



Tennessee Technological University

**OFFICE OF RESEARCH  
ANNUAL REPORT**

Fiscal Year 2010-11



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. Approximately 200,000 students attending post-secondary institutions in Tennessee are enrolled in the Tennessee Board of Regents (TBR) system.

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Executive Secretary

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Proposal Development Specialist

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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.
- Conducting seminars and workshops on proposal writing and funding sources.
- 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.
- Monitoring compliance with a broad range of federal policies and guidelines that regulate research activities in the following areas: responsible conduct of research, research ethics, human subjects research, and the humane care and use of animals in laboratory research and experimentation.

## SUMMARY OF ACTIVITIES 2010-11

During fiscal year 2010-11, the University's Mission was supported through the Office of Research in the following ways:

- Grants and contracts externally funded numbered 133 with a value of \$13,784,423, which represents a decrease of 19% over the 2009-10 total of \$17,071,437. Decrease in funding is due to the resignations of several research-active faculty who transferred their grants and contracts to their respective institutions.
- Grants and contracts received through the three Centers of Excellence and the STEM Center numbered 86 with a value of \$8,813,138, which represents 64% of total dollars and 66% of the total number of grants and contracts received.
- Grants and contracts received through federal agencies numbered 77 with a value of \$6,485,866, which represents 58% of grants and contracts and 47% of total dollars received.
- Grants and contracts received through state agencies numbered 48 with a value of \$7,036,396 which represents 36% of the total number of grants and contracts and 51% of total grant and contract dollars received.
- Private contracts were at 6 with a value of \$138,143, which represents 5% of the total number of grants and contracts and 1% of total grant and contract dollars.
- Local sources accounted for 2 contracts or 1% of total grants and contracts with a value of \$124,018 or 1% of grant and contract dollars.
- Grants and contracts received for research numbered 83 with a value of \$8,869,731, which represents 62% of the total number of grants and contracts and 64% of total dollars received.
- Grants and contracts received for public service numbered 34 with a value of \$3,667,760 which represents 25% of all grants and contracts and 26% of total grant and contract dollars received.
- Instruction funding received numbered 9 with a value of \$652,526, which represents 7% of total number of grants and contracts and 5% of total grant and contract dollars.
- Academic Support funding accounted for 1 contract with a value of \$6,960, which represents 1% of the total number of grants and contracts and 1% of total grant and contract dollars.

- Grants and contracts received for institutional support/capital projects was 6 with a value of \$587,446 which represents 5% of all grants and contracts and 4% of total grants and contract dollars.
- Internal funds were provided in the amount of \$115,487 for small grants to support faculty research in the form of ***research initiation and/or research development***. Twenty-three projects involving 25 faculty members were supported. The typical amount of support granted was \$5,000 per faculty member.
- The top three funding agencies were the Tennessee Board of Regents at \$1,925,322, the National Science Foundation with \$1,504,227, and the Tennessee Department of Education at \$1,143,169.
- Proposals submitted for external funding numbered 148 with a value of \$28,145,822.
- Proposals submitted through the Centers of Excellence and STEM Center numbered 102 with a value of \$22,541,687, which represents 69% of proposals submitted and 80% of funds requested.
- Proposals submitted to federal agencies numbered 87 requesting \$20,470,922, which represents 59% of proposals submitted and 73% of dollars requested.
- Proposals submitted to state agencies numbered 40 requesting \$6,892,047 which represents 27% of proposals submitted and 24% of dollars requested.
- Proposals submitted to private agencies numbered 19 requesting \$658,835 which represents 13% of proposals submitted and 2% of dollars requested.
- Proposals submitted to local agencies numbered 2 requesting \$124,018 which represents 1% of proposals submitted and 1% of dollars requested.

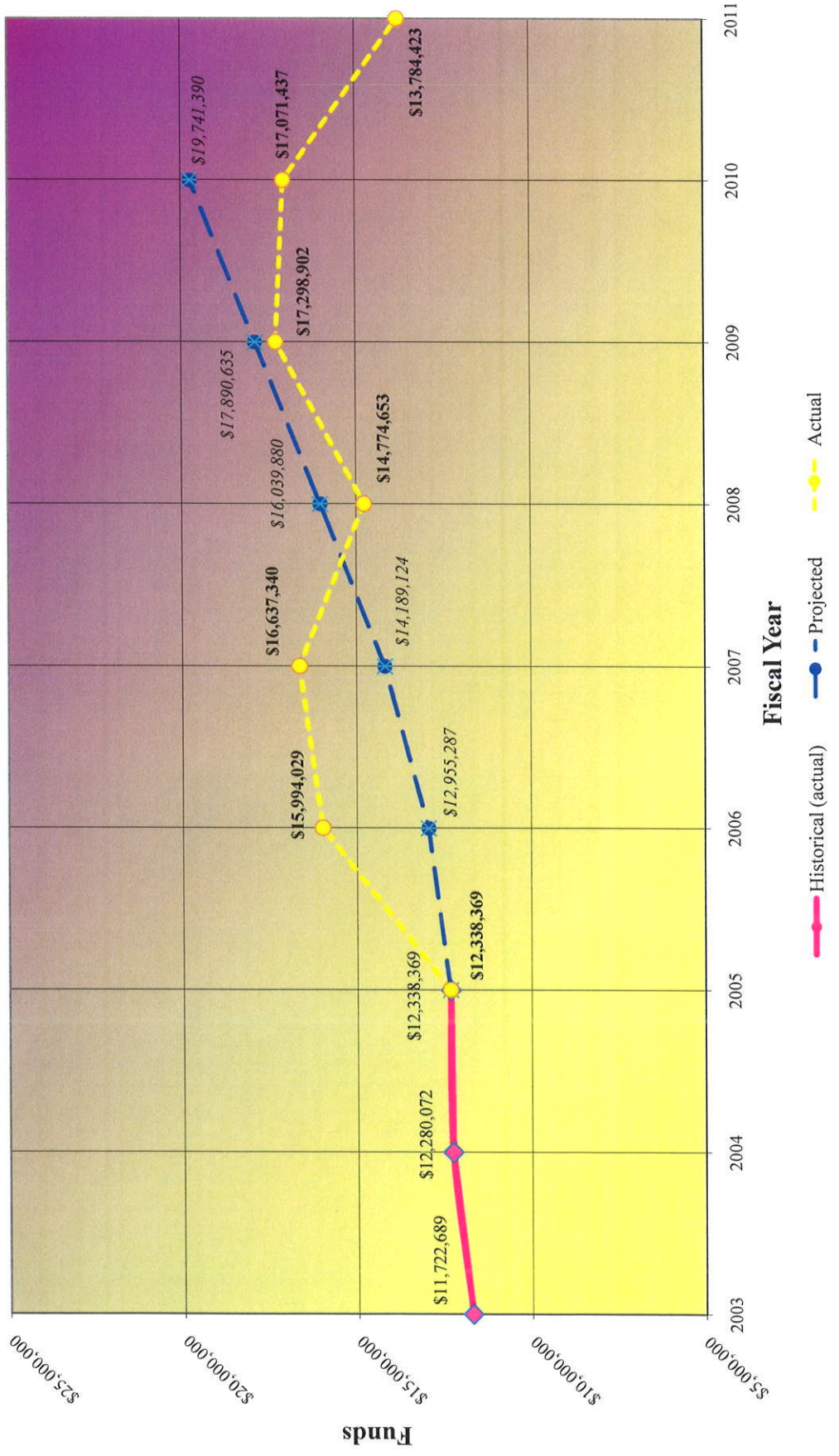
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**FIGURE I**  
**External Funds**  
**Historical, Actual and Projected**  
**2003-2011**



