALOG-DISCOVERY&CFID=7933147&CFTOKEN=b68879e74918f2d2-3797CFC8-5056-0201-0257B1AD53242757>