



WORCESTER POLYTECHNIC INSTITUTE
REPORT OF SPONSORED PROGRAM ACTIVITY

for the Period
July 1, 2010 to June 30, 2011

Prepared by the
Office of Sponsored Programs

Spring 2012

(For WPI Use Only)

**WORCESTER POLYTECHNIC INSTITUTE
OFFICE OF SPONSORED PROGRAMS**

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INTRODUCTION

This report is a publication of the Office of Sponsored Programs (OSP). As with previous annual reports, the objective of this publication is to provide to the WPI community a summary of activities surrounding the submission of proposals for extramural funding, the receipt of awards from external sponsors, and other activities falling under the purview of OSP. A brief analysis of sponsored program expenditures is provided as well, although expenditure processing is the sole responsibility of the Research Accounting office and OSP has no responsibility for this area.

As with prior years, this report includes only those proposals and awards administered by OSP. It does not include any data regarding proposals and awards that are exclusively the purview of the University Relations Office, the Projects Program, or other University offices. Every effort has been made to ensure the accuracy of data presented, but should any errors be noted, please let us know so that we may make corrections to the report.

Due to recent staff changes as well as the overall complexity brought about by multi-institutional activity, electronic research administration, and compliance initiatives, the breadth and scope of this report has been scaled back somewhat from previous years' reports in an effort to complete it on a timely basis. We will do our best to respond to any questions regarding the data portrayed.

Now that the new deans are in place at the University, it is expected that OSP will be making many changes in the ways information about sponsored programs is portrayed. We look forward to working with the deans and department heads to develop the most useful and accurate information possible.

As always, your comments about and suggestions for improving this report and the services provided by the Office of Sponsored Programs are welcomed.

Illustration Intro-1

Worcester Polytechnic Institute Comparative Summary of Sponsored Program Activity by Department July 1, 2010 - June 30, 2011 and July 1, 2009 - June 30, 2010										
Department	Proposals Submitted				Award Actions Received				Expenditures	
	7/1/10 - 6/30/11		7/1/09 - 6/30/10		7/1/10 - 6/30/11		7/1/09 - 6/30/10		7/1/10 - 6/30/11	7/1/09 - 6/30/10
	No.	Amount	No.	Amount	No.	Amount	No.	Amount	Amount	Amount
Bioengineering Institute	4	\$4,288,758	4	\$4,554,472	3	\$1,865,526	0	\$0	\$696,334	\$1,035,286
Biology & Biotechnology	15	4,827,805	27	12,480,103	2	295,971	17	1,546,663	794,278	816,595
Biomedical Engineering	24	8,753,771	16	2,504,154	10	334,877	14	1,216,137	1,100,156	580,430
Chemical Engineering	15	7,087,084	20	17,216,479	9	2,365,427	13	2,062,956	2,490,126	1,727,766
Chemistry & Biochemistry	13	3,415,631	11	5,821,414	5	659,386	6	1,186,331	832,169	489,843
Civil & Environmental Engineering	12	3,536,135	12	3,378,187	2	44,777	5	450,692	266,061	528,543
Computer Science	33	31,217,981	42	54,472,759	13	3,183,209	14	1,374,899	2,370,726	2,131,633
Electrical & Computer Engineering	42	10,498,197	40	10,405,487	28	1,361,934	19	2,985,696	1,826,865	2,149,107
Fire Protection Engineering	19	3,966,466	18	4,963,910	4	368,759	9	1,411,789	827,060	779,859
Humanities & Arts	2	203,551	1	226,892	0	0	1	215,856	140,324	2,147
Interdisciplinary & Global Studies	6	310,807	12	2,828,698	2	113,055	5	213,737	167,441	147,382
Mathematical Sciences	21	4,964,000	19	4,107,280	12	1,231,033	11	1,601,139	1,496,200	946,762
Mechanical Engineering	50	19,493,076	90	53,073,772	27	3,036,274	24	1,862,528	2,288,451	1,988,856
Physics	10	4,561,813	11	2,637,768	2	231,362	3	115,383	247,520	107,149
School of Business	8	2,705,938	5	1,412,365	3	391,334	2	112,672	324,622	392,347
Social Science & Policy Studies	9	2,531,258	9	4,079,125	8	2,155,031	4	764,796	1,401,682	865,389
Other	5	723,963	7	1,187,836	6	434,938	5	253,187	359,974	428,277
Totals	288	\$113,086,234	344	\$185,350,701	136	\$18,072,893	152	\$17,374,461	\$17,629,987	\$15,117,371

**I. THE YEAR IN BRIEF - A SUMMARY OF FISCAL YEAR 2011 ACTIVITY
(WITH COMPARATIVE FY2010 INFORMATION)**

	<u>FY2011</u>	<u>FY2010</u>	<u>% Change Inc./Dec.</u>
1. Number of Proposal Submissions	288	344	(16.3%)
2. \$ Composition of Proposals Submitted			
Direct Costs	\$86,004,057	\$141,624,238	(39.3%)
Indirect Costs	<u>27,082,177</u>	<u>43,726,464</u>	(38.1%)
Totals Requested	\$113,086,234	\$185,350,701	(39.0%)
Cost Sharing	<u>3,531,554</u>	<u>3,003,883</u>	17.6%
Total Project Costs Proposed	\$116,617,788	\$188,354,584	(38.1%)
3. Number of Proposals (Net of Congressional Funding)	287	344	(16.6%)
4. \$ Volume of Proposals (Net of Congressional Funding)			
Direct Costs	\$85,404,572	\$141,624,238	(39.7%)
Indirect Costs	<u>26,748,059</u>	<u>43,726,464</u>	(38.8%)
Totals Requested	\$112,152,631	\$185,350,701	(39.5%)
Cost Sharing	<u>3,531,554</u>	<u>3,003,883</u>	17.6%
Total Project Costs Proposed	\$115,684,185	\$188,354,584	(38.6%)
5. Number of Award Actions	136	152	(10.5%)
6. \$ Composition of Award Actions Received			
Direct Costs	\$13,400,997	\$13,181,013	1.7%
Indirect Costs	<u>4,671,896</u>	<u>4,193,448</u>	11.4%
Total Award \$ Received	\$18,072,893	\$17,374,461	4.0%
Cost Sharing	<u>1,233,918</u>	<u>1,491,384</u>	(17.3%)
Total Project Costs	\$19,306,811	\$18,865,845	2.3%
7. Number of Award Actions (Net of Congressional Funding)	134	151	(11.3%)
8. \$ Composition of Awards (Net of Congressional Funding)			
Direct Costs	\$12,722,669	\$13,019,344	(2.3%)
Indirect Costs	<u>4,296,621</u>	<u>4,110,117</u>	4.5%
Total Award \$ Received	\$17,019,290	\$17,129,461	(0.6%)
Cost Sharing	<u>1,203,918</u>	<u>1,430,134</u>	(15.8%)
Total Project Costs (Net of Congressional Funding)	\$18,223,208	\$18,559,595	(1.8%)
9. Selected Proposal Coordination Form (PCF) "Special Considerations" Summary Data:			
a. Proposals Involving Human Participants	58	47	23.4%
b. Proposals Involving Use of Animals	18	14	28.6%
c. Proposals Involving Hazardous Materials	22	28	(21.4%)
d. Proposals Requesting Support for Research Assistants	165	203	(18.7%)
e. Proposals Requesting Support for Non-Student Personnel	68	100	(32.0%)
f. Proposals Including Funds for Consultants/Subcontractors	63	51	23.5%
g. Proposals with Academic Year Faculty Salary Budgeted	32	47	(31.9%)
h. Proposals Requesting Equipment Funds	105	115	(8.7%)

II. PROPOSAL ACTIVITY FOR FISCAL YEAR 2011

Illustration II-1 below provides a departmental summary of proposal submission statistics for fiscal year 2011. This summary includes information about requested direct and indirect costs, average proposal amounts and indirect cost rates requested, and cost sharing on proposal submissions. There are totals shown at the bottom of the schedule for both the entire University and for science, technology, engineering and mathematics (STEM) departments only. A second summary (Illustration II-2) on the following page provides this data sorted and totaled by dean.

Note: Major funding for the Bioengineering Institute has been requested from the U.S. Army Medical Research and Materiel Command since fiscal year 2003. In addition to appointees in the Bioengineering Institute itself, faculty members from the Biomedical Engineering, Chemistry and Biochemistry, Chemical Engineering, and Electrical and Computer Engineering departments continue to play key roles in Bioengineering Institute programs.

Illustration II-1

Worcester Polytechnic Institute Summary of Proposal Submissions by Department July 1, 2010 to June 30, 2011										
Department	No.	Proposal Amounts			Average Proposal Amount	Average Indirect Cost Rates ¹	Proposed Cost Sharing	Average Cost Sharing per Proposal	Cost Sharing Effective Rates ²	Excess of Indirect Costs Over Cost Sharing
		Direct Costs	Indirect Costs	Total Costs						
BEI	4	\$2,786,895	\$1,501,863	\$4,288,758	\$1,072,190	53.9%	\$0	\$0	0.0%	\$1,501,863
BBT	15	3,297,136	1,530,669	4,827,805	\$321,854	46.4%	102,264	\$6,818	2.1%	1,428,405
BME	24	6,447,401	2,306,370	8,753,771	\$364,740	35.8%	162,327	\$6,764	1.9%	2,144,043
CHE	16	6,453,383	752,273	7,205,656	\$450,354	11.7%	808,725	\$50,545	11.2%	(56,452)
CBC	12	2,610,006	687,053	3,297,059	\$274,755	26.3%	714,649	\$59,554	21.7%	(27,596)
CEE	12	2,778,222	757,913	3,536,135	\$294,678	27.3%	364,523	\$30,377	10.3%	393,390
CS	33	24,672,025	6,545,956	31,217,981	\$945,999	26.5%	167,641	\$5,080	0.5%	6,378,315
ECE	42	7,267,630	3,230,567	10,498,197	\$249,957	44.5%	82,871	\$1,973	0.8%	3,147,696
FPE	19	2,947,300	1,019,166	3,966,466	\$208,761	34.6%	120,996	\$6,368	3.1%	898,170
H&A	2	189,955	13,596	203,551	\$101,776	7.2%	199,082	\$99,541	0.0%	(185,486)
IGSD	6	278,061	32,746	310,807	\$51,801	11.8%	61,564	\$10,261	19.8%	(28,818)
MGT	8	2,056,275	649,663	2,705,938	\$338,242	31.6%	314,550	\$39,319	11.6%	335,113
MS	21	3,686,045	1,277,955	4,964,000	\$236,381	34.7%	4,261	\$203	0.1%	1,273,694
ME	50	14,851,835	4,641,240	19,493,075	\$389,862	31.3%	297,869	\$5,957	1.5%	4,343,371
PH	10	3,395,220	1,166,593	4,561,813	\$456,181	34.4%	102,146	\$10,215	2.2%	1,064,447
SSPS	9	1,743,768	787,490	2,531,258	\$281,251	45.2%	1,746	\$0	0.0%	785,744
Other	5	542,900	181,063	723,963	\$144,793	33.4%	26,340	\$5,268	3.6%	154,723
Totals	288	\$86,004,057	\$27,082,176	\$113,086,233	\$392,661	30.1%	\$3,531,554	\$12,262	3.1%	\$23,550,622
STEM Departments	267	\$82,936,866	\$26,205,108	\$109,141,974	\$408,771	31.6%	\$2,930,018	\$10,974	2.7%	\$23,275,090

¹Average indirect cost rates are expressed as a simple percentage of Total Direct Costs - actual rates will be somewhat higher based on MTDC.
²Cost sharing effective rates are expressed as a simple percentage of Total Costs.

Illustration II-2

Worcester Polytechnic Institute
Summary of Proposal Submissions
July 1, 2010 to June 30, 2011

Department	No.	Proposal Amounts			Average Proposal Amount	Average Indirect Cost Rates ¹	Proposed Cost Sharing	Average Cost Sharing per Proposal	Cost Sharing Effective Rates ²	Excess of Indirect Costs Over Cost Sharing
		Direct Costs	Indirect Costs	Total Costs						
Arts & Sciences										
BBT	15	3,297,136	1,530,669	4,827,805	\$321,854	46.4%	102,264	\$6,818	2.1%	1,428,405
CBC	12	2,610,006	687,053	3,297,059	\$274,755	26.3%	714,649	\$59,554	21.7%	(27,596)
CS	33	24,672,025	6,545,956	31,217,981	\$945,999	26.5%	167,641	\$5,080	0.5%	6,378,315
H&A	2	189,955	13,596	203,551	\$101,776	7.2%	199,082	\$99,541	0.0%	(185,486)
MS	21	3,686,045	1,277,955	4,964,000	\$236,381	34.7%	4,261	\$203	0.1%	1,273,694
PH	10	3,395,220	1,166,593	4,561,813	\$456,181	34.4%	102,146	\$10,215	2.2%	1,064,447
SSPS	9	1,743,768	787,490	2,531,258	\$281,251	45.2%	1,746	\$0	0.0%	785,744
A&S Totals	102	39,594,155	12,009,312	51,603,467	505,916	31.5%	1,291,789	12,665	3.8%	10,717,523
Business	8	2,056,275	649,663	2,705,938	\$338,242	31.6%	314,550	\$39,319	11.6%	335,113
Engineering										
BME	24	6,447,401	2,306,370	8,753,771	\$364,740	35.8%	162,327	\$6,764	1.9%	2,144,043
CHE	16	6,453,383	752,273	7,205,656	\$450,354	11.7%	808,725	\$50,545	11.2%	(56,452)
CEE	12	2,778,222	757,913	3,536,135	\$294,678	27.3%	364,523	\$30,377	10.3%	393,390
ECE	42	7,267,630	3,230,567	10,498,197	\$249,957	44.5%	82,871	\$1,973	0.8%	3,147,696
FPE	19	2,947,300	1,019,166	3,966,466	\$208,761	34.6%	120,996	\$6,368	3.1%	898,170
ME	50	14,851,835	4,641,240	19,493,075	\$389,862	31.3%	297,869	\$5,957	1.5%	4,343,371
Engineering Totals	163	40,745,771	12,707,529	53,453,300	327,934	30.8%	1,837,311	11,272	28.8%	10,870,218
IGSD	6	278,061	32,746	310,807	\$51,801	11.8%	61,564	\$10,261	19.8%	(28,818)
Other BEI	4	\$2,786,895	\$1,501,863	\$4,288,758	\$1,072,190	53.9%	\$0	\$0	0.0%	\$1,501,863
Other	5	542,900	181,063	723,963	\$144,793	33.4%	26,340	\$5,268	3.6%	154,723
Other Totals	9	3,329,795	1,682,926	5,012,721	556,969	87.2%	26,340	2,927	3.6%	1,656,586
Totals	288	\$86,004,057	\$27,082,176	\$113,086,233	\$392,661	37.4%	\$3,531,554	\$12,262	3.1%	\$23,550,622
STEM Departments	267	\$82,936,866	\$26,205,108	\$109,141,974	\$408,771	31.6%	\$2,930,018	\$10,974	2.7%	\$23,275,090

¹Average indirect cost rates are expressed as a simple percentage of Total Direct Costs - actual rates will be somewhat higher based on MTDC.

