



Tennessee Technological University

**OFFICE OF RESEARCH
ANNUAL REPORT**

Fiscal Year 2007-08



Tennessee Technological University is one of the member institutions governed by the Tennessee Board of Regents. The 46 institutions in this system include six senior universities, 13 two-year community colleges and 26 technology centers. More than 80% of all Tennessee students attending post-secondary institutions are enrolled in the Tennessee Board of Regents (TBR) system.

Administration and Staff

Office of Research

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Executive Aide

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MISSION OF THE OFFICE OF RESEARCH

The mission of the Office of Research is to promote, support, and facilitate research, scholarly, and creative activities of faculty and graduate students. The Office of Research supports the University community in obtaining externally funded support for research, scholarship, instruction/training, and public service in the context of scholarly excellence and sound ethical justification.

The personnel of the Office of Research support the University's mission by:

- Disseminating information on funding opportunities for research, scholarly, and creative activities.
- Providing background information for use in proposals.
- Assisting faculty in the development of proposals.
- Reviewing proposals for accuracy, completeness, and compliance with both University, state, and federal regulations.
- Preparing and negotiating grants/contracts.
- Administering Tennessee's Public Records Act (T.C.A. 49-7-120) relative to sponsored research and services.
- Executing awarded contracts and processing activation forms to establish accounts.
- Assisting faculty in protecting their ideas and implementing technology transfer activities in the best interest of all parties concerned.
- Monitoring compliance with the range of federal policies that regulate research activities in the following areas: responsible conduct of research, research ethics, human subjects research, and the humane care of laboratory animals used in research and experimentation.
- Conducting seminars and workshops on proposal writing and funding sources.

SUMMARY OF ACTIVITIES 2007-08

During fiscal year 2007-08, the University's Mission was supported through the Office of Research in the following ways:

- Grants and contracts externally funded numbered 174 with a value of \$14,774,653.
- Grants and contracts received through the three Centers of Excellence and the STEM Center numbered 109 with a value of \$10,847,911, which represents 73% of total dollars and 62% of the total number of grants and contracts received.
- Grants and contracts received through federal agencies numbered 99 with a value of \$6,896,065, which represents 57% of grants and contracts and 47% of total dollars received.
- Grants and contracts received through state agencies numbered 55 with a value of \$7,326,215 which represents 32% of the total number of grants and contracts and 50% of total grant and contract dollars received.
- Private contracts were third at 16 with a value of \$299,931, which represents 9% of the total number of grants and contracts and 2% of total grant and contract dollars.
- Local sources accounted for 4 contracts or 2% of total grants and contracts with a value of \$252,442 or 2% of grant and contract dollars.
- Proposals submitted for external funding numbered 165 with a value of \$33,811,304.
- Proposals submitted through the Centers of Excellence and STEM Center numbered 108 with a value of \$27,940,600, which represents 65% of proposals submitted and 83% of funds requested.
- Proposals submitted to federal agencies numbered 92 requesting \$23,889,612, which represents 56% of proposals submitted and 71% of dollars requested.
- Proposals submitted to state agencies numbered 45 requesting \$8,416,370 which represents 27% of proposals submitted and 25% of dollars requested.
- Proposals submitted to private agencies numbered 24 requesting \$1,210,380 which represents 15% of proposals submitted and 4% of dollars requested.
- Proposals submitted to local agencies numbered 4 requesting \$294,942 which represents 2% of proposals submitted and .9% of dollars requested.

- Grants and contracts received for research numbered 108 with a value of \$10,722,678, which represents 62% of the total number of grants and contracts and 73% of total dollars received.
- Grants and contracts received for public service numbered 45 with a value of \$2,808,781 which represents 26% of all grants and contracts and 19% of total grant and contract dollars received.
- Instruction funding was third at 21 with a value of \$1,243,194, which represents 12% of total number of grants and contracts and 8% of total grant and contract dollars.
- Internal funds were provided in the amount of \$90,620 for small grants to support faculty research in the form of ***research initiation and/or research development***. Twenty-two projects involving 24 faculty members were supported. The typical amount of support granted was \$4,000 per faculty member.
- Internal funds provided for contract matching was \$24,430, which included items such as equipment, faculty release time, student salaries and fees.

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FIGURE I
External Funds
Historical, Actual and Projected
2000-2010

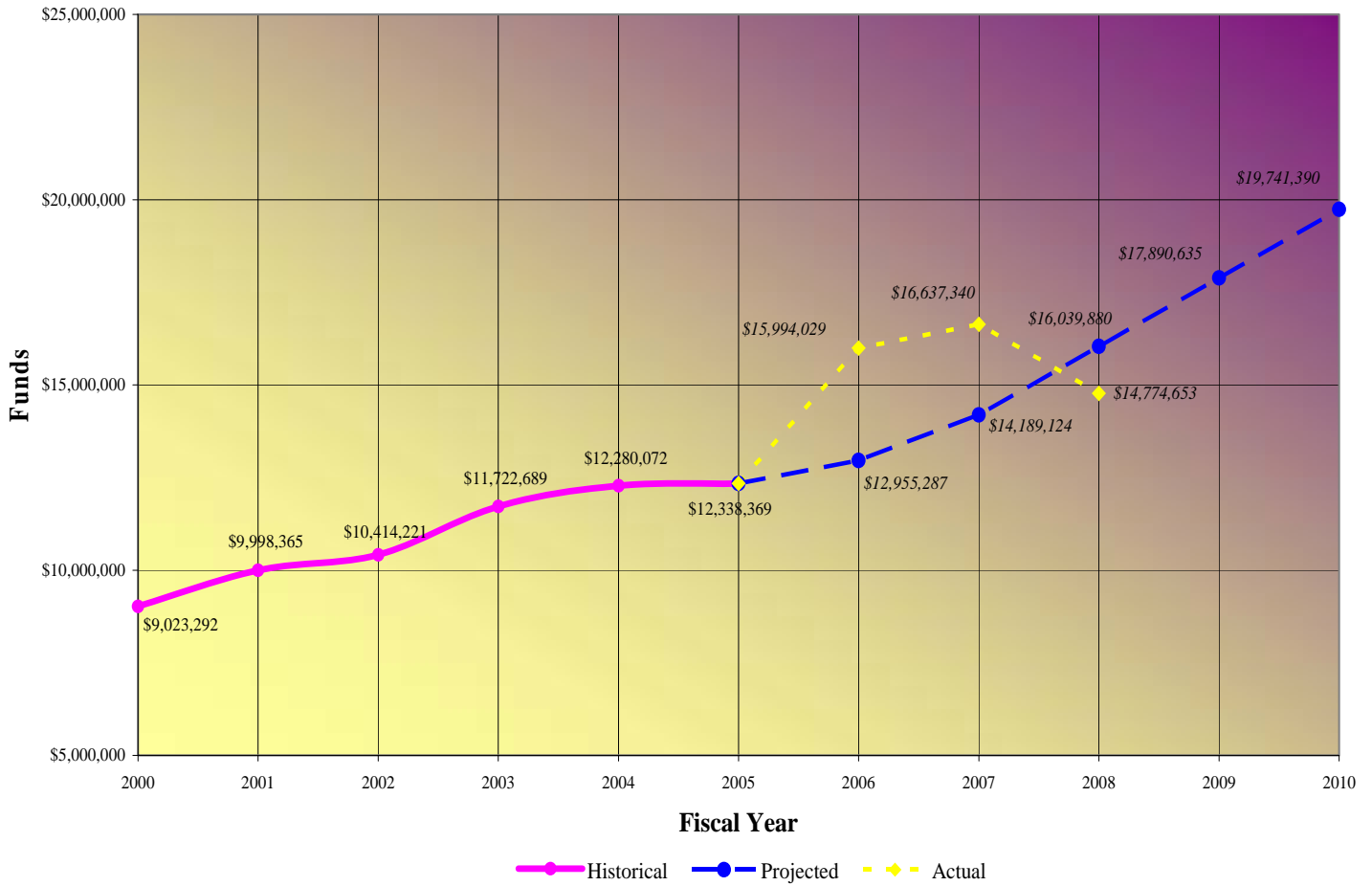


TABLE I

**Proposals Submitted and Awards Received
by University Unit
FY 2007-08**

University Unit	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Agricultural & Human Sciences*	10	\$1,437,894	16	\$996,591
Arts & Sciences*	7	\$1,435,020	8	\$263,020
Business Administration*	11	\$423,015	13	\$908,304
Education*	22	\$2,136,707	18	\$1,280,882
Engineering*	2	\$214,068	3	\$244,068
Interdisciplinary Studies and Extended Education	2	\$150,000	2	\$170,000
Administrative Offices*	3	\$74,000	5	\$63,877
C/E Energy Systems Research**	26	\$6,990,813	22	\$2,483,998
C/E Manufacturing Research**	37	\$9,906,634	27	\$3,996,467
C/E Water Resources Research**	33	\$5,454,172	52	\$3,030,730
STEM Center**	12	\$5,588,981	8	\$1,336,716
TOTAL	165	\$33,811,304	174	\$14,774,653

* Without Centers of Excellence or STEM Center

** See Table II

NOTE: The number of awards received may be greater than the number of proposals submitted because proposals submitted in previous years could be awarded in the current year.

