Biotechnology Education is an interdisciplinary program providing courses leading to minor degrees in biotechnology at both the undergraduate and graduate level. These courses provide instruction and hands-on experience in the cutting-edge technologies needed for modern biological studies but which are too expensive for departments or colleges to provide independently. This year students from 39 curricula in seven colleges and life long education enrolled in biotechnology courses. Administrative, instructional and support personnel costs are provided by the Provost and the Biotechnology Program. Instructional material and equipment costs and a portion of the instructional personnel costs are provided by ETF funds. The 2005-2006 ETF allocation of $354,144 for Biotechnology Education was included in the allocation to the College of Agriculture and Life Sciences which provided administrative oversight of its expenditure.

1. Categorized ETF Expenditure Summary

   a. Personnel

   - $9,875.72 was expended for an 0.2 FTE computer consultant to maintain the 55 laptop computers, software, and wireless network utilized in the lecture and laboratory portions of the courses.
   - $7,437.50 was spent to hire eight proctors to provide necessary hands-on assistance for the laboratories of BIT 463/563, BIT 464/564, BIT 466/566 and VMP 987ART. The highly specialized nature of these courses requires different assisting personnel for each course and could not be served by a single TA.
   - $20,442.54 was expended for partial support of a teaching postdoctoral associate. This Postdoc taught sections of BIT 410/510, BIT 493 and the newly developed course BIT 595N.
   - $43,246.90 was expended for Teaching Assistants. This included stipend supplements for 3 TA positions provided by the CALS and assigned to the 9 lab sections of BIT 410/510, and stipends for the TA’s of the 9 half-semester module courses BIT 462, BIT 463/563, BIT 464/564, BIT 466/566, BIT 467/567, BIT 468, BIT 481/581, BIT 595N, and BIT 595Q.
   - $1,654.00 was spent to hire student laboratory assistants for laboratory set-up and media preparation.
   - $386.22.00 was spent on miscellaneous fringe benefits for the above personnel.

   b. IT infrastructure, equipment and services

   - $52,279.72 was spent on replacing 20 laptop computers used by students in the classroom/laboratory and wet laboratories, a wireless access point for a satellite teaching laboratory in Scott Hall, insurance for the laboratory computing equipment, and computers and wireless networking capability for teaching biotechnologies in three other departments.
c. Non-IT infrastructure, equipment (experimental labs, wet labs, etc.)

- $9,423.59 was spent on repair and maintenance of laboratory equipment and instruments including pipette calibration, sterile-hood certification & maintenance, autoclave repairs, FPLC repairs, microarray scanner repairs, cell-culture incubator repairs, and deionized water system maintenance.
- $107,293.80 was used to purchase new and replacement laboratory equipment essential for the BIT courses and allowing for increased enrollments, updated instrumentation and new laboratory exercises. A portion of this equipment equipped a satellite teaching laboratory in Scott Hall allowing for students in three courses access to a $100K+ research instrument located in the research laboratory of the course instructors. These purchases include refrigerated-microcentrifuges, an additional liquid chromatograph, an additional 3-liter fermentor, thermocyclers, nano-drop spectrophotometers, and a microscope.
- $18,790.98 was used to purchase new laboratory equipment for teaching biotechnologies in courses in 6 other departments. These biotechnological courses provide an initial exposure to biotechnologies, satisfy requirements for the biotechnology minor, or provide additional hands-on learning opportunities in advanced biotechniques.

d. Facilities (repairs and renovations, furniture, etc.)

- $0.00 was spent.

e. Discipline/instructional related field trips, professional development/experiences, travel, conferences, services etc.