²Cost sharing effective rates are expressed as a simple percentage of Total Costs.

Proposal Distribution

Illustration II-2 below provides a comparative breakdown by major sponsor in terms of numbers and dollar amounts of proposals submitted in fiscal year 2010 and fiscal year 2009.

Illustration II-2

Worcester Polytechnic Institute
Comparative Summary of Proposal Submissions by Sponsor
FY2011 and FY2010

Sponsor	FY2011				FY2010			
	No.	%	Amount	%	No.	%	Amount	%
Federal								
Air Force	9	3.1%	\$800,844	0.7%	5	1.5%	\$717,415	0.4%
Army	6	2.1%	3,941,267	3.5%	14	4.1%	25,868,756	14.0%
DARPA	6	2.1%	909,401	0.8%	10	2.9%	2,042,932	1.1%
Department of Education	8	2.8%	5,577,704	4.9%	12	3.5%	29,700,491	16.0%
Department of Energy	9	3.1%	3,648,235	3.2%	25	7.3%	19,496,129	10.5%
Health and Human Services	34	11.8%	29,265,441	25.9%	30	8.7%	23,949,632	12.9%
Department of Homeland Security ¹	7	2.4%	2,402,689	2.1%	4	1.2%	1,711,648	0.9%
Department of Justice	0	0.0%	0	0.0%	2	0.6%	852,526	0.5%
Department of Transportation	2	0.7%	235,628	0.2%	5	1.5%	349,057	0.2%
NASA	9	3.1%	739,878	0.7%	7	2.0%	1,131,559	0.6%
National Science Foundation	110	38.2%	56,048,900	49.6%	141	41.0%	68,829,847	37.1%
Navy	10	3.5%	1,083,834	1.0%	8	2.3%	856,423	0.5%
NEH	0	0.0%	0	0.0%	2	0.6%	700,899	0.4%
NIST	1	0.3%	24,150	0.0%	9	2.6%	4,036,810	2.2%
Other Federal	16	5.6%	2,369,343	2.1%	10	2.9%	704,485	0.4%
Subtotal - Federal	227	78.8%	\$107,047,314	94.7%	284	82.6%	\$180,948,609	97.6%
Commonwealth of Massachusetts	7	2.4%	390,849	0.3%	8	2.3%	372,527	0.2%
Corporations	20	6.9%	1,595,759	1.4%	31	9.0%	1,937,089	1.0%
Foundations	11	3.8%	1,108,563	1.0%	4	1.2%	236,502	0.1%
Foreign Organizations	7	2.4%	574,064	0.5%	5	1.5%	751,609	0.4%
Private Organizations	16	5.6%	2,369,595	2.1%	11	3.2%	867,442	0.5%
Public Organizations	0	0.0%	0	0.0%	1	0.3%	236,923	0.1%
Totals	<u>288</u>	<u>100.0%</u>	<u>\$113,086,144</u>	<u>100.0%</u>	<u>344</u>	<u>100.0%</u>	<u>\$185,350,701</u>	<u>100.0%</u>

¹Includes Federal Emergency Management Agency (FEMA)

Participation by Tenured and Tenure-Track Faculty Members

Note: In Illustration II-3 on the following page, faculty member assignments are shown by home departments with the Bioengineering Institute being the only exception.

Illustration II-3

Worcester Polytechnic Institute Participation Analysis by Department (Tenured & Tenure Track Faculty as PI Only) Fiscal Year 2011										
	[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]	[j]
						Proposals per Participating Faculty Member				
		No. of Participating Faculty	Participation Rate [b/a]	No. of Proposals	Proposals per Faculty Member [d/a]	Proposals per Participating Faculty Member [d/b]	Proposal \$ Volume	\$ Amount Requested/ Faculty Member (g/a)	\$ Amount Requested/ Participating Faculty Member (g/b)	Average Proposal \$ Amount (g/d)
Dept.	No. of Faculty									
Biology & Biotechnology	12	6	50.0%	11	0.92	1.83	3,621,150	301,763	603,525	329,195
Biomedical Engineering	9	8	88.9%	22	2.44	2.75	8,608,181	956,465	1,076,023	391,281
Chemical Engineering	10	7	70.0%	16	1.60	2.29	7,205,656	720,566	1,029,379	450,354
Chemistry & Biochemistry	9	7	77.8%	15	1.67	2.14	5,684,615	631,624	812,088	378,974
Civil & Environmental Engineering	13	6	46.2%	10	0.77	1.67	2,977,734	229,056	496,289	297,773
Computer Science	24	11	45.8%	32	1.33	2.91	31,193,981	1,299,749	2,835,816	974,812
Electrical & Computer Engineering	18	15	83.3%	42	2.33	2.80	10,498,197	583,233	699,880	249,957
Fire Protection Engineering	5	5	100.0%	19	3.80	3.80	3,966,466	793,293	793,293	208,761
Humanities & Arts	30	2	6.7%	2	0.07	1.00	203,551	6,785	101,776	101,776
Interdisciplinary & Global Studies	3	2	66.7%	4	1.33	2.00	256,785	85,595	128,393	64,196
Management	19	5	26.3%	6	0.32	1.20	2,407,938	126,734	481,588	401,323
Mathematical Sciences	25	12	48.0%	19	0.76	1.58	4,855,121	194,205	404,593	255,533
Mechanical Engineering	28	18	64.3%	50	1.79	2.78	19,492,986	696,178	1,082,944	389,860
Physics	12	5	41.7%	9	0.75	1.80	3,255,560	271,297	651,112	361,729
Social Science & Policy Studies	12	4	33.3%	9	0.75	0.00	2,531,258	210,938	632,815	281,251
Other	0	0	0.0%	0	0.00	0.00	0	0	0	0
Totals	229	113	49.3%	266	1.16	2.35	\$106,759,179	\$466,197	\$944,771	\$401,350

Note: Proposal counts and \$ amounts are for tenured and tenure-track faculty only. Amounts do not include submissions by staff, deans, adjuncts, etc.

Participation by Co-Principal Investigators

A key element in writing successful proposals, especially those with larger project scopes, is the involvement of individuals designated as Co-Principal Investigators (CPI's). These individuals include tenured and tenure-track faculty as well as other classes of employees. Illustration II-4 on the following page summarizes the critical role played by these individuals at the University in fiscal year 2011.

It should be noted that Illustration II-4 portrays co-PI involvement from the co-PI department's perspective (i.e., each instance of co-PI participation is counted as a proposal for her/his department's purposes). For fiscal year 2011, a total of 89 proposals that included co-PIs were submitted (115 proposals when spread across all departments and counted as indicated above). The 89 proposals that involved co-PIs represents a decrease from the 102 proposals with co-PIs that were submitted in fiscal year 2010.

Illustration II-4

**Worcester Polytechnic Institute
Analysis of Co-Principal Investigator Contributions to Proposal Submissions
July 1, 2010 to June 30, 2011**

<u>Department</u>	<u>No. of Proposals with Co-Pis</u>	<u>Total Amounts for Proposals with Co-Pis</u>	<u>Average Proposal Amount</u>	<u>Total Co-PI Occurrences Across All Proposals</u>	<u>Average Occurrence Amount</u>	<u>Actual No. of Individuals Involved As Co-Pis</u>	<u>Average Individual Contribution</u>
BME	8	5,296,545	\$662,068	12	441,379	6	\$882,758
BBT	8	3,014,765	\$376,846	8	376,846	6	\$502,461
CHE	4	476,472	\$119,118	6	79,412	4	\$119,118
CBC	4	812,399	\$203,100	5	162,480	5	\$162,480
CEE	6	791,835	\$131,973	9	87,982	7	\$113,119
CS	18	5,427,708	\$301,539	20	271,385	15	\$361,847
ECE	19	4,579,353	\$241,019	20	228,968	11	\$416,305
FPE	5	1,151,936	\$230,387	5	230,387	3	\$383,979
H&A	3	218,472	\$72,824	4	54,618	3	\$72,824
IGSD	1	99,896	\$99,896	2	49,948	2	\$49,948
MGT	10	2,505,617	\$250,562	14	178,973	7	\$357,945
MS	7	7,223,231	\$1,031,890	8	902,904	7	\$1,031,890
ME	10	2,264,740	\$226,474	11	205,885	6	\$377,457
PH	2	89,161	\$44,581	2	44,581	2	\$44,581
SSPS	6	1,204,717	\$200,786	8	150,590	5	\$240,943
Other Dept.	<u>4</u>	<u>183,868</u>	<u>\$45,967</u>	<u>6</u>	<u>30,645</u>	<u>5</u>	<u>\$36,774</u>
Totals	<u>115</u>	<u>\$35,340,715</u>	<u>\$36,861</u>	<u>140</u>	<u>24,978</u>	<u>94</u>	<u>\$54,834</u>

Note: Calculations are based on dividing each proposal total by the total number of investigators (PI plus Co-PI).

III. AWARD ACTIVITY FOR FISCAL YEAR 2011

Illustration III-1 below provides departmental data for award actions received in fiscal year 2011. It also includes summary information regarding indirect cost rates and cost sharing on awards (unaudited - for comparison purposes only) as well as a breakdown at the bottom of the report that shows total University award information and awards for science, technology, engineering and mathematics (STEM) departments only. A second summary (Illustration III-2) on the following page provides this data sorted and totaled by dean.

Note: Major funding for the Bioengineering Institute has been provided by the U.S. Army Medical Research and Materiel Command since fiscal year 2003. In addition to appointees in the Bioengineering Institute itself, faculty members from the Biomedical Engineering, Chemistry and Biochemistry, Chemical Engineering, and Electrical and Computer Engineering departments continue to play key roles in Bioengineering Institute programs.

Illustration III-1

Worcester Polytechnic Institute Summary of Award Actions by Department July 1, 2010 to June 30, 2011										
Department	No.	Award Amounts ¹			Average Award Amount	Average Indirect Cost Rates ²	Actual Cost Sharing	Average Cost Sharing per Award	Cost Sharing Effective Rates ³	Excess of Indirect Costs Over Cost Sharing
		Direct Costs	Indirect Costs	Total Costs						
BEI	3	\$1,240,633	\$624,893	\$1,865,526	\$621,842	50.4%	\$0	\$0	0.0%	\$624,893
BBT	2	199,713	96,258	295,971	\$147,986	48.2%	0	\$0	0.0%	96,258
BME	10	284,362	50,515	334,877	\$33,488	17.8%	47,138	\$4,714	14.1%	3,377
CHE	9	1,788,617	576,810	2,365,427	\$262,825	32.2%	375,481	\$41,720	15.9%	201,329
CBC	5	466,963	192,423	659,386	\$131,877	41.2%	8,395	\$1,679	1.3%	184,028
CEE	2	29,420	15,357	44,777	\$22,389	52.2%	0	\$0	0.0%	15,357
CS	13	2,448,506	734,703	3,183,209	\$244,862	30.0%	199,541	\$15,349	6.3%	535,162
ECE	28	1,013,565	348,369	1,361,934	\$48,641	34.4%	20,322	\$726	1.5%	328,047
FPE	4	289,939	78,820	368,759	\$92,190	27.2%	0	\$0	0.0%	78,820
H&A	0	0	0	0	\$0	0.0%	0	\$0	0.0%	0
IGSD	2	97,296	15,759	113,055	\$56,528	16.2%	0	\$0	0.0%	15,759
MGT	3	384,420	6,914	391,334	\$130,445	1.8%	317,063	\$105,688	81.0%	(310,149)
MS	12	887,279	343,754	1,231,033	\$102,586	38.7%	0	\$0	0.0%	343,754
ME	27	2,226,673	809,601	3,036,274	\$112,455	36.4%	50,000	\$1,852	1.6%	759,601
PH	2	154,358	77,004	231,362	\$115,681	49.9%	0	\$0	0.0%	77,004
SSPS	8	1,486,677	668,354	2,155,031	\$269,379	45.0%	0	\$0	0.0%	668,354
Other	6	402,576	32,362	434,938	\$72,490	8.0%	215,978	\$35,996	49.7%	(183,616)
Totals	136	\$13,400,997	\$4,671,896	\$18,072,893	\$132,889	29.9%	\$1,233,918	\$9,073	6.8%	\$3,437,978
STEM Departments	125	\$12,516,705	\$4,616,861	\$17,133,566	\$137,069	36.9%	\$700,877	\$5,607	4.1%	\$3,915,984

¹BME, CBC, and ECE faculty members are key participants in BEI research funded by the U.S. Army Medical Research & Materiel Command.
²Average indirect cost rates are expressed as a simple percentage of Total Direct Costs - actual rates will be somewhat higher based on MTDC.
³Cost sharing effective rates are expressed as a simple percentage of Total Costs.

