



Tennessee Technological University

**OFFICE OF RESEARCH
ANNUAL REPORT**

Fiscal Year 2005-06



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

Dr. Francis O. Otuonye
Associate Vice President

Mark Lynam
Coordinator

Sue Ann Smith
Secretary II

Sue Smith
Executive Aide

Sammie Sparks
Contract Compliance Assistant

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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 research-related funding opportunities.
- 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 animals used in research and experimentation.
- Conducting seminars and workshops on proposal writing and funding sources.

SUMMARY OF ACTIVITIES 2005-06

During fiscal year 2005-06, 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 \$15,994,029.
- Grants and contracts received through the three Centers of Excellence and the STEM Center numbered 117 with a value of \$11,606,515, which represents 73% of total research dollars and 67% of grants and contracts received.
- Grants and contracts received through federal agencies numbered 74 with a value of \$6,840,614, which represents 43% of grants and contracts and 43% of total dollars received.
- Grants and contracts received through state agencies numbered 69 with a value of \$8,060,198 which represents 40% of all contracts and 50% of total contract dollars received.
- Industry contracts were third at 22 with a value of \$952,514, which represents 12% of total contracts and 6% of total contract dollars.
- Various miscellaneous sources accounted for 9 contracts or 5% of total contracts with a value of \$140,703 or 1% of contract dollars.
- Proposals submitted for external funding numbered 194 with a value of \$55,412,527.
- Proposals submitted through the Centers of Excellence and STEM Center numbered 146 with a value of \$38,659,892, which represents 76% of proposals submitted and 70% of funds requested.
- Proposals submitted to federal agencies numbered 111 requesting \$47,105,681, which represents 57% of proposals submitted and 85% of dollars requested.
- Proposals submitted to state agencies numbered 56 requesting \$7,278,799 which represents 29% of proposals submitted and 13% of dollars requested.
- Proposals submitted to industry numbered 17 requesting \$747,975 which represents 9% of proposals submitted and 1% of dollars requested.
- Proposals submitted to miscellaneous sources numbered 10 requesting \$280,072 which represents 5% of proposals submitted and 1% of dollars requested.

- Internal funds were provided in the amount of \$109,817 for small grants to support faculty research in the form of *research initiation and/or research development*. Twenty-six projects involving 31 faculty members were supported. The average amount of support granted was \$4,000 per faculty member. The amount of funds available is declared each year.
- Internal funds provided for contract matching was \$21,531, 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**

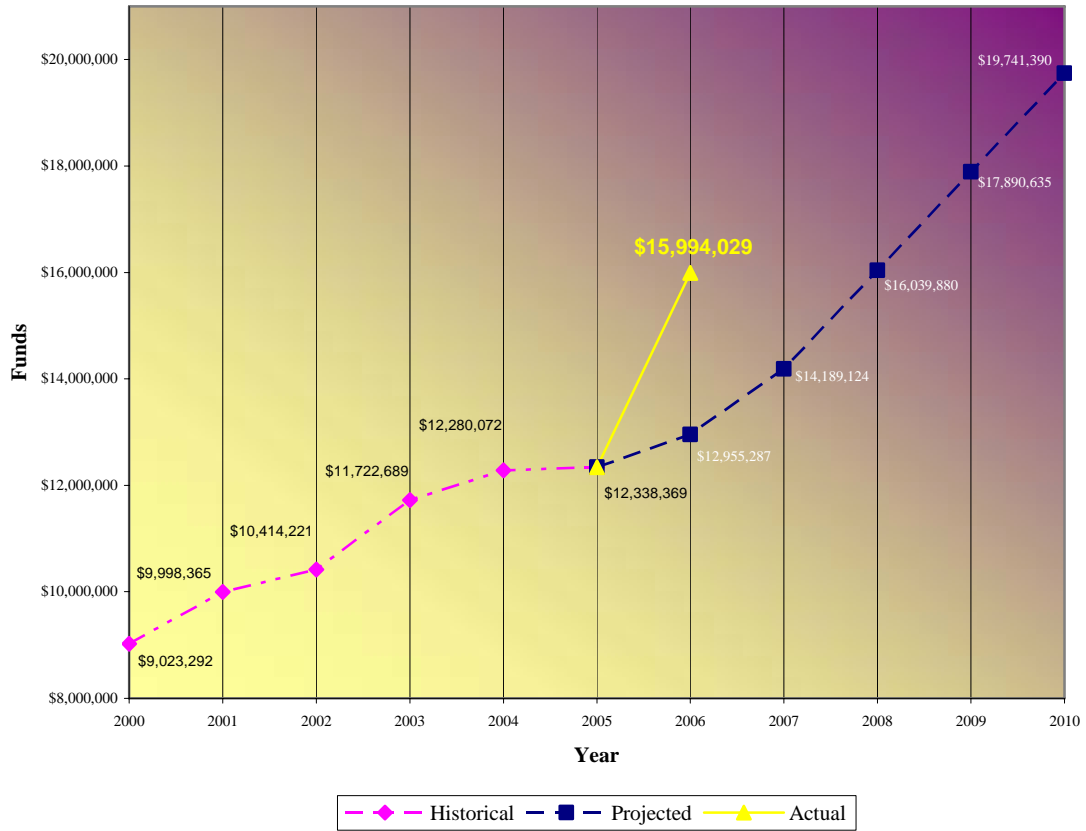


TABLE I
Proposals Submitted and Awards Received
By University Unit
FY 2005-06

University Unit	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Agriculture & Human Ecology*	9	\$280,769	12	\$666,337
Arts & Sciences*	12	\$2,190,338	11	\$290,623
Business Administration*	3	\$148,663	6	\$373,662
Education*	18	\$14,052,265	17	\$2,437,164
Engineering*	3	\$69,200	8	\$185,720
Nursing	-	-	1	\$491,032
Administrative Offices*	1	\$900	2	\$2,396
Craft Center	2	\$10,500	2	\$10,500
C/E Energy Systems Research**	43	\$7,980,596	32	\$2,945,987
C/E Manufacturing Research**	44	\$13,345,535	38	\$4,104,695
C/E Water Resources Research**	42	\$9,123,146	42	\$3,020,037
STEM Center**	17	\$8,210,615	5	\$1,465,876
TOTAL	194	\$55,412,527	174	\$15,994,029