TABLE II

**Proposals Submitted and Awards Received
Through Centers of Excellence and STEM Center
by Academic Unit
FY 2007-08**

Center/Academic Unit	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Energy Systems Research				
Center	3	\$974,402	3	\$1,009,002
Center/Basic Engineering	-	-	1	\$35,000
Center/Chemical Engineering	3	\$613,558	-	-
Center/Civil and Environmental Engineering	4	\$570,095	6	\$191,844
Center/Civil and Environmental Engineering/Mechanical Engineering	1	\$24,000	1	\$12,500
Center/Electrical and Computer Engineering	8	\$3,947,021	7	\$1,012,874
Center/Manufacturing and Industrial Technology	1	\$20,000	1	\$43,993
Center/Manufacturing and Industrial Technology/Electrical and Computer Engineering	1	\$129,950	1	\$34,425
Center/Mechanical Engineering	3	\$611,173	-	-
Center/Mechanical Engineering/Basic Engineering	1	\$35,000	-	-
Center/Mechanical Engineering/Electrical and Computer Engineering	-	-	1	\$78,746
Center/Mechanical Engineering/Manufacturing and Industrial Technology	1	\$65,614	1	\$65,614
Total Energy Center	26	\$6,990,813	22	\$2,483,998

TABLE II, cont'd

**Proposals Submitted and Awards Received
Through Centers of Excellence and STEM Center
by Academic Unit
FY 2007-08**

Center/Academic Unit	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Manufacturing Center				
Center	14	\$5,196,957	8	\$2,076,028
Center/Chemical Engineering	3	\$352,055	3	\$74,730
Center/Chemical Engineering/ Mechanical Engineering/Earth Sciences	1	\$481,230	-	-
Center/Computer Science	6	\$1,274,869	5	\$340,879
Center/Electrical and Computer Engineering	6	\$1,453,396	4	\$295,447
Center/Electrical and Computer Engineering/Earth Sciences	1	\$307,809	-	-
Center/Electrical and Computer Engineering/Mechanical Engineering	2	\$519,980	1	\$20,000
Center/Manufacturing and Industrial Technology	1	\$215,338	-	-
Center/Mechanical Engineering	3	\$105,000	6	\$1,189,383
Total Manufacturing Center	37	\$9,906,634	27	\$3,996,467

TABLE II, cont'd

**Proposals Submitted and Awards Received
Through Centers of Excellence and STEM Center
by Academic Unit
FY 2007-08**

Center/Academic Unit	Proposals Submitted	Amount Requested	Awards Received	Amount Received
<u>Water Resources Research</u>				
Center	9	\$1,661,903	15	\$1,763,322
Center/Agriculture	2	\$499,845	1	\$187,690
Center/Biology	7	\$573,392	18	\$514,200
Center/Biology/Civil and Environmental Engineering	-	-	1	\$15,000
Center/Chemical Engineering			1	\$50,000
Center/Chemistry	2	\$80,000	4	\$93,790
Center/Civil and Environmental Engineering	4	\$422,600	4	\$130,308
Center/Civil and Environmental Engineering/Electrical and Computer Engineering	1	\$116,552	-	-
Center/Civil and Environmental Engineering/Engineering Administration	1	\$387,227	-	-
Center/Cooperative Fisheries Unit	3	\$40,095	6	\$177,230
Center/Earth Sciences	1	\$85,000	1	\$42,500
Center/Exercise Science and Physical Education/Human Ecology/Agriculture	1	\$947,178	-	-
Center/Human Ecology/Agriculture	-	-	1	\$56,690
Center/Mathematics	1	\$219,495	-	-
Center/University Police	1	\$420,885	-	-
Total Water Center	33	\$5,454,172	52	\$3,030,730

TABLE II, cont'd

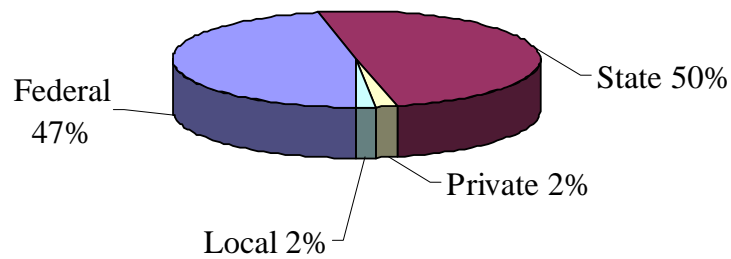
**Proposals Submitted and Awards Received
Through Centers of Excellence and STEM Center
by Academic Unit
FY 2007-08**

Center/Academic Unit	Proposals Submitted	Amount Requested	Awards Received	Amount Received
STEM Center				
Center	1	\$48,600	1	\$25,805
Center/Academic Affairs/Research	1	\$992,158	-	-
Center/Basic Engineering/ Engineering Administration	1	\$1,861,792	1	\$588,830
Center/Curriculum and Instruction	4	\$708,963	2	\$419,202
Center/Curriculum and Instruction/ Economics, Finance and Marketing/Mathematics	-	-	1	\$144,214
Center/Curriculum and Instruction/ Mathematics	2	\$157,663	1	\$86,126
Center/Facilities and Business Services	1	\$752,000	-	-
Center/Mechanical Engineering/ Mathematics/Chemical Engineering/ Engineering Minority Program	1	\$999,951	-	-
Center/Physics	1	\$67,854	2	\$72,539
Total STEM Center	12	\$5,588,981	8	\$1,336,716
GRAND TOTAL	108	\$27,940,600	109	\$10,847,911

TABLE III

**Proposals Submitted and Awards Received
by Agency Classification
FY 2007-08**

Agency Classification	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Federal	92	\$23,889,612	99	\$6,896,065
State	45	\$8,416,370	55	\$7,326,215
Private	24	\$1,210,380	16	\$299,931
Local	4	\$294,942	4	\$252,442
TOTAL	165	\$33,811,304	174	\$14,774,653



**Figure 2. Percentage Funding by Agency Classification
FY 2007-08**

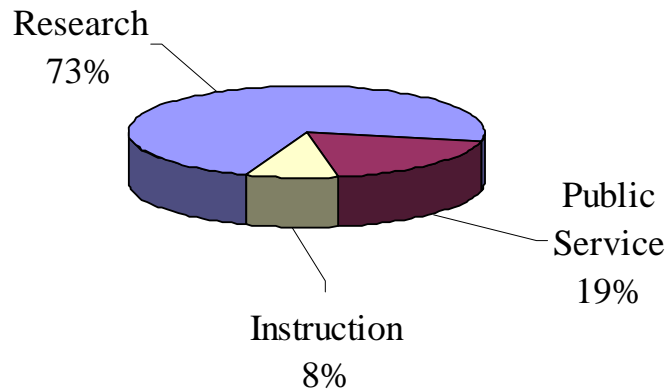
TABLE IV**Federal Awards Received by Agency
FY 2007-08**

Federal Agencies	Awards Received
National Aeronautics and Space Administration	\$121,104
National Endowment for the Humanities	\$25,200
National Park Service	\$25,000
National Institutes of Health	\$38,676
National Science Foundation	\$1,285,809
Oak Ridge National Laboratory	\$14,000
Office of Naval Research	\$146,892
Sandia National Laboratories	\$50,000
Tennessee Department of Education	\$22,700
Tennessee Wildlife Resources Agency	\$45,000
U. S. Army	\$850,000
U. S. Department of Agriculture	\$275,515
U. S. Department of Energy	\$286,789
U. S. Department of Justice	\$3,930
U. S. Department of the Interior	\$36,650
U. S. Fish and Wildlife Service	\$87,621
U. S. Geological Survey	\$36,380
Total DIRECT Federal Dollars	\$3,351,266

