

## BME ETF Report 2011-2012

### a. New and/or transformative initiatives undertaken with ETF

*Biomaterials Characterization Course:* A long recognized weakness of the BME curriculum was the lack of hands-on experience for our students studying the biomaterials area of emphasis. In the spring of 2012, we offered a new course in biomaterials characterization. Using ETF funds, we previously acquired over \$57,000 of equipment needed to implement the planned labs. This year we invested an additional \$7,000 of ETF funds in equipment and supplies to teach the course. The class is a lab-intensive course with 1.5 hours of lecture and 5 hours of lab each week. 12 students enrolled this year. Topics included cell culture, cytotoxicity, anti-microbial properties testing, soft lithography and scanning force microscopy.

*Student Computing Lab:* In response to a request from our students, ETF funds were used to install a student computer lab with 16 workstations. The lab can be used for scheduled teaching labs. Since our move to EB3, ECE has provided teaching computer labs for BME. However, due to heavy use of their computer labs, they are not able to accommodate all of the needs for BME labs resulting in some computer labs being taught in wet lab space. As our enrollment continues to increase, the need for additional computer based lab sessions will also increase, and the suboptimal solution of using wet lab space will no longer be a viable alternative as demand for that space also increases. There was a pressing need for a BME teaching computer lab, and ETF funds were used to meet that need. When the lab is not in use for teaching, any BME student with access to EB3 and a student ID will be able to enter and use the lab. In addition to 16 workstations, the lab also houses a teaching workstation complete with a projection system.

### b. Actions taken to improve efficiency/return on ETF investments–

*Use of Funds:* ETF expenditures are approved by the ETF committee consisting of faculty, the BME laboratory manager, an IT specialist, and student representatives. Requests for ETF expenditures are submitted to the committee. All requests must include the following information: the items requested, the cost, the course(s) that will use the equipment, learning outcomes that can be met using the equipment, and the number of students impacted. The committee then prioritizes expenditures looking to impact the greatest number of students in the most significant manner.

*Collaboration:* When possible, we look to share equipment with other departments. For example, our biomaterials characterization lab is taught in BTEC to take advantage of the fume hoods, incubators, microscopes and other equipment needed to teach the course.

*Competitive Pricing:* As always, we continue to use all sources available to us to locate the lowest price for equipment including Marketplace, surplus, and 2<sup>nd</sup> hand sources. When possible, we negotiate for bulk and/or educational discounts.

*Student Impact:* All decisions for prioritizing ETF fund expenditures by the ETF committee are made with student impact in mind. In general, we try to allocate funds in a way that will make the greatest impact on the largest number of students.

c. Unmet ETF-eligible needs

*Spectrophotometry units:* As our enrollment increases, the sizes of our labs necessarily increase. Currently, we have enough equipment for 8 complete lab stations for BME 204, Biomedical Measurements, with the exception of spectrophotometry units. Due to the high cost of these units (approximately \$4,000 each), we have been unable to purchase additional units. We need 3 additional spectrophotometry units to have enough for 8 complete lab stations, allowing students to work in groups of 2 rather than groups of 3.

*Additional computing resources:* Additional laptop computers for teaching labs are needed. The physiology lab has 9 laptops. Often the need arises for students to work independently during the lab session. In this case, we are forced to ask students to bring their personal laptops to use during the lab section in order to have enough computers. This only works when the necessary software is available on the college or university level. For software that is owned by our department, we aren't able to install and maintain software on student owned computers. To solve the problem, we need 10 laptop computers and 1 laptop cart.

*Fluorescent lighting source:* One additional fluorescent lighting source is needed for one of the 2 microscopes purchased with ETF funds.

d. Assessment of impact of ETF investments on student learning

Assessment data is collected through many mechanisms including comments on course evaluations about lab quality and availability of equipment, assessment by instructors of courses that use ETF funds, feedback of students on the ETF committee, and senior exit interviews where students are asked to comment on labs and the availability of necessary equipment.

This year, \$7000 of the BME ETF budget was allocated to the continued development and improvement of the biomaterials characterization course. Course evaluations related to the laboratory portion of the course over the past two years follow.

	2012	2013
Lab sessions contributed to mastery of course concepts	3.8	5.0
Lab facilities, equipment, supplies, etc. were adequate	4.0	5.0
The degree of lab difficulty was appropriate	3.0	4.8
Overall, the labs were effective learning experiences	3.5	4.8

It's clear that our investments in the course together with our collaborative use of BTEC facilities has made a significant difference in the overall learning experience.

Approximately half of the available ETF funds were allocated to the student computing lab. Since that lab is currently being installed, we will not have assessment data until next year.

e. Planning and review process

The ETF committee reviews and authorizes all ETF expenditures. The committee consists of 2 faculty members, an IT specialist, the BME lab manager and a student representative from each of the junior class, the senior class, and the graduate students.

The committee reviews student surveys assessing equipment usage and generates internal requests. The committee also solicits external requests for equipment.