Illustration III-2

**Worcester Polytechnic Institute
Summary of Award Actions
July 1, 2010 to June 30, 2011**

Department	No.	Award Amounts			Average Award Amount	Average Indirect Cost Rates ¹	Actual Cost Sharing	Average Cost Sharing per Proposal	Cost Sharing Effective Rates ²	Excess of Indirect Costs Over Cost Sharing
		Direct Costs	Indirect Costs	Total Costs						
Arts & Sciences										
BBT	2	199,713	96,258	295,971	\$147,986	48.2%	0	\$0	0.0%	96,258
CBC	5	466,963	192,423	659,386	\$131,877	41.2%	8,395	\$1,679	1.3%	184,028
CS	13	2,448,506	734,703	3,183,209	\$244,862	30.0%	199,541	\$15,349	6.3%	535,162
H&A	0	0	0	0	\$0	0.0%	0	\$0	0.0%	0
MS	12	887,279	343,754	1,231,033	\$102,586	38.7%	0	\$0	0.0%	343,754
PH	2	154,358	77,004	231,362	\$115,681	49.9%	0	\$0	0.0%	77,004
SSPS	8	1,486,677	668,354	2,155,031	\$269,379	45.0%	0	\$0	0.0%	668,354
A&S Totals	42	5,643,496	2,112,496	7,755,992	184,666	36.1%	207,936	4,951	1.1%	1,904,560
Business	3	384,420	6,914	391,334	\$130,445	1.8%	317,063	\$105,688	81.0%	(310,149)
Engineering										
BME	10	284,362	50,515	334,877	\$33,488	17.8%	47,138	\$4,714	14.1%	3,377
CHE	9	1,788,617	576,810	2,365,427	\$262,825	32.2%	375,481	\$41,720	15.9%	201,329
CEE	2	29,420	15,357	44,777	\$22,389	52.2%	0	\$0	0.0%	15,357
ECE	28	1,013,565	348,369	1,361,934	\$48,641	34.4%	20,322	\$726	1.5%	328,047
FPE	4	289,939	78,820	368,759	\$92,190	27.2%	0	\$0	0.0%	78,820
ME	27	2,226,673	809,601	3,036,274	\$112,455	36.4%	50,000	\$1,852	1.6%	759,601
Engineering Totals	80	5,632,576	1,879,472	7,512,048	93,901	33.4%	492,941	6,162	33.1%	1,386,531
IGSD	2	97,296	15,759	113,055	\$56,528	16.2%	0	\$0	0.0%	15,759
Other BEI	3	\$1,240,633	\$624,893	\$1,865,526	\$621,842	50.4%	\$0	\$0	0.0%	\$624,893
Other	6	402,576	32,362	434,938	\$72,490	8.0%	215,978	\$35,996	49.7%	(183,616)
Other Totals	9	1,643,209	657,255	2,300,464	255,607	58.4%	215,978	23,998	49.7%	441,277
Totals	136	\$13,400,997	\$4,671,896	\$18,072,893	\$132,889	37.4%	\$1,233,918	\$9,073	6.8%	\$3,437,978
STEM Departments	125	\$12,516,705	\$4,616,861	\$17,133,566	\$137,069	36.9%	\$700,877	\$5,607	4.1%	\$3,915,984

¹Average indirect cost rates are expressed as a simple percentage of Total Direct Costs - actual rates will be somewhat higher based on MTDC.

²Cost sharing effective rates are expressed as a simple percentage of Total Costs.

Award Distribution

Illustration III-3 below provides a comparative breakdown by major sponsor in terms of numbers and dollar amounts of award actions received during fiscal year 2011 and fiscal year 2010.

Illustration III-3

Worcester Polytechnic Institute Comparative Summary of Awards Received by Sponsor FY2011 and FY2010								
Sponsor	FY2011				FY2010			
	No.	%	Amount	%	No.	%	Amount	%
Federal								
Air Force	7	5.1%	\$409,014	2.3%	3	2.0%	\$261,041	1.5%
Army	7	5.1%	2,292,276	12.7%	11	7.2%	517,947	3.0%
DARPA	7	5.1%	629,458	3.5%	3	2.0%	252,621	1.5%
Department of Education	4	2.9%	678,282	3.8%	4	2.6%	588,738	3.4%
Department of Energy	6	4.4%	1,995,336	11.0%	6	3.9%	1,873,708	10.8%
Health & Human Services	16	11.8%	2,250,676	12.5%	16	10.5%	3,141,712	18.1%
Dept. of Homeland Security ¹	1	0.7%	20,000	0.1%	3	2.0%	1,444,144	8.3%
Department of Transportation	0	0.0%	0	0.0%	2	1.3%	104,839	0.6%
NASA	4	2.9%	126,950	0.7%	4	2.6%	321,773	1.9%
NIST	2	1.5%	287,978	1.6%	3	2.0%	1,378,548	7.9%
National Science Foundation	35	25.7%	6,446,917	35.7%	37	24.3%	4,522,426	26.0%
Navy	8	5.9%	203,009	1.1%	5	3.3%	314,313	1.8%
Other Federal	6	4.4%	459,522	2.5%	13	8.6%	967,232	5.6%
Subtotal - Federal	103	75.7%	\$15,799,418	87.4%	110	72.4%	\$15,689,042	90.3%
Commonwealth of Massachusetts	5	3.7%	199,343	1.1%	4	2.6%	63,932	0.4%
Corporations	18	13.2%	875,655	4.8%	28	18.4%	916,752	5.3%
Foundations	4	2.9%	412,438	2.3%	3	2.0%	310,556	1.8%
Foreign Organizations	4	2.9%	285,039	1.6%	3	2.0%	204,109	1.2%
Private Organizations	2	1.5%	501,000	2.8%	4	2.6%	190,070	1.1%
Public Organizations	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Totals	<u>136</u>	<u>100.0%</u>	<u>\$18,072,893</u>	<u>100.0%</u>	<u>152</u>	<u>100.0%</u>	<u>\$17,374,461</u>	<u>100.0%</u>

¹Includes Federal Emergency Management Agency (FEMA)

IV. EXPENDITURE ACTIVITY FOR FISCAL YEAR 2011

It should be noted that the Office of Sponsored Programs (OSP) has no authority over the expenditure approval, cash management, or other accounting processes at the University. The following brief analysis of sponsored program expenditures for fiscal year 2011 is provided as supplementary data based on a report generated by the Controller's Office. Illustration IV-1 below provides a summary of fiscal year 2011 expenditures by department and cost type while Illustration IV-2 on the following page provides a comparative summary of expenditures by major cost element for both fiscal years 2011 and 2010. Note: OSP is working with the Accounting Office to develop financial data to more accurately portray actual expenditures on sponsored programs and cost sharing by the University and collaborators.

Illustration IV-1

Worcester Polytechnic Institute Summary of Sponsored Program Expenditure Activity by Department July 1, 2010 - June 30, 2011										
Dept.	Cost Sharing	Salaries & Wages	Fringe Benefits	Equipment	Other Direct Costs	F&A Costs	Grand Totals	Excess of F&A Costs over C.S.	Faculty & Staff S&W	Student Stipends
BBT	\$(9,054)	\$227,218	\$42,197	\$27,226	\$239,956	\$266,736	\$794,278	\$257,681	\$157,452	\$69,765
BEI	(133)	268,458	46,004	21,060	184,806	176,139	696,334	176,006	\$171,656	96,802
BME	(66,175)	377,335	54,925	22,080	357,224	354,767	1,100,157	288,591	\$204,944	172,391
CM	(4,744)	703,969	108,954	79,401	1,005,943	596,603	2,490,126	591,859	\$406,545	297,424
CBC	0	318,553	67,668	(1,832)	203,428	244,352	832,170	244,352	\$252,492	66,061
CEE	(2,894)	90,203	8,607	799	99,279	70,067	266,061	67,173	\$32,115	58,088
CS	(89,373)	979,369	98,751	13,768	879,087	489,124	2,370,726	399,751	\$368,474	610,896
ECE	(77,099)	796,802	104,006	62,692	402,622	537,842	1,826,865	460,743	\$388,082	408,720
FPE	(30,353)	302,141	37,397	11,603	303,174	203,097	827,060	172,744	\$139,541	162,600
H&A	0	71,014	17,344	0	3,839	48,127	140,324	48,127	\$64,715	6,299
IGSD	(10,389)	52,559	14,092	1,239	86,001	23,939	167,441	13,550	\$52,581	(22)
MGT	(1,340)	128,645	29,475	585	103,564	63,693	324,622	62,353	\$109,981	18,664
MS	0	517,418	110,804	14,896	488,087	364,995	1,496,200	364,995	\$413,449	103,969
ME	(62,765)	947,142	152,527	187,415	391,618	672,514	2,288,451	609,749	\$569,130	378,012
PH	(32,791)	123,914	21,325	26,969	25,889	82,215	247,520	49,424	\$79,570	44,344
SSPS	0	567,167	108,595	3,851	331,482	390,588	1,401,683	390,588	\$405,205	161,963
Other	(46,747)	116,388	12,601	0	234,064	43,668	359,975	(3,079)	\$47,019	69,369
Totals	\$(433,857)	\$6,588,293	\$1,035,271	\$471,753	\$5,340,063	\$4,628,464	\$17,629,987	\$4,194,607	\$3,862,950	\$2,725,344

Sponsored Program Expenditure Activity by Element of Cost

Illustration IV-2 on the following page provides a comparative breakdown by broad cost category of expenditures incurred in fiscal year 2011 and fiscal year 2010.

Illustration IV-2

**Worcester Polytechnic Institute
Comparative Summary of Sponsored Program Expenditure Activity
FY2011 and FY2010**

<u>Element of Cost</u>	<u>FY2011 Expenses</u>	<u>FY2010 Expenses</u>	<u>% Change</u>
Salaries & Wages	\$6,588,293	\$5,453,129	20.8%
Fringe Benefits	1,035,271	805,839	28.5%
Equipment	471,753	606,415	-22.2%
Other Direct Expenses	<u>5,340,063</u>	<u>4,983,455</u>	7.2%
Subtotal Direct Program Costs	\$13,435,380	\$11,848,838	13.4%
Indirect Costs	<u>4,628,464</u>	<u>3,655,439</u>	26.6%
Total Program Costs	\$18,063,844	\$15,504,277	16.5%
Less: WPI Cost Sharing ¹	<u>(433,857)</u>	<u>(386,908)</u>	12.1%
Total Sponsored Program Costs	<u>\$17,629,987</u>	<u>\$15,117,369</u>	16.6%

¹Due to the method used for recording expenditures, a breakdown of WPI cost sharing to net against direct sponsored program costs by category is not possible without further analysis.

V. HISTORICAL REVIEW OF PROPOSALS, AWARDS, AND EXPENDITURES

Illustration V-1 below provides a snapshot of all proposal, award, and expenditure totals for the most recent ten years. Illustration V-1a on the following page is a similar report, but the amounts shown are net of the impact of Congressional appropriations, thus illustrating the University's ten-year sponsored program results through conventional, peer-reviewed activities only.

