

## FY 2008 Technology Fee Proposal

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Submitting Organization:

Major Unit: **College of Arts and Sciences**

Department: **Biology**

Contact Person: **Teryl Frey**

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### 1. Project Short Title

<i>5-8 Word Project Title</i>
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<b>Enhancing Instruction in Biology Through Technology</b>
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### 2. Total Requested

Fiscal Year 2008
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<b>\$246,828</b>
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### 3. Executive Summary

<b>Project Description (three or four sentences)</b>
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To continue its efforts to provide its students with up-to-date technology to enhance their learning experience, it is proposed that older computers in four of the Biology instructional labs be replaced. A server and backup are proposed to allow students doing independent research to store and manage data. Funds are also requested to upgrade maintain instructional software licenses. Finally, keypad-based Classroom Participation Systems are requested for use in 1000-3000 level lectures offered by the department.
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### 4. Project Description

The Department of Biology offers instructional laboratories that are components of almost all courses taught at the 1000, 2000, and 3000 level. The "wet lab" experience in all of these courses has been enhanced by computerization of the twelve instructional labs in which these courses are taught (16 courses enrolling ~3000 students per semester; see courses and enrollment under Item 8 "Impact on Students Served") through funds made available by the Student Technology Fee over the past five years. In addition, the Biology Department has established both undergraduate and graduate student computer labs (Rooms 514 and 516 SA) for use on course assignments and independent studies. Thanks to Student Technology Fee funding, students in all Biology laboratory courses now can utilize modeling and simulation software (both commercial and instructor-designed) to enhance their laboratory learning experience. To extend the instructional capacity in these courses:

- 100 laptops are requested to replace laptops that are greater than three years old and have fallen below the standard replacement threshold. These computers are in Rooms 332 (Biol 1110K), 334 (Biol 1120K), 434 (Biol 2250/3250/7250) and 439 (Biol 3810) Kell. There are 25 laptops in each of these labs (24 for students, 1 for the instructor).
- Three portable digital computers are requested for student use in making presentations.
- A server and a backup are requested for data storage by undergraduates and graduates engaged in either classroom or independent research (students will be able to access the server either through a workstation in a department instructional or research lab or remotely from their own laptop)
- Digital microscopes are requested for Room 308, the undergraduate research lab, for use by undergraduate students doing independent research.
- Two BioPac Systems are requested for each of the Physiology labs (332, 334, and 434 Kell). These systems, which include processors and monitors as well as software, allow for “virtual, interactive” exploration of human anatomy and physiology by students in the lab.
- Seventy five computers, purchased from prior years’ Tech Fee funding and surplused after falling below the standard replacement threshold, were retained by the department and are loaned to students for individual use on independent research. Battery replacement for these computers is requested.
- Keypad-based Classroom Participation Systems are requested for use in the Department’s 1000, 2000, and 3000 level lectures. These systems consist of keypads for students and a receiver that allow an instructor to ask multiple choice or true and false questions to which students immediately respond using the keypad, providing instantaneous feedback for the students and the instructor. In addition to providing in-class review, material on which students are having difficulty can be identified and the instructor can spend more time on this material, enhancing student learning outcomes. Classroom Participation Systems included in the previous two year’s Tech Fee proposal have been used effectively in the department’s instructional laboratories and these keypads will allow for use in lectures.
- Funds are requested to purchase or update site licenses for software used in courses instructed in instructional labs (the lab in which each is used is indicated on the itemized list of software in Item 9). The software requested includes concurrency licenses for Adobe Photoshop and Acrobat used by students in compilation and presentation of data.
- Trackit and Novastar inventory and management software is requested to allow the Department to keep track of and manage its instructional technology resources

- A wireless hub is requested to cover the 4<sup>th</sup> floor Kell Hall corridor to allow students waiting in this corridor to access the network. This is the last area of Kell Hall that is not a wireless zone.
5. Record the review numbers assigned by IS&T and Facilities. Their assessments must be included in Sections 16 and 17.