**TABLE I**  
**Externally Funded Projects by Department of Project PI**  
**Fiscal Year 2010-11**

|                                    | PI's Department, Center, or Unit        | Centers of Excellence       |                      |              |           |             | STEM Center  | Departments/<br>Other Units | Total              |
|------------------------------------|---|-----------------------------|----------------------|--------------|-----------|-------------|--------------|-----------------------------|--------------------|
|                                    |   | Energy Center               | Manufacturing Center | Water Center |           |             |              |                             |                    |
| Agricultural and Human Sciences    | Agriculture                             |                             |                      |              |           |             | \$184,361    | \$184,361                   |                    |
|                                    | Human Ecology                           |                             |                      |              |           |             | \$1,021,786  | \$1,021,786                 |                    |
|                                    | Dean's Office                           |                             |                      |              |           |             | \$150,000    | \$150,000                   |                    |
| <b>Subtotal</b>                    |   |                             |                      |              |           |             |              | <b>\$1,356,147</b>          |                    |
| Arts and Sciences                  | Biology                                 |                             |                      | \$473,641    |           |             |              | \$473,641                   |                    |
|                                    | Chemistry                               |                             |                      | \$70,000     |           |             |              | \$70,000                    |                    |
|                                    | Cooperative Fisheries Research Unit     |                             |                      | \$638,950    |           |             | \$30,000     | \$668,950                   |                    |
|                                    | Mathematics                             | \$50,945                    |                      |              |           | \$226,902   |              | \$277,847                   |                    |
|                                    | Physics                                 |                             |                      |              |           |             | \$97,000     | \$97,000                    |                    |
| <b>Subtotal</b>                    |   |                             |                      |              |           |             |              | <b>\$1,587,438</b>          |                    |
| Business                           | Business Media Center                   |                             |                      |              |           |             | \$859,621    | \$859,621                   |                    |
|                                    | Decision Sciences and Management        |                             |                      |              |           |             | \$123,300    | \$123,300                   |                    |
|                                    | Small Business Development Center       |                             |                      |              |           |             | \$151,251    | \$151,251                   |                    |
| <b>Subtotal</b>                    |   |                             |                      |              |           |             |              | <b>\$1,134,172</b>          |                    |
| Education                          | Counseling and Psychology               |                             |                      |              |           |             | \$506,831    | \$506,831                   |                    |
|                                    | Curriculum and Instruction              |                             |                      |              |           | \$74,994    | \$965,701    | \$1,040,695                 |                    |
|                                    | Exercise Science and Physical Education |                             |                      |              |           |             | \$15,000     | \$15,000                    |                    |
| <b>Subtotal</b>                    |   |                             |                      |              |           |             |              | <b>\$1,562,526</b>          |                    |
| Engineering                        | Basic Engineering                       |                             |                      |              |           |             | \$184,910    | \$184,910                   |                    |
|                                    | Chemical Engineering                    |                             | \$129,404            |              |           |             |              | \$129,404                   |                    |
|                                    | Civil and Environmental Engineering     | \$348,566                   |                      | \$27,600     |           |             |              | \$376,166                   |                    |
|                                    | Computer Science                        |                             | \$245,000            |              |           |             | \$138,500    | \$383,500                   |                    |
|                                    | Electrical and Computer Engineering     | \$92,624                    |                      |              |           |             |              | \$92,624                    |                    |
|                                    | Manufacturing and Industrial Technology | \$24,011                    | \$66,706             |              |           |             |              | \$90,717                    |                    |
|                                    | Mechanical Engineering                  | \$348,713                   | \$197,489            |              |           | \$40,100    |              | \$586,302                   |                    |
|                                    | Engineering Administration              | \$11,266                    |                      |              |           |             | \$33,178     | \$44,444                    |                    |
|                                    | <b>Subtotal</b>                         |                             |                      |              |           |             |              |                             | <b>\$1,888,067</b> |
|                                    | Centers of Excellence                   | Energy Center Appropriation | \$896,700            |              |           |             |              |                             | \$896,700          |
| Energy Center Other                |   | \$180,464                   |                      |              |           |             |              | \$180,464                   |                    |
| Manufacturing Center Appropriation |   |                             | \$1,512,400          |              |           |             |              | \$1,512,400                 |                    |
| Manufacturing Center Other         |   |                             | \$1,242,412          |              |           |             |              | \$1,242,412                 |                    |
| Water Center Appropriation         |   |                             |                      | \$1,188,000  |           |             |              | \$1,188,000                 |                    |
| Water Center Other                 |   |                             |                      | \$326,251    |           |             |              | \$326,251                   |                    |
| <b>Subtotal</b>                    |   |                             |                      |              |           |             |              | <b>\$5,346,227</b>          |                    |
| Interdisciplinary Studies          | Extended Education                      |                             |                      |              |           | \$500,000   |              | \$500,000                   |                    |
| <b>Subtotal</b>                    |   |                             |                      |              |           |             |              | <b>\$500,000</b>            |                    |
| Other                              | Counseling Center                       |                             |                      |              |           |             | \$3,619      | \$3,619                     |                    |
|                                    | STEM Center                             |                             |                      | \$400,000    |           |             |              | \$400,000                   |                    |
|                                    | University Police                       |                             |                      |              |           | \$6,227     |              | \$6,227                     |                    |
| <b>Subtotal</b>                    |   |                             |                      |              |           |             |              | <b>\$409,846</b>            |                    |
| <b>Total</b>                       | All Units                               | \$1,953,289                 | \$3,393,411          | \$2,724,442  | \$741,996 | \$4,971,285 | \$13,784,423 |                             |                    |

**TABLE II**

**Proposals Submitted and Awards Received  
by University Unit  
FY 2010-11**

| <b>University Unit</b>         | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Funded</b> |
|--------------------------------|----------------------------|-------------------------|------------------------|----------------------|
| Agricultural & Human Sciences* | 12                         | \$2,441,454             | 10                     | \$1,356,147          |
| Arts & Sciences*               | 7                          | \$1,077,044             | 3                      | \$127,000            |
| Business Administration*       | 9                          | \$516,099               | 13                     | \$1,134,172          |
| Education*                     | 5                          | \$274,581               | 13                     | \$1,487,532          |
| Engineering*                   | 5                          | \$395,713               | 4                      | \$356,588            |
| Administrative Offices*        | 8                          | \$899,244               | 4                      | \$509,846            |
| C/E Energy Systems Research**  | 17                         | \$2,979,970             | 26                     | \$1,953,289          |
| C/E Manufacturing Research**   | 37                         | \$10,786,886            | 23                     | \$3,393,411          |
| C/E Water Resources Research** | 33                         | \$4,592,568             | 33                     | \$2,724,442          |
| STEM Center**                  | 15                         | \$4,182,263             | 4                      | \$741,996            |
| <b>TOTAL</b>                   | <b>148</b>                 | <b>\$28,145,822</b>     | <b>133</b>             | <b>\$13,784,423</b>  |

\* Without Centers of Excellence or STEM Center

\*\* See Table III

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 III**

**Proposals Submitted and Awards Received  
Through Centers of Excellence and STEM Center  
by Academic Unit  
FY 2010-11**

| <b>Center/Academic Unit</b>  | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Funded</b> |
|--|----------------------------|-------------------------|------------------------|----------------------|
| <b>Energy Systems Research</b>   |                            |                         |                        |                      |
| Center   | 3                          | \$1,063,064             | 4                      | \$1,088,430          |
| Center/Chemical Engineering  | 1                          | \$409,470               | -                      | -                    |
| Center/Civil and Environmental Engineering   | 3                          | \$443,000               | 11                     | \$308,466            |
| Center/Civil and Environmental Engineering/Mechanical Engineering                  | 2                          | \$31,266                | 3                      | \$40,100             |
| Center/Electrical and Computer Engineering   | 3                          | \$414,172               | 2                      | \$92,624             |
| Center/Manufacturing Center/Computer Science/Electrical and Computer Engineering   | 1                          | \$242,880               | -                      | -                    |
| Center/Manufacturing and Industrial Technology                                     | 1                          | \$178,718               | 1                      | \$24,011             |
| Center/Mathematics   | -                          | -                       | 1                      | \$50,945             |
| Center/Mechanical Engineering  | 3                          | \$197,400               | 3                      | \$115,000            |
| Center/Mechanical Engineering/Computer Science/Electrical and Computer Engineering | -                          | -                       | 1                      | \$233,713            |
| <b>Total Energy Center</b>   | <b>17</b>                  | <b>\$2,979,970</b>      | <b>26</b>              | <b>\$1,953,289</b>   |

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 III, cont'd**

**Proposals Submitted and Awards Received  
Through Centers of Excellence and STEM Center  
by Academic Unit  
FY 2010-11**

| <b>Center/Academic Unit</b>   | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Received</b> |
|---|----------------------------|-------------------------|------------------------|------------------------|
| <b>Manufacturing Center</b>   |                            |                         |                        |                        |
| Center  | 12                         | \$4,287,150             | 10                     | \$2,754,812            |
| Center/Chemical Engineering   | 2                          | \$25,974                | 3                      | \$129,404              |
| Center/Chemical Engineering/<br>Mechanical Engineering              | 2                          | \$1,519,735             | -                      | -                      |
| Center/Chemical Engineering/<br>Chemistry                           | 2                          | \$55,632                | -                      | -                      |
| Center/Chemical Engineering/<br>Electrical and Computer Engineering | 1                          | \$398,365               | -                      | -                      |
| Center/Computer Science   | 5                          | \$1,860,847             | 2                      | \$245,000              |
| Center/Electrical and Computer<br>Engineering                       | 4                          | \$1,072,061             | -                      | -                      |
| Center/Manufacturing and Industrial<br>Technology                   | 4                          | \$635,945               | 1                      | \$66,706               |
| Center/Mechanical Engineering                                       | 5                          | \$931,177               | 7                      | \$197,489              |
| <b>Total Manufacturing Center</b>                                   | <b>37</b>                  | <b>\$10,786,886</b>     | <b>23</b>              | <b>\$3,393,411</b>     |