Illustration V-1

Worcester Polytechnic Institute											
Ten-Year Historical Summary of Sponsored Program Activity (Including Congressional Funding)											
FY2002 (Base Year) to FY2011											
Fiscal Year	Proposal Volume				Award Volume				Expenditure Volume ¹		
	No.	Amount	% Change from Prior Yr.	% Change from Base Yr.	No.	Amount	% Change from Prior Yr.	% Change from Base Yr.	Amount	% Change from Prior Yr.	% Change from Base Year
Base 2002	202	60,428,924			93	7,834,171			8,549,516		
2003	228	73,472,235	21.6%	21.6%	128	10,904,309	39.2%	39.2%	9,265,725	8.4%	8.4%
2004	207	72,503,900	-1.3%	20.0%	122	13,593,899	24.7%	73.5%	11,740,812	26.7%	37.3%
2005	209	82,590,969	13.9%	36.7%	111	11,488,805	-15.5%	46.6%	11,965,468	1.9%	40.0%
2006	219	69,308,920	-16.1%	14.7%	122	16,654,758	45.0%	112.6%	12,645,331	5.7%	47.9%
2007	217	53,058,847	-23.4%	-12.2%	120	11,436,003	-31.3%	46.0%	11,736,587	-7.2%	37.3%
2008	274	91,400,387	72.3%	51.3%	126	14,631,997	27.9%	86.8%	12,129,731	3.3%	41.9%
2009	312	126,584,577	38.5%	109.5%	139	13,706,844	-6.3%	75.0%	12,426,357	2.4%	45.3%
2010	344	185,350,701	46.4%	206.7%	152	17,374,461	26.8%	121.8%	15,117,369	21.7%	76.8%
2011	288	113,086,144	-39.0%	87.1%	136	18,072,893	4.0%	130.7%	17,629,987	16.6%	106.2%

¹Source: Sponsored Programs and Research Accounting files

Illustration V-1a

**Worcester Polytechnic Institute
Ten-Year Historical Summary of Sponsored Program Activity (Net of Congressional Funding)
FY2002 (Base Year) to FY2011**

Fiscal Year	Proposal Volume				Award Volume				Expenditure Volume ¹		
	No.	Amount	% Change from Prior Yr.	% Change from Base Yr.	No.	Amount	% Change from Prior Yr.	% Change from Base Yr.	Amount	% Change from Prior Yr.	% Change from Base Year
Base 2002	201	59,556,509			93	7,834,171			8,549,516		
2003	226	71,656,738	20.3%	20.3%	127	10,077,309	28.6%	28.6%	8,590,641	0.5%	0.5%
2004	207	72,503,900	1.2%	21.7%	120	11,784,261	16.9%	50.4%	10,378,145	20.8%	21.4%
2005	203	74,570,618	2.9%	25.2%	108	9,748,383	-17.3%	24.4%	10,099,745	-2.7%	18.1%
2006	216	65,283,920	-12.5%	9.6%	117	10,661,472	9.4%	36.1%	9,917,665	-1.8%	16.0%
2007	217	63,058,847	-3.4%	5.9%	120	11,436,003	7.3%	46.0%	9,254,134	-6.7%	8.2%
2008	272	89,692,387	42.2%	50.6%	123	12,084,997	5.7%	54.3%	11,240,643	21.5%	31.5%
2009	311	124,379,627	38.7%	108.8%	139	13,706,844	13.4%	75.0%	11,519,641	2.5%	34.7%
2010	344	185,350,701	49.0%	211.2%	151	17,129,461	25.0%	118.7%	13,957,224	21.2%	63.3%
2011	287	112,152,541	-39.5%	88.3%	134	17,019,290	-0.6%	117.2%	16,889,260	21.0%	97.5%

¹Source: Sponsored Programs and Research Accounting files

APPENDIX I. FISCAL YEAR 2011 AWARD LISTINGS

The following listings of awards received in fiscal year 2011 are sorted alphabetically by department. Additional names of co-principal investigators on awards are provided in the column next to the principal investigator name. Prime sponsors are shown in parentheses when the award to WPI is a subcontract. To save space, the names of some sponsors have been abbreviated. Please see the list below for a cross-reference, if needed.

CIHR	Canadian Institutes of Health Research
CommMA	Commonwealth of Massachusetts
DARPA	Defense Advanced Research Projects Agency
DED	Department of Education
DHHS	Department of Health & Human Services
DHS	Department of Homeland Security
DOD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
EPA	Environmental Protection Agency
NAS	National Academies of Science
NASA	National Aeronautics & Space Administration
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NSA	National Security Agency
NSF	National Science Foundation
USDA	Department of Agriculture
VA	US Department of Veterans Affairs

**AWARDS RECEIVED
BIOENGINEERING INSTITUTE
JULY 1, 2010 TO JUNE 30, 2011**

Note: Faculty members from the Biomedical Engineering, Chemistry and Biochemistry, and Electrical and Computer Engineering departments continue to play a key role in the research activities of the Bioengineering Institute.

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Lambert, Christopher R.	R. James Duckworth, Christopher R. Lambert, Yitzhak Mendelson, Peder C. Pedersen	Real-Time Troop Physiological Status Monitoring Systems Using a Common Wireless Network	US Army	876,000
McGimpsey, W. Grant	Christopher R. Lambert	Development of Highly Functional, Neurally Controlled, Skeletally Attached, and Intelligent Prosthetic Devices	University of Utah (Army)	933,603
		Real-Time Troop Physiological Monitoring using a Common Wireless Network	US Army	55,923
Total (3)				\$1,865,526

**AWARDS RECEIVED
BIOLOGY & BIOTECHNOLOGY DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Dominko, Tanja		De-Differentiating Adult Human Fibroblasts into Stem-Like Cells Using Defined Conditions	National Institutes of Health	289,971 ¹
Vidali, Luis		REU Supplement: RIG: Analysis of the Role of Myosin XI in Plant Cell Polarized Growth	National Science Foundation	6,000
Total (2)				\$295,971

**AWARDS RECEIVED
BIOMEDICAL ENGINEERING DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Note: Faculty members from Biomedical Engineering continue to play a key role in the research activities of the Bioengineering Institute. Please also see Bioengineering Institute awards for recognition of these efforts.

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Billiar, Kristen	Marsha W. Rolle	REU Site: Integrated Bioengineering Research, Education, and Outreach Experiences for Females and Underrepresented Minorities at WPI	National Science Foundation	100,146
Chon, Ki H.		Noninvasive Diagnosis and Real-time Evaluation of the Effects of Hyperbaric Dive Environments on the Autonomic Nervous System, Utilizing Principal Dynamic Mode Analysis	US Navy	31,436
		Noninvasive Diagnosis and Real-time Evaluation of the Effects of Hyperbaric Dive Environments on the Autonomic Nervous System, Utilizing Principal Dynamic Mode Analysis	US Navy	31,436
		Complex Signal Analysis for "Mechanisms of Fatigue and Exercise Intolerance Following Multiple 6-hour Drives at 1.35 atm PO ₂ "	US Navy	35,000
		Distributed Auto Regulation of Renal Blood Flow	Simon Fraser University	30,750
Mendelson, Yitzhak		MRI In Animal Models	UMass Medical School	22,878
Rolle, Marsha W.	Olufunmilayo Olatokunbo Adebayo, Kristen Billiar	Analysis of Material Properties and Failure Behavior of Cell-Derived Tissue Rings	Sigma Xi Scientific Research Society	1,000
Sotak, Christopher Howard		MR Signal Amplification for Receptor Imaging	UMass Medical School	63,353
		Development of an Animal Model for Parkinson's Disease	UMass Medical School	14,648
		Development of an Animal Model for Parkinson's Disease	UMass Medical School	4,230
Total (10)				\$334,877

**AWARDS RECEIVED
CHEMICAL ENGINEERING DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Camesano, Terri Anne		Polymer Multilayers for Non-Mechanical Closures Application	US Army	50,000
	Jianyu Liang	CCLI: Developing Grand Challenges Nanobiotechnology Laboratory Experience for Sophomores	National Science Foundation	199,433
		Molecular Scale Characterization of the Mechanism of Action of Antimicrobial Peptides on Lipid Membranes Using Quartz Crystal Microbalance with Dissipation	US Army Natick RD&E Center	64,303
		Environmental Cytotoxicity of Nanoparticles: Differentiating "Nanoparticulate" from "Molecular Scale" Effects	National Science Foundation	307,138
		Role of Lipopolysaccharide Properties of Adhesion of Pseudomonas Aeruginosa	Dartmouth College	4,500
DiBiasio, David		Marine Pollution in International Waters and Validating Safety on Commercial Fishing Vessels	U. S. Coast Guard	6,500
Dixon, Anthony G.		Detailed Catalyst Modeling for Fixed Bed Reactors Using CFD	Johnson Matthey PLC	33,781
Ma, Yi Hua	Nikolaos K. Kazantzis	Engineering Design of Advanced H ₂ -CO ₂ Pd and Pd/alloy Composite Membrane Separation and Process Intensification	Department of Energy	1,499,772
Zhou, Hong Susan		Engineering Rapid and Ultrasensitive Microsystem with Hybrid Nanomaterials	National Science Foundation	200,000
Total (9)				\$2,365,427

**AWARDS RECEIVED
CHEMISTRY & BIOCHEMISTRY DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Note: Faculty members from Chemistry and Biochemistry continue to play a key role in the research activities of the Bioengineering Institute. Please also see Bioengineering Institute awards for recognition of these efforts.

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Arguello, Jose' M.	Kristin K. Wobbe	Structure and Function of Copper Transport ATPases	National Science Foundation	180,000
		Structure and Function of Copper Transport ATPases	National Science Foundation	13,000
		Mycobacterium Tuberculosis Metal Transport P-Type ATPases	National Institutes of Health	194,561
Connors, Robert E.		Modeling and Characterization of Singlet Oxygen Entrapment and Release	Battelle Chapel Hill Operations	12,447
Kaminski, George A.		Protein Simulation with a Fast Polarizable Force Field	National Institutes of Health	259,378
Total (5)				\$659,386

**AWARDS RECEIVED
 CIVIL & ENVIRONMENTAL ENGINEERING DEPARTMENT
 JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Plummer, Jeanine D.		Virus: A Potential Indicator of Human Enteric Viruses in Source and Drinking Waters	University of Wisconsin-Madison	39,021
		Virus: A Potential Indicator of Human Enteric Viruses in Source and Drinking Waters	University of Wisconsin-Madison	5,756
Total (2)				\$44,777

**AWARDS RECEIVED
COMPUTER SCIENCE DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Claypool, Mark L.	Craig E Wills	Measuring DNS Performance	Dynamic Network Services, Inc.	55,297
Fisler, Kathryn		BPC-DP: Deploying a Vertically-Integrated Computing Curriculum to At-Risk Students	National Science Foundation	599,320
Gennert, Michael A.	Allen H. Hoffman, John M. Sullivan	Patient Motion Detection and Compensation in SPECT	UMass Medical School	87,048
	Allen H. Hoffman, John M. Sullivan	Patient Motion Detection and Compensation in SPECT	UMass Medical School	80,128
Heffernan, Neil	Janice Gobert, George T. Heineman, Robert W. Lindeman, Murali Mani, Gary F. Pollice, Carolina Ruiz, Elke A. Rundensteiner	PIMSE: A GK-12 Partnership Implementing Mathematics & Science Education (PIMSE):Assisting Middle School Use of Tutoring Technology in the Classroom	National Science Foundation	422,217
		National Center for Cognitive and Mathematics Instruction (NCCMI)	WestEd	93,640
		ASSISTments: Using Web-Based Technologies to Support Grades 7 - 9 Mathematics	Educause	500,000
Rundensteiner, Elke A.		III-Small: Query Mesh - A Novel Paradigm for Query Processing	National Science Foundation	161,101
		III-Small: Query Mesh - A Novel Paradigm for Query Processing	National Science Foundation	167,254
		III:Small: Complex Event Analytics	National Science Foundation	499,894
Sarkozy, Gabor N		Graph Partitions and their Applications	National Science Foundation	133,086
Sidner, Candace L.	Charles Rich	HCC: Large: Collaborative Research: Always-On Relational Agents for Social Support of Older Adults	National Science Foundation	360,224
	Charles Rich	HCC: Large: Collaborative Research: Always-On Relational Agents for Social Support of Older Adults	National Science Foundation	24,000
Total (13)				\$3,183,209

**AWARDS RECEIVED
ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Note: Faculty members from Electrical & Computer Engineering continue to play a key role in the research activities of the Bioengineering Institute. Please also see Bioengineering Institute awards for recognition of these efforts.

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Brown, Donald R.		Synchronization and Pointing Techniques for Precision Electronic Warfare	Raytheon BBN Technologies	62,255
		Synchronization and Pointing Techniques for Precision Electronic Warfare	Raytheon BBN Technologies	75,841
		Synchronization and Pointing Techniques for Precision Electronic Warfare	Raytheon BBN Technologies	80,000
Clancy, Edward A.		Filtering of ERG Oscillatory Potentials	UMass Medical School	7,587
Cyganski, David	R. James Duckworth	Search and Rescue Prototype Systems	Honeywell International, Inc	118,081
	Mark L. Claypool, Brian J. Moriarty, John A. Orr, Kenneth A. Stafford	REDEFINING AMERICA'S UNDERSTANDING OF ENERGY, Empowerment Concept Development Project	FIRST	125,000
Duckworth, R. James	David Cyganski	Development and Support of August 2011 Workshop- "Precision Indoor Personnel Location and Tracking for Emergency Responders"	Constellation Software Engineering Corporation	50,000
Huang, Xinming		MQP: A FPGA Design of Beamforming for MIMO Wireless Communications	MathWorks, Inc.	6,000
		Collaborative Activities Between The MathWorks and WPI Electrical and Computer Engineering: Array Signal Processing on Embedded Targets	MathWorks, Inc.	70,487
		Design and Fabrication of a Low-Power Reconfigurable Processor for Mobile Platform	DARPA	60,000
	Arthur Gerstenfeld	The Current and Near-Future Technologies for Low-latency Electronic Trading	BNP Paribas	50,000
Lou, Wenjing		CAREER: Opportunistic Routing in Multihop and Multirate Wireless Networks	National Science Foundation	90,002

AWARDS RECEIVED
ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT (continued)
JULY 1, 2010 TO JUNE 30, 2011