TABLE V

**Proposals Submitted and Awards Received
by Activity
FY 2007-08**

Activity/Use	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Research	104	\$27,769,484	108	\$10,722,678
Public Service	34	\$2,383,818	45	\$2,808,781
Instruction	13	\$1,704,446	21	\$1,243,194
TOTAL	165	\$33,811,304	174	\$14,774,653

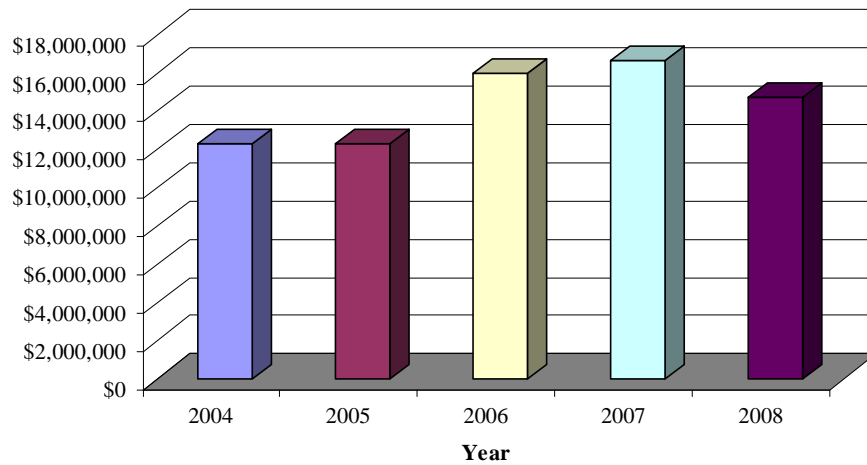


**Figure 3. Percentage Funding by Activity
FY 2007-08**

TABLE VI

**Proposals Submitted and Awards Received
FY 2004-08**

Fiscal Year	Proposals Submitted	Amount Requested	Awards Received	Amount Received
2004	193	\$32,987,186	159	\$12,280,072
2005	153	\$37,713,825	154	\$12,338,369
2006	194	\$55,412,527	174	\$15,994,029
2007	190	\$36,986,928	171	\$16,637,340
2008	165	\$33,811,304	174	\$14,774,653

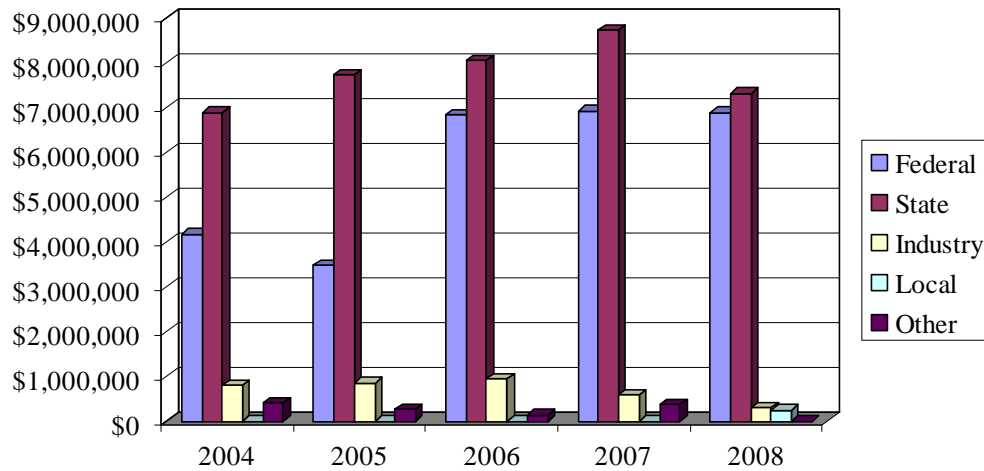


**Figure 4. External Funds Received
FY 2004-FY 2008**

TABLE VII

**Awards Received and Award Amounts
by Classification
FY 2004-08**

Fiscal Year	Federal		State		Industry		Local		Other	
	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount
2004	60	\$4,174,244	56	\$6,895,156	34	\$810,510	-	-	9	\$400,162
2005	61	\$3,486,617	65	\$7,722,363	17	\$859,395	-	-	11	\$269,997
2006	74	\$6,840,614	69	\$8,060,198	22	\$952,514	-	-	9	\$140,703
2007	79	\$6,933,526	70	\$8,742,157	10	\$578,532	-	-	12	\$383,125
2008	99	\$6,896,065	55	\$7,326,215	16	\$299,931	4	\$252,442	-	-



**Figure 5. Funding Received by Classification
FY 2004-08**

TABLE VIII

**Awards Received and Award Amounts
by Type of Activity
FY 2004-08**

Fiscal Year	Research		Public Service		Instruction		Operation/ Maintenance		Academic Support		Institutional Support		Capital Project		Fellowship/ Scholarships	
	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount
2004	119	\$7,530,479	26	\$2,678,234	8	\$1,647,836	-	-	-	-	-	-	5	\$423,523	-	-
2005	115	\$8,363,691	24	\$2,600,879	12	\$1,015,064	-	-	-	-	-	-	3	\$358,735	-	-
2006	123	\$10,079,726	34	\$3,331,969	16	\$2,547,334	-	-	-	-	-	-	1	\$35,000	-	-
2007	112	\$11,576,413	47	\$3,711,068	10	\$1,114,859	-	-	-	-	-	-	2	\$235,000	-	-
2008	108	\$10,722,678	45	\$2,808,781	12	\$969,961	4	\$168,415	3	\$81,068	1	\$18,750	-	-	1	\$5,000

RESEARCH COMPLIANCE AND GENERAL COMPLIANCE SUPPORT

Research Compliance

The Office of Research is responsible for monitoring compliance with the federal policies that regulate research activities in the following areas: responsible conduct of research, research ethics, human subjects research, the humane care of laboratory animals used in research and experimentation, the management of conflicts of interest in research, research integrity, export laws, and other areas of oversight.

It is the responsibility of the Research Office personnel to make sure these compliances are adhered to by the investigator(s) involved in the research. A research contract may involve both federal and state compliances in addition to those required by the funding agency, which could be private.

General Compliance Support

Several University Standing Committees are regulated federally and must meet certain compliance criteria, as well as other special committees. These committees are, in general, research related and are associated with the Office of Research. The Associate Vice President serves as the Executive Officer for these committees which include: the Institutional Committee for the Humane Care and Use of Laboratory Animals in Experimentation, the Institutional Review Committee for Human Subjects, the Advisory Committee on Patents and Copyrights, the Faculty Research Committee, and the Caplenor Faculty Research Award Committee. The Annual Report of each of these Committees is on file in the Office of Research and Graduate Studies.

**INSTITUTIONAL COMMITTEE FOR THE CARE AND USE
OF LABORATORY ANIMALS IN EXPERIMENTATION
2007-08**

The Institutional Committee for the Care and Use of Laboratory Animals in Experimentation provides for and protects the welfare of laboratory animals used for research and pedagogy as set forth by the University and in accordance with the Public Health Service Act (PHS Act) mandated by the Health Research Extension Act of 1985, Public Law 99-158, and its amendments from the U.S. Department of Agriculture, 9 CFR 9, Parts 1-3. The committee membership includes faculty, administrators, a veterinarian, and a community representative. The Committee reports to the Administrative Council.

Meeting Dates

September 20, 2007 March 20, 2008

Committee Members

Dr. Gerald Barker, Veterinarian	Mr. Ray Jordan, Biology
Dr. Bruce Greene, Agriculture	Dr. Christy Killman, Health and Physical Education
Dr. Steve Hayslette, Biology (Chair)	Dr. Jessica Matson, Industrial and Systems Engineering
Dr. Wesley Henry, Clergy	Dr. Francis Otuonye, Executive Officer
Ms. Tammy Howard, Nursing	

Committee Actions

- The Committee performed laboratory inspections in 2007-08 during the months of September and March.
- The Committee reviewed one application for use of animals in experimentation-Dr. Steve Hayslette, Department of Biology. The proposal was approved.
- Because of rising costs of maintaining animal laboratories and the need to meet federally-mandated guidelines with respect to animal care, the Committee is requesting University funding to support and maintain animal laboratories which are not supported by outside funding sources. Costs associated with maintaining the herptile/mammals laboratories in Pennebaker Hall and the captive avian facility are estimated at \$4,000 and \$400 per year, respectively.