* 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 2005-06**

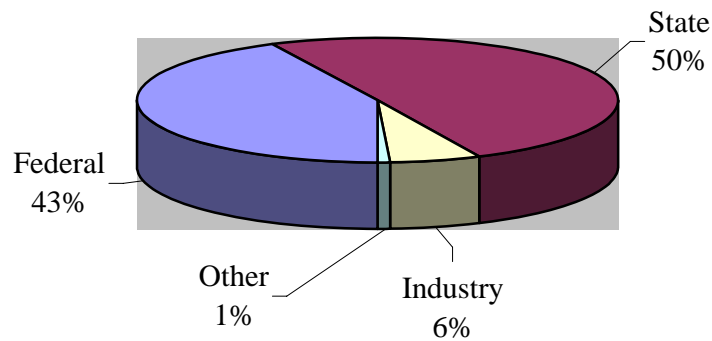
Center/Academic Unit	Proposals Submitted	Amount Requested	Awards Received	Amount Received
<u>Energy Systems Research</u>				
The Center	7	\$1,101,278	6	\$981,378
Chemical Engineering	10	1,782,987	2	430,000
Chemical Engineering/Mechanical Engineering	1	320,499	-	-
Civil and Environmental Engineering	7	784,787	6	149,453
Electrical and Computer Engineering	3	1,581,248	4	1,063,201
Manufacturing and Industrial Technology	1	120,067	1	23,990
Manufacturing and Industrial Technology/Electrical and Computer Engineering	1	653,812	1	40,186
Mathematics	1	272,879	1	98,125
Mechanical Engineering	10	1,013,099	11	229,574
Mechanical Engineering/Chemical Engineering	1	199,957	-	-
Mechanical Engineering/Electrical and Computer Engineering/ Mathematics	1	149,983	-	-
TOTAL	43	\$7,980,596	32	\$3,015,907
<u>Manufacturing Research</u>				
The Center	12	\$3,127,075	14	\$2,169,731
Business Administration	1	61,283	1	61,283
Chemical Engineering	1	7,250	4	304,659
Chemical Engineering/Chemistry	1	2,699,999	-	-
Chemistry/Mechanical Engineering	1	223,744		
Computer Science	2	227,140	1	149,137
Electrical and Computer Engineering	14	3,098,757	7	721,959
Engineering	1	850,000	-	-
Manufacturing and Industrial Technology	-	-	1	11,369
Mechanical Engineering	9	1,235,538	9	584,254
Mechanical Engineering/Chemical Engineering/Chemistry	1	1,518,000	-	-

Mechanical Engineering/Decision Science and Management/Earth Sciences	1	296,749	-	-
Mechanical Engineering/Electrical and Computer Engineering	-	-	1	102,303
TOTAL	44	\$13,345,535	38	\$4,104,695
Water Resources Research				
The Center	7	\$1,894,224	7	\$1,532,301
Administrative Offices	-	-	1	493,322
Biology	15	493,146	22	351,726
Biology/Co-op Fisheries Unit	1	55,162	-	-
Chemical Engineering	-	-	1	50,000
Co-op Fisheries Unit	4	54,958	5	79,718
Biology/Civil and Environmental Engineering	-	-	1	70,000
Chemistry	2	173,393	1	8,135
Civil and Environmental Engineering	10	1,800,752	2	55,649
Civil and Environmental Engineering/Mechanical Engineering	1	172,491	-	-
Engineering	-	-	1	279,194
Mechanical Engineering	1	39,999	1	99,992
Mathematics/Curriculum and Instruction	1	4,439,021	-	-
TOTAL	42	\$9,123,146	42	\$3,020,037
STEM Center				
The Center	1	\$23,328	2	\$1,313,328
Biology/Chemistry/Mathematics	1	2,879,244	-	-
Curriculum and Instruction	2	850,081	-	-
Curriculum and Instruction/Mathematics	1	72,692	1	72,692
Facilities and Business Services	3	1,850,000	-	-
Human Ecology	2	328,751	-	-
Mathematics	2	106,078	1	6,078
Mathematics/Computer Science/Chemistry/Electrical and Computer Engineering/Chemical Engineering	1	500,000	-	-
Mechanical Engineering	1	44,873	-	-
Physics	1	73,778	1	73,778
Physics/Chemical Engineering/Curriculum and Instruction	1	485,633	-	-
Mechanical Engineering/Physics/Chemical Engineering/Curriculum and Instruction/ Mathematics	1	996,157	-	-
TOTAL	17	\$8,210,615	5	\$1,465,876
GRAND TOTAL	146	\$38,659,892	117	\$11,606,515

TABLE III

**Proposals Submitted and Awards Received
By Agency Classification
FY 2005-06**

Agency Classification	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Federal	111	\$47,105,681	74	\$6,840,614
State	56	\$7,278,799	69	\$8,060,198
Industry	17	\$747,975	22	\$952,514
Foundations	-	-	-	-
Other	10	\$280,072	9	\$140,703
TOTAL	194	\$55,412,527	174	\$15,994,029



**Figure 2. Percentage Funding of Proposals by Agency Classification
FY 2005-06**

TABLE IV

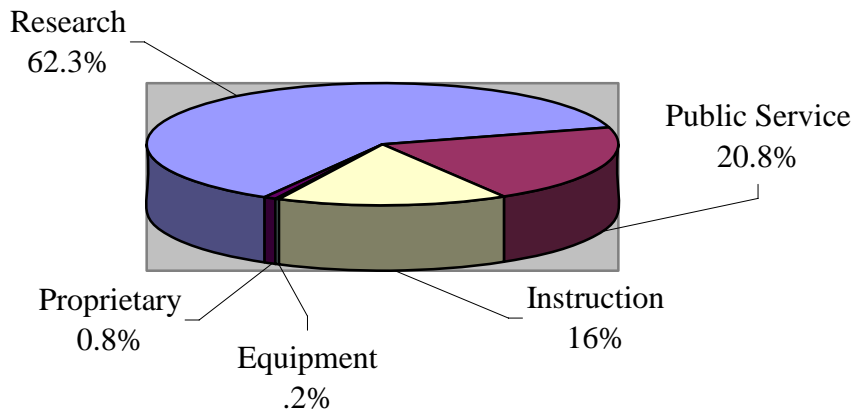
**Federal Awards Received by Agency
FY 2005-06**

Federal Agencies	Awards Received
Army Research Office	\$15,000
Federal Highway Administration	\$95,884
National Aeronautics and Space Administration	\$1,442,282
National Park Service	\$62,381
National Reconnaissance Office	\$400,000
National Science Foundation	\$1,027,141
Oak Ridge National Laboratory	\$1,078,735
Office of Naval Research	\$153,481
Sandia National Laboratories	\$50,000
U. S. Department of Agriculture	\$50,000
U. S. Department of Defense	\$194,821
U. S. Department of Energy	\$750,436
U. S. Department of Health and Human Services	\$491,032
U. S. Department of Justice	\$493,322
U. S. Fish and Wildlife Service	\$58,449
U. S. Geological Survey	\$61,552
TOTAL Direct Federal Dollars	\$6,424,516

TABLE V

**Proposals Submitted and Awards Received
By Activity
FY 2005-06**

Activity/Use	Proposals Submitted	Amount Requested	Awards Received	Amount Received
Research	134	\$31,191,001	120	\$9,957,650
Public Service	30	\$7,333,037	34	\$3,331,969
Instruction	23	\$14,965,842	16	\$2,547,334
Equipment	5	\$1,877,338	1	\$35,000
Proprietary	2	\$45,309	3	\$122,076
TOTAL	194	\$55,412,527	174	\$15,994,029