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Lou, Wenjing		IEEE Communications Society Conference on Sensor, Mesh, and Ad Hoc Communications and Network (SECON) 2011: Student Travel Awards	National Science Foundation	10,000
Makarov, Sergey N.	Stephen John Bitar, Reinhold Ludwig	Array Calibration Algorithms	MIT Lincoln Laboratory	32,605
		ECE3113 Intro to RF Circuit Design, ECE514 Fundamentals of RF and Microwave Engineering, and ECE539 Introduction to Antenna Systems	MathWorks, Inc.	106,785
		Intro to Electrical and Computer Engineering for Majors and Not-Majors	MathWorks, Inc.	4,000
		Reduction of Mutual Coupling Between E- and B- Field Antennas in SQUIF Arrays	Physical Sciences, Inc.	19,500
Orr, John A.	Linda Carre Looft	The Institute for Energy and Sustainability	Massachusetts Clean Energy Center	150,000
Padir, Taskin		Sabertooth: Design and Implementation of a High-Mobility Quadruped Robot	MathWorks, Inc.	5,000
		ORYX: WPI's Entry to RASCAL Exploration Robo-Ops Competition	National Institute of Aerospace	10,000
Pahlavan, Kaveh		Development and Support of June 2011 Workshop-"Wireless Access and Localization for Emerging Body Area Networks Applications"	Department of Homeland Security	20,000
Wyglinski, Alexander		Collaborative Activities between The MathWorks and WPI Electrical and Computer Engineering: Software-Defined Radio	MathWorks, Inc.	70,487
		Communication System Prototyping for Software-Defined Radio Platforms	MathWorks, Inc.	6,000
		BLISS: A Blind Spectrum Separation Approach for Jamming-Resistant Communications	US Navy	15,000

**AWARDS RECEIVED
ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT (continued)
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
		BLISS: A Blind Spectrum Separation Approach for Jamming-Resistant Communications	US Navy	14,505
		Adaptive Satellite Communications via FPGA-Based Software-Defined Radio	COSMIAC	39,998
		Electrospace Measurement, Characterization, and Adaptive Communication	MIT Lincoln Laboratory	50,301
		Time of Arrival-Based Ranging for Localization using an IEEE 802.11-Style Communication System	US Naval Research Laboratory	12,500
Total (28)				\$1,361,934

**AWARDS RECEIVED
FIRE PROTECTION ENGINEERING DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Dembsey, Nicholas A.		Development of Guidelines for Obtaining Material Parameters for Input into Fire Models	NIST	199,978
		SRNS Phase II Fire Testing	Savannah River Nuclear Solutions, LLC	48,424
Meacham, Brian Jay		Quantification of Fire Risk, Performance Levels, Design Fires and Acceptance Criteria for Use in Performance-Based Codes and Fire Safety Design	NIST	88,000
Rangwala, Ali S.		Ignition and Flame Propagation Study	United Technologies Corporation	32,357
Total (4)				\$368,759

**AWARDS RECEIVED
INTERDISCIPLINARY & GLOBAL STUDIES DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Carrera, Fabio		Digital Earth Watch: A Program to Promote Environmental Monitoring by Students and Citizens through Remote Sensing and Digital Photography	University of New Hampshire	46,950
Vaz, Richard Francis		WPI Project Center at MIT Lincoln Laboratory	MIT Lincoln Laboratory	66,105
Total (2)				\$113,055

**AWARDS RECEIVED
MANAGEMENT DEPARTMENT (SCHOOL OF BUSINESS)
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Schaufeld, Jerome	John A. Orr	Building an Innovation and Entrepreneurial Mindset at WPI	Kern Family Foundation	75,000
	John A. Orr	Accelerating the Entrepreneurial Mindset at WPI	Kern Family Foundation	223,000
Zeng, Amy Z.	Yiming Rong, Jennifer Rudolph	U.S. China Link Initiative at WPI	US Dept. of Education	93,334
Total (3)				\$391,334

**AWARDS RECEIVED
MATHEMATICAL SCIENCES DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Martin, William J.		Structure and Applications of Cometric Association Schemes	National Security Agency	33,137
Nandram, Balgobin		Statistical Multi-Source Predictive Models and Error Estimates	National Institute of Statistical Sciences	15,000
		Statistical Multi-Source Predictive Models and Error Estimates with Application to Major USDA Crop Protection Forecasts and Estimates	National Institute of Statistical Sciences	27,000
Tang, Dalin	Kristen Billiar, Joseph D. Petrucci	In Vivo IVUS Image-Based Modeling for Human Coronary Plaque Assessment	National Institutes of Health	314,580
	Kristen Billiar, Joseph D. Petrucci	In Vivo IVUS Image-Based Modeling for Human Coronary Plaque Assessment	National Institutes of Health	21,391
		3D MRI-based Modeling for Computer-Aided Right Ventricle Remodeling Surgery	Children's Hospital- Boston, MA	152,200
		3D MRI-based Modeling for Computer-Aided Right Ventricle Remodeling Surgery	Children's Hospital- Boston, MA	152,200
Walker, Homer F.		Anderson Acceleration for Fixed-Point Iterations	Department of Energy	254,843
Weekes, Suzanne L.	Burt S. Tilley, Zheyang Wu	REU Site: Research Experiences for Undergraduates in Industrial Mathematics and Statistics	National Science Foundation	111,824
Yakovlev, Vadim V.		CAD of Microwavable Multi-Component Food Products	General Mills, Inc.	60,905
		Computer Model of Hybrid Microwave-Radiant Heating of Materials	Ceralink, Inc.	39,979
		High Temperature Microwave Processing of Clay-Type Materials - Modeling-Based Feasibility Study	Spheric Technologies, Inc.	47,974
Total (12)				\$1,231,033

**AWARDS RECEIVED
MECHANICAL ENGINEERING DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Apelian, Diran	Makhlouf M. Makhlouf	HyperCAST Program	North American Die Casting Assoc.	120,000
	Daniel G Backman	Collaborative Research: Center for Resource Recovery and Recycling (CR3)	National Science Foundation	80,000
		Proposal to Accept KU of Leuven as a University Partner of the Center for Resource Recovery and Recycling -CR3	National Science Foundation	24,059
Bar-On, Isa	Sharon Johnson, Diane M. Strong	Development of Ultra-low Carbon Si Casting Technology	Huasheng Tianlong Photoelectric Co., Ltd.	170,508
		New England Healthcare Engineering Partnership (NEHCEP)	U.S. Dept. of Veterans Affairs	298,342
		New England Healthcare Engineering Partnership (NHCEP)	U.S. Dept. of Veterans Affairs	79,543
Blandino, John J.	Nikolaos A. Gatsonis	Characterization of an RF Plasma Source using Langmuir Probe and Emission Spectroscopy	Busek Company, Inc.	32,318
		Investigation of Dispenser Cathode Operation Using Iodine Propellant	Busek Company, Inc.	25,000
Brown, Christopher A.		Lens Retention within Safety Eyewear	Sperian Protection Americas, Inc.	9,049
		Special Problems in Abrasive Finishing Technology	Supfina Machine Company	24,225
		Surface Texture and Seals	Metso Corporation	51,811
Demetriou, Michael A.	Nikolaos A. Gatsonis	Integration of Model-Based Estimation Theory with an Adaptive Finite Volume Method for the Detection of a Moving Gaseous Source via a Mobile Sensor	Air Force Office of Scientific Research	116,616
Dimentberg, Mikhail F.		Vibrations and Dynamics of Oil Well Drill Strings	Weatherford International, Ltd.	66,328
Furlong-Vazquez, Cosme		Computer-based Holography and Middle Ear Function	Massachusetts Eye and Ear Infirmary	138,108
		Development of a Laser Holographic Otoscope for Diagnosis in the Clinic	Massachusetts Eye and Ear Infirmary	205,863

**AWARDS RECEIVED
MECHANICAL ENGINEERING DEPARTMENT (continued)
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Gatsonis, Nikolaos A.		A Multilevel Smooth Dissipative Particle Dynamics Computational Method for Parallel Simulation of Complex 3D Mesoscale Flows	Air Force Office of Scientific Research	78,389
		Space Grant Support for Fellowships and Training	MIT	20,000
Liang, Jianyu		Integrated Studies on the Interfaces in Nanocomposites and Nanoimprinting	University of Akron	36,047
Olinger, David J.		Applications of Hydrofoils with Leading Edge Protuberances	California State University, Northridge	43,632
	Islam Hussein, Gretar Tryggvason	An Integrated Study of Ground Tethered Energy Systems	National Science Foundation	296,050
Sisson, Richard D.	Diran Apelian	Center for Thermomechanical Processing of Materials by Design	US Army	300,000
Sullivan, John M.		Alternative Breast Cancer Imaging Modalities	Dartmouth College	64,283
		Possible Significance of Cholinergic Influence in ADHD	UMass Medical School	27,612
Tryggvason, Gretar		Multiscale Simulations of Multiphase Flows	National Science Foundation	100,000
	Jiacai Lu	Modeling Flow in a Nozzle	Cymer, Inc.	15,869
Van de Ven, James D.		Portable Hydraulic Rescue Spreader: Drive Train and Hydraulic Circuit Design	KaZaK Composites, Inc.	120,000
		Novel Compressed Air Approach for Wind Energy Storage	University of Minnesota	492,622
Total (27)				\$3,036,274

**AWARDS RECEIVED
PHYSICS DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Ram-Mohan, L.R.		Phonon Dynamics in III-Nitrides: Heat Dissipation in High Power Devices	DARPA	168,824
		Improving Electron-Phonon Interaction Calculations	MIT Lincoln Laboratory	62,538
Total (2)				\$231,362

**AWARDS RECEIVED
SOCIAL SCIENCE & POLICY STUDIES DEPARTMENT
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Baker, Ryan Shaun		PSLC Projects in Affect Detection and Closing the Loop on Gaming the System	Carnegie Mellon University	77,020
		Promoting Robust Understanding of Genetics with a Cognitive Tutor that Integrates Conceptual Learning with Problem Solving	Carnegie Mellon University	92,432
		Empirical Research: Emerging Research: Robust and Efficient Learning: Modeling and Remediating Student's Domain Knowledge	Carnegie Mellon University	53,906
		Empirical Research: Emerging Research: Robust and Efficient Learning: Modeling and Remediating Student's Domain Knowledge	Carnegie Mellon University	55,659
		Research: Predicting STEM Career Choice From Computational Indicators of Student Engagement Within Middle School Mathematics Classes	National Science Foundation	234,380
Gobert, Janice	Ryan Shaun Baker, Neil Heffernan, Ryung S Kim, Carolina Ruiz	ASSISTments Meets Inquiry	National Science Foundation	256,647
	Joseph E. Beck, Neil Heffernan	Assistments Meets Science Learning	US Dept. of Education	398,876
	Ryan Shaun Baker	Empirical Research: Emerging Research: Using Automated Detectors to Examine the Relationships Between Learner Attributes and Behaviors During Inquiry in Science Microworlds	National Science Foundation	986,111
Total (8)				\$2,155,031

**AWARDS RECEIVED
OTHER DEPARTMENTS
JULY 1, 2010 TO JUNE 30, 2011**

Principal Investigator	CoPI(s)	Project Title	Sponsor	Amount
Cyr, Martha	Audra Gaul, Suzanne M. Sontgerath	Middle School Tours/STEM Saturdays	Intel Foundation	34,550
Sisson, Richard D.		Graduate Research Fellowship Program	National Science Foundation	40,500
Sisson, Richard D.	NaTonia Trammell	Northeast LSAMP Phase II	University of Massachusetts Amherst	80,000
Trammell, NaTonia		ExxonMobil Bernard Summer Science Camp at WPI-2011	Harris Foundation	79,888
Morse, Charles C.		Worcester Polytechnic Institute Suicide Prevention Program	SAMHSA	100,000
		Worcester Polytechnic Institute Suicide Prevention Program	SAMHSA	100,000
Total (6)				<u>\$ 434,938</u>
FY2011 Grand Total (136)				<u>\$18,072,893</u>

**OTHER AWARDS
GRADUATE FELLOWSHIPS
JULY 1, 2010 TO JUNE 30, 2011**

Award Type: NSF Graduate Research Fellowship Program

Name of graduate students: Scott Rockwell, Fire Protection Engineering Department and Erin Kiley, Mathematical Sciences

Award Amount: \$40,500/year that includes a \$30,000 stipend and \$10,500 tuition allowance.

APPENDIX II. HISTORICAL AND SUPPLEMENTARY DATA

Appendix II contains a several supplemental charts and schedules that look back a number of years to provide information about proposals, awards, and expenditures through fiscal year 2011.