**INSTITUTIONAL REVIEW COMMITTEE
FOR HUMAN SUBJECTS
2007-08**

The Institutional Review Committee for Human Subjects serves as the review board in accordance with the requirements for the protection of human subjects as set forth by the regulations created by Congress (Code of Federal Regulations, Title 45, Part 46). The committee is composed of faculty, administrators, and persons not affiliated with the University. It reports to the Administrative Council. The use of human subjects in any experimental environment, whether it be research (funded or non-funded), or other scholarly activities such as surveys, questionnaires, and classroom experiences, must be reviewed and approved by the committee.

Meeting Dates

September 10, 2007 April 7, 2008
November 5, 2007

Committee Members

Dr. Tony Baker, English (Chair)	Dr. Shelia Green, Nursing
Dr. Sharon Berk, Biology	Dr. Don Loskot, Counseling and Psychology
Dr. Patricia Campion, Sociology and Philosophy	Dr. Lachelle Norris, Sociology and Political Science
Dr. Michael Clark, Music and Art	Mr. James Rogers, Minister, Smyrna Church of Christ
Dr. Jan Cupp, Counseling and Psychology	Dr. Lisa Zagumny, Curriculum and Instruction
Dr. Ismail Fidan, Manufacturing and Industrial Technology	Dr. Francis Otuonye, Executive Officer
Dr. Linda Giesbrecht-Bettoli, Counseling and Psychology	

Committee Actions

- During the 2007-08 academic year, the Committee received 190 research proposals classified as exempt, 32 research proposals requiring expedited review from three Committee members each, and one research proposal requiring full Committee review.
- The Committee approved the addition of a checklist designed to help researchers compose Informed Consent Forms; the checklist is available online with Forms A and B.
- The Committee articulated criteria for making distinctions between proposals requiring expedited review and those requiring full board review.
- The Committee initiated changes to distribute review work more efficiently among members. Instead of the IRB chair serving as default lead reviewer, now experienced IRB members serve as lead reviewers. As before, two additional reviewers are assigned to each expedited proposal. The new lead reviewer system has effectively relieved the considerable workload previously borne by the Committee chair.

**ADVISORY COMMITTEE ON
PATENTS AND COPYRIGHTS
2007-08**

Tennessee Technological University acknowledges that the faculty and staff may from time to time conceive of an idea or discover a process that could lead to the development of a patent or the production of copyrightable materials. The University encourages such activities by the faculty and staff and recognizes its responsibility to see that ideas and discoveries are administered for the best interest of all parties concerned, including the public. The University has established an Advisory Committee on Patents and Copyrights for the purpose of advising the President on all matters involving patents and copyrights. Membership is composed of faculty and staff experienced in research, innovation, and the production of copyrightable materials. A majority of the membership is from the faculty.

Meeting Dates		
September 11, 2007	November 13, 2007	February 7, 2008
October 19, 2007	January 15, 2008	March 18, 2008

Committee Members

Dr. Mohamed Abdelrahman, Electrical and Computer Engineering	Ms. Pat McGee, Library
Dr. Ali Alouani, Electrical and Computer Engineering	Dr. Christine Miller, Decision Sciences and Management
Dr. Michael Best, Agriculture (Chair)	Dr. Scott Northrup, Chemistry
Dr. John Boots, Student	Dr. Jon Schwenk, Student
Dr. Sherrie Foster, Counseling and Psychology	Dr. Ken Wiant, Economics, Finance and Marketing
Dr. Kim Hanna, Nursing	Dr. Francis Otuonye, Executive Officer

Committee Actions

- The Committee approved for full patent applications to be filed for Dr. Mohamed Abdelrahman and Mr. Michael Baswell for the invention “An Impedence Measurement Device for Non-Destructive Greensand Mold Inspection” and Drs. Holly Stretz, Pedro Arce, and Mr. Jeffrey Thompson for the invention “Nanoparticle-Templated Composite Gels for Separations.”
- The Committee approved the funding of the marketing and development costs for “My Health Track Smart Card” not to exceed \$15,500 through PMR, Inc.
- All rights to the invention “Fire Fighting Robot” were approved to be returned to Dr. Ali Alouani.
- The Committee approved a provisional patent application for the invention “Apparatus and Method for Screening Lung Tumor at Early Stage Using Noninvasive Respiratory Sound Data.”
- The Committee approved a utility patent application for the work developed by Dr. Stephen Canfield on his climbing robot invention.

FACULTY RESEARCH COMMITTEE 2007-08

The Faculty Research Program was established in the fall quarter of 1963 to: 1) stimulate interest in research on the part of the faculty; 2) provide institutional assistance to faculty members who wish to undertake research projects; and 3) assist in the dissemination of information developed in faculty research projects. The research program provides support for investigations of new research areas for the faculty members involved. The results of such support are expected to be publications or other dissemination of results and, where appropriate, proposals for external funding. It is anticipated that the results of faculty research will filter downward into the classroom, particularly to graduate courses. The Faculty Research Program is coordinated by the Faculty Research Committee. This committee consists of nine faculty members with the Associate Vice President of Research serving as Executive Officer.

Meeting Dates

October 11, 2007 February 7, 2008
January 31, 2008

Committee Members

Dr. Phillip Bettoli, Biology	Dr. Richard Le Borne, Mathematics
Dr. Michael Burduck, English (Chair)	Dr. Deborah Setliff, Curriculum and Instruction
Dr. Ferdinand DiFurio, Economics, Finance and Marketing	Dr. Kim Stearman, Water Center
Dr. Melissa Geist, Nursing	Dr. Donald Visco, Chemical Engineering
Dr. Xubin He, Electrical and Computer Engineering	Dr. Lisa Zagumny, Curriculum and Instruction
	Dr. Francis Otuonye, Executive Officer

Committee Actions

- The Faculty Research Committee awarded 22 projects involving 26 faculty members for a total amount of \$90,620.
- Five (5) Research Initiation proposals were funded, and 17 Research Development proposals were funded.
- The Committee held two proposal development workshops during fall semester.

**CAPLENOR FACULTY RESEARCH AWARD COMMITTEE
2007-08**

The Caplenor Faculty Research Award, established in 1984 in honor of the late Dr. Charles Donald Caplenor, former Associate Vice President for Research and Dean of Instructional Development, is awarded annually to one member of the faculty of Tennessee Technological University for outstanding research accomplished while employed at the University.

Meeting Dates

September 6, 2007 November 1, 2007
October 23, 2007

Committee Members

Dr. Lewis K. Crouch, Civil and Environment Engineering	Dr. Joseph Ojo, Electrical and Computer Engineering (Chair)
Dr. Melissa Geist, Nursing	Dr. Michael Redding, Biology
Dr. Tor Guimaraes, Decision Sciences and Management	Dr. Kim Stearman, Water Center
Dr. Rhonda Folio, Curriculum and Instruction	Dr. Francis Otuonye, Executive Officer

Committee Actions

- Dr. Phillip Bettoli, Biology, and Dr. Kwun-Lon Ting, Mechanical Engineering, were the recipients of the 2007-08 Caplenor Faculty Research Award.

Appendices

Appendix A gives the external funds brought into the University by College/Area and by Departments/Units. The gift from the Tennessee Higher Education Commission (THEC) to the three Centers of Excellence is included in the external funding, which makes up 25% of the total external funds received. Administrators, faculty, and staff were responsible for approximately \$11 million, or the remaining 75% of the total grant income.

Appendix B gives the total amount of research funds brought into the University from external sources by college/area, departments/units within a given college, the faculty/administrators/staff responsible for writing the proposal(s), the funding agency, and the amount of funding received.

Appendix C summarizes the intellectual property activity in the areas of patents and copyrights.

Appendix D summarizes the Faculty Research Committee awards.