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 III, cont'd**

**Proposals Submitted and Awards Received  
Through Centers of Excellence and STEM Center  
by Academic Unit  
FY 2010-11**

| <b>Center/Academic Unit</b>                | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Funded</b> |
|--|----------------------------|-------------------------|------------------------|----------------------|
| <b><u>Water Resources Research</u></b>     |                            |                         |                        |                      |
| Center                                     | 9                          | \$1,870,689             | 8                      | \$1,415,726          |
| Center/Agriculture                         | 2                          | \$341,577               | 1                      | \$98,525             |
| Center/Biology                             | 3                          | \$320,000               | 7                      | \$205,641            |
| Center/Biology/Cooperative Fisheries Unit  | 1                          | \$111,626               | -                      | -                    |
| Center/Biology/Earth Sciences              | -                          | -                       | 1                      | \$268,000            |
| Center/Chemistry                           | 2                          | \$255,026               | 2                      | \$70,000             |
| Center/Civil and Environmental Engineering | 4                          | \$514,232               | 1                      | \$27,600             |
| Center/Cooperative Fisheries Unit          | 12                         | \$1,179,418             | 13                     | \$638,950            |
| <b>Total Water Center</b>                  | <b>33</b>                  | <b>\$4,592,568</b>      | <b>33</b>              | <b>\$2,724,442</b>   |

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 III, cont'd**

**Proposals Submitted and Awards Received  
Through Centers of Excellence and STEM Center  
by Academic Unit  
FY 2010-11**

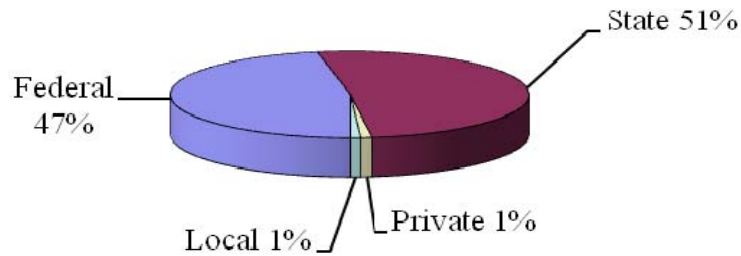
| <b>Center/Academic Unit</b>   | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Funded</b> |
|---|----------------------------|-------------------------|------------------------|----------------------|
| <b>STEM Center</b>  |                            |                         |                        |                      |
| Center  | -                          | -                       | 1                      | \$400,000            |
| Center/Basic Engineering  | 1                          | \$47,500                | -                      | -                    |
| Center/Chemical Engineering   | 1                          | \$550,662               | -                      | -                    |
| Center/Chemical Engineering/<br>Chemistry/Mathematics/Physics                   | 1                          | \$750,000               | -                      | -                    |
| Center/Chemistry/Curriculum and<br>Instruction                                  | 1                          | \$123,919               | -                      | -                    |
| Center/Computer Science/<br>Curriculum and Instruction/<br>Chemical Engineering | 1                          | \$449,909               | -                      | -                    |
| Center/Curriculum and Instruction   | 5                          | \$441,023               | 1                      | \$74,994             |
| Center/Curriculum and Instruction/<br>Basic Engineering                         | 1                          | \$198,542               | -                      | -                    |
| Center/Curriculum and Instruction/<br>Mathematics                               | 2                          | \$310,300               | -                      | -                    |
| Center/Mathematics  | -                          | -                       | 1                      | \$226,902            |
| Center/Mechanical Engineering   | 1                          | \$110,500               | 1                      | \$40,100             |
| Center/Physics/Curriculum and<br>Instruction                                    | 1                          | \$1,199,908             | -                      | -                    |
| <b>Total STEM Center</b>  | <b>15</b>                  | <b>\$4,182,263</b>      | <b>4</b>               | <b>\$741,996</b>     |
| <b>GRAND TOTAL</b>  | <b>102</b>                 | <b>\$22,541,687</b>     | <b>86</b>              | <b>\$8,813,138</b>   |

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 IV**

**Proposals Submitted and Awards Received  
by Agency Classification  
FY 2010-11**

| <b>Agency Classification</b> | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Funded</b> |
|------------------------------|----------------------------|-------------------------|------------------------|----------------------|
| Federal                      | 87                         | \$20,470,922            | 77                     | \$6,485,866          |
| State                        | 40                         | \$6,892,047             | 48                     | \$7,036,396          |
| Private                      | 19                         | \$658,835               | 6                      | \$138,143            |
| Local                        | 2                          | \$124,018               | 2                      | \$124,018            |
| <b>TOTAL</b>                 | <b>148</b>                 | <b>\$28,145,822</b>     | <b>133</b>             | <b>\$13,784,423</b>  |



**Figure 2. Percentage Funding by Agency Classification  
FY 2010-11**

**TABLE V**

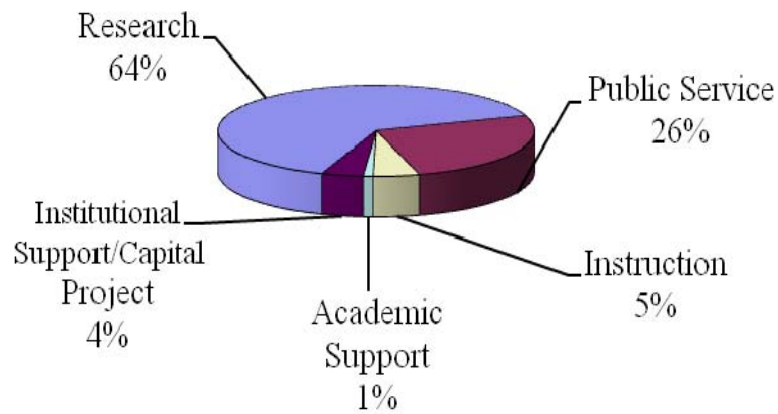
**Federal Awards Received by Agency  
FY 2010-11**

| <b>Federal Agencies</b>                            | <b>Awards Funded</b> |
|--|----------------------|
| Alignment Nashville                                | \$66,706             |
| Appalachian Regional Commission                    | \$500,000            |
| Georgia Environmental Facilities Authority         | \$84,234             |
| Great Smoky Mountain National Park                 | \$23,700             |
| Hydrologics, Inc.                                  | \$34,865             |
| National Aeronautics and Space Administration      | \$467,700            |
| National Science Foundation                        | \$1,504,227          |
| National Shipbuilding Research Program             | \$24,011             |
| National Writing Project                           | \$35,000             |
| Oak Ridge National Laboratories                    | \$197,698            |
| Office of Naval Research                           | \$836,322            |
| Sandia National Laboratories                       | \$75,000             |
| Tennessee Department of Agriculture                | \$29,949             |
| Tennessee Department of Education                  | \$736,401            |
| Tennessee Department of Finance and Administration | \$6,227              |
| Tennessee Department of Human Services             | \$33,264             |
| Tennessee Department of Transportation             | \$149,500            |
| Tennessee Higher Education Commission              | \$208,661            |
| Tennessee Small Business Development Center        | \$151,251            |
| Tennessee Valley Authority                         | \$10,000             |
| Tennessee Wildlife Resources Agency                | \$155,000            |
| The Nature Conservancy                             | \$268,000            |
| U. S. Department of Agriculture                    | \$17,760             |
| U. S. Department of Energy                         | \$177,000            |
| U. S. Department of Health and Human Services      | \$15,000             |
| U. S. Department of Homeland Security              | \$170,000            |
| U. S. Fish and Wildlife Service                    | \$17,500             |
| U. S. Geological Survey                            | \$413,100            |
| UT-Battelle, LLC                                   | \$50,000             |
| West Virginia University                           | \$27,790             |
| <b>Total Federal Dollars</b>                       | <b>\$6,485,866</b>   |

**TABLE VI**

**Proposals Submitted and Awards Received  
by Activity  
FY 2010-11**

| <b>Activity/Use</b>                   | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Funded</b> |
|---------------------------------------|----------------------------|-------------------------|------------------------|----------------------|
| Research                              | 94                         | \$20,185,059            | 83                     | \$8,869,731          |
| Public Service                        | 31                         | \$3,201,428             | 34                     | \$3,667,760          |
| Instruction                           | 10                         | \$1,250,305             | 9                      | \$652,526            |
| Academic Support                      | 3                          | \$879,826               | 1                      | \$6,960              |
| Institutional Support/Capital Project | 10                         | \$2,629,204             | 6                      | \$587,446            |
| <b>TOTAL</b>                          | <b>148</b>                 | <b>\$28,145,822</b>     | <b>133</b>             | <b>\$13,784,423</b>  |