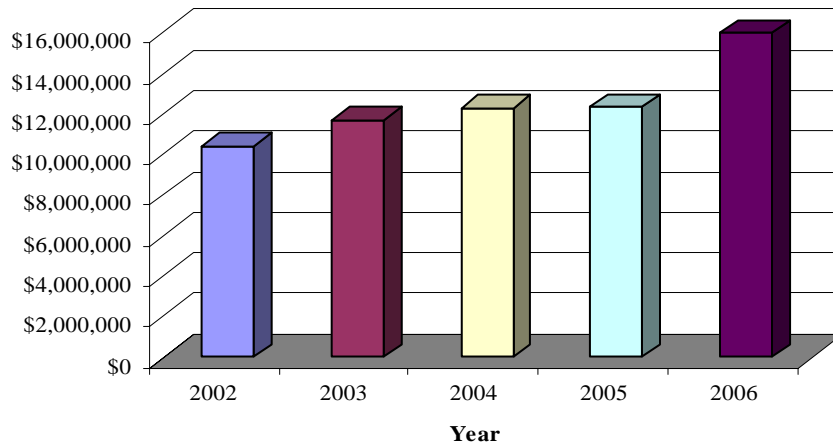


**Figure 3. Percentage Funding of Grants by Activity
FY 2005-06**

TABLE VI

**Proposals Submitted and Awards Received
FY 2002-06**

Fiscal Year	Proposals Submitted	Amount Requested	Awards Received	Amount Received
2002	177	\$23,483,871	191	\$10,414,221
2003	193	\$63,490,117	160	\$11,722,689
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

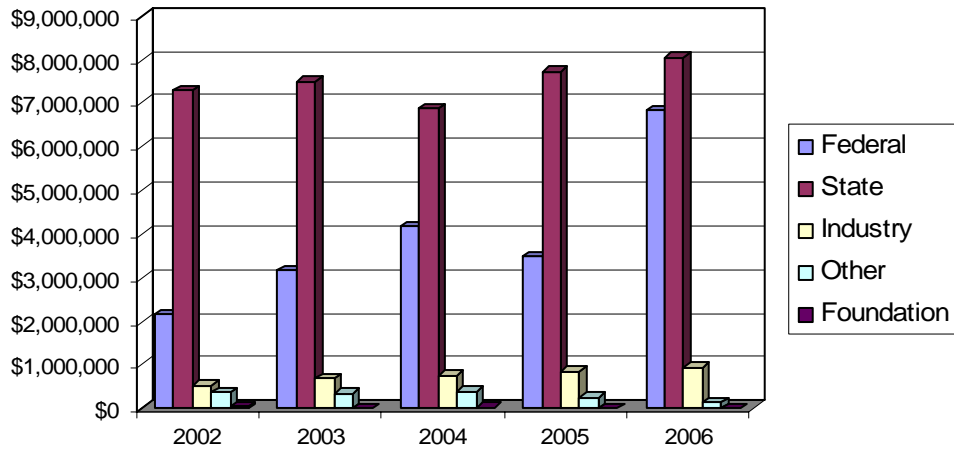


**Figure 4. External Funds Received
FY 2002-FY 2006**

TABLE VII

**Awards Received and Award Amounts
By Classification
FY 2002-06**

Fiscal Year	Federal		State		Industry		Other		Foundations	
	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount
2002	46	\$2,159,598	57	\$7,300,126	67	\$536,926	17	\$370,946	4	\$46,625
2003	43	\$3,167,670	59	\$7,497,635	41	\$699,434	17	\$357,950	-	-
2004	60	\$4,174,244	56	\$6,895,156	31	\$774,565	9	\$400,162	3	\$35,945
2005	61	\$3,486,617	65	\$7,722,363	16	\$854,395	11	\$269,997	1	\$5,000
2006	74	\$6,840,614	69	\$8,060,198	22	\$952,514	9	\$140,703	-	-

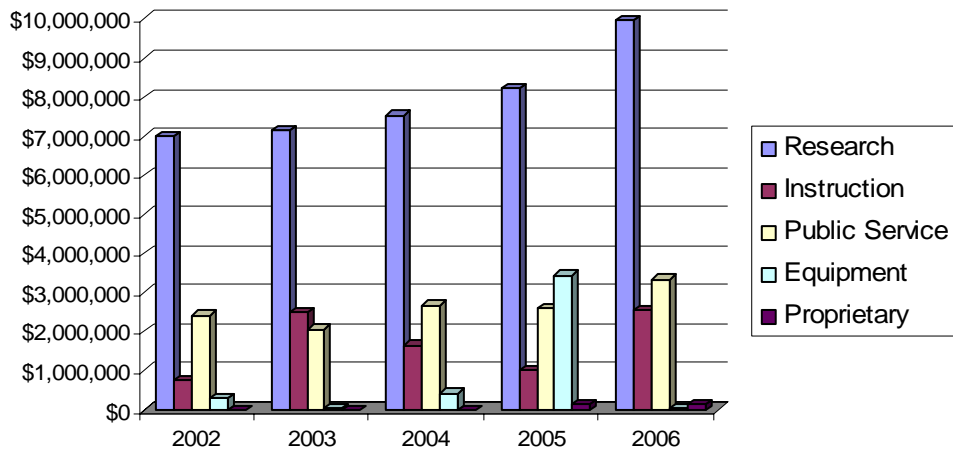


**Figure 5. Awards Received by Classification
FY 2002-06**

TABLE VIII

**Awards Received and Award Amounts
By Type of Activity
FY 2002-06**

Fiscal Year	Research		Instruction		Public Service		Equipment		Proprietary	
	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount	No.	Award Amount
2002	150	\$6,978,439	12	\$747,230	27	\$2,410,820	2	\$277,732	-	-
2003	124	\$7,131,095	12	\$2,499,765	23	\$2,062,875	1	\$28,954	-	-
2004	119	\$7,530,479	8	\$1,647,836	26	\$2,678,234	5	\$423,523	-	-
2005	113	\$8,213,657	12	\$1,015,064	24	\$2,600,879	3	\$358,735	2	\$150,034
2006	120	\$9,957,650	16	\$2,547,334	34	\$3,331,969	1	\$35,000	3	\$122,076



**Figure 6. Awards Received by Type of Activity
FY 2002-06**

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 animals used in research and experimentation, the management of conflicts of interest in research, research fraud prevention, 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 Assistant Vice President serves as the Executive Officer for these committees which include: the Institutional Committee for the 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

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.

2005-06 Meeting Dates

September 29, 2005

March 23, 2006

2005-06 Committee Members

Dr. Gerald Barker, Veterinarian
Rev. David Eisenmenger, Clergy
Dr. Bruce Greene, Agriculture
Dr. Steve Hayslette, Biology (Chair)
Ms. Tammy Howard
Mr. Ray Jordan

Dr. Christy Killman, Health and
Physical Education
Dr. Jessica Matson, Industrial
and Manufacturing Engineering
Dr. Rubye Torrey, Executive
Director

Committee Actions:

- The Committee performed laboratory inspections in 2005-06 during the months of April and May.
- The Committee reviewed three applications for use of animals in experimentation-Dr. Bruce Greene, Dr. Steve Hayslette, and Dr. Daniel Combs and his graduate student, Danny Bryan.

**INSTITUTIONAL REVIEW COMMITTEE
FOR HUMAN SUBJECTS**

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.

