ATTACHMENT 1B-2

PROPOSAL – 2
NEW ACADEMIC ADMINISTRATIVE UNIT

1. PROPOSED NAME OF ADMINISTRATIVE UNIT

Department of Biomedical Engineering

2. CONTACT PERSON

Dr. Sharon Gaber
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3. PROPOSED EFFECTIVE DATE

July 1, 2012

4. JUSTIFICATION FOR ESTABLISHING PROPOSED ADMINISTRATIVE UNIT