Illustration A-II-1

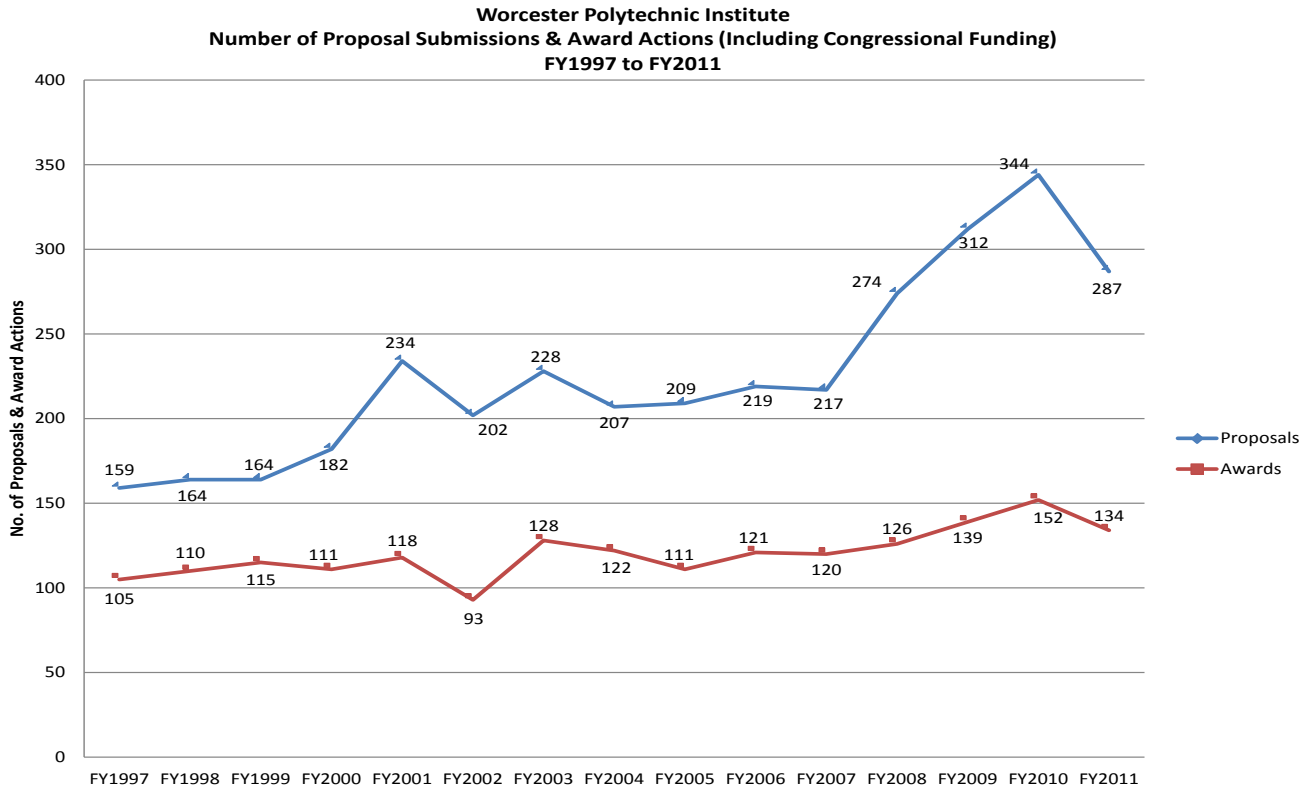


Illustration A-II-2

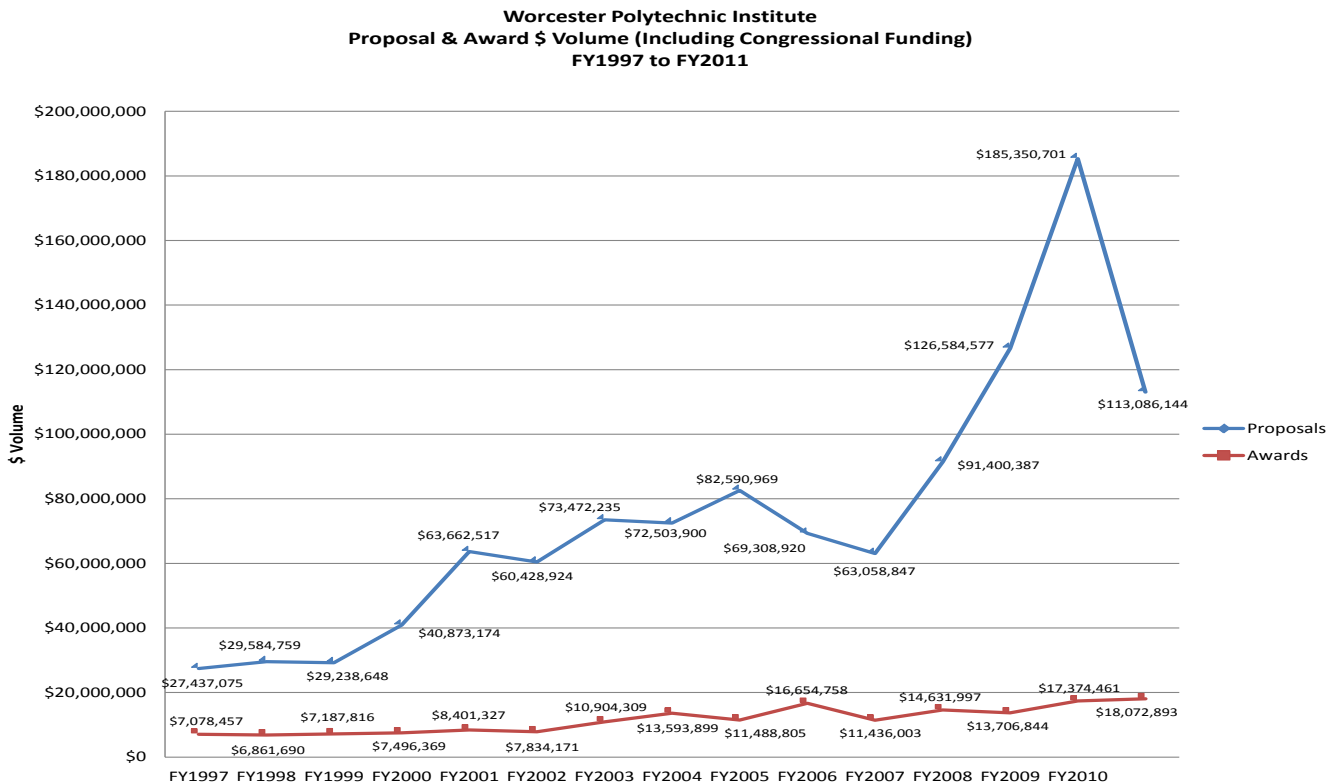


Illustration A-II-3

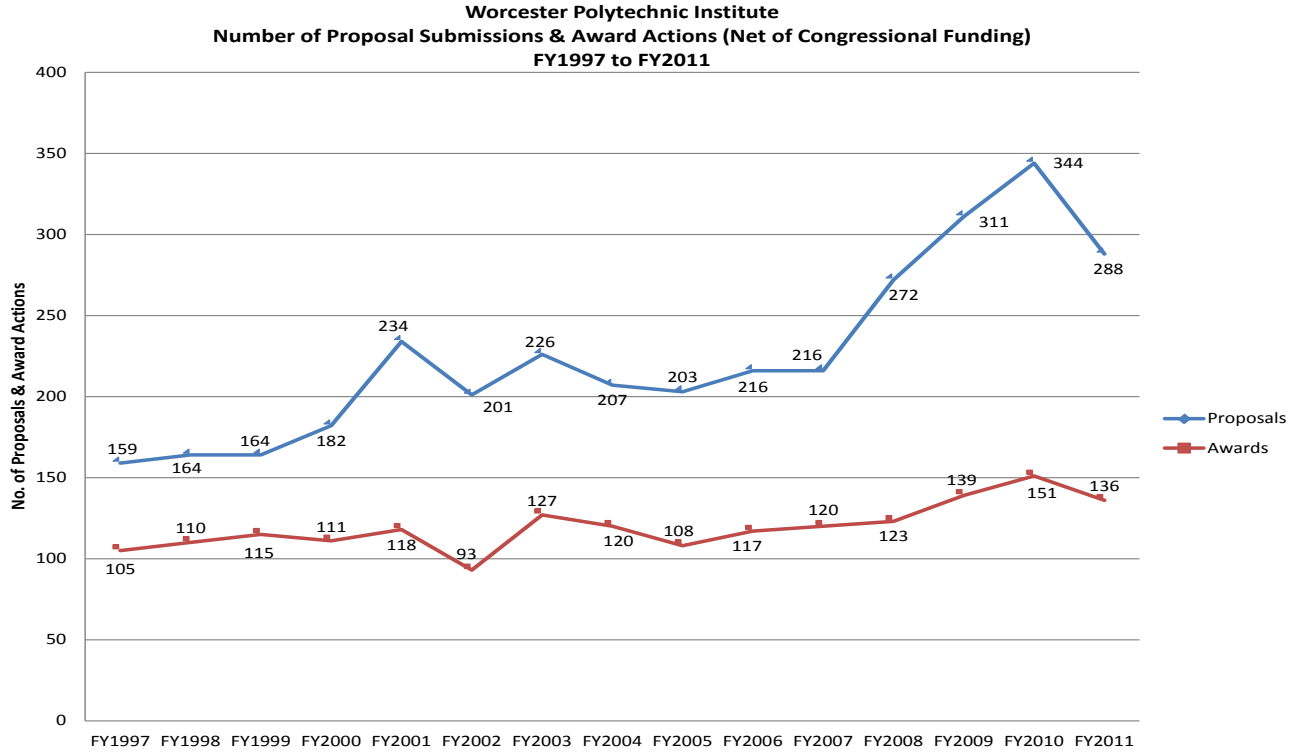
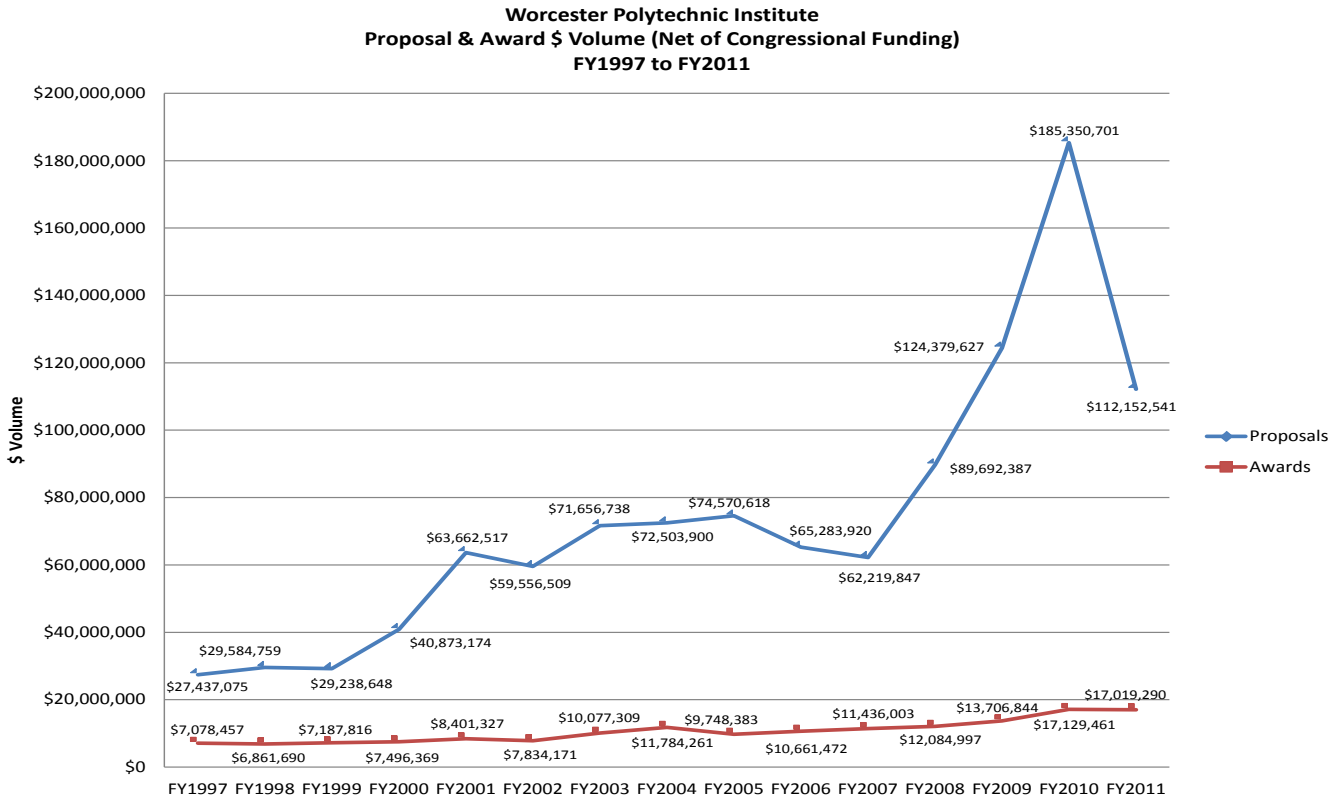
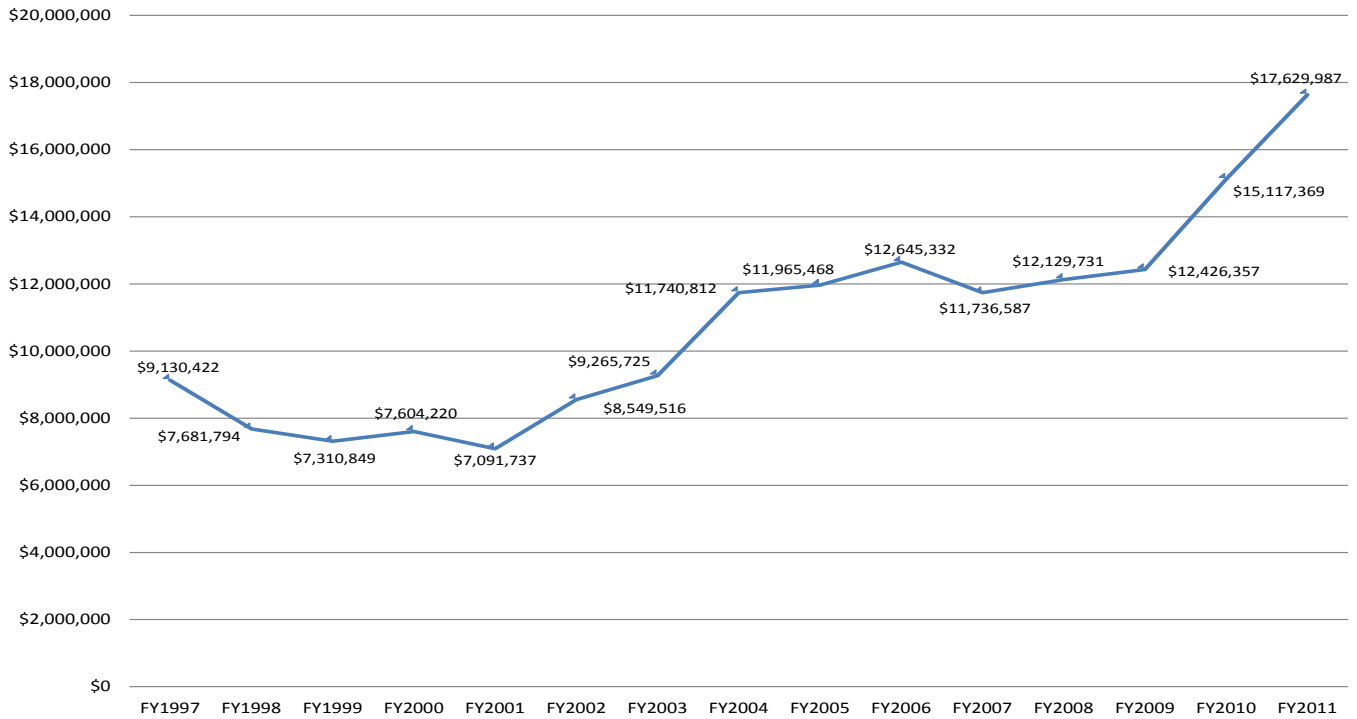