2005-06 Meeting Dates

September 12, 2005	January 23, 2006
November 7, 2005	April 3, 2006

2005-06 Committee Members

Dr. Sharon Berk, Biology	Dr. Shelia Green, Nursing
Dr. Tom Brignall, Sociology and Political Science	Dr. Tony Baker, English
Dr. Michael Clark, Music and Art	Dr. Lachelle Norris, Sociology and Political Science
Rev. Peter Coffey, Clergy	Dr. Jan Turner, Counseling and Psychology
Dr. Jan Cupp, Counseling and Psychology	Dr. Francis Otuonye, Executive Director
Dr. Linda Giesbrecht-Bettoli, Counseling and Psychology (Chair)	

Committee Actions:

- The Committee received 168 exempt proposals, 21 for expedited review and four for full Committee review.
- Revisions for the IRB Forms A, B and C were approved and have been made available on the Research website.
- The Committee voted to require that all requests to the Committee must be made two weeks prior to expected consideration.

ADVISORY COMMITTEE ON PATENTS AND COPYRIGHTS

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.

2005-06 Meeting Dates

September 13, 2005	November 15, 2005	February 9, 2006
October 11, 2005	January 17, 2006	March 21, 2006

2005-06 Committee Members

Dr. Mohamed Abdelrahman, Electrical and Computer Engineering	Dr. Shelia Green, Nursing
Dr. Douglas Airhart, Agriculture	Dr. Glen Johnson, Engineering Administration
Dr. Ali Alouani, Electrical and Computer Engineering (Chair)	Ms. Nancy Mielke, Library
Mr. Michael Baswell, Electrical Engineering	Dr. Scott Northrup, Chemistry
Dr. Robert Clougherty, English	Dr. Jack Matson, Decision Sciences and Management
Mr. Robert Cravens, Business Administration	Dr. Jan Turner, Counseling and Psychology
	Dr. Francis Otuonye, Executive Officer

Committee Actions:

- A provisional patent was filed for the Autonomous Firefighting Robot (Dr. Alouani, inventor).
- Invention disclosure was received from Dr. Alouani for the invention Multichannel Digital Stethoscope.
- Continuation-in-Parts filing for the Automatic Prescription Verification System (Currie, et al) was withdrawn.
- Issue fees were paid for the original Automatic Prescription Verification System (Alouani/Currie). A patent may be issued summer or early fall of 2006.
- A royalty check was received from UT-Battelle on Non-Optical Explosive Detection using Micro-Cantilevers patent.
- An agreement between TTU and San Diego State University was approved to license a technology developed by Dr. Stephen Robinson.
- The patent/invention was returned to the inventor, Dr. Alexander Shibakov.
- The invention disclosure form was updated.

FACULTY RESEARCH COMMITTEE

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.

2005-06 Meeting Dates

October 13, 2005	February 9, 2006
February 2, 2006	March 21, 2006

2005-06 Committee Members

Dr. Phillip Bettoli, Biology	Dr. Xubin He, Electrical and Computer Engineering
Dr. Michael Burduck, English	Dr. Richard LeBorne, Mathematics
Dr. Rodney Carlson, Decision Sciences and Management	Dr. Dean Richey, Curriculum and Instruction
Dr. Glenn Cunningham, Mechanical Engineering	Dr. Jed Young, Agriculture
Mr. Jonathan Good, Music and Art (Chair)	Dr. Francis Otuonye, Executive Officer
Dr. Kim Hanna, Nursing	

Committee Actions:

- The Faculty Research Committee awarded 26 projects involving 31 faculty members for a total amount of \$109,817.
- Twelve (12) Research Initiation proposals were funded, and 14 Research Development proposals were funded.
- The Committee revised the *Handbook for Faculty Research Committee Grants*.
- The Committee held two proposal development workshops during fall semester.

CAPLENOR FACULTY RESEARCH AWARD COMMITTEE

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.

2005-06 Meeting Dates

September 8, 2005

November 1, 2005

2005-06 Committee Members

Dr. George Buchanan, Civil and
Environmental Engineering

Dr. Tor Guimaraes, Business
Administration

Dr. David Larimore, Curriculum
and Instruction

Mr. R. Winston Morris, Music
and Art (Chair)

Dr. Sastry Munukutla, Energy
Systems Research Center

Ms. Bedelia Russell, Nursing

Dr. Kim Stearman, Water
Resources Center

Dr. George Webb, History

Dr. David Viera, Foreign
Languages

Dr. Francis Otuonye, Executive
Officer

Committee Actions:

- Dr. Dean Richey, Curriculum and Instruction, was the recipient of the 2005-06 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 23% of the total external funds received. Administrators, faculty, and staff were responsible for approximately \$12.4 million, or the remaining 77% 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 A

Externally Funded Research by College/Area, Academic Unit and Funding Amount Fiscal Year 2005-06

ADMINISTRATION		\$929,205
Business Administration	\$75,283	
Engineering Administration	360,494	
Nursing	491,032	
Research and Graduate Studies	2,396	
AGRICULTURE & HUMAN ECOLOGY		\$666,337
Agriculture	\$136,382	
Human Ecology	529,955	
ARTS & SCIENCES		\$1,064,092
Biology	\$374,004	
Chemistry	8,135	
Computer Science	149,137	
Co-op Fisheries	105,290	
English	30,000	
History	77,693	
Mathematics	98,125	
Physics	221,708	
BUSINESS ADMINISTRATION		\$359,662
Decision Science and Management	\$347,500	
Economics, Finance and Marketing	12,162	

Appendix A, cont'd
Externally Funded Research
by College/Area, Academic Unit and Funding Amount
Fiscal Year 2005-06

EDUCATION		\$2,520,356
Counseling and Psychology	\$236,017	
Craft Center	10,500	
Curriculum and Instruction	2,273,839	
ENGINEERING		\$3,419,243
Chemical Engineering	\$591,838	
Civil and Environmental Engineering	138,069	
Electrical and Computer Engineering	1,887,463	
Manufacturing and Industrial Technology	75,545	
Mechanical Engineering	726,328	
RESEARCH CENTERS		\$7,035,134
Center for Energy Systems Research	\$1,124,106	
Center for Manufacturing Research	2,364,552	
Center for Management, Utilization and Protection of Water Resources Research	2,227,070	
STEM Center	1,319,406	
Total Amount for Externally Funded Research		\$15,994,029

Appendix B
Externally Funded Research
by
College/Area, Department, Investigator(s),
Project Title, Funding Agency and Funding Amount
Fiscal Year 2005-06
(Principal Investigator is Named First)

Administration: 7 projects; 6 Administrators			\$929,205	
<i>Business Administration</i>	Virginia Moore	Leadership Upper Cumberland	Leadership Upper Cumberland	\$14,000
	Virginia Moore and Kenneth Currie	Tennessee Small Business Development Center	Tennessee Small Business Development Center	\$61,283
<i>Engineering</i>	Glen Johnson	Tennessee Space Grant Consortium Award	Vanderbilt University via NASA	\$46,300
		College of Engineering Equipment Grant Fund	Tennessee Department of Commerce and Insurance	\$35,000
	Roy Loutzenheiser	TTU/UC Partnership: Meeting 7-12 Math & Physical Science through Engineering Applications	Tennessee Department of Education	\$279,194
<i>Nursing/Facilities and Business Services</i>	Glenn Binkley	New Nursing and Health Services Building	Department of Health and Human Services	\$491,032
<i>Research and Graduate Studies</i>	Francis Otuonye	Community Opportunities, Training and Educational Services	Upper Cumberland Human Resources Agency	\$2,396