Appendix A

Externally Funded Projects by College/Area, Academic Unit and Funding Amount Fiscal Year 2007-08

PI's College	PI's Department, Center, or Unit	Centers of Excellence				Departments/ Other Units	Total
		Energy Center	Manufacturing Center	Water Center	STEM Center		
Agricultural and Human Sciences	Agriculture					\$142,431	\$142,431
	Human Ecology			\$56,690		\$849,154	\$905,844
	Dean's Office					\$5,006	\$5,006
Subtotal							\$1,053,281
Arts and Sciences	Biology			\$529,200			\$529,200
	Chemistry			\$93,790		\$41,829	\$135,619
	Computer Science		\$340,879				\$340,879
	Cooperative Fisheries Research Unit			\$177,230		\$30,000	\$207,230
	Earth Sciences			\$42,500			\$42,500
	English					\$15,000	\$15,000
	History					\$85,191	\$85,191
	Physics				\$72,539	\$91,000	\$163,539
Subtotal							\$1,519,158
Business	Decision Sciences and Management					\$123,300	\$123,300
	Economics, Finance and Marketing					\$30,345	\$30,345
	Business Administration					\$75,223	\$75,223
	Business Media Center					\$679,436	\$679,436
Subtotal							\$908,304
Education	Academic Development					\$10,000	\$10,000
	Counseling and Psychology					\$244,474	\$244,474
	Curriculum and Instruction				\$505,328	\$840,609	\$1,345,937
	Doctoral Studies					\$140,000	\$140,000
	Exercise Science and Physical Education					\$41,799	\$41,799
	Music and Art					\$4,000	\$4,000
Subtotal							\$1,786,210

Appendix A, cont'd

**Externally Funded Projects
by College/Area, Academic Unit and Funding Amount
Fiscal Year 2007-08**

PI's College	PI's Department, Center, or Unit	Centers of Excellence				STEM Center	Departments/ Other Units	Total
		Energy Center	Manufacturing Center	Water Center				
Engineering	Basic Engineering				\$588,830	\$180,000	\$768,830	
	Chemical Engineering		\$74,730	\$50,000			\$124,730	
	Civil and Environmental Engineering	\$190,254		\$125,308		\$34,068	\$349,630	
	Electrical and Computer Engineering	\$550,224	\$208,178				\$758,402	
	Manufacturing and Industrial Technology	\$78,418					\$78,418	
	Mechanical Engineering	\$179,360	\$1,189,383			\$30,000	\$1,398,743	
	Engineering Other			\$5,000			\$5,000	
Subtotal							\$3,483,753	
Centers of Excellence	Energy Center Appropriation	\$939,700					\$939,700	
	Energy Center Other	\$546,042					\$546,042	
	Manufacturing Center Appropriation		\$1,581,700				\$1,581,700	
	Manufacturing Center Other		\$601,597				\$601,597	
	Water Center Appropriation			\$1,243,900			\$1,243,900	
	Water Center Other			\$707,112			\$707,112	
Subtotal							\$5,620,051	
Interdisciplinary Studies/ Extended Education	Extended Education					\$170,000	\$170,000	
Subtotal							\$170,000	
Other	Minority Affairs					\$37,000	\$37,000	
	Office of Research and Graduate Studies					\$4,197	\$4,197	
	STEM Center				\$170,019		\$170,019	
	Student Affairs					\$18,750	\$18,750	
	University Police					\$3,930	\$3,930	
Subtotal							\$233,896	
Total	All Units	\$2,483,998	\$3,996,467	\$3,030,730	\$1,336,716	\$3,926,742	\$14,774,653	

Appendix B
Externally Funded Projects
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Administration: 5 Administrators; 6 Projects			\$233,877	
<i>Minority Affairs</i>	Robert Owens	Summer Bridge Program for Ethnic Minorities and the Economically Disadvantaged	Tennessee Board of Regents	\$37,000
<i>Research and Graduate Studies</i>	Sammie Sparks	Community Opportunities, Training and Educational Services	Upper Cumberland Human Resources Agency	\$4,197
<i>School of Interdisciplinary Studies/Extended Education</i>	Susan Elkins	New Occupational Teacher Training and Mentorship Program	Tennessee Department of Education	\$120,000
		P-16 Outreach Partnerships: Increasing Diversity and Enrollment in Engineering and STEM Disciplines	Tennessee Board of Regents	\$50,000
<i>Student Affairs</i>	Marc Burnett	Professional Development Opportunities: Strategies for Attracting and Retaining Underrepresented Faculty and Staff	Tennessee Board of Regents	\$18,750
<i>University Police</i>	Gay Shepherd	Bulletproof Vest Partnership	U. S. Department of Justice	\$3,930

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Agriculture and Human Ecology: 7 Researchers, 12 Projects			\$1,053,281	
<i>Dean's Office</i>	Pat Bagley	Enhancement of the Agricultural Learning Facilities at Hyder-Burks Pavilion and Shipley Farm at TTU	Tennessee Department of Agriculture	\$5,006
<i>Agriculture</i>	Ben Byler	Tennessee Association FFA Camp Clements Leadership Grant 2007-2010	Tennessee Department of Education	\$100,587
		Agricultural Education In-Service Program 2007-2010		\$14,348
		Tennessee Association FFA Camp Clements Grant-Maintenance Utility Worker 2007-08		\$27,496
<i>Human Ecology</i>	Sue Bailey	Tennessee Early Childhood Training Alliance	Tennessee State University/Tennessee Department of Human Services	\$226,166
		FACS Vocational Education Basic Grant	Tennessee Department of Education	\$22,700
	Sue Bailey/Betty Vaudt	Upper Cumberland Child Care Resource and Referral-Project REEL	Tenn. Department of Human Services via Signal Centers of Chattanooga	\$82,500
		Upper Cumberland Child Care Resource and Referral	Tenn. Department of Human Services via Signal Centers of Chattanooga	\$413,817
		Upper Cumberland Child Care Resource and Referral and Inclusion Services	Tenn. Department of Human Services via Signal Centers of Chattanooga	\$10,000
		Upper Cumberland Child Care Resource and Referral-Project Students Against Meth (Project SAM)	Volunteer Tennessee	\$35,000
		Melinda Swafford	TDE Special Education Institute-Strand II 2007-08	Tennessee Department of Education
<i>Human Ecology/ Agriculture/Water Center</i>	Melinda Anderson/Janice Branson	Testing a Model to Increase Vegetable Intake and Reduce Obesity Indices in Rural Families through Hydroponic Gardening	U. S. Department of Agriculture	\$56,690

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Arts and Sciences: 28 Researchers, Projects 42			\$1,519,158	
<i>Biology/Water Center</i>	Bradford Cook	Protocol Development for Long-Term Monitoring of Rare Fish at Big South Fork National River and Recreation Area	U. S. Department of the Interior National Park Service	\$28,719
		Benthic Macroinvertebrate Assessment Associated with Brook Trout Restoration of Lynn Camp Prong, Great Smokey Mountains	Great Smokey Mountains National Park	\$24,075
		Habitat Characterization of the Nashville Crayfish (<i>Orconectes Shoupi</i>) in Mill Creek Watershed, Tennessee	U. S. Fish and Wildlife Service	\$18,318
		Threatened or Endangered Aquatic Insect Survey	U. S. Department of the Interior	\$7,931
	Daniel Combs	Distribution, Status, and Species-Habitat Relationships of the Green Salamander, <i>Aneides aeneus</i>	Tennessee Wildlife Resources Agency	\$20,000
	Steven Hayslette	Mourning Dove Recruitment in Tennessee	U. S. Fish and Wildlife Service	\$26,099
	Hayden Mattingly	Science Advisory Committee Coordination for the Cumberland Habitat Conservation Plan	The Nature Conservancy	\$20,000
		Life History and Reproductive Ecology of the Imperiled Williams' Crayfish, <i>Orconectes williamsi</i> Fitzpatrick 1966 (Cambaridae)	Missouri Department of Conservation	\$28,490
		Population, Status, and Monitoring of the Imperiled Barrens Topminnow, <i>Fundulus julisia</i>	Tennessee Wildlife Resources Agency	\$6,000
	Hayden Mattingly/Daniel Combs	Distribution, Status and Species-Habitat Relationships of the Rare Barrens Darter, <i>Etheostoma forbesi</i>	U. S. Fish and Wildlife Service	\$45,000
	Kenneth Morgan/Thomas Roberts	Ecological Assessment of Wetland Inventory at Fort Campbell, Kentucky	U. S. Army Corps of Engineers (via U. S. Department of Defense)	\$199,000