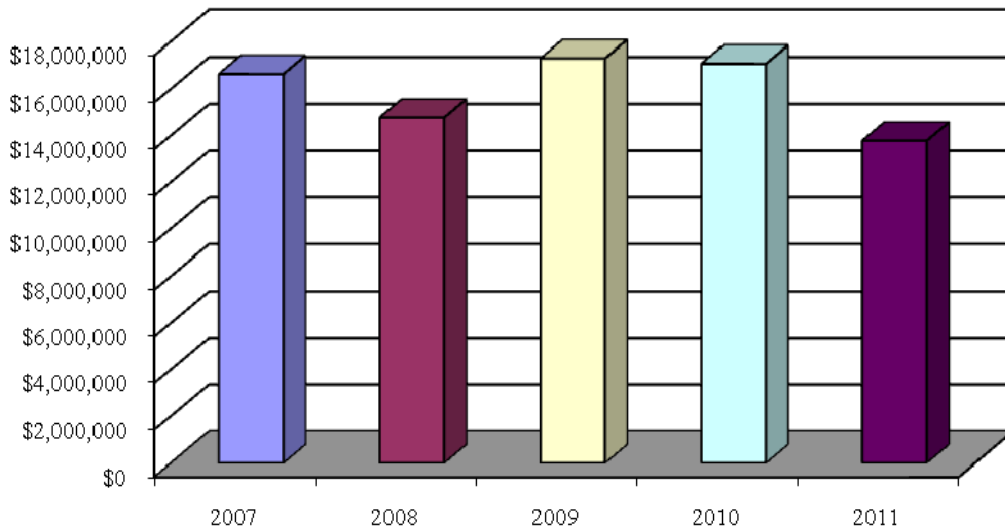


**Figure 3. Percentage Funding by Activity  
FY 2010-11**

**TABLE VII**

**Proposals Submitted and Awards Received  
FY 2007-11**

| <b>Fiscal Year</b> | <b>Proposals Submitted</b> | <b>Amount Requested</b> | <b>Awards Received</b> | <b>Amount Funded</b> |
|--------------------|----------------------------|-------------------------|------------------------|----------------------|
| 2007               | 190                        | \$36,986,928            | 171                    | \$16,637,340         |
| 2008               | 165                        | \$33,811,304            | 174                    | \$14,774,653         |
| 2009               | 170                        | \$38,582,380            | 157                    | \$17,298,902         |
| 2010               | 169                        | \$60,770,653            | 153                    | \$17,071,437         |
| 2011               | 148                        | \$28,145,822            | 133                    | \$13,784,423         |

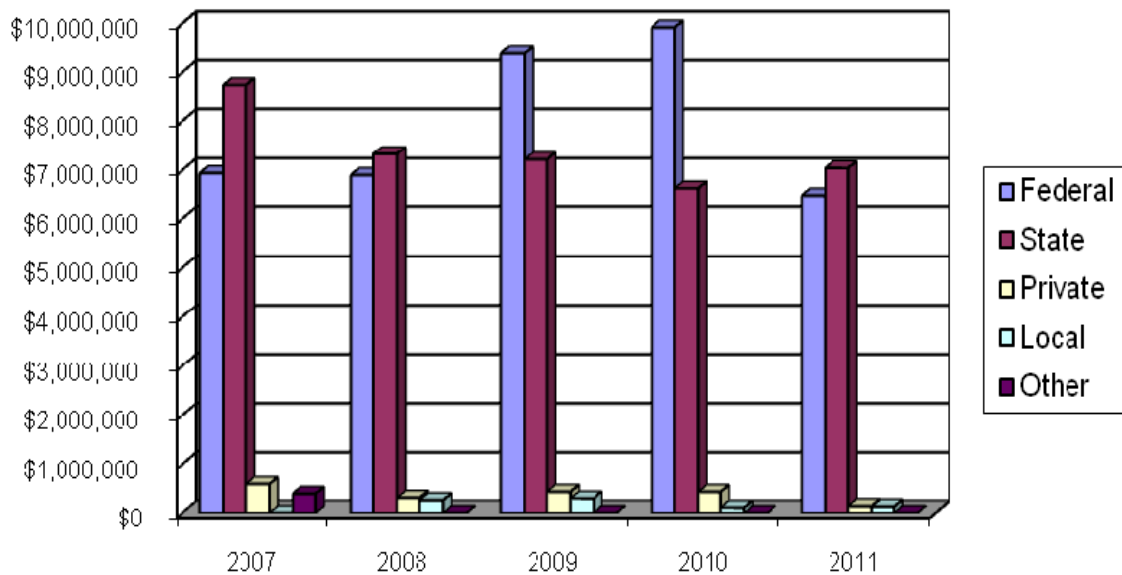


**Figure 4. External Funds Received  
FY 2007-FY 2011**

**TABLE VIII**

**Awards Received and Award Amounts  
by Classification  
FY 2007-11**

| Fiscal Year | Federal |              | State |              | Private |              | Local |              | Other |              |
|-------------|---------|--------------|-------|--------------|---------|--------------|-------|--------------|-------|--------------|
|             | No.     | Award Amount | No.   | Award Amount | No.     | Award Amount | No.   | Award Amount | No.   | Award Amount |
| 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    | -     | -            |
| 2009        | 98      | \$9,371,492  | 41    | \$7,214,141  | 14      | \$423,821    | 4     | \$289,448    | -     | -            |
| 2010        | 89      | \$9,914,695  | 48    | \$6,631,280  | 14      | \$418,524    | 2     | \$106,938    | -     | -            |
| 2011        | 77      | \$6,485,866  | 48    | \$7,036,396  | 6       | \$138,143    | 2     | \$124,018    | -     | -            |



**Figure 5. Funding Received by Classification  
FY 2007-11**

**TABLE IX**  
**Awards Received and Award Amounts**  
**by Type of Activity**  
**FY 2007-11**

| Fiscal Year | Research |              | Public Service |              | Instruction |              | Operation/<br>Maintenance |              | Academic Support |              | Institutional Support |              | Capital Project |              | Fellowship/<br>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 |
| 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      |
| 2009        | 98       | \$12,121,341 | 38             | \$2,728,441  | 14          | \$1,217,069  | -                         | -            | 3                | \$761,608    | -                     | -            | 1               | \$196,000    | 3                           | \$274,443    |
| 2010        | 99       | \$11,619,395 | 29             | \$2,572,610  | 11          | \$1,003,794  | -                         | -            | 9                | \$804,795    | -                     | -            | 3               | \$1,038,323  | 2                           | \$32,520     |
| 2011        | 83       | \$8,869,731  | 34             | \$3,667,760  | 9           | \$652,526    | -                         | -            | 1                | \$6,960      | 1                     | \$6,227      | 2               | \$550,000    | 3                           | \$31,219     |

## **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 Animal Care and Use Committee, the Institutional Review Board for the Protection of 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 ANIMAL CARE AND USE COMMITTEE 2010-11**

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 16, 2010                      March 17, 2011

### **Committee Members**

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

### **Committee Actions**

- The Committee performed laboratory inspections in 2010-11 on September 20, 2010, and February 28, 2011.
- Two applications for the use of animals in research were reviewed by the Committee during the 2010-11 academic year. These applications, from Dr. Sean Blomquist and Dr. Steven Hayslette from the Department of Biology, were approved.

**INSTITUTIONAL REVIEW BOARD FOR THE  
PROTECTION OF HUMAN SUBJECTS  
2010-11**

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 13, 2010                      April 4, 2011  
January 24, 2011

**Committee Members**

|   |   |
|---|---|
| Dr. Michael Clark, Music and Art (Chair)                | Dr. Michael Redding, Biology                            |
| Dr. George Chitiyo, Curriculum & Instruction            | Mr. James Rogers, Community Representative              |
| Dr. Shannon Collins, Curriculum & Instruction           | Mr. Drew Shelley, Community Representative              |
| Dr. Jan Cupp, Counseling and Psychology                 | Dr. Lenly Weathers, Civil and Environmental Engineering |
| Dr. Linda Giesbrecht-Bettoli, Counseling and Psychology | Dr. Kim Wright, Community Representative                |
| Dr. Leeann Jolley, School of Human Ecology              | Dr. Lisa Zagumny, Curriculum & Instruction              |
| Dr. Patricia McGee, Media Services                      | Dr. Francis Otuonye, Executive Officer                  |
| Dr. Shannon Morgan, Counseling & Psychology             |   |

**Committee Actions**

- During the 2010-11 academic year, the Office of Research processed 376 exempt proposals. The IRB did not conduct any full reviews since none of the proposals met the federal guidelines for requiring a full review.
- The IRB reviewed 19 proposals for expedited review. Four were approved on first submission, one was rejected, nine were approved pending minor revisions, and five were required to be revised and resubmitted for additional review. One proposal is currently under review.
- Since many proposals are submitted which relate to educational strategies and evaluations conducted as part of regular classroom activities, the guidelines were revised to more accurately pinpoint those proposals which do not present risk; and therefore, qualify for exempt review. Many of these proposals are not classified as exempt. As a result, the number of proposals for expedited review was lower than that of the previous year.