Appendix B, cont'd
Externally Funded Research
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College/Area, Department, Investigator(s),
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Fiscal Year 2005-06
(Principal Investigator is Named First)

Agriculture and Human Ecology: 4 Researchers, 9 Projects \$666,337				
<i>Agriculture</i>	Douglas Airhart	Developing Written Standards for Selecting, Transplanting and Establishing Young Trees in Urban Settings	Tennessee Department of Agriculture	\$20,800
	Ben Byler	Tennessee Association FFA Camp Clements Leadership Grant-Maintenance Worker	Tennessee Association of FFA	\$25,552
		Agricultural Education In-service Program	Tennessee Department of Education	\$14,348
		Tennessee Association FFA Camp Clements Leadership Grant		\$75,682
<i>Human Ecology</i>	Sue Bailey	Tennessee Early Childhood Training Alliance	Tennessee State University Center of Excellence for Research Policy and Basic Skills	\$151,918
		Family and Consumer Science Program	Tennessee Department of Education	\$8,385
		Upper Cumberland Child Care Resource and Referral-Project REEL	Tennessee Department of Human Services via Signal Centers of Chattanooga	\$39,000
	Sue Bailey and Betty Vaudt	Upper Cumberland Child Care Resource and Referral	Department of Human Services via Signal Centers of Chattanooga	\$330,652

Appendix B, cont'd
Externally Funded Research
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College/Area, Department, Investigator(s),
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Arts and Sciences: 25 Researchers, Projects 33			\$1,064,092	
<i>Biology</i>	Phillip Bettoli and Michael Redding	Dispersal, Stress Response and Delayed Mortality of Largemouth Bass Caught in Live-Release Tournament	Tennessee Wildlife Resources Agency	\$35,850
	Daniel Combs	Chronic Waste Disease Sampling at Deer Check Stations	Tennessee Wildlife Resources Agency	\$5,000
	Bradford Cook	Spotfin Chub (<i>Eriomonax Monachus</i>) Microhabitat Evaluation, Emory River Watershed	National Park Service	\$5,100
		Quantification of Injury to Aquatic Resources Resulting from the Pryor Oil Spill and Fire, Obed Wild and Scenic River	Proprietary	\$10,308
		Spotfin Chub (<i>Eriomonax Monachus</i>) Microhabitat Evaluation, Emory River Watershed	The Nature Conservancy	\$10,800
	Michael Harvey	Bat Ecosystem Management	Forest Service, Ozark-St. Francis National Forest	\$10,000
		Monitor the Populations of Three Species of Endangered Bats Found in Northern Arkansas	Arkansas Game and Fish Commission	\$15,000
	Steven Hayslette	Effects of Eurasian Collared-Doves on Populations of Mourning Doves and Other Species in the Southeastern U.S.	U. S. Fish and Wildlife Service	\$11,855
	Hayden Mattingly	Identifying Mechanisms of Species Coexistence for Barrens Topminnow Populations Exposed to Invasive Mosquitofish	U. S. Department of Interior Fish and Wildlife Service	\$24,000
		Science Advisory Committee Coordination for the Northern Cumberland Plateau Habitat Conservation Plant	The Nature Conservancy	\$12,500
	Hayden Mattingly and Tyler Black	Impacts of Human Land Use Activities on <i>Blackside Dace</i> Reproductive Ecology: Evaluating the Role of Siltation		\$20,759
	Hayden Mattingly and James Layzer	Evaluating Reintroduction of the Barrens Topminnow	Tennessee Wildlife Resources Agency	\$20,000

Appendix B, cont'd
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Arts and Sciences, continued:				
<i>Biology cont'd</i>	Kenneth Morgan and Thomas Roberts	Development of a Geo-Referenced Database to Identify and Inventory Wetlands at Guilford Courthouse National Military Park	National Park Service	\$29,958
		Hydrogeomorphic Classification and Assessment of Slope Wetlands on the Tennessee Highland Rim	Tennessee Department of Environment and Conservation	\$79,874
	Thomas Roberts	Deer Check Stations	Tennessee Wildlife Resources Agency	\$3,000
	Thomas Roberts and Kenneth Morgan	Monitoring Groundwater Hydrology and Selected Plant Communities at the Black Swamp Greentree Reservoir Project		\$10,000
<i>Biology/Civil and Environmental Engineering</i>	Phillip Bettoli and Vincent Neary	Tailwater Trout Investigation	Tennessee Wildlife Resources Agency	\$70,000
<i>Chemistry</i>	Dale Ensor	Separation Studies of /f/-Elements	Oak Ridge National Laboratory	\$8,135
<i>Computer Science</i>	Douglas Talbert and Michael Rogers	VEH1 Subcontract with Vanderbilt	Vanderbilt University	\$149,137
<i>Co-op Fisheries Unit</i>	James Layzer	TWRA-Base Funds	Tennessee Wildlife Resources Agency	\$30,000
		Survey of the Mussel Fauna of the Wolf River, Pickett and Fentress Counties, Tennessee		\$5,000
		Distribution of Chucky <i>Madtom</i> (<i>Noturus sp. Cf. elegans</i>) in Upper Little Chucky Creek		\$5,000
		Status and Recovery of the Endangered <i>Ringpink Obovaria Retusa</i> in the Green River	U. S. Geological Survey	\$18,868
		Status of the Mussel Fauna in the Green River within the Mammoth Cave National Park		\$4,099
		Development and Testing of a Protocol for Monitoring Mussels		\$15,000
		Propagate Mussels at TTU and Cultivate Juveniles at Mammoth Cave National Park		National Park Service

Appendix B, cont'd
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Arts and Sciences, continued:				
<i>English</i>	Homer Kemp	THC Computerization Project	Tennessee Historical Commission	\$30,000
<i>History</i>	Jeff Roberts and Michael Birdwell	Cumberland Plateau Consortium Teaching American History	White County Board of Education via U. S. Department of Education	\$77,693
<i>Mathematics</i>	Sabine LeBorne	Theory and Application of Hierarchical Matrices in Multiscale Problems	U. S. Department of Energy	\$98,125
<i>Physics</i>	Raymond Kozub	Nuclear Physics with Radioactive Ion Beams	U. S. Department of Energy	\$45,000
	Stephen Robinson	Professional Development Materials for Constructing Physics Understanding	San Diego State University	\$14,930
	John Shriner	Proton Resonance Spectroscopy	U. S. Department of Energy	\$88,000
<i>Physics and STEM Center</i>	Paula Engelhardt and Margaret Phelps	Visual Quantum Mechanics Workshop	Tennessee Higher Education Commission	\$73,778