Appendix B, cont'd
Externally Funded Projects
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Arts and Sciences, continued:				
<i>Biology/Water Center continued</i>	Thomas Roberts	Collection of Deer Check Stations	Tennessee Wildlife Resources Agency	\$3,000
	Thomas Roberts/ Kenneth Morgan	Black Swamp Hydrogeomorphic Bottomland Hardwood Functional Assessment	Tennessee Wildlife Resources Agency	\$10,000
		Monitoring the Plant Community at the Yuchi Waterfowl Project		\$5,181
		Monitoring Groundwater Hydrology and Selected Plant Communities at the Three Rivers Mitigation Bank		\$16,620
		Monitoring the Hydrology and Selected Plant Communities at the Hatchie River Wetland Mitigation Bank	Tennessee Wildlife Resources Foundation	\$30,767
		Development of Geo-Referenced Database to Identify and Inventory Wetlands at Little River Canyon National Preservation	National Park Service	\$25,000
<i>Biology/Civil and Environmental Engineering/Water Center</i>	Hayden Mattingly/ Vincent Neary	Conservation and Recovery of Barrens Topminnow Populations Exposed to Invasive Mosquitofish	U. S. Fish and Wildlife Service	\$15,000
<i>Chemistry</i>	John Harwood/ Thurston Banks/ Jeffrey Boles	CCLI: Micro Total Analysis System in Undergraduate Biochemistry and Analytical Chemistry	National Science Foundation	\$41,829
<i>Chemistry/Water Center</i>	Dale Ensor	Separation Studies of /f/-Elements	Oak Ridge National Laboratory	\$14,000
		Nuclear Energy Research Initiative for Consortia (NERI-C)	Washington State University	\$24,790
	John Harwood	Application of CADDIS to an Impaired Mixed Urban/Rural Watershed	Tennessee Department of Environment and Conservation	\$25,000
	Hong Zhang	Molecular Photoredox Chemistry of Mercury in Aquatic Systems: Kinetics, Mechanisms and Environmental Implications	Oak Ridge National Laboratories (via U. S. Department of Energy)	\$30,000

Appendix B, cont'd
Externally Funded Projects
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Arts and Sciences, continued:				
<i>Computer Science/ Manufacturing Center</i>	Frank Hadlock	Smart Card Health-Care Demonstration	State of Tennessee	\$72,000
	William Eberle	Insider Threat Detection Using Graph-Based Approach	Washington State University (via U. S. Department of Health and Human Services)	\$60,074
	Douglas Talbert	Improving the Triage Process with Trimmed Machine Learning Models	University of Central Florida (via National Institutes for Health)	\$38,676
	Douglas Talbert/ Michael Rogers	VEHI Subcontract with Vanderbilt	Vanderbilt University	\$170,129
<i>Co-op Fisheries Unit</i>	James Layzer/ Phillip Bettoli	TWRA Base Funds	Tennessee Wildlife Resources Agency	\$30,000
<i>Co-op Fisheries Unit/Water Center</i>	Phillip Bettoli	Mississippi River Sturgeon Telemetry Project	Tennessee Wildlife Resources Agency	\$25,000
		Evaluation of Fish Stockings into Tennessee Warm Water and Cool Water Reservoirs		\$35,850
		Reservoir Trout Fisheries		\$70,000
	James Layzer	Development and Testing of a Protocol for Monitoring Mussels	U. S. Geological Survey	\$17,513
		Research Directed at the Recovery of Endangered Mussels		\$18,867
		Assess the Fish and Mussel Communities Associated with the Green River/Glenview Nature Preserve	Green County, Kentucky	\$10,000
<i>Earth Sciences/ Water Center</i>	Hugh Mills/Evan Hart, Peter Li	Cookeville Sinkhole Flood Plain Map Project	City of Cookeville	\$42,500
<i>English</i>	Homer Kemp	THC Computerization Project	Tennessee Historical Commission	\$15,000

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Arts and Sciences, continued:				
<i>History</i>	Katherine Osburn	Faculty Research Fellowship	National Endowment for the Humanities	\$25,200
	Jeff Roberts and Michael Birdwell	Cumberland Plateau Consortium Teaching American History	White County Board of Education via U. S. Department of Education	\$59,991
<i>Physics</i>	Sakir Ayik	Studies of Fluctuation Processes in Nuclear Collisions	U. S. Department of Energy	\$37,000
	Raymond Kozub	Nuclear Physics with Radioactive Ion Beams	U. S. Department of Energy	\$54,000
<i>Physics/STEM Center</i>	Paula Engelhardt/ Stephen Robinson	CCLI: Developing a Learner-centered Environment for Algebra-based Physics (LEAP)	National Science Foundation	\$51,033
	Stephen Robinson	Developing a Large Enrollment Physics (LEP) Curriculum	San Diego State University Foundation (via U. S. Department of Education)	\$21,506

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Business Administration: 8 Researchers, 12 Projects			\$908,304	
<i>Business Media Center</i>	Kevin Liska	Developing and Marketing Web Delivery of Annual Perkins Reports-Parts I and II	Tennessee Board of Regents	\$50,000
		Tennessee Board of Regents-Workforce Development		\$40,000
		Post Katrina Marketing for Southern University of New Orleans	State of Louisiana	\$24,990
		Ollie Otter's Seat Belt Education Program	Tennessee Department of Safety	\$18,000
		Ollie's Seatbelt Safety Toolkit	Tennessee Department of Transportation	\$49,996
		Interactive Website-Statewide Tennessee Small Business Development Center	Middle Tennessee State University-TSBDC Lead Center	\$10,000
	Kevin Liska/Ferdinand Difurio, J. D. Weinrauch	Tennessee Board of Regents Marketing RODP Campaign	Tennessee Board of Regents	\$486,450
<i>Decision Sciences and Management</i>	Curtis Armstrong	Governor's School for Information Technology Leadership	Tennessee Department of Education	\$123,300
<i>Economics, Finance and Marketing</i>	Ferdinand Difurio	Small Business Loan Program 2007-08	Tennessee Department of Economic and Community Development	\$10,500
	Ferdinand Difurio/Steven Isbell, Kenneth Wiant	Life Cycle Cost Analysis-Independent Review	Babcock & Wilcox Technical Services Y-12, LLC (via Department of Energy)	\$19,845
<i>Small Business Development Center</i>	Vicki Henley	USDA Rural Business Enterprise Grant	U. S. Department of Agriculture	\$20,000
	Vicki Henley/Virginia Moore	TTU Small Business Development Center 2008	Tennessee Small Business Development Center	\$55,223

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Education: 21 Researchers, 18 Projects			\$1,786,210	
<i>Academic Development</i>	Janet Whiteaker	Academic Development Learning Center (ADLC) Enhancement	Tennessee Board of Regents	\$10,000
<i>Counseling and Psychology</i>	Barry Stein/Ada Haynes and Michael Redding	CAT National Dissemination Assessment and Improvement of Learning	National Science Foundation	\$244,474
<i>Craft Center</i>	Gail Gentry	Hands-On Craft Program for Elementary School Students	Tennessee Arts Commission	\$4,000
<i>Curriculum and Instruction</i>	Shannon Collins/Sandy H. Smith	Upper Cumberland Writing Project	National Writing Project	\$30,000
	Helen Dainty	Picture This: Even More Success for Students with Autism when Special and General Educators Collaborate	Tennessee Higher Education Commission	\$57,500
	Michael Mayton	Healthy Start for Upper Cumberland Families and Young Children	Holland T. Stephens Center	\$12,876
	Carl Owens	Special Ed Programs and Services	Tennessee Department of Education	\$5,000
	Larry Peach	Tennessee's Early Intervention System	Tennessee Department of Education	\$306,252
	Thomas Willis	TDE Special Education Institute – Strand I	Tennessee Department of Education	\$187,934
		TTU Base-Tennessee Teaching Program		\$74,625
<i>Curriculum and Instruction/Child Development Lab</i>	Jane Baker/Angie Smith	Tennessee Early Childhood Education Pilot Program	Tennessee Department of Education	\$79,158
	Larry Peach,/ Angie Smith, Matthew Smith	Child and Adult Food Care Program	Tennessee Department of Human Services	\$33,264
<i>Curriculum and Instruction/English</i>	Shannon Collins/Anthony Baker	Write On! Developing Teachers of Writers and Readers	Tennessee Higher Education Commission	\$54,000
<i>Curriculum and Instruction/STEM Center</i>	Susan Gore	Upper Cumberland Middle Grades Science Partnership	Tennessee Department of Education	\$349,202

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Education, continued:				
<i>Curriculum and Instruction/STEM Center</i>	Holly Anthony	Developing Algebraic Reasoning in Grades 3-5 Classrooms	Tennessee Higher Education Commission	\$70,000
<i>Curriculum and Instruction/Mathematics/STEM Center</i>	Holly Anthony/ David Smith	Learning from Data: Sense, Nonsense and Statistics (GEAR UP)	Tennessee Higher Education Commission	\$86,126
<i>Education Administration</i>	John Wheeler	TTU Positive Behavior Support and Intervention Project	Tennessee Department of Education	\$140,000
<i>Exercise Science and Physical Education</i>	J. P. Barfield/ Rhonda Folio	Determination of Predictors and Barriers to Minority Enrollment in Undergraduate Exercise Science and Allied Health Majors	Tennessee Board of Regents	\$41,799