Illustration A-II-4



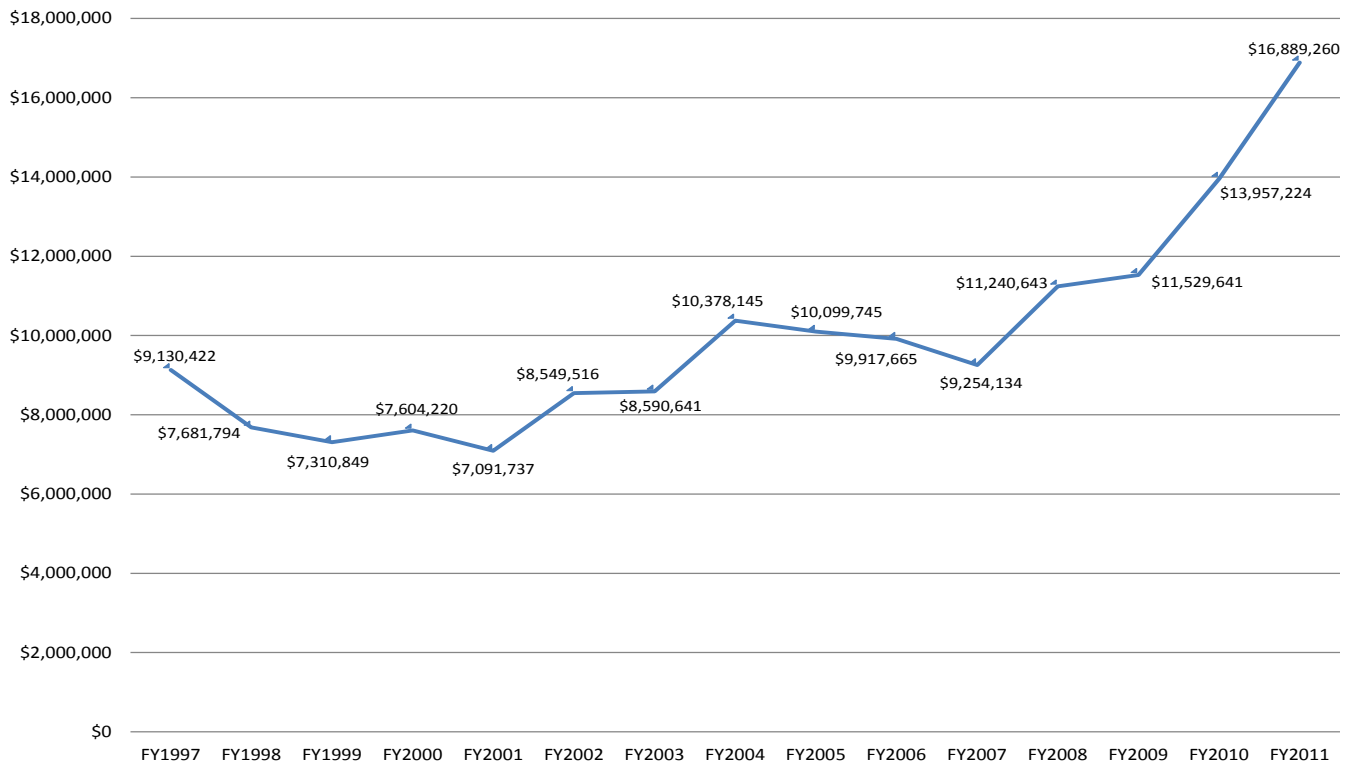
Appendix A-II-5

**Worcester Polytechnic Institute
Sponsored Program Expenditures (Including Congressional Funding)
FY1997 - FY2011**



Appendix A-II-6

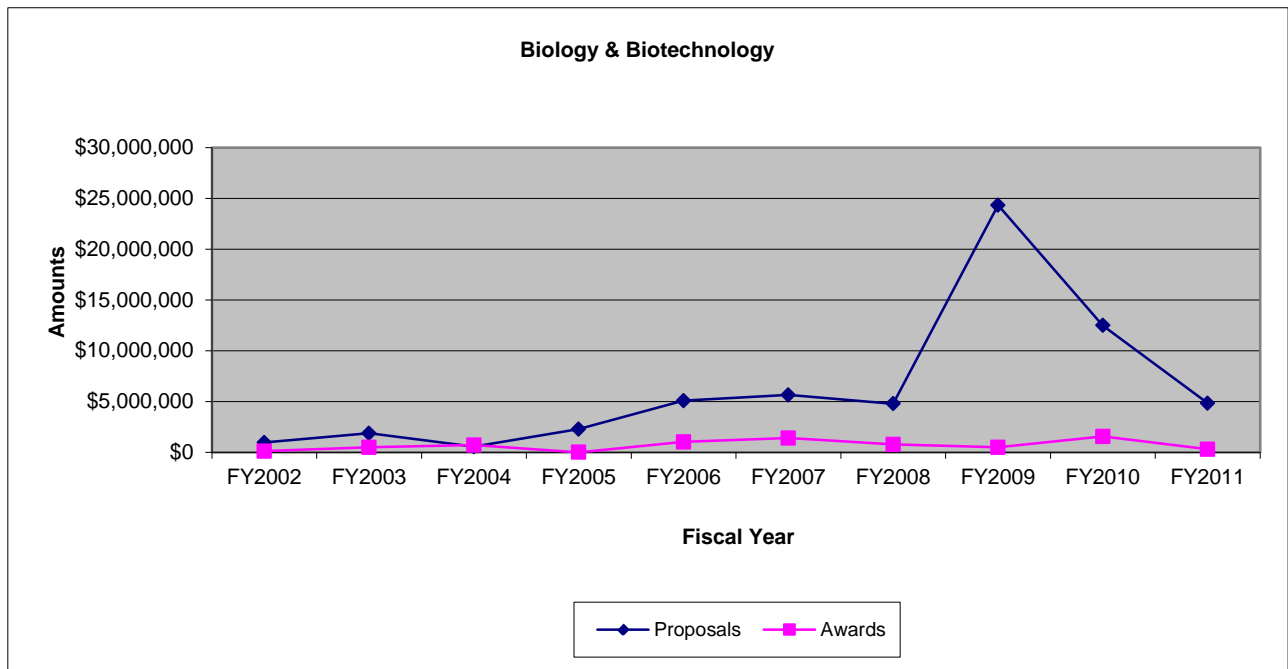
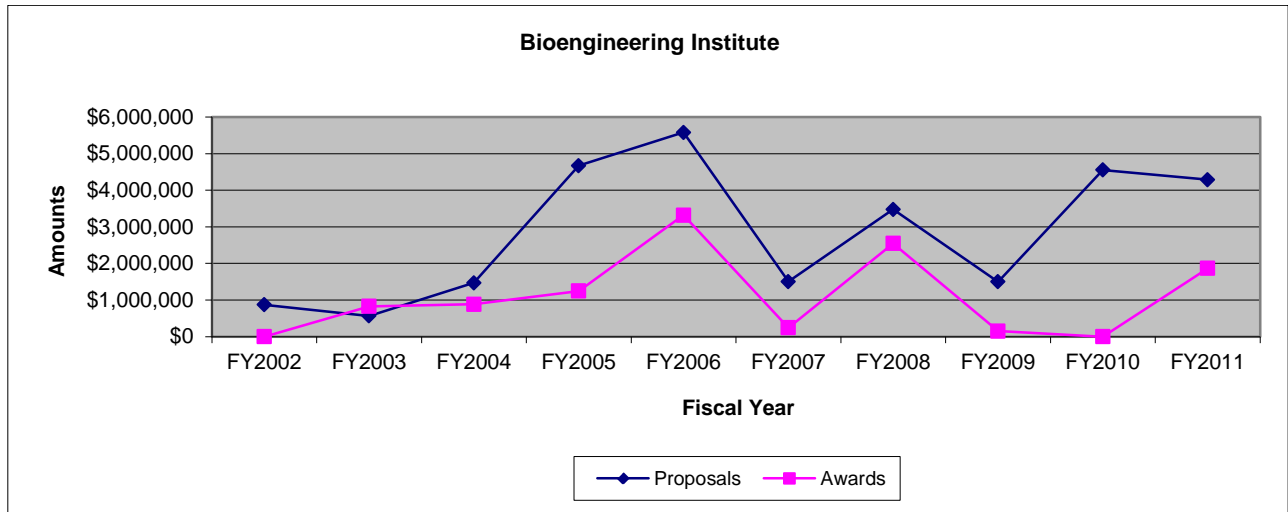
**Worcester Polytechnic Institute
Sponsored Program Expenditures (Net of Congressional Funding)
FY1997 - FY2011**

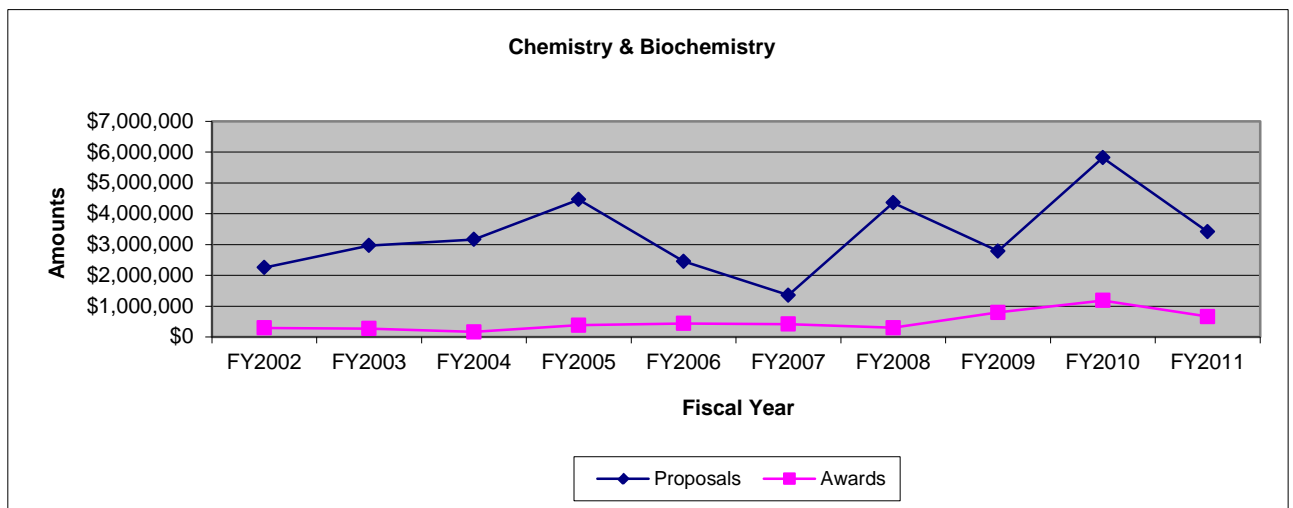
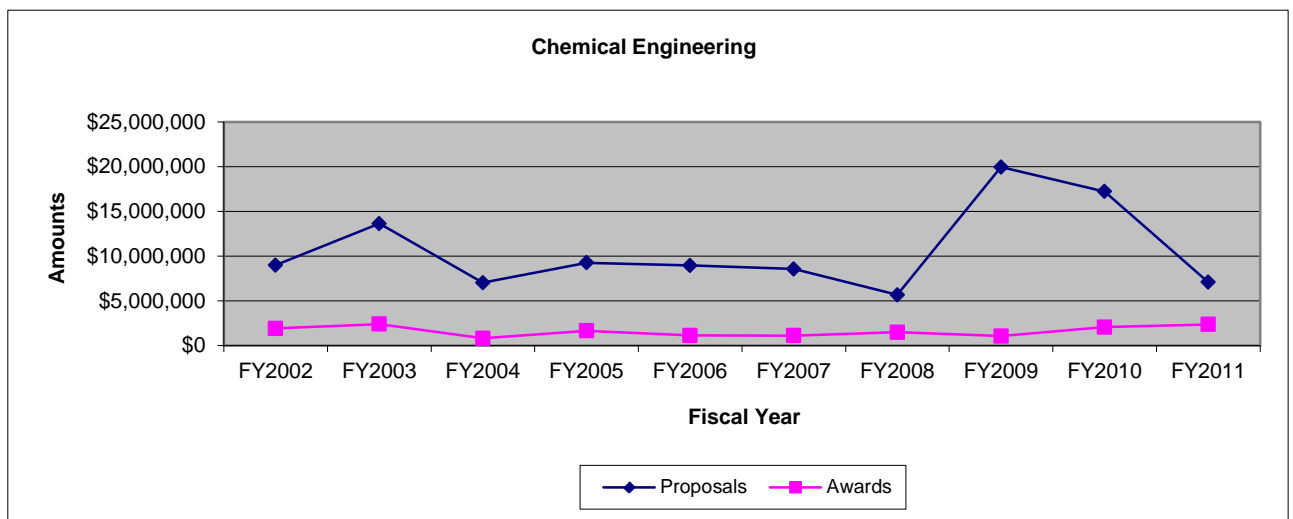
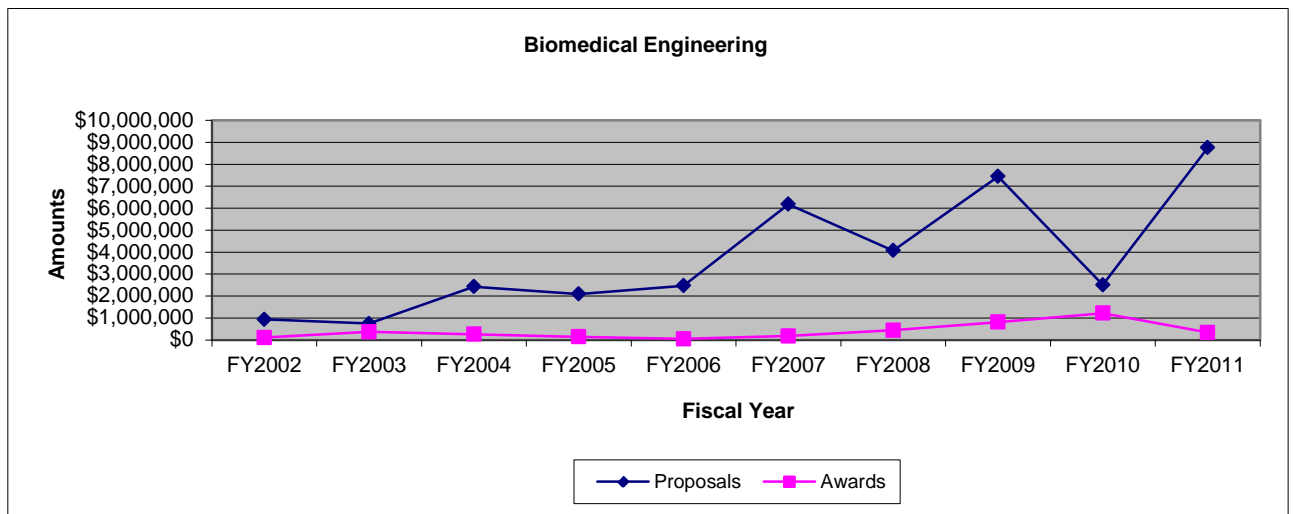