Appendix B, cont'd
Externally Funded Research
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Business Administration: 3 Researchers, 5 Projects			\$359,662	
<i>Decision Sciences and Management</i>	Curtis Armstrong	Governor's School for Information Technology Leadership	Tennessee Department of Education	\$118,000
	Kevin Liska	Strategic Planning	Tennessee Board of Regents	\$11,000
		RODP Marketing Campaign		\$200,000
		Post Katrina Marketing for Southern University of New Orleans	State of Louisiana	\$18,500
<i>Economics, Finance and Marketing</i>	Ferdinand DiFurio	Small Business Energy Loan Program Study	Tennessee Department of Economic and Community Development	\$12,162

Appendix B, cont'd
Externally Funded Research
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College/Area, Department, Investigator(s),
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Education: 17 Researchers, 15 Projects			\$2,520,356	
<i>Counseling and Psychology</i>	Barry Stein, Ada Haynes and Michael Redding	Project CAT: Assessing Critical Thinking Skills	National Science Foundation	\$236,017
<i>Craft Center</i>	Gail Gentry	Hands-On Craft Program for Elementary School Students	Tennessee Arts Commission	\$5,000
		High School Art/Vocational Craft Program		\$5,500
<i>Curriculum and Instruction</i>	Suellen Alfred and Deborah Setliff	Teaching Across the Curriculum in Middle School	Tennessee Higher Education Commission	\$65,418
	Carl Owens	Integration of Assistive Technology into the Curricular Program	Tennessee Department of Education	\$4,966
	Kristin Pennycuff	Reading and Writing Institute	Tennessee Higher Education Commission	\$74,121
	Dean Richey	Tennessee's Early Intervention System	Tennessee Department of Education	\$1,408,092
		Healthy Start for Upper Cumberland Families and Young Children	Stephens Center	\$12,876
	John Wheeler	Make A Difference Project	Tennessee Department of Education	\$136,987
	Thomas Willis	TDE Special Education Institute-Strand I	Tennessee Department of Education	\$179,117
		TDE Special Education Institute-Strand II		\$71,318
TTU Base-TN Teaching Program		\$149,987		
<i>Curriculum and Instruction/Child Development Lab</i>	Darrell Garber and Angie Smith	Child and Adult Care Food Program	Tennessee Department of Human Services	\$33,264
<i>Curriculum and Instruction/Child Development Lab</i>	Kristin Pennycuff, Angie Smith and Jane Baker	Tennessee Early Childhood Education Pilot Program	Tennessee Department of Education	\$65,001
<i>Curriculum and Instruction/Mathematics/STEM Center</i>	Holly Anthony, Wendy Smith and Sheryl Webb	Developing Conceptual Understanding of K-4 Mathematics Core Content	Tennessee Higher Education Commission	\$72,692

Appendix B, cont'd
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Engineering: 39 Researchers, 75 Projects			\$9,134,971	
<i>Chemical Engineering</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	\$38,836
		RUI: Micro and Meso-Scale Strain Measurements in Cement-Based Materials	National Science Foundation	\$66,002
		Supplement to Micro and Meso-Scale Strain Measurements in Cement-Based Materials		\$5,000
	Venkat Subramanian	Efficient Modeling and Simulation of Lithium-Ion Batteries for Satellite Applications in an Automated Environment	National Reconnaissance Office, DII	\$400,000
		Exploratory Research: A Novel AC Impedance Model for Understanding Transport and Kinetic Limitations of Electromechanical Devices	National Science Foundation	\$30,000
	Donald Visco	Developing Novel Scaffolds for Biological Molecules by Solving the I-QSAR Problem Using the Signature Molecular Descriptor	Sandia National Laboratories	\$50,000
		Interpreting Student-Constructed Study Guides: A Constructive/ Constructionist Perspective	Colorado School of Mines via National Science Foundation	\$2,000
	<i>Civil and Environmental Engineering</i>	Daniel Badoe	Development of Tennessee Travel Demand Model Users' Group	University of Tennessee-Knoxville via Tennessee Department of Transportation
L. K. Crouch		Rapid Repair of Highway and Airfield Pavements	Federal Highway Administration	\$95,884
Sharon Huo		Structural Analysis of Structural Insulated Panels (SIPs)	SGI Ventures	\$15,000
		Simplified Live-Load Distribution-Factor Equations	BridgeTech, Inc.	\$1,841
Vincent Neary		Everglades Hydrodynamic Model Review	U. S. Fish and Wildlife Service	\$11,344

Appendix B, cont'd
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Engineering, continued:				
<i>Electrical and Computer Engineering</i>	Mohamed Abdelrahman	An Out-Reach Program to Manufacturing Industries in Tennessee for Introducing and Implementing Novel Energy Savings Materials Processes	Tennessee Department of Economic and Community Development	\$99,900
	Mohamed Abdelrahman and Sally Pardue	REU Site: Research Exploration for Undergraduates in the Industrial Application of Sensing, Modeling, and Controls	National Science Foundation	\$102,303
	Nasir Ghani	International: Terabits Networks Workshop Held in Conjunction with IEEE INFOCOM 2006 Conference	Oak Ridge National Laboratory via U. S. Department of Energy	\$20,000
		Dynamic Multi-Domain/Multi-Granularity Network Provisioning	National Science Foundation	\$116,729
	Xubin He	Active/Active Metadata Server Research	Oak Ridge National Laboratory	\$25,000
		SGER: Distributed Symmetric Active/Active Metadata Management	National Science Foundation	\$50,000
	Xubin He and Nasir Ghani	REU Site: Research Experience for Undergraduates in Network and Communication Systems	National Science Foundation	\$99,681
	Satish Mahajan	Explosive Vapor Detection Using Microcantilevers	Oak Ridge National Laboratory	\$27,600
	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	\$153,481
	Ghadir Radman	Proposed Collaborative Research Between TVA and TTU and Graduate Student Support	Tennessee Valley Authority	\$52,120
<i>Electrical and Computer Engineering/ Energy Systems Research</i>	Satish Mahajan, Ghadir Radman and Sastry Munukutla	Optimization of High Voltage Lines	Oak Ridge National Laboratory-UT Battelle	\$830,000

Appendix B, cont'd
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Engineering, continued				
<i>Electrical and Computer Engineering/ Manufacturing Center</i>	Mohamed Abdelrahman and Kenneth Currie	In-Situ Real Time Monitoring and Control of Mold Making and Filling Processes	U. S. Department of Energy	\$310,649
<i>Energy Systems Research</i>	Sastry Munukutla	Center for Energy Systems Research	Tennessee Higher Education Commission	\$937,960
		Demonstration Project for Waigaoqiao 900 MW Coal-Fired Power Plant	Shanghai Power Equipment Research Institute	\$10,000
	Sastry Munukutla and Robert Craven	Updating Real-Time Performance Monitoring Software for JPM and Genoa Units	Dairyland Power Cooperative	\$15,000
		Real-Time Performance Monitoring and CO2 Tracking System Validation and Training	Research and Development Solutions, LLC via U. S. Department of Energy	\$18,418
<i>Energy Systems Research/Civil and Environmental Engineering/ Mechanical Engineering</i>	Sastry Munukutla, L. K. Crouch and Stephen Idem	Power-Test-Service Account Projects	Various	\$22,728
<i>Energy Systems Research / Mechanical Engineering</i>	Sastry Munukutla and Stephen Idem	Boiler Cleanliness Model at Brandon Shores	Clyde Bergemann	\$10,000
		Generic Cleanliness and Plant Heat Rate Program Application	Clyde Bergemann	\$70,000
		Boiler Cleanliness Model at Big Cajun #1 Station	Clyde Bergemann	\$10,000
		Boiler Cleanliness Model at Big Cajun #2 Station	Clyde Bergemann	\$20,000
		Boiler Cleanliness Model at Big Cajun #3 Station	Clyde Bergemann	\$10,000

