

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/aspx/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: *Interactive Demonstration kits for teaching basic EE principles* ____

2. Proposal Participants:

Primary Contact for Proposal

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

Department/Major: _____

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

Additional proposal participants

Name: Olivera Notaros E-Mail: olivera@engr.colostate.edu

Department/Major: _____

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

Department/Major: _____

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3. Proposal Abstract (limit to 100 words):

The goal of this proposal is to acquire the necessary elements to implement a series of simple experiments for in class demonstrations, and also to provide the necessary material to a group of students (5) to perform simple experiments in class. These experiments are aimed to support and complement the learning objectives of ECE204 “Introduction to Electrical Engineering”. The set of experiments will cover all the basic aspects of the syllabus, starting with the concepts of charge, current, power and energy, to continue with more advanced topics like DC and AC circuits. This project will assist to a better delivering of basic ECE concepts to a broad student population and will benefit all students with Engineering majors.

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
Van de Graaff Generator	569.00
Basic Electrometer	309.00
Basic Variable Capacitor	129.00
Charge proof planes	32.00
Conductive spheres (2)	218.00
Electrostatic voltage source	198.00
Coulomb's Law apparatus	1,229.00
Coulomb's Law experiment	2,389.00
Resistivity experiment	589.00
Ohm's law experiment	249.00
AC/DC electronics laboratory (5)	945.00
RLC resonance experiment	399.00
Charge-discharge circuits (5)	645.00
Hand crank generator (5)	1,125.00
AC/DC motor accessory (5)	495.00
Decade capacitor box (5)	650.00
Decade resistor box (5)	500.00
Energy transfer generator with turbine	177.00
Complete coil set	189.00
500 turns coil	109.00
PASPORT charge sensor (5)	525.00
PASPORT high current sensor (5)	625.00
PASPORT magnetic field sensor (5)	300.00
PASPORT voltage-current sensor (5)	495.00
Dataloggers (5)	845.00
Sparkvue (Acquisition software)	249.00
Total	14,184.00

Dollar or percentage amount requested from ESTC: We are requesting 100% of the budget

Dollar or percentage amount(s) to be provided by other fund(s):

Include name of person providing other funding (must be a participating party in the proposal):

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 a series of in class demonstration that will be performed by the instructor and a series of hands-on experiments for students (with a maximum of 5 groups but easily scalable to more students if necessary). The demonstrations will be designed to reinforce basic concepts in electricity that are introduced in ECE204, like electric charge, current, capacitance, magnetic field, inductance, etc. A set of laboratory equipment for the students will allow simple testing of DC and AC circuits, electric motors, transformers, filters etc..

The budget presented is based on products from PASCO. There are other suppliers with similar products, and the list of elements requested in this proposal is only indicative to provide a basic dollar amount for the project. The selection of PASCO as a possible supplier for the elements is based on the vast experience of this company selling and developing scientific equipment oriented to teaching. For example, they provide interesting innovative options like a set of detectors that the students can use to acquire the data in the experiments and that can be downloaded in a PC or even in an iPod.

The project is focused to enhance the teaching experience in ECE204, a college wide course required for all Engineering majors. Consequently a large number of students will have direct access and will take advantage of these improvements. The project will have a direct high impact in a large number of students from all Engineering orientations. The list of requested material is in accordance with the allowable expenditures described in the CFT manual.