**ADVISORY COMMITTEE ON  
PATENTS AND COPYRIGHTS  
2010-11**

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 7, 2010 | January 18, 2011 |
| October 5, 2010   | February 1, 2011 |
| November 9, 2010  | March 15, 2011   |

**Committee Members**

|   |  |
|---|--|
| Dr. Daniel Badoe, Civil and Environmental 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. Sherrie Foster, Counseling and Psychology         | Mr. Jeffrey Thompson, Student                          |
| Dr. Kim Hanna, Nursing                                | Dr. Ken Wiant, Economics, Finance and Marketing        |
| Mr. Isaac Keebler, Student                            | Dr. Francis Otuonye, Executive Officer                 |

**Committee Actions**

Please see Appendix C for a complete listing of intellectual property activity for 2010-11.

## FACULTY RESEARCH COMMITTEE 2010-11

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 7, 2010  | February 10, 2011 |
| January 27, 2011 | March 17, 2011    |

### Committee Members

|   |   |
|---|---|
| Dr. Ferdinand DiFurio, Economics, Finance and Marketing (Chair) | Dr. Josephine McQuail, English                  |
| Dr. Billye Foster, Agriculture                                  | Dr. Deborah Setliff, Curriculum and Instruction |
| Dr. John Harwood, Chemistry                                     | Dr. Kim Stearman, Water Center                  |
| Dr. Richard Le Borne, Mathematics                               | Dr. Chris Wilson, Mechanical Engineering        |
| Dr. Jessica Matson, Industrial and Systems Engineering          | Dr. Francis Otuonye, Executive Officer          |

### Committee Actions

- The Faculty Research Committee awarded 23 projects involving 25 faculty members for a total amount of \$115,487.
- Two (2) Research Initiation proposals were funded, and 21 Research Development proposals were funded.
- The Committee held two proposal development workshops on November 18, 2010.
- The Committee voted to approve electronic submission of proposals.
- The Committee revised Appendix A, B and G of the *Handbook for Faculty Research Committee Grants*.

**CAPLENOR FACULTY RESEARCH AWARD COMMITTEE  
2010-11**

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 2, 2010

November 4, 2010

**Committee Members**

|  |   |
|--|---|
| Dr. Halina Ablamowicz, English             | Dr. Joseph Ojo, Electrical Engineering          |
| Dr. Joseph Biernacki, Chemical Engineering | Dr. Sandi J. W. Smith, Curriculum & Instruction |
| Dr. Billye Foster, School of Agriculture   | Dr. Hong Zhang, Chemistry                       |
| Dr. Tor Guimaraes, Business Administration | Dr. Ziahong Zhu, Mechanical Engineering (Chair) |
| Dr. Melissa Geist, Nursing                 | Dr. Francis Otuonye, Executive Officer          |

**Committee Actions**

- Dr. Sakir Ayik, Physics was the recipient of the 2010-11 Caplenor Faculty Research Award.

## **Appendices**

**Appendix A** 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 each proposal, the funding agency, and the amount of funding received.

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

**Appendix C** summarizes the Faculty Research Committee awards.

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|  |                  |
|--|------------------|
| <b>Administration: 4 Researchers, 4 Projects</b> | <b>\$509,846</b> |
|--|------------------|

*Counseling Center*

---

**Smith, Patricia**

Fall 2010 Alcohol Free Alternative Programming  
Coalition for Healthy and Safe Campus Communities  
\$1,080.00

**Co-PI(s):**

Center:

---

Social Norms Media Campaign 2010-11  
Tennessee Independent Colleges and Universities Association  
\$2,539.00

**Co-PI(s):**

Center:

*Extended Education*

---

**Elkins, Susan**

Center for Rural Regional Development  
Appalachian Regional Commission  
\$500,000.00

**Co-PI(s):** David Elizandro, Industrial and Systems Manufacturing

Center:

*University Police*

---

**Shepherd, Gay**

Law Enforcement Equipment  
Tennessee Department of Finance and Administration  
\$6,227.00

**Co-PI(s):**

Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|   |                    |
|---|--------------------|
| <b>Agricultural and Human Sciences: 8 Researchers, 9 Projects</b> | <b>\$1,356,147</b> |
|---|--------------------|

*Agriculture Administration*

---

**Bagley, Pat**

Ag Enhancement Fund  
Tennessee Department of Agriculture  
\$150,000.00

**Co-PI(s):**

Center:

*Agriculture*

---

**Best, Michael**

Demonstration of Strawberry Production Methods for Early Market  
Tennessee Department of Agriculture  
\$29,949.00

**Co-PI(s):** Kim Stearman, Water Center

Center:

**Branson, Janice**

Rapid Assessment of Soil Carbon for MLRA 18  
U. S. Department of Agriculture  
\$6,960.00

**Co-PI(s):**

Center:

**Byler, Ben**

Tennessee Association FFA Camp Clements  
Tennessee Department of Education  
\$103,468.00

**Co-PI(s):**

Center:

---

Tennessee Association FFA Camp Clements Maintenance Worker  
Tennessee Association of FFA  
\$32,386.00

**Co-PI(s):**

Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Agricultural and Human Sciences cont'd**

*Agriculture*

---

**Frazier, David C.**

Agricultural Education Inservice Program  
Tennessee Department of Education  
\$11,598.00

**Co-PI(s):**  
Center:

*Human Ecology*

---

**Bailey, Sue**

Tennessee Early Childhood Training Alliance  
Tennessee Department of Human Services  
\$453,419.00

**Co-PI(s):**  
Center:

---

Upper Cumberland Child Care Resource and Referral  
Signal Centers of Chattanooga  
\$550,317.00

**Co-PI(s):** Leeann Jolley, Human Ecology  
Center:

---

FACS Career Technical Education Grant  
Tennessee Department of Education  
\$18,050.00

**Co-PI(s):**  
Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|   |                    |
|---|--------------------|
| <b>Arts and Sciences: 15 Researchers, 27 Projects</b> | <b>\$1,587,438</b> |
|---|--------------------|

*Biology*

---

**Cook, Bradford**

Recovery Evaluation of Threatened and Endangered Fishes in Abrams Creek  
 Great Smoky Mountain National Park  
 \$23,700.00

**Co-PI(s):**

Center: Water

**Mattingly, Hayden**

Scientific Support for the Cumberland Habitat Conservations Plans  
 The Nature Conservancy  
 \$268,000.00

**Co-PI(s):** Evan Hart, Earth Science; Trisha Johnson, Water Center

Center: Water

---

Distribution, Status and Species-Habitat Relationships of the Rare Barrens Darter, *Etheostoma forbesi*  
 U. S. Fish and Wildlife Service  
 \$17,500.00

**Co-PI(s):** Daniel Combs, Biology

Center: Water

**Roberts, Thomas**

Monitoring Groundwater Hydrology and Selected Plant Communities at the Three Rivers Mitigation  
 Bank  
 Tennessee Wildlife Resources Agency  
 \$16,260.00

**Co-PI(s):** Kenneth Morgan, Biology

Center: Water

---

Classification and Rapid Assessment of Wetlands for the State of Tennessee  
 Tennessee Department of Environment and Conservation  
 \$140,000.00

**Co-PI(s):** Kenneth Morgan, Biology

Center: Water

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Arts and Sciences cont'd**

*Biology*

**Roberts, Thomas**

Collection of Data at Deer Check Stations  
Tennessee Wildlife Resources Agency  
\$3,000.00

**Co-PI(s):**

Center: Water

---

Monitoring the Plant Community at the Yuchi Waterfowl Project  
Tennessee Wildlife Resources Agency  
\$5,181.00

**Co-PI(s):** Kenneth Morgan, Biology

Center: Water

*Chemistry*

**Ensor, Dale**

Radio Chemical Separation for Environmental and Nuclear Applications  
UT-Battelle, LLC  
\$50,000.00

**Co-PI(s):**

Center: Water

**Zhang, Hong**

Molecular Photoredox Chemistry of Mercury in Aquatic Systems: Kinetics, Mechanisms and  
Environmental Implications