Appendix B, cont'd
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Engineering, continued				
<i>Manufacturing Center</i>	Kenneth Currie	Center for Manufacturing Research	Tennessee Higher Education Commission	\$1,515,435
		Counter Gravity (Hitchiner) and Pressure Assisted Lost Foam Magnesium Casting	Oak Ridge National Laboratory	\$110,000
		UT-CIS Contract for Employee Services 2005-06	The University of Tennessee Center for Industrial Services	\$50,000
		Titanium Welded Bellows-Phase II	Flexial Corporation	\$76,768
		Simulation Analysis	ArvinMeritor	\$24,000
		Manufacturing Center Workshop Agency Account 2005-06	Various	\$2,575
		General Work Study 2005-06	Various	\$191,041
		Testing and Design 2005-06	Various	\$64,912
	Robert Qiu	Time-Reversal for UWB Communications System	Army Research Office	\$15,000
		Development of Simulation Platform of Millimeter Wave UWB for Wireless Personal Area Networks	Panasonic Digital Networking Laboratory of Panasonic R&D Company of America	\$40,000
	Chunsheng Wang	Battery Research	Proprietary	\$70,000
		SGER: Exploratory Research on an Oxide Ion and Proton Co-Ionic Conducting Membrane for Fuel Cell Applications	National Science Foundation	\$10,000
		High Power CsH ₂ PO ₄ -BITIVOX Membrane Fuel Cells for Military Applications	U. S. Department of Defense	\$194,821
	<i>Manufacturing and Industrial Technology</i>	Ahmed Elsayy	International: Innovative Technology for Improving Wear Resistance and Fracture Toughness of Austempered Ductile Iron Used for Automotive Industry by Either Thermomechanical or Two-Step Austempering	National Science Foundation

Appendix B, cont'd
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Engineering, continued				
<i>Manufacturing and Industrial Technology continued</i>	Ismail Fidan	Integrating Rapid Prototyping Technology into a Manufacturing and Industrial Technology Curriculum	National Science Foundation	\$23,990
<i>Manufacturing and Industrial Technology/ Electrical and Computer Engineering</i>	Ismail Fidan and Nasir Ghani	The Development of a Remotely Accessible Rapid Prototyping Laboratory	National Science Foundation	\$40,186
<i>Mechanical Engineering</i>	Stephen Canfield	Capture Concepts and Model Development for MXER Tether Systems w/Model Development	NASA	\$81,982
	Jie Cui	Combustion and Performance Optimization of Coal-Fired Units Equipped with Ecojets: Phase I	Synterprise Solutions, LLC	\$25,286
	Glenn Cunningham	Tennessee Energy Institute-Energy Audits 2005-06	Tennessee Energy Institute	\$20,000
	Stephen Idem	Laboratory Testing of Duct Fittings to Determine Loss Coefficients	American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.	\$45,930
	Chris Wilson	Effects of Porosity and Low-Velocity Impact Damage on Residual Strength of GFRP Laminates	NASA	\$24,000
	Chris Wilson and Joseph Richardson	Stabilizer Bar Modeling	Proprietary	\$35,000
	Ying Zhang	Aluminide Coatings for Power-Generation Applications-Renewal	Oak Ridge National Laboratory	\$78,000
		A Novel Low-Temperature Diffusion Aluminide Coating for Ultrasupercritical Coal-Fired Boiler Applications	U. S. Department of Energy	\$54,395
		GOALI: Platinum-Enriched Y+Y' Bond Coats for Next-Generation Single-Crystal Ni-Base Superalloys	National Science Foundation	\$113,319

Appendix B, cont'd
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Engineering, continued				
<i>Mechanical Engineering continued</i>	Jiahong Zhu	Novel Composite Materials for SOFC Cathode-Interconnect Contact	U. S. Department of Energy	\$62,939
		Tailoring Fe-Base Alloys for Intermediate-Temperature SOFC Interconnect Application		\$52,910
		Career: Novel Conductive Oxide Coatings on Metallic Interconnect for Intermediate-Temperature SOFC Application	National Science Foundation	\$81,709
<i>Mechanical Engineering/ Energy Systems Research</i>	Stephen Canfield and James Beard	NDE Testing Boiler Water Wall Inspection Robot	ARF, Inc./EPRI I&C Center	\$18,358
<i>Mechanical Engineering/ Curriculum and Instruction</i>	Stephen Canfield and Dean Richey	Enabling Families, Infants, Toddlers and Preschoolers through Technology-EIME Project	Tennessee Department of Education	\$32,500
<i>Water Center</i>	Sharon Berk	Microbial Ecology of Food-Borne Pathogens-Role of Protozoa in Pathogen Survival and Maintenance in the Environment	U. S. Department of Agriculture	\$50,000
	Yvette Clark	Local Planning Assistance Office-Geographic Information System Improvement Proposal	Tennessee Department of Economic and Community Development	\$132,482
	Dennis George	Center for the Management, Utilization and Protection of Water Resources	Tennessee Higher Education Commission	\$1,201,311
		A Comparative Study of the Historical and Present Ecological State of the Emory River	Tennessee Wildlife Resources Agency	\$15,000
		Water Center Analytical and Computer Services	Various	\$102,441
	Dennis George and Martha Wells	Determination of a Water Quality Marker Reflecting System Effectiveness of the Sewanee Utility District's Land Application System	Sewanee Utility District	\$43,382

Appendix B, cont'd
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Engineering, continued				
<i>Water Center continued</i>	Gay Shepherd	Comprehensive/Multi-Faceted Meth Response Project (SMART)	U. S. Department of Justice	\$493,322
	Martha Wells	An Assessment of the Occurrence of Chemicals Causing Endocrine Disruption in Fish in the South Branch of the Potomac River-Phase II	U. S. Geological Survey	\$23,585
<i>Water Center/ Biology</i>	Dennis George and Bradford Cook	A Comparative Study of the Historical and Present Ecological State of the Emory River Watershed	U. S. Fish and Wildlife Service	\$11,250
	Dennis George, Yvette Clark and Bradford Cook	Collect and Analyze Water Quality Samples from the Emory River Watershed	Tennessee Valley Authority	\$10,000
<i>Water Center/ Mechanical Engineering</i>	Dennis George, Martha Wells and Glenn Cunningham	Franke Co. Innovative Food Processing Exhaust Emission Treatment System-Research Program	Franke Company	\$99,992
<i>Water Center/ Civil and Environmental Engineering</i>	Kim Stearman, Dennis George, Yvette Clark and Vincent Neary	Pigeon Roost Creek Watershed Restoration Project: Storm Water Control Using Bioretention Filters and Long-Range Comprehensive Plan	Tennessee Department of Agriculture/ National Park Service	\$44,305