<b>IS&amp;T: # IST08-086</b>
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<b>Facilities: #14672-07</b>
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6. Relevance to Regents Guidelines

The proposal meets the Regents' Guidelines, most specifically guideline 1 (Technology fee revenues should be used primarily for the direct benefit of students to assist them in meeting the educational objectives of their academic programs) and 3 (Technology fee revenues should be used for hardware and Network related expenditures that include support of general purpose or special purpose laboratories used by students for body productivity and more discipline related activities) and to a lesser extent Guidelines 2 (Technology fee revenues should be used to assure that there are sufficient campus licenses for primary productivity tools such as those found in the Microsoft Office product suites and for discipline specific software) and Guideline 4 (Technology fee revenues may be used for training of students and, to a lesser extent, staff and faculty). While not targeted as such, implementation of the proposal would enhance the possibility of obtaining instructional grants from agencies such as the National Science Foundation. Funds from the proposal will not be used for new staffing (Guideline 6), development of software packages (Guideline 7), other than allowing implementation of software developed by faculty or encouraging faculty to do so, or administrative software (Guideline 8)

7. Relevance to Strategic Plan(s)

Improvement of both undergraduate and graduate instruction in the Natural Sciences is a priority in the University Strategic Plan. In the Biology Department Strategic Plan, implementation of state-of –the-art technology to enhance instruction is a priority.

8. Impact on Students Served

- The Keypad Participation Systems potentially will be used by instructors of 30 sections of 1000, 2000, and 3000 level courses with a total enrollment of 3000 students per semester

- 200 graduate students and 100 undergraduates participate in independent research each semester (Biol 4910, 8800, 8888, 8999, and 9999; many of these students use the undergraduate and graduate computer labs in 514 and 516 Science Annex). The server (and backup, projectors, Ingenuity, GraphPad, and Sigma Plot software, and Adobe Photoshop and Acrobat software are used by these students. The batteries are for computers checked out by students in these courses.
- The ebiomedia interactive downloadable DVD/software is for Biol 2108K (second semester of the introductory core sequence for majors) and Biol 3840 (Animal Biology, required of all majors) that enroll 300 students/semester.
- Specific requests for instructional laboratories, the courses involved, and the number of students served include:
- 332 Kell and 334 Kell: **Biol 1110K, 1120K** (Anatomy and Physiology I and II)(Required for students in HHS programs such as Nursing) 600 students/semester combined
  - 25 new laptops in each
  - 2 BioPac Systems in each
- 434 Kell: **Biol 2250K/3250K** (Human Physiology Laboratory) 50 students and **Biol 1104K** (Special Topics: Human Physiology) 100 students/semester
  - 25 new laptops
  - 2 BioPac Systems
  - Drylab dissection/anatomy software
- 439 Kell: **Biol 3810K** (Molecular Cell Biology Lab)(Required of Biology Majors) 150 students/semester
  - 25 new laptops
- 308 Kell: **Biol 4910** (Undergraduate Research) 20 students/semester
  - 5 digital microscopes
- 334 NSC: **Biol 4180/6180** (Neurobiology Laboratory) 10 students/semester
  - BioRad software