- $0.00 was spent on travel.

f. Other/miscellaneous

- $56,998.33 was spent on laboratory course supplies for BIT 410/510 Core Technologies, BIT 462 Gene Expression Analysis: Microarrays, BIT 463/563 Fermentation, BIT 464/564 Protein Purification, BIT 467/567 PCR, BIT(PO) 466/566 Animal Cell Culture, BIT 468 Genome Mapping, BIT 481/581 Plant Cell Culture, BIT 493 Special Problems in Biotechnology, BIT 569 RNA Purification, BIT 595N RNA interference and Model Organisms, and BIT 595Q Real-time PCR.
- $26,314.71 was spent for laboratory course supplies for teaching biotechnologies in courses in 7 other departments. These biotechnological courses provide an initial exposure to biotechnologies, satisfy requirements for the biotechnology minor, or provide additional hands-on learning opportunities in advanced biotechniques.
- $3,994.28 remaining in the project as of 6/30/06 due to miscommunication, was spent by the college for unmet laboratory course supplies needs.
2. Justification/Purpose of Expenditures—strategic overview

In each subsection below, please include a brief description of the direct services and resources provided to students.

a. New and/or transformative initiatives undertaken with ETF

Describe how your unit has used funds in progressive and innovative ways

- The biotechnology courses utilize ETF funds to update course content every semester. This year the new course BIT 595N RNA interference and Model Organisms was taught. Additional instrument purchases allowed for increased enrollment in high-demand module courses while maintaining an optimal number of students per lab group. The newly equipped satellite teaching laboratory in Scott Hall allowed students in three courses to utilize a $100K+ research instrument located in the research laboratory of the course instructors.

Describe how your unit continues to rethink and reassess use of funds to improve teaching/learning/business models to maintain nimbleness, adaptability, etc.

- The model used of the basic molecular techniques core-course followed with half-semester advanced module courses allows for rapid updating of course content and satisfies interests in a broad range of advanced topics. Additionally, Biotechnology Education supports the teaching of biotechniques in a number of courses offered in other departments. These courses provide an initial exposure to biotechnologies, satisfy requirements for the biotechnology minor, or provide additional hands-on learning opportunities in additional advanced biotechniques.

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

Describe your unit’s efforts to increase/maximize the value of ETF expenditures

- Most of our advanced instruments are used in multiple courses. New courses are built upon the capabilities of current instrumentation. We are continuously exploring ways to partner with other units on campus to fully utilize our teaching resources.

c. Unmet ETF-eligible needs

- The current ETF funding level is sufficient for the current enrollment levels, however, as additional course sections need to be added to satisfy anticipated interest we may need additional funds in the future
d. Assessment of impact of ETF investments on student learning

How and what does your unit measure to evaluate the effectiveness of ETF expenditures?

- We measure our effectiveness from feedback from students, instructors, research faculty and employers of our graduated students. The biotechnology courses have been greatly praised for the breadth and depth of the knowledge and techniques conveyed.

In brief, what is your unit’s assessment of the impact of ETF investments on student learning?

- Biotechnology Education relies solely upon ETF funding for supplies and equipment. Without ETF funding we would not be able to provide any courses and there would be no graduate or undergraduate minor curriculum in biotechnology.

e. Planning and review process

Describe your internal review process and level of student participation

- The Director, Assistant Director, Academic Coordinator, Instructors, Teaching Postdoc, Lab Manager, and TA’s discuss current and future needs and priorities. Students are surveyed at the end of every course as to what their opinion is of the teaching laboratory environment what additional needs they might perceive. Additionally, the 5-hour laboratory sections allow for opportune times to engage students in direct one-on-one conversations on this topic.
3. **Itemized List of Expenditures by Account Code**

   a. Please work with the CALS business office to generate an ETF expenditure report by allowable ETF expenditure category.

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<thead>
<tr>
<th>Object Code</th>
<th>Description</th>
<th>Amount</th>
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<td>51000-51199</td>
<td>EPA Non-Teaching Salaries</td>
<td>7,746.00</td>
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<td>SPA Employee Salaries</td>
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<td>51300-51399</td>
<td>EPA Teaching Salaries</td>
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<td>51400-51499</td>
<td>Temporary Wages</td>
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<td>Other Personnel Expenditures</td>
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<td>Staff Benefits</td>
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<td>51900-51999</td>
<td>Contracted Services</td>
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<td><strong>Total Personnel Expenditures</strong></td>
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<td>52000-52999</td>
<td>Supplies and Materials</td>
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<td><strong>50000-59999</strong></td>
<td><strong>Total Expenditures</strong></td>
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