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STEM Center: 3 Researchers, 3 Projects			\$1,319,406	
<i>STEM Center</i>	Margaret Phelps	NSF ATE Eastern Corridor Teacher Education Project	Pellissippi State Technical Community College via National Science Foundation	\$23,328
<i>STEM Center/ Facilities and Business Services</i>	Glenn Binkley and Margaret Phelps	STEM Center	NASA	\$1,290,000
<i>STEM Center/ Mathematics</i>	Margaret Phelps and Rafal Ablamowicz	Middle School Math Partnership	Putnam County Schools	\$6,078

Appendix C
Intellectual Property Activity
FY 2002-06

Invention Disclosures & Status FY 2002-FY 2006					
Disclosure Number	Filing Date	Title	TTU or First Named Inventor	Other Inventors	Status
02-001-ID	7/20/2002	Multiple Description Coding Using Transform And Data Fusion	Tian, Shumin	P.K. Rajan	Inactive. Utility Patent Application published
03-001-ID	2/14/2003	Vortex Tube Particle Separator	Cunningham, Glenn	Hoy, Darrell; Idem, Steve; Ballal, S.K.	Inactive
03-002-ID	2/28/2003	Optically Based Instrument To Id Organic Matter In Water Solution	Wells, Martha	Cunningham, Glenn	Active Utility Patent Application currently underway
03-003-ID	3/27/2003	Flexible AC Current Meter Using Integrated Magnetic Fields	Mahajan, Satish	Ingram, Michael (Tva)	Active Utility Patent Application currently underway
03-004-ID	4/14/2003	Piezoelectric Nano Surface Machining	Underdown, Frank	Jackson, Mark; Hyde, Luke; Robinson, Grant	Assigned back to inventors 07/06
03-005-ID	4/23/2003	Microscale Clamping Device	Jackson, Mark	Underdown, Frank; Hyde, Luke; Robinson, Grant	Assigned back to inventors 07/06
03-006-ID	4/23/2003	Laser Assisted Nano Grinding And Machining	Jackson, Mark	Hyde, Luke; Robinson, Grant	Assigned back to inventors 07/06
03-007-ID	5/5/2003	X-Ray And High Resolution Ultrasonic Spectrometer	Underdown, Frank		Inactive
03-008-ID	6/16/2003	Non Deflecting Boring Bar	Jackson, Mark	Hyde, Luke; Robinson, Grant	Assigned back to inventors 07/06
03-009-ID	6/16/2003	X-Y-Z Nanoslides	Jackson, Mark	Hyde, Luke; Robinson, Grant	Assigned back to inventors 07/06
04-001-ID	7/28/2003	Automatic Prescription Verification System	Alouani, Ali	Currie, Kenneth	Active PATENT ISSUED 04/06
04-002-ID	7/29/3003	Multi-Layer Distributed IP Storage (Mds-Ips)	He, Xubin		Inactive
04-003-ID	11/11/2003	A Compliant Parallel-Gravity Suspension System For A Tracked, Climbing Robot	Canfield, Stephen	Beard, Jamie	Inactive
04-004-ID	11/4/2003	Digital Smith Predictor	Dunn, Alex		Inactive
04-005-ID	12/3/2003	Wear Compensation Of Machine Tools Using Neural Image Processing To Measure Changes In Tool Geometry	Hyde, Luke	Rhodes, Richard; Jackson, Mark	Inactive Inventor given permission to pursue additional action.
04-006-ID	1/21/2004	Pulsed Water Jet Machining Center	Jackson, Mark	Hyde, Luke; Robinson, Grant	Assigned back to inventors 07/06
04-007-ID	3/9/2004	Micro Air-Powered Precision Cutting Tool	Khalili, Seyed	Jackson, Mark; Peddieson, John	Assigned back to inventors 07/06
04-008-ID	4/13/2004	A Method And Device For Measurement Of The Profile Of Void Space Distribution In Foam Materials	Abdelrahman, Mohamed	Currie, Kenneth; Walford, Graham	Inactive
05-001-ID	7/29/2004	A Flask And Methodology For Lost Foam Casting Under Controlled Environment	Abdelrahman, Mohamed	Walford, Graham; Currie, Kenneth; Renfro, Mike; Vondra, Fred	Inactive
05-002-ID	9/15/2004	Air System For Vibration Testing (ASVT)	Pardue, Sally	Abdelrahman, Mohamed; Renfro, Mike; Baswell, Mike; Shaam, Naren	Inactive

Appendix C, cont'd
Intellectual Property Activity
FY 2002-06

05-003-ID	12/6/2004	Continuation-In-Parts Of The Automatic Prescription Verification System	Currie, Kenneth	Rhodes, Richard; Renfro, Mike	Inactive Continuation-in-parts application abandoned
05-004-ID	11/2/2004	Trianex Metal Chelation Materials	Lisic, Edward		Inactive
05-005-ID	2/10/2005	A Novel All-Solid-State Micro (And/Or Nano)-Battery And Supercapacitor Architectures	Wang, Chunsheng	Hong, Jian	Active Utility Patent Application currently underway
05-006-ID	3/18/2005	Non-Optical Explosive Sensor Based On Two-Tract Piezoresistive Microcantiliver	Yi, Dechang	Wage, Thundat, Pinnaduwege	Active Licensed Invention Patent Application Published
05-007-ID	6/3/2005	Multi-Axle Robot For Climbing And Exploration Of Harsh Environments	Canfield, Stephen	Beard, Jamie; White, Neal	Inactive
06-001-ID	11/23/2005	Multipurpose Autonomous Robot with Application to Autonomous Detection and Extinction of Small Indoor Fires	Alouani, Ali		Active Utility Patent Application currently underway
06-001-ID	2/14/2006	Integrated Multichannel Digital Stethoscope	Alouani, Ali		Active Provisional Patent Application Issued. Expires 05/19/2007

Additional IP Activity | FY 2006

Utility Patent ISSUED for: Automatic Prescription Verification System; Inventor Alouani & Currie; Patent # US 7,028,723. Date of Patent: 4/18/2006

Patent 5,769,335 | Method and Apparatus for Shear Pulverization of Polymer Materials | Rights ASSIGNED BACK to Inventor, Fyodor Shutov 01/06

Patents Held by Tennessee Technological University:

- 1) **US 7,028,723 | Automatic Prescription Verification System (Alouani/Currie)**
- 2) **6,567,795 | Artificial Neural Network and Fuzzy Logic Based Boiler Tube Leak Detection Systems (divisional application) (Alouani, Chang)**
- 3) **6,192,352 | Artificial Neural Network and Fuzzy Logic Based Boiler Tube Leak Detection Systems (Alouani, Chang)**

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Disclosure Number	Date	Title	Author	Status
06-001-C	5/16/2006	CAT (Critical Thinking Assessment Test) ; Version 4.0	Barry Stein	Registered Copyright TXu1-301-043