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Engineering: 49 Researchers, 58 Projects			\$9,103,804	
<i>Basic Engineering/Extended Education</i>	Kenneth Hunter/ Susan Elkins	Governor's School for Emerging Technologies	Tennessee Department of Education	\$180,000
<i>Basic Engineering/STEM Center</i>	Kenneth Hunter/ Roy Loutzenheiser, Margaret Phelps	TTU Pre-Engineering Math Science Research Partnership	Tennessee Department of Education	\$588,830
<i>Chemical Engineering/Manufacturing Center</i>	Joseph Biernacki	Multi-Scale Kinetics-Based Model for Predicting Mechanical Property Development of Concrete Containing Supplementary Cementitious Materials	University of Michigan Ann Arbor via National Science Foundation	\$49,650
		International Summit on Cement Hydration Kinetics and Modeling	National Science Foundation	\$25,080
<i>Chemical Engineering/Water Center</i>	Donald Visco	PECASE: Developing Novel Scaffolds for Biological Molecules by Solving the I-QSAR Problem Using the Signature Molecular Descriptor	Sandia National Laboratories	\$50,000
<i>Civil and Environmental Engineering</i>	David Huddleston	College of Engineering Equipment Grant Fund	Tennessee Department of Commerce and Insurance	\$34,068
<i>Civil and Environmental Engineering/Energy Systems Research</i>	Daniel Badoe	Development of Tennessee Travel Demand Model Users' Group	University of Tennessee via Tennessee Department of Transportation	\$7,000
	Steven Click	Non-Traditional Interchange Improvements	Tennessee Department of Transportation	\$100,000
	Benjamin Mohr	Transport Kinetics of Internal Curing Water in High Performance Concretes	National Science Foundation	\$70,754
<i>Civil and Environmental Engineering/Mechanical Engineering/Energy Systems Research</i>	George Buchanan/John Peddieson	Mechanical Modeling heof Foam Mattresses	Tempur-Pedic	\$12,500

Appendix B, cont'd
Externally Funded Projects
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Engineering, continued:				
<i>Civil and Environmental Engineering/ Water Center</i>	Faisal Hossain	Defining Optimality Criteria for the Effective Use of Satellite Precipitation Datasets in Land Surface Hydrology and Water Cycle Studies	NASA (joint with University of Connecticut)	\$52,104
		Validating Prototype Global Precipitation Measurement Data Product in the SERVIR System	University of Mississippi (via NASA)	\$30,000
	Vincent Neary	Everglades Hydrodynamic Model Review	U. S. Fish and Wildlife Service	\$43,204
<i>Electrical and Computer Engineering/ Energy Systems Research</i>	Satish Mahajan	Methodology for Estimation of Loss of Life of a Wave Trap	Tennessee Valley Authority	\$40,000
	Satish Mahajan/ Wenzhong Gao, Sastry Munukutla, Ghadir Radman	Optimization of High Voltage Lines - Phase II	Oak Ridge National Laboratory	\$415,000
	Ghadir Radman	Proposed Collaborative Research Between TVA and TTU and Graduate Student Support	Tennessee Valley Authority	\$55,134
	Joseph Ojo	Mixed-Winding, High Phase Order Induction Machines with Multi-Phase, Multi-Level Converters for High Power Drive and Generator Applications	Office of Naval Research	\$40,090
<i>Electrical and Computer Engineering/ Manufacturing Center</i>	Xubin He	CSR-PDOS: A Benchmarking Framework for High-Availability Distributed Storage Systems	National Science Foundation	\$85,000
<i>Electrical and Computer Engineering/ Mechanical Engineering/ Manufacturing Center</i>	Mohamed Abdelrahman/ Sally Pardue	REU Site: Research Experiences for Undergraduates in the Industrial Application of Sensing, Modeling, and Controls	National Science Foundation	\$103,178
		Supplement to REU Site: Research Experiences for Undergraduates in the Industrial Application of Sensing, Modeling and Controls		\$20,000

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Engineering, continued				
<i>Energy Systems Research</i>	Sastry Munukutla	Center for Energy Systems Research	State of Tennessee	\$939,700
		Center for Energy Systems Research Carryover		\$69,302
<i>Energy Systems Research/Civil and Environmental Engineering</i>	Sastry Munukutla/James Beard, L. K. Crouch, Benjamin Mohr	Power-Test-Service Account	Various	\$14,090
<i>Energy Systems Research/Electrical and Computer Engineering</i>	Wenzhong Gao/Joseph Ojo	MRI: Acquisition of a Real Time Digital Simulator for Power and Energy Systems Research and Education	National Science Foundation	\$117,650
	Wenzhong Gao/Satish Mahajan, Ghadir Radman	Power System Application Development Using FNET Data	Oak Ridge National Laboratory	\$310,000
	Sastry Munukutla/Robert Craven, Mohamed Abdelrahman	Real-Time Performance Monitoring of Four Coal-Fired Units in Huntly Station	Genesis Power Ltd.	\$35,000
<i>Manufacturing Center</i>	Kenneth Currie	Center for Manufacturing Research	State of Tennessee	\$1,653,300
		Center for Manufacturing Research Carryover		\$67,801
		UT-CIS Contract for Employee Services	The University of Tennessee Center for Industrial Services	\$80,000
		General Work Study Program	Various	\$128,601
		Testing and Design		\$39,524
	Robert Qiu	Time-Reversal Based Range Extension Techniques for Ultra-Wideband (UWB) Sensors and Applications in Tactical Communications and Networking	Office of Naval Research	\$106,802

Appendix B, cont'd
Externally Funded Projects
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Engineering, continued				
<i>Manufacturing Center/Electrical and Computer Engineering</i>	Robert Qiu/P. K. Rajan	Time-Reversal Based Ultrawideband MIMO (UWB-MIMO) for Low Cost, High Data Rate Communications	National Science Foundation	\$66,519
		IREE Supplement to Time-Reversed Ultrawideband MIMO (UWB-MIMO) for Low Cost, High Data Rate Communications	National Science Foundation	\$40,750
<i>Manufacturing and Industrial Technology/Energy Systems Research</i>	Ismail Fidan	Integrating Rapid Prototyping Technology into a Manufacturing and Industrial Technology Curriculum	National Science Foundation	\$43,993
	Ismail Fidan/Omar Elkeelany	The Development of a Remotely Accessible Rapid Prototyping Laboratory	National Science Foundation	\$34,425
<i>Mechanical Engineering</i>	Corinne Darvennes	Tennessee Space Grant Consortium Award	Vanderbilt University via NASA	\$30,000
<i>Mechanical Engineering/Basic Engineering/Energy Systems Research</i>	Stephen Canfield/Kenneth Hunter	Enabling Families, Infants, Toddlers and Preschoolers through Technology EIME Project	Tennessee Department of Education	\$35,000
<i>Mechanical Engineering/Electrical and Computer Engineering/Energy Systems Research</i>	Stephen Canfield/Mohamed Abdelrahman	CCLI: Enhancing the Programming Experience for Engineering Students through Hands-On Integrated Computer Experiences	National Science Foundation	\$78,746
<i>Mechanical Engineering/Manufacturing and Industrial Technology/Energy Systems Research</i>	Stephen Canfield/Ahmed Elsayw, Delbert Stone	Development and Demonstration of a Mobile Robotic Ship Welding System	Robotic Technologies of Tennessee	\$65,614

Appendix B, cont'd
Externally Funded Projects
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Engineering, continued				
<i>Mechanical Engineering/ Manufacturing Center</i>	Glenn Cunningham/ Kenneth Currie	Tennessee 3-Star Industrial Assessment Center	U. S. Department of Energy	\$77,054
	Glen Johnson/ Kenneth Currie	Advanced Portable Power Institute Phase I and II	U. S. Army Communications Electronics Command	\$850,000
	Christopher Wilson	Elastic-Plastic Fracture Mechanics Considerations in Proof Testing (GSRP - E. Watts)	NASA	\$30,000
	Ying Zhang	GOALI: Platinum-Enriched Y+Y' Bond Coats for Next-Generation Single-Crystal Ni-Base Superalloys	National Science Foundation	\$113,594
		A Novel Low-Temperature Diffusion Aluminide Coating for Ultrasupercritical Coal-Fired Boiler Applications	U. S. Department of Energy	\$67,277
	Jiahong Zhu	Novel Composite Materials for SOFC Cathode-Interconnect Contact	U. S. Department of Energy	\$51,458
<i>Water Center</i>	Sharon Berk	Interactions of Salmonella enterica and E. coli 0157:H7 with Protozoa from Fresh Produce	U. S. Department of Agriculture	\$195,979
		Research Work Plan to Test Eight Biocides against Legionella pneumophila Sequestered with Food Vacuoles of Acanthamoeba polyphaga	The Dow Chemical Company	\$2,303
	Yvette Clark	Local Planning Assistance Office-Geographic Information System Improvement Proposal	Tennessee Department of Economic and Community Development	\$74,626
	Dennis George	Center for Management, Utilization and Protection of Water Resources	Tennessee Higher Education Commission	\$1,298,200
		Center for the Management, Utilization and Protection of Water Resources - Carryover		\$17,300
		Water Center Analytical and Computer Services	Various	\$71,341