9. Justification of Funding Requirements for Fiscal Year 2008

Object of Expense	Itemized Descriptions	Quantity	Per unit price	Extended Total
<b>Supplies</b> (Note: PCs under \$5,000 go here. Also, use standard dollar amounts and replacement thresholds from sections 11/12, or provide explanation in sections 11/12.)	Dell Latitude Laptop	100	\$1,000.00	\$150,947.00
	Olympus Digital Microscope	5	\$2,500.00	
	Epson Digital Projector	3	\$499.00	
	E-instruction Classroom Participation System pads	350	\$55.00	
	BioPac v8 (Phys complete computer system)	6	\$2,200.00	
	Batteries	75	\$60.00	
	Item 7			
<b>Equipment</b>	Overland ISCI Server (all students)	1	\$10,000.00	\$18,000.00
	Overland ISCI Backup Solution	1	8000	
<b>Software</b> (Note: Include Vendor and Product Name.)	BioRad Neuro Simulation Software (Biol 4160/6160)	8	\$495.00	\$41,984.00
	Drylab Dissection/Anatomy software (Biol 1104)	1	\$1,299.00	
	ebiomed interactive downloadable DVD/software (Biol 2108K, 3840)	1	\$1,000.00	
	Ingenuity DNA/Pathway Analysis (undergraduate and graduate computer labs)	1	\$7,000.00	
	Graph Pad Prism 4.0 (5 user pack; undergraduate and graduate computer lab)	1	\$1,860.00	
	Sigma Plot 5000 (statistical software, undergraduate and graduate computer labs)	5	\$495.00	
	Plaiagerism Detection Online Service (all courses)	1	\$10,000.00	
<b>Maintenance or Contractual Services</b>	Adobe Photoshop CS2 for PC (Concurrency License)	10	\$255.00	\$25,897.00
	Acrobat User copies for PC (Concurrency License)	10	\$150.00	
	Acrobat User copies for Mac (Concurrency License)	10	\$150.00	
	Adobe In Design (PC)(Concurrency License)	4	\$200.00	
	Adobe Illustrator (Mac)(Concurrency License)	10	\$150.00	
	MacOSX Dreamweaver (Grad lab)	5	\$20.00	
	Trackit 3000 (inventory management system)	1	\$1,895.00	
	Novastar 3000 (system backup)	1	\$1,995.00	
	Set up for 100 new computers	100	\$250.00	
	Set up for 3 new projectors	3	\$299.00	
<b>Board of Regents Guidelines state "In almost no cases should technology fee revenues be used for ... space renovation, or other items or activities that do not have a direct and immediate impact upon students instructional objectives." (See Attachment 1, #8)</b>				
<b>Construction Services</b> (Requires review of Planning & Facilities)	Item 1			\$0.00
	Item 2			
	Item 3, etc			
<b>Network Connections and Infrastructure Costs</b> (Requires review of UCCS)	Wireless Access Points 5th Floor Kell Hall	2	\$1,000.00	\$2,000.00
	Item 2			
	Item 3			
	Item 4, etc			
<b>Physical Security</b> (Note: Costs normally should not exceed 2.5% of Total Requested.)	Keypad Online Doors (514, 516 Science Annex)	2	\$2,500.00	\$8,000.00
	Laptop security locks	100	\$30.00	
	Item 3			
	Item 4, etc			
<b>Other Expenses</b> (explain)	Item 1			\$0.00
	Item 2, etc			
<b>Board of Regents Guidelines state "Technology fee revenues may be used - with caution - for new staffing that is either temporary or ongoing." (See Attachment 1, #6)</b>				
<b>Staff Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>Fringe Benefits</b>	Item 1			\$0.00
	Item 2, etc			
		<b>Hours/wk</b>	<b>Hourly Rate</b>	
<b>Student Assistant Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>Graduate Student Assistant Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>TOTAL</b>				<b>\$246,828.00</b>

### 10. Consequences of Partial Funding

**Only 75% funded: Viable. Computer replacement in 332 and 334 Kell deferred**

Object of Expense	Itemized Descriptions	Quantity	Per unit price	Extended Total
<b>Supplies</b> (Note: PCs under \$5,000 go here. Also, use standard dollar amounts and replacement thresholds from sections 11/12, or provide explanation in sections 11/12.)	Dell Latitude Laptop	50	\$1,000.00	\$100,947.00
	Olympus Digital Microscope	5	\$2,500.00	
	Epson Digital Projector	3	\$499.00	
	E-instruction Classroom Participation System pads	350	\$55.00	
	BioPac v8 (Phys complete computer system)	6	\$2,200.00	
	Batteries	75	\$60.00	
	Item 7			
<b>Equipment</b>	Overland ISCI Server (all students)	1	\$10,000.00	\$18,000.00
	Overland ISCI Backup Solution	1	8000	
<b>Software</b> (Note: Include Vendor and Product Name.)	BioRad Neuro Simulation Software (Biol 4160/6160)	8	\$495.00	\$41,984.00
	Drylab Dissection/Anatomy software (Biol 1104)	1	\$1,299.00	
	ebiomeia interactive downloadable DVD/software (Biol 2108K, 3840)	1	\$1,000.00	
	Ingenuity DNA/Pathway Analysis (undergraduate and graduate computer labs)	1	\$7,000.00	
	Graph Pad Prism 4.0 (5 user pack; undergraduate and graduate computer lab)	1	\$1,860.00	
	Sigma Plot 5000 (statistical software, undergraduate and graduate computer labs)	5	\$495.00	
	Plagerism Detection Online Service (all courses)	1	\$10,000.00	
	Adobe Photoshop CS2 for PC (Concurrency License)	10	\$255.00	
	Adobe Photoshop CS2 for Mac (Concurrency License)	10	\$255.00	
	Acrobat User copies for PC (Concurrency License)	10	\$150.00	
Acrobat User copies for Mac (Concurrency License)	10	\$150.00		
Adobe In Design (PC)(Concurrency License)	4	\$200.00		
Adobe Illustrator (Mac)(Concurrency License)	10	\$150.00		
MacOSX Dreamweaver (Grad lab)	5	\$20.00		
Trackit 3000 (inventory management system)	1	\$1,895.00		
Novastar 3000 (system backup)	1	\$1,995.00		
<b>Maintenance or Contractual Services</b>	Set up for 50 new computers	50	\$250.00	\$13,397.00
	Set up for 3 new projectors	3	\$299.00	
<b>Board of Regents Guidelines state "In almost no cases should technology fee revenues be used for ... space renovation, or other items or activities that do not have a direct and immediate impact upon students instructional objectives." (See Attachment 1, #8)</b>				
<b>Construction Services</b> (Requires review of Planning & Facilities)	Item 1			\$0.00
	Item 2			
	Item 3, etc			
<b>Network Connections and Infrastructure Costs</b> (Requires review of UCCS)	Wireless Access Points 5th Floor Kell Hall	2	\$1,000.00	\$2,000.00
	Item 2			
	Item 3			
	Item 4, etc			
<b>Physical Security</b> (Note: Costs normally should not exceed 2.5% of Total Requested.)	Keypad Online Doors (514, 516 Science Annex)	2	\$2,500.00	\$8,000.00
	Laptop security locks	100	\$30.00	
	Item 3			
	Item 4, etc			
<b>Other Expenses</b> (explain)	Item 1			\$0.00
	Item 2, etc			
<b>Board of Regents Guidelines state "Technology fee revenues may be used - with caution - for new staffing that is either temporary or ongoing." (See Attachment 1, #6)</b>				
<b>Staff Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>Fringe Benefits</b>	Item 1			\$0.00
	Item 2, etc			
		<b>Hours/wk</b>	<b>Hourly Rate</b>	
<b>Student Assistant Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>Graduate Student Assistant Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>TOTAL</b>				<b>\$184,328.00</b>