Oak Ridge National Laboratories  
\$20,000.00

**Co-PI(s):**

Center: Water

*Cooperative Fisheries Unit*

**Bettoli, Phillip**

Reservoir Trout Fisheries  
Tennessee Wildlife Resources Agency  
\$70,000.00

**Co-PI(s):**

Center: Water

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|                                 |
|---------------------------------|
| <b>Arts and Sciences cont'd</b> |
|---------------------------------|

*Cooperative Fisheries Unit*

---

**Bettoli, Phillip**

Evaluation of Fish Stockings into Tennessee Warm Water and Cool Water Reservoirs  
Tennessee Wildlife Resources Agency  
\$35,850.00

**Co-PI(s):**

Center: Water

---

Assessment of Biotic Integrity, Water Quality and Habitat, Fishing Pressure, and Economic Value of the Fishery in the Caney Fork River below Center Hill Dam

U. S. Geological Survey  
\$109,433.00

**Co-PI(s):**

Center: Water

---

Elk River Adaptive Resource Management Project

U. S. Geological Survey  
\$122,642.00

**Co-PI(s):**

Center: Water

**Layzer, James**

Shift in Composition of the Mussel Fauna in the Green River Dam  
U. S. Geological Survey  
\$20,755.00

**Co-PI(s):**

Center: Water

---

Predicting the Effects on Endangered Mussels from Incremental Decreases in Minimum Flows

U. S. Geological Survey  
\$113,666.00

**Co-PI(s):**

Center: Water

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Arts and Sciences cont'd**

*Cooperative Fisheries Unit*

**Layzer, James**

Establish Non-essential Populations of Two Endangered Mussel Species in the Lower French Broad River, Tennessee

U. S. Geological Survey

\$27,736.00

**Co-PI(s):**

Center: Water

Barrens Heelsplitter Ecology and Population Dynamics

Tennessee Wildlife Resources Agency

\$10,000.00

**Co-PI(s):**

Center: Water

The Reintroduction of Mussels into the Little Tennessee River at the Calderwood Dam By-Pass, Blount and Monroe Counties

Tennessee Wildlife Resources Agency

\$25,000.00

**Co-PI(s):**

Center: Water

Propagation and Re-establishment of Endangered Tennessee Mussels

Tennessee Wildlife Resources Agency

\$30,000.00

**Co-PI(s):**

Center: Water

Propagation of Pink Mucklets

Tennessee Valley Authority

\$10,000.00

**Co-PI(s):**

Center: Water

Research Directed at the Recovery of Endangered Mussels

U. S. Geological Survey

\$18,868.00

**Co-PI(s):**

Center: Water

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Arts and Sciences cont'd**

*Cooperative Fisheries Unit*

---

**Layzer, James**

Population Demographics of Three Endangered and Four Imperiled Mussel Species in the Duck River,  
Tennessee

Tennessee Wildlife Resources Agency

\$45,000.00

**Co-PI(s):**

Center: Water

---

TWRA FU Base 7-11

Tennessee Wildlife Resources Agency

\$30,000.00

**Co-PI(s):** Philip Bettoli, Biology

Center:

*Mathematics*

---

**Le Borne, Sabine**

Algebraic Hierarchical Matrix Preconditioners for Two- and Three-Dimensional Saddle Point Problems

National Science Foundation

\$50,945.00

**Co-PI(s):**

Center: Energy

**Mills, Allan**

Math Success for STEM Majors

National Science Foundation

\$226,902.00

**Co-PI(s):**

Center: STEM

*Physics*

---

**Ayik, Sakir**

Studies of Fluctuation Processes in Nuclear Collisions

U. S. Department of Energy

\$37,000.00

**Co-PI(s):**

Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|                                 |
|---------------------------------|
| <b>Arts and Sciences cont'd</b> |
|---------------------------------|

*Physics*

---

**Kozub, Raymond**

Nuclear Physics with Radioactive Ion Beams

U. S. Department of Energy

\$60,000.00

**Co-PI(s):**

Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|  |                    |
|--|--------------------|
| <b>Business Administration: 6 Researchers, 11 Projects</b> | <b>\$1,134,172</b> |
|--|--------------------|

*Business Media Center*

---

**Liska, Kevin**

Entrepreneurial Success Statewide Online Training SBDC System  
Tennessee Small Business Development Center  
\$9,714.00  
**Co-PI(s):**  
Center:

---

ELearn Marketing  
Tennessee Board of Regents  
\$15,500.00  
**Co-PI(s):**  
Center:

---

Tennessee Ready2Teach Marketing Management and Public Relations Campaign  
Tennessee Board of Regents  
\$120,000.00  
**Co-PI(s):**  
Center:

---

Tennessee Workforce Development, Green Jobs, and Clean Energy Marketing Project  
Tennessee Board of Regents  
\$25,000.00  
**Co-PI(s):**  
Center:

---

Ollie the Otter Statewide Seat Belt and Booster Seat Education Campaign  
Governor's Highway Safety Office  
\$112,585.00  
**Co-PI(s):** Julie Brewer, Business Media Center  
Center:

---

TBR-Ready2Teach Statewide Marketing  
Tennessee Board of Regents  
\$10,000.00  
**Co-PI(s):**  
Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Business Administration cont'd**

**Liska, Kevin**

TBR Marketing RODP Campaign

Tennessee Board of Regents

\$566,822.00

**Co-PI(s):** Ferdinand Difurio and J. D. Weinrauch, Economics, Finance and Marketing  
Center:

*Decision Sciences and Management*

---

**Armstrong, Curtis**

Governor's School for Information Technology Leadership 2011

Tennessee Department of Education

\$123,300.00

**Co-PI(s):**

Center:

*Small Business Development Center*

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**Henley, Vicki**

Tennessee Small Business Development Center

Tennessee Small Business Development Centers

\$80,000.00

**Co-PI(s):**

Center:

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Tennessee Small Business Development Center Online Center

Tennessee Small Business Development Center

\$20,000.00

**Co-PI(s):**

Center:

---

Tennessee Small Business Development Center

Tennessee Small Business Development Center

\$51,251.00

**Co-PI(s):**

Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|   |                    |
|---|--------------------|
| <b>Education: 25 Researchers, 14 Projects</b> | <b>\$1,562,526</b> |
|---|--------------------|

*Counseling and Psychology*

---

**Stein, Barry**

CCLI: Expanding the use of the CAT: Assessing and Improving Critical Thinking  
National Science Foundation  
\$506,831.00

**Co-PI(s):** Ada Haynes, Sociology and Political Science; Michael Redding, Biology  
Center:

*Curriculum and Instruction*

---

**Anthony, Holly**

Supporting the New Algebra II Standards: Focus on Content and Assessment  
Tennessee Higher Education Commission  
\$74,994.00

**Co-PI(s):**  
Center: STEM

**Howard, Martha**

Healthy Start for Upper Cumberland Families and Young Children  
Stephens Center  
\$11,889.00

**Co-PI(s):**  
Center:

**Baker, Jane**

Tennessee Early Childhood Pilot Program  
Putnam County School Board  
\$85,038.00

**Co-PI(s):**  
Center:

**Collins, Shannon**

Upper Cumberland Writing Project  
National Writing Project  
\$35,000.00

**Co-PI(s):** Sandra H. Smith, Curriculum and Instruction  
Center:

**Dainty, Helen**

Positive Behavior Support and Inclusion Project  
Tennessee Department of Education  
\$320,000.00

**Co-PI(s):**  
Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|                         |
|-------------------------|
| <b>Education cont'd</b> |
|-------------------------|

*Curriculum and Instruction*

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**Dainty, Helen**

TTU Base-TN Teaching Program  
Tennessee Department of Education  
\$95,000.00

**Co-PI(s):**

Center:

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Special Education Institute - Strand I  
Tennessee Department of Education  
\$191,304.00

**Co-PI(s):**

Center:

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Special Education - Strand II  
Tennessee Department of Education  
\$55,539.00

**Co-PI(s):**

Center:

**Owens, Carl**

Special Ed Programs and Services-Assistive Technology Grant  
Tennessee Department of Education  
\$5,000.00

**Co-PI(s):** Jeremy Wendt, Curriculum and Instruction

Center:

**Smith, Matthew**

Child and Adult Care Food Program  
Tennessee Department of Human Services  
\$33,264.00

**Co-PI(s):**

Center:

**Wendt, Jeremy**

V-SPACE: Virtual Spaces for Accessing Content in English  
Tennessee Higher Education Commission  
\$69,654.00

**Co-PI(s):** Julie Baker and Janet Isbell, Curriculum and Instruction; Brenda Wilson, English and Communications

Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|                         |
|-------------------------|
| <b>Education cont'd</b> |
|-------------------------|

*Curriculum and Instruction*

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**Zagumny, Lisa**

Teaching Mathematics with Chess: Improving Middle School Students' Critical Thinking and Academic Outcomes