Appendix B, cont'd
Externally Funded Projects
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

Engineering, continued				
<i>Water Center continued</i>	Dennis George	Protocol for Determination of Maximum Safe Loading Rate Increase during Anaerobic Digester Start-Up with Waste Activated Sludge	Earth Tech	\$41,650
	Kim Stearman/ Sharon Berk	Strengthening Agricultural and Environmental Education at TSU: Student Experiential Training in Approaches and Techniques for Investigating Interactions that are Important in Agriculture and the Environment	Tennessee State University (via U. S. Department of Agriculture)	\$22,846
	Martha Wells	Evaluating Disinfectant By-Product Formation Potential in Source Water	Barge, Waggoner, Sumner & Cannon, Inc.	\$35,341
		Endocrine Disruption Studies	U. S. Geological Survey	\$3,736
<i>Water Center/ Agriculture</i>	Kim Stearman/ James Baier, Michael Best, Janice Branson, Bruce Greene, Jed Young	Waters Organic Farm Startup	Tennessee Department of Agriculture	\$187,690
<i>Water Center/ Civil and Environmental Engineering</i>	Mohammad Chowdhury	Ivanhoe Fellowship	The Ivanhoe Foundation	\$5,000

Appendix B, cont'd
Externally Funded Projects
 by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2007-08
(Principal Investigator/Co-PI(s))

STEM Center: 5 Researchers, 2 Projects			\$170,019	
<i>STEM Center</i>	Margaret Phelps	NSF ATE Eastern Corridor Teacher Education Project	Pellissippi State Technical Community College (via National Science Foundation)	\$25,805
	Margaret Phelps/ Michael Allen, Laura Graves, Sandra J. Smith, Kenneth Wiant	Effects of Teaching w/ Tablet PC's w/ Asynchronous Student Access in Postsecondary STEM Courses on Students w/ Learning Disabilities	National Science Foundation	\$144,214

Appendix C

FY 2007-08 Intellectual Property Activity

The Office of Research received six invention disclosures, filed five provisional patents, and two utility patent applications. Tennessee Technological University currently holds three patents.

Invention Disclosures

1. Elimination of Bleeding by Rotation for Autogenous Shrinkage in Cement-Based Materials (Mohr, Batey, Holmes)
2. Nanoparticle-Templated Composite Gels for Separations (Stretz, Arce, Thompson)
3. A System for Monitoring and Evaluating Greensand Molds (Abdelrahman, Baswell)
4. Wind Aeolipile (Van Neste, Gao)
5. Apparatus and Method for Screening Lung Tumor and Early Stage Using Noninvasive Respiratory Sound Data (Alouani, Kamal, Elkeelany)
6. Identifying Inhibitors for Factor Xia using Support Vector Machine with the Signature Molecular Descriptor (Visco, Wells)

Provisional Patents

1. Nanoparticle-Templated Composite Gels for Separations (Stretz, Arce, Thompson)
2. Integrated Multichannel Data Acquisition and Processing System (Alouani, Elkeelany)
3. Myhealth Track (Massengill*, Hadlock) *Industry Sponsor/Not TTU as 1st named inventor
4. Wind Aeolipile (Van Neste, Gao)
5. Apparatus and Method for Screening Lung Tumor at Early Stage Using Noninvasive Respiratory Sound Data (Alouani, Kamal, Elkeelany)

Utility Patent Applications

1. Monitoring of Greensand Molds (Abdelrahman, Baswell)
2. A Compliant, Parallel-gravity Suspension System for a Tracked, Climbing Robot (Canfield, Beard)

Utility Patents Held

1. Artificial neural network and fuzzy logic based boiler tube leak detection systems (Alouani) 6,192,352 & 6,567,795
2. Apparatus and method for automatic prescription verification (Alouani, Currie)

*Tennessee Technological University is not the first-named inventor.

Appendix D
FY 2007-08 Faculty Research Committee Awards

Author(s)	Title	Department	Amount	Type
Albu, Titus	Direct Dynamics Studies of Hydrogen Abstraction from Hydrofluoropropanes	Chemistry	\$4,000	Research Development
Badoe, Daniel	Synthesizing Reliable Trip-Rates for Cross-Classification Cells in Trip Generation Modeling	Civil and Environmental Engineering	\$4,000	Research Development
Brown, Chris	Assessment of Predation Risk by the Use of Chemical Cues in the Riparian Wolf Spider <i>Pardosa valens</i>	Biology	\$3,350	Research Development
Eberle, William	Graph-Based Anomaly Detection in Real-World Domains	Computer Science	\$2,890	Research Initiation
Hajdik, David	Use of Tennessee electronic Library (TCL) to Increase Science and Mathematics Test Scores of K-12 Students	Volpe Library	\$3,250	Research Development
Hauser, Joshua/ Willie, Eric	Research and Recording of Works for Trombone and Percussion Deserving Wider Recognition as well as New Contributions to the Extant Literature	Music and Art	\$8,000	Research Development
Henderson, Craig	Behavior and Capacity of Masonry Infilled Frames Under Out-of-Plane Loads	Civil and Environmental Engineering	\$4,000	Research Development
Hossain, Faisal	Investigating Spatial Downscaling of Coarse Resolution Satellite Rainfall Data for Application in High Resolution Hydrologic Models	Civil and Environmental Engineering	\$4,000	Research Development
Kline, Eugene	Reactions in Mass Spectroscopy and Thermal Reactors	Chemistry	\$4,000	Research Development
Knox, Larry	Evolution of Two Species of Amphissites from the Upper Paleozoic	Earth Sciences	\$4,000	Research Development

Appendix D, cont'd
FY 2007-08 Faculty Research Committee Awards

Author(s)	Title	Department	Amount	Type
Le Borne, Sabine	Numerical Groundwater Flow Modeling: A Novel Nullspace Solver	Mathematics	\$4,000	Research Development
Lisic, Ed	Planar Tridentate Ligands: Synthesis, Coordination Chemistry, and Catalytic Studies of New Water-Soluble Thiosemicarbazone Ligands	Chemistry	\$4,000	Research Development
McQuail, Josephine	Research African American Literature and Culture to Encourage Diversity	English	\$4,000	Research Development
Northrup, Scott	Advanced Electrostatic Modeling in Protein Electron Transfer Reactions	Chemistry	\$4,000	Research Development
Panchagnula, Mahesh	A Model to Calculate the Shape of a Sessile Drop	Mechanical Engineering	\$4,000	Research Initiation
Ramirez, Guillermo	Micromechanics of Piezoelectric Composite Materials Reinforced with Nanotubes	Civil and Environmental Engineering	\$4,000	Research Development
Stapor, Frank	5000 Years of Episodic Barrier Island Formation in the St. Helena Marshes, Beaufort Co., SC: An Interplay between Sand Supply and Changing Sea Level	Earth Sciences	\$4,000	Research Development
Stretz, Holly	Effect of Responsive Nanoparticles Embedded in a Polymer Gell on Solute Transport	Chemical Engineering	\$4,000	Research Initiation
Swafford, Melinda/ Southward, Leigh	The Relationship Between Dress and Behavior Among High School Students	Human Ecology	\$5,703	Research Development

Appendix D, cont'd
FY 2007-08 Faculty Research Committee Awards

Author(s)	Title	Department	Amount	Type
Wendt, Jeremy	Podcasting in Education	Curriculum and Instruction	\$3,427	Research Development
Yoon, Hwan- Sik	Development of a Thin- Film Strain Sensor Using an Inkjet Printing System	Mechanical Engineering	\$4,000	Research Initiation
Zagumny, Lisa	Constructing Islam and the Middle East: An Analysis of World Geography Textbook Representations	Curriculum and Instruction	\$4,000	Research Initiation

22 Proposals Funded
24 Faculty

\$90,620.00