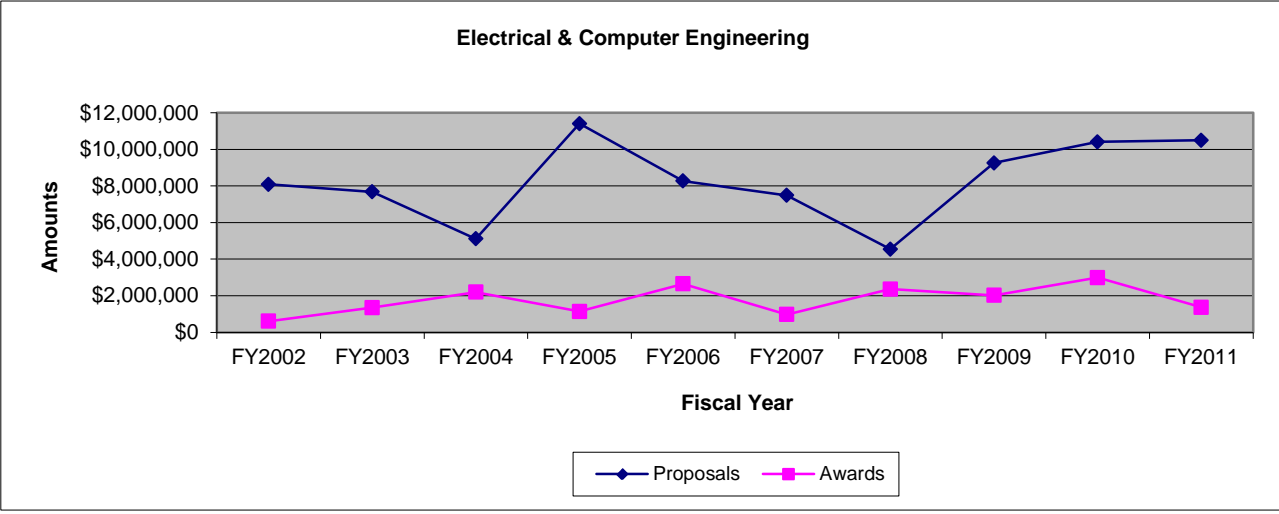
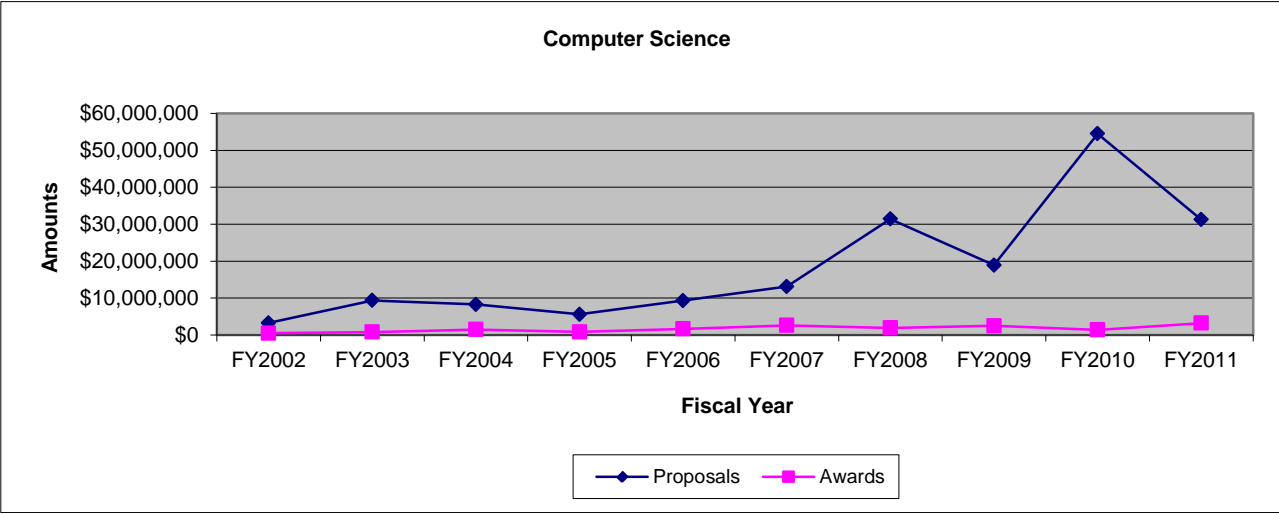
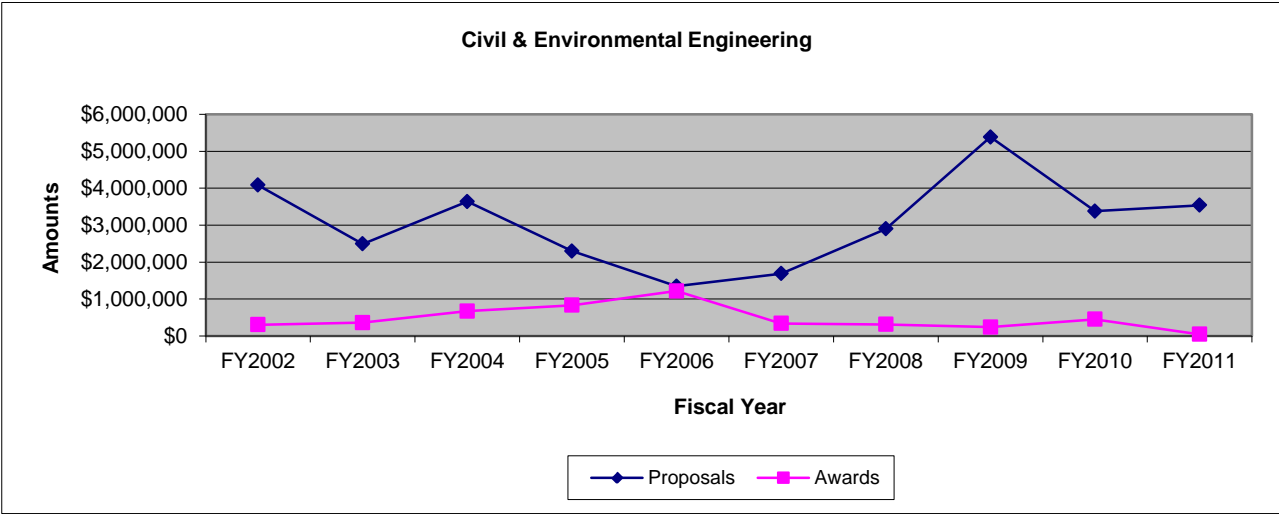
Appendix A-II-7

**Ten-Year Departmental Trend Line Summaries
Proposal and Award Amounts
FY2002 to FY2011**

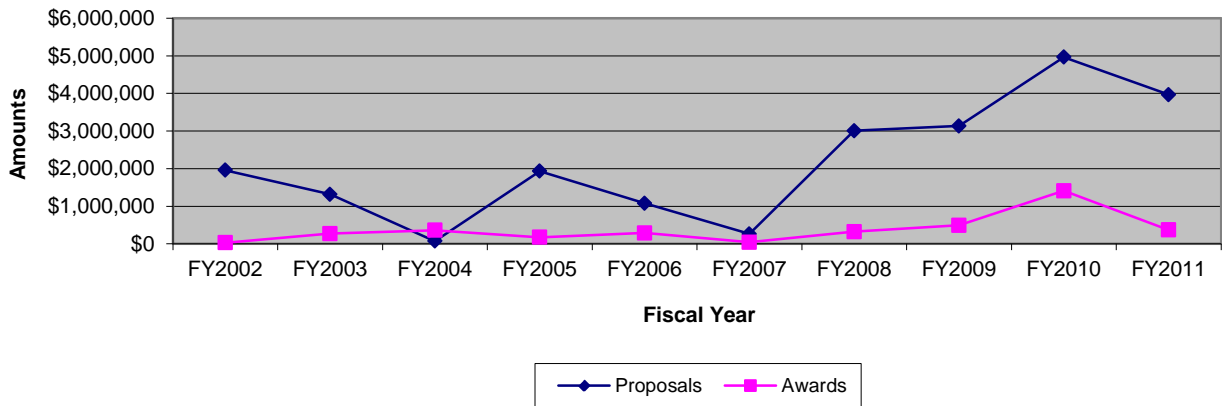
Note: Major funding for the Bioengineering Institute has been requested of and provided by the U.S. Army Medical Research and Materiel Command since the University began submitting proposals in fiscal year 2002. It must be acknowledged though that, in addition to appointees in the Bioengineering Institute itself, faculty members from the Biomedical Engineering, Chemistry and Biochemistry, and Electrical and Computer Engineering departments have played and continue to play key roles in Bioengineering Institute programs. The following charts reflect proposal and award dollars for each department, but not the cross-departmental effort of the faculty members from these departments.



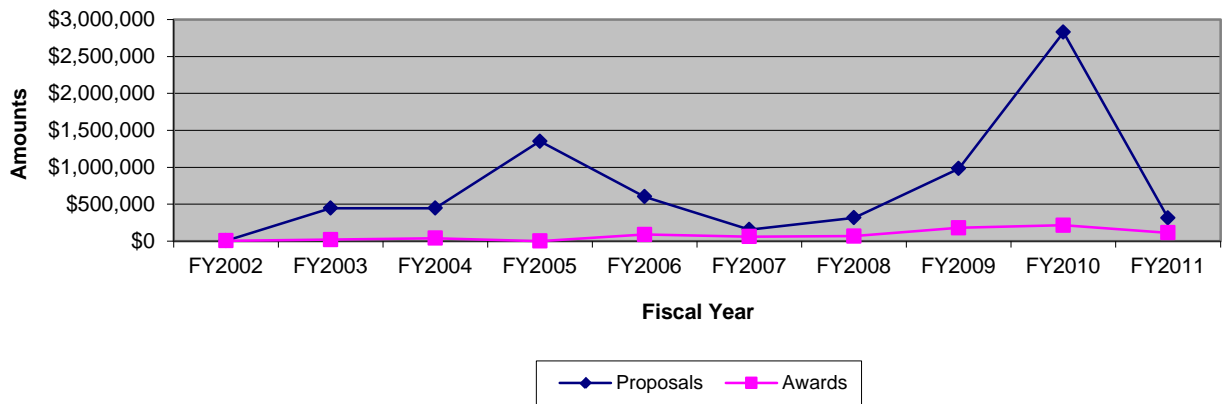




Fire Protection Engineering



Interdisciplinary & Global Studies



Management (School of Business)