Tennessee Higher Education Commission

\$64,013.00

**Co-PI(s):** George Chitiyo and Deborah Setliff, Curriculum and Instruction; Paul Semmes, Arts and Sciences Administration

Center:

*Exercise Science and Physical Education*

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**Killman, Christy**

I Can Do It, You Can Do It, Upper Cumberland

Slippery Rock University

\$15,000.00

**Co-PI(s):** J. P. Barfield, Exercise Science and Physical Education

Center:

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|   |                    |
|---|--------------------|
| <b>Engineering: 38 Researchers, 46 Projects</b> | <b>\$7,234,294</b> |
|---|--------------------|

*Basic Engineering*

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**Hunter, Kenneth**

Governor's School for Emerging Technologies  
Tennessee Department of Education  
\$180,000.00

**Co-PI(s):**

Center:

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Principles of Technology and Physics-Standards Alignment and Professional Development  
Tennessee Department of Education  
\$4,910.00

**Co-PI(s):**

Center:

*Chemical Engineering*

---

**Biernacki, Joseph**

RUI: Controlling the Properties and Performance of Concrete Using Computer Aided Molecular Design  
National Science Foundation  
\$103,430.00

**Co-PI(s):** Donald Visco, Chemical Engineering

Center: Manufacturing

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REU Supplement - Controlling the Properties and Performance of Concrete Using Computer Aided  
Molecular Design  
National Science Foundation  
\$6,000.00

**Co-PI(s):**

Center: Manufacturing

**Stretz, Holly**

Polymer Microcapsule Pesticide Product Imaging and UV Degradation  
Syngenta Corporation  
\$19,974.00

**Co-PI(s):**

Center: Manufacturing

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Engineering cont'd**

*Civil and Environmental Engineering*

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**Badoe, Daniel**

Development of Tennessee Travel Demand Model Users' Group  
University of Tennessee-Knoxville  
\$18,250.00

**Co-PI(s):**

Center: Energy

**Click, Steven**

Field Evaluation of Traffic Signal Based Interchange Treatments  
Tennessee Department of Transportation  
\$67,000.00

**Co-PI(s):**

Center: Energy

**Crouch, L. K.**

High Volume Fly Ash PCC for Sustainable and Performance  
Tennessee Department of Transportation  
\$65,000.00

**Co-PI(s):** Benjamin Mohr, Civil and Environmental Engineering

Center: Energy

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Optimum Air Content Range (Plastic and Hardened) for TDOT Class D PCC  
Tennessee Department of Transportation  
\$50,000.00

**Co-PI(s):** Benjamin Mohr, Civil and Environmental Engineering

Center: Energy

**Hossain, Faisal**

Modeling the Hydrologically-Relevant Features of Uncertainty of NASA's High Resolution  
Precipitation Products for Advancing Global Applications Over Ungauged Regions (Abel  
Woldemichael)

NASA (NESSF Program)  
\$27,600.00

**Co-PI(s):**

Center: Water

**Huo, Sharon**

Simplified Live Load Distribution Factor Equations for Tennessee Highway Bridge Design  
Tennessee Department of Transportation  
\$32,500.00

**Co-PI(s):**

Center: Energy

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Engineering cont'd**

*Civil and Environmental Engineering*

---

**Liu, Jane**

Large Strain Behavior of Rohacell  
United Launch Alliance  
\$20,000.00  
**Co-PI(s):** John Peddieson, Civil and Environmental Engineering  
Center: Energy

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Modeling of Moisture Diffusion in Composites  
United Launch Alliance  
\$20,100.00  
**Co-PI(s):** John Peddieson, Civil and Environmental Engineering  
Center: Energy

**Mohr, Benjamin**

Nanoscale Characterization of Expansion Due to Delayed Ettringite Formation  
National Science Foundation  
\$75,716.00  
**Co-PI(s):**  
Center: Energy

*Computer Science*

---

**Eberle, William**

Detecting Anomalies in Shipping Data Using a Graph-Based Approach  
Department of Homeland Security  
\$170,000.00  
**Co-PI(s):**  
Center: Manufacturing

**Scott, Stephen**

Joint Faculty Agreement with ORNL  
Oak Ridge National Laboratories  
\$138,500.00  
**Co-PI(s):**  
Center:

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Automatic Dynamic Resource-Aware Runtime System  
Sandia National Laboratories  
\$75,000.00  
**Co-PI(s):**  
Center: Manufacturing

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Engineering cont'd**

*Electrical and Computer Engineering*

---

**Alouani, Ali**

Using Solar Power for Chevy Volts Commuters: Feasibility Study  
Merritt Island Holdings, LLC  
\$16,302.00

**Co-PI(s):**

Center: Energy

**Ojo, Joseph**

Performance Optimization and Extended Speed Control of Multi-Phase Open Winding Induction and Interior Permanent Magnet Machines Actuated with Dual Multi-Phase, Multi-Level Converters  
Office of Naval Research  
\$76,322.00

**Co-PI(s):**

Center: Energy

*Energy Center*

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**Munukutla, Sastry**

Center for Energy Systems Research  
Tennessee Higher Education Commission  
\$180,464.00

**Co-PI(s):**

Center: Energy

**Deivanayagam, Subramaniam**

Center for Energy Systems Research  
Tennessee Higher Education Commission  
\$896,700.00

**Co-PI(s):**

Center: Energy

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Power-Test-Service Account

various  
\$11,266.00

**Co-PI(s):** Steven Click and L. K. Crouch, Civil and Environmental Engineering; Stephen Idem, Mechanical Engineering

Center: Energy

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|                           |
|---------------------------|
| <b>Engineering cont'd</b> |
|---------------------------|

*Engineering Administration*

---

**Huddleston, David**

College of Engineering Equipment Grant  
Tennessee Board of Architectural and Engineering Examiners  
\$33,178.00  
**Co-PI(s):**  
Center:

*Manufacturing and Industrial Technology*

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**Elsawy, Ahmed**

Advanced Systems Development of the MRWS: A Remote Climbing Robot for Automating Welding Processes in the Ship Building Industry  
Robotic Technologies of Tennessee  
\$24,011.00  
**Co-PI(s):**  
Center: Energy

**Fidan, Ismail**

From Art to STEM - A Creative Journey of Discovery and Transformational Project for Nashville Middle School Students  
Alignment Nashville  
\$66,706.00  
**Co-PI(s):**  
Center: Manufacturing

*Manufacturing Center*

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**Currie, Kenneth**

Center for Manufacturing Research  
Tennessee Higher Education Commission  
\$1,561,539.00  
**Co-PI(s):**  
Center: Manufacturing

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Southeast Industrial Energy Alliance  
Georgia Environmental Facilities Authority  
\$84,234.00  
**Co-PI(s):**  
Center: Manufacturing

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Engineering cont'd**

*Manufacturing Center*

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**Currie, Kenneth**

UT-CIS Contract for Employee Services  
The University of Tennessee Center for Industrial Services  
\$80,000.00

**Co-PI(s):**

Center: Manufacturing

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Testing and Design

various  
\$48,349.00

**Co-PI(s):**

Center: Manufacturing

**Qiu, Robert**

Collaborative Research: Wideband Cognitive Radio Communication Systems: Modeling, Algorithms  
and Test-Bed

National Science Foundation  
\$55,359.00

**Co-PI(s):**

Center: Manufacturing

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Cognitive Radio Institute

Office of Naval Research  
\$760,000.00

**Co-PI(s):** Kenneth Currie, Manufacturing Center

Center: Manufacturing

**Rice-York, Cynthia**

Components and Devices for Energy Storage and Conversion  
University of Tennessee  
\$165,331.00

**Co-PI(s):**

Center: Manufacturing

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Engineering cont'd**

*Mechanical Engineering*

---

**Canfield, Stephen**

Enabling Children with Disabilities and Their Families in Tennessee Through Technology - EIME Project

Tennessee Department of Education  
\$35,000.00

**Co-PI(s):** Hwan-Sik Yoon, Mechanical Engineering  
Center: Energy

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CCLI: Enhancing the Programming Experience for Engineering Students through Hands-on Integrated Computer Experience: Phase II Proposal

National Science Foundation  
\$233,713.00

**Co-PI(s):** Mohamed Abdelrahman and Sheikh Ghafoor, Mechanical Engineering  
Center: Energy

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Evaluation and Design of Advanced 3-dof Gimbal for In-Space Applications  
Tethers Unlimited, Inc.