**Only 50% funded: Viable. Computer replacement deferred.**

Object of Expense	Itemized Descriptions	Quantity	Per unit price	Extended Total
<b>Supplies</b> (Note: PCs under \$5,000 go here. Also, use standard dollar amounts and replacement thresholds from sections 11/12, or provide explanation in sections 11/12.)	Olympus Digital Microscope	5	\$2,500.00	\$50,947.00
	Epson Digital Projector	3	\$499.00	
	E-instruction Classroom Participation System pads	350	\$55.00	
	BioPac v8 (Phys complete computer system)	6	\$2,200.00	
	Batteries	75	\$60.00	
	Item 7			
<b>Equipment</b>	Overland ISCI Server (all students)	1	\$10,000.00	\$18,000.00
	Overland ISCI Backup Solution	1	8000	
<b>Software</b> (Note: Include Vendor and Product Name.)	BioRad Neuro Simulation Software (Biol 4160/6160)	8	\$495.00	\$41,984.00
	Drylab Dissection/Anatomy software (Biol 1104)	1	\$1,299.00	
	ebiomeia interactive downloadable DVD/software (Biol 2108K, 3840)	1	\$1,000.00	
	Ingenuity DNA/Pathway Analysis (undergraduate and graduate computer labs)	1	\$7,000.00	
	Graph Pad Prism 4.0 (5 user pack; undergraduate and graduate computer lab)	1	\$1,860.00	
	Sigma Plot 5000 (statistical software, undergraduate and graduate computer labs)	5	\$495.00	
	Plaiagerism Detection Online Service (all courses)	1	\$10,000.00	
	Adobe Photoshop CS2 for PC (Concurrency License)	10	\$255.00	
	Adobe Photoshop CS2 for Mac (Concurrency License)	10	\$255.00	
	Acrobat User copies for PC (Concurrency License)	10	\$150.00	
Acrobat User copies for Mac (Concurrency License)	10	\$150.00		
Adobe In Design (PC)(Concurrency License)	4	\$200.00		
Adobe Illustrator (Mac)(Concurrency License)	10	\$150.00		
MacOSX Dreamweaver (Grad lab)	5	\$20.00		
Trackit 3000 (inventory management system)	1	\$1,895.00		
Novastar 3000 (system backup)	1	\$1,995.00		
<b>Maintenance or Contractual Services</b>			\$250.00	\$897.00
	Set up for 3 new projectors	3	\$299.00	
<b>Board of Regents Guidelines state "In almost no cases should technology fee revenues be used for ... space renovation, or other items or activities that do not have a direct and immediate impact upon students instructional objectives." (See Attachment 1, #8)</b>				
<b>Construction Services</b> (Requires review of Planning & Facilities)	Item 1			\$0.00
	Item 2			
	Item 3, etc			
<b>Network Connections and Infrastructure Costs</b> (Requires review of UCCS)	Wireless Access Points 5th Floor Kell Hall	2	\$1,000.00	\$2,000.00
	Item 2			
	Item 3			
	Item 4, etc			
<b>Physical Security</b> (Note: Costs normally should not exceed 2.5% of Total Requested.)	Keypad Online Doors (514, 516 Science Annex)	2	\$2,500.00	\$8,000.00
	Laptop security locks	100	\$30.00	
	Item 3			
	Item 4, etc			
<b>Other Expenses</b> (explain)	Item 1			\$0.00
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<b>Board of Regents Guidelines state "Technology fee revenues may be used - with caution - for new staffing that is either temporary or ongoing." (See Attachment 1, #6)</b>				
<b>Staff Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>Fringe Benefits</b>	Item 1			\$0.00
	Item 2, etc			
		<b>Hours/wk</b>	<b>Hourly Rate</b>	
<b>Student Assistant Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>Graduate Student Assistant Salaries</b>	Item 1			\$0.00
	Item 2, etc			
<b>TOTAL</b>				<b>\$121,828.00</b>

#### 11. Standard Dollar Amounts

Standard dollar amounts for replacement computers have been followed

#### 12. Standard Replacement Thresholds

The 100 laptops to be replaced fall below the current university operating threshold (see Appendix 3)

#### 13. Prerequisite, Non-Technology Fee Funding

Not Applicable

#### 14. Matching Funds

Not Applicable

#### 15. Staffing and Other Support Availability

Computer facilities in the Biology Department, including those proposed in this project, are administered and supported by Biology Technical Support. This unit consists of Mr. Preston May, Director, one full time technician, one full time Web coordinator, one part time temporary staff member, and four part time student assistants. The salaries of these employees are provided by the Department.

#### 16. Space Availability and Impact on Facilities

**This project has no impact on facilities.**

#### 17. Impact on Computing/Networking/Information Security Infrastructure

Information Security Review (Tammy Clark):

Impact: Yes

Assessment: Security review required; additionally, pls ensure that AV/ISS Proventia desktop software is installed on all computers—contact [security@gsu.edu](mailto:security@gsu.edu) for instructions.

Wireless and Network Ports Review (Mark Roberson):

Impact: No

Assessment:

Server Connections (Charles Hollingsworth, Tammy Clark, Keith Campbell):

Impact: (Yes-CWH) , No impact – KEC

Assessment: The request mentions that the servers will be secured on a secure vlan behind firewalls etc. However, current University Policy prohibits the placement of non-centrally managed firewalls on the network, and no firewall has been requested from IST. A request should be made for acquisition and management of a firewall from IST for this purpose.

External Connections (Charles Hollingsworth):

Impact: (No-CWH)

Assessment:

DVR Installations (Mark Roberson, Tammy Clark, Charles Hollingsworth):

Impact: (No-CWH), MR-NO

Assessment:

Lab and Classroom Configurations (Joe Amador):

Impact: Yes/No YES

Assessment: IS&T PS&I WTS currently has an audience response system. Contact Jane Leonard for assistance.

## 18. Physical Security Needs

- Online keypad doors are requested for the Undergraduate and Graduate Computer labs (514 and 516 Science Annex). Access to these labs is managed in the Biology Office complex in Kell Hall and online access would allow rapid addition/removal of student access without office personnel having to physically go to the computer labs. These labs are subject to frequent turnover and rapid changes in access is necessary to maintain security.
- Security locks are requested for each of the new laptops

## 19. Post-Project Assessment Criteria

Instructors of the physiology labs (Biol 1110K, 1120K, Biol 2250/3250/7250) will upgrade computer assignments and incorporate BioPac v8 into their courses. Instructors of Biol 2108K and 3840 will incorporate ebiomedia DVD/software into their courses. Students in Biol 4910 will use digital microscopes in their research. The resulting outcomes will be assessed by review of syllabi, laboratory manuals, and student reports. Instructors of 1000, 2000, and 3000 level lectures will incorporate the CPS systems into their lecture presentations. Outcomes will be determined both the learning outcomes assessments in place in many of these courses and course development extracted from faculty teaching portfolios.

## 20. Review and Acknowledgements

Not Applicable