\$50,501.00

**Co-PI(s):**  
Center: Manufacturing

**Cui, Jie**

CAREER: Wind Power-Multi-Level Control, Intelligent Grid Integration and Real-Time Digital Simulation

National Science Foundation  
\$80,000.00

**Co-PI(s):**  
Center: Energy

**Cunningham, Glenn**

Tennessee 3-Star Industrial Assessment Center  
U. S. Department of Energy  
\$80,000.00

**Co-PI(s):** Kenneth Currie, Manufacturing Center  
Center: Manufacturing

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|                           |
|---------------------------|
| <b>Engineering cont'd</b> |
|---------------------------|

*Mechanical Engineering*

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**Darvennes, Corinne**

Tennessee Space Grant Consortium  
Vanderbilt University  
\$40,100.00

**Co-PI(s):**

Center: STEM

**Idem, Stephen**

Development of a Regional Assessment/Implementation SEN Delivery Partnership System II  
West Virginia University  
\$27,790.00

**Co-PI(s):**

Center: Manufacturing

**Zhang, Ying**

Alumina-Forming Coatings for Power-Generation Applications  
Oak Ridge National Laboratory  
\$20,000.00

**Co-PI(s):**

Center: Manufacturing

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Alumide Coatings to Protect High-Temperature Cast Stainless Steel CF8C-Plus  
Oak Ridge National Laboratory  
\$19,198.00

**Co-PI(s):**

Center: Manufacturing

*Water Center*

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**Clark, Yvette**

Tennessee Statewide Server for the OASIS Software (TN\_OASIS)  
Hydrologics, Inc.  
\$34,865.00

**Co-PI(s):**

Center: Water

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

**Engineering cont'd**

*Water Center*

---

**Dodson, Daniel**

Acquisition of Goods and Services  
U. S. Department of Agriculture  
\$10,800.00

**Co-PI(s):**

Center: Water

**George, Dennis**

Center for the Management, Utilization and Protection of Water Resources  
Tennessee Board of Regents  
\$1,294,392.00

**Co-PI(s):**

Center: Water

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Water Center Analytical and Computer Services  
various  
\$75,669.00

**Co-PI(s):**

Center: Water

**Stearman, Kim**

Compost Center and High Tunnel Construction and Management  
Tennessee Agricultural Enhancement Program  
\$98,525.00

**Co-PI(s):** Michael Best, Agriculture

Center: Water

**Appendix A**  
**Externally Funded Projects By**  
**College/Area, Department, Investigator(s), Project Title,**  
**Funding Agency and Funding Amount**  
**Fiscal Year 2010-11**  
*(Principal Investigator/Co-PI(s))*

|  |                  |
|--|------------------|
| <b>STEM Center: 2 Researchers, 1 Project</b> | <b>\$400,000</b> |
|--|------------------|

*STEM Center*

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**Pardue, Sally**

TTU Millard Oakley Center for Teaching and Learning in Science, Technology, Engineering and Mathematics (STEM Center)

National Aeronautics and Space Administration

\$400,000.00

**Co-PI(s):** Mark Hutchins, University Advancement

Center: STEM

## **Appendix B**

### **FY 2010-11 Intellectual Property Activity**

#### **Invention Disclosures:**

1. Method To Optimize Bio-Diesel Production In The Reaction And Phase Separation Processes For Both Time And Yield (John Cooper, Jeffery Thompson, Mario Oyanader)
2. Compact 3 DOF Parallel Architecture Gimbal for Pointing Application (Stephen Canfield & David Bryant)
3. Immediate Results Medical Tankless Toilet (Edumundo Chaparro-Barriguete)
4. Intelligent Synchrophasor Technology for Smart Grid Monitoring & Control (Ali Alouani)

#### **Provisional Patents:**

1. Method To Optimize Bio-Diesel Production In The Reaction And Phase Separation Processes For Both Time And Yield (John Cooper, Jeffery Thompson, Mario Oyanader)
2. Intelligent Synchrophasor Technology for Smart Grid Monitoring & Control (Ali Alouani)

The Tennessee NEXT Conference, sponsored by the Tennessee Technology Development Corporation, provided universities and small businesses the opportunity to present selected technologies to a panel of experts and receive feedback on the development, refinement, financing and marketing of the technologies.

Two technologies from Tennessee Technological University were selected for this conference:

- Intelligent Synchrophasor Technology for Smart Grid Monitoring & Control (Ali Alouani)
- Free-Form Tooth Profile for Next Generation Gearing (Kwun-lon Ting)

Mark Lynam coordinated the presentations with the TBR and the inventors.

**Appendix C**  
**FY 2010-11 Faculty Research Committee Awards**

| <b>Author(s)</b>                | <b>Title</b>   | <b>Dept.</b>                            | <b>Amt.</b> | <b>Type</b>          |
|---------------------------------|--|---|-------------|----------------------|
| Titus Albu                      | A Computational Study on the Nucleophilic Attack on the C=C Double Bond of Quinones  | Chemistry                               | \$5,000     | Research Development |
| Daniel Badoe                    | Investigating the Impact Receipt of Travel-Survey Advance-Letter has on Reported Trips and the Number of Phone-Calls for Survey Completion in Transportation Surveys | Civil and Environmental Engineering     | \$5,000     | Research Development |
| Joseph Biernacki                | A Multi-Scale Environmental-Kinetic Study on the Pyrolysis of Sustainable Biomass Feedstock  | Chemical Engineering                    | \$5,000     | Research Development |
| Jeffrey Boles                   | Analysis of Differentially Expressed Proteins via Proteomics When Telluromethionine Replaces Methionine in Growing Cell Cultures for Protein Structural Studies      | Chemistry                               | \$5,000     | Research Development |
| Kathy Brashears/Nancy Kolodziej | Using Technology to Promote Knowledge of Literacy and Teaching Pedagogy  | Curriculum and Instruction              | \$10,000    | Research Development |
| Andrew Callender                | Microfluidic Sensors for Simultaneous Determination of Nitrite and Nitrate   | Chemistry                               | \$5,000     | Research Initiation  |
| George Graham                   | Ultrasonic Elastic Wave Emission for Sensing and Control of the Gas Metal Arc Welding Process  | Manufacturing and Industrial Technology | \$5,000     | Research Initiation  |
| Mark Groundland                 | Edition of Lope de Vega's Arte nuevo de hacer comedias en este tiempo (1609)   | Foreign Languages                       | \$2,937     | Research Development |
| Andrzej Gutek                   | Shift Operators and Homeomorphisms with Subsequentially Dense Orbits   | Mathematics                             | \$5,000     | Research Development |
| Craig Henderson                 | Steel Pile Bent Connections for Achieving Plastic Moment Capacity in High Seismic Zones  | Civil and Environmental Engineering     | \$5,000     | Research Development |
| Ahmed Kamal                     | Autonomic Function Assessment of Epileptic Patients Using Nonlinear Dynamics Method  | Manufacturing and Industrial Technology | \$5,000     | Research Development |
| Edward Lisic                    | Heavy Metal Extraction from Water Using New Triplex Chelating Resins   | Chemistry                               | \$5,000     | Research Development |
| Motoya Machida                  | Imputation methodology for case-referent scheme using Markov chain Monte Carlo technique with applications in medical signal detection                               | Mathematics                             | \$4,500     | Research Development |
| Josephine McQuail               | Persistence of Vision: William Blake and James Joyce   | English                                 | \$5,000     | Research Development |
| Linda McQuiston/Kim Hanna       | Peer Coaching Between Graduating Seniors and Incoming Junior Nursing Students in the Clinical Setting  | Nursing                                 | \$5,000     | Research Development |
| Jeffrey Norden                  | Commuting Functions on a Finite Set  | Mathematics                             | \$5,000     | Research Development |
| David D. Smith                  | Statistical Modeling of Extreme Events   | Mathematics                             | \$3,250     | Research Development |
| Kim Stearman                    | Compost Operation and Analysis   | Agriculture                             | \$5,000     | Research Development |
| Judith Sullivan                 | Musical Playground, Millard Oakley STEM Center   | Music and Art                           | \$5,000     | Research Development |

**Appendix C, cont'd**  
**FY 2010-11 Faculty Research Committee Awards**

| <b>Author(s)</b>   | <b>Title</b>  | <b>Dept.</b>                                    | <b>Amt.</b> | <b>Type</b>          |
|--------------------|---|---|-------------|----------------------|
| Dan Swartling      | The Synthesis of Stable Isotops Analogs of Gamma Amino Butyric Acid as Potential Therapeutic Agents | Chemistry                                       | \$5,000     | Research Development |
| Douglas Talbert    | Computerized Decision Support to Facilitate Crisis Management by Ad Hoc Groups                      | Computer Science                                | \$4,800     | Research Development |
| Kwun-Lon Ting      | Free-Form Conjugation Synthesis and Applications  | Manufacturing Center/<br>Mechanical Engineering | \$5,000     | Research Development |
| Deborah Watlington | Interactive White Board Impact on Students' Engagement in Classroom                                 | Curriculum and Instruction                      | \$5,000     | Research Development |
|                    |   |   | \$115,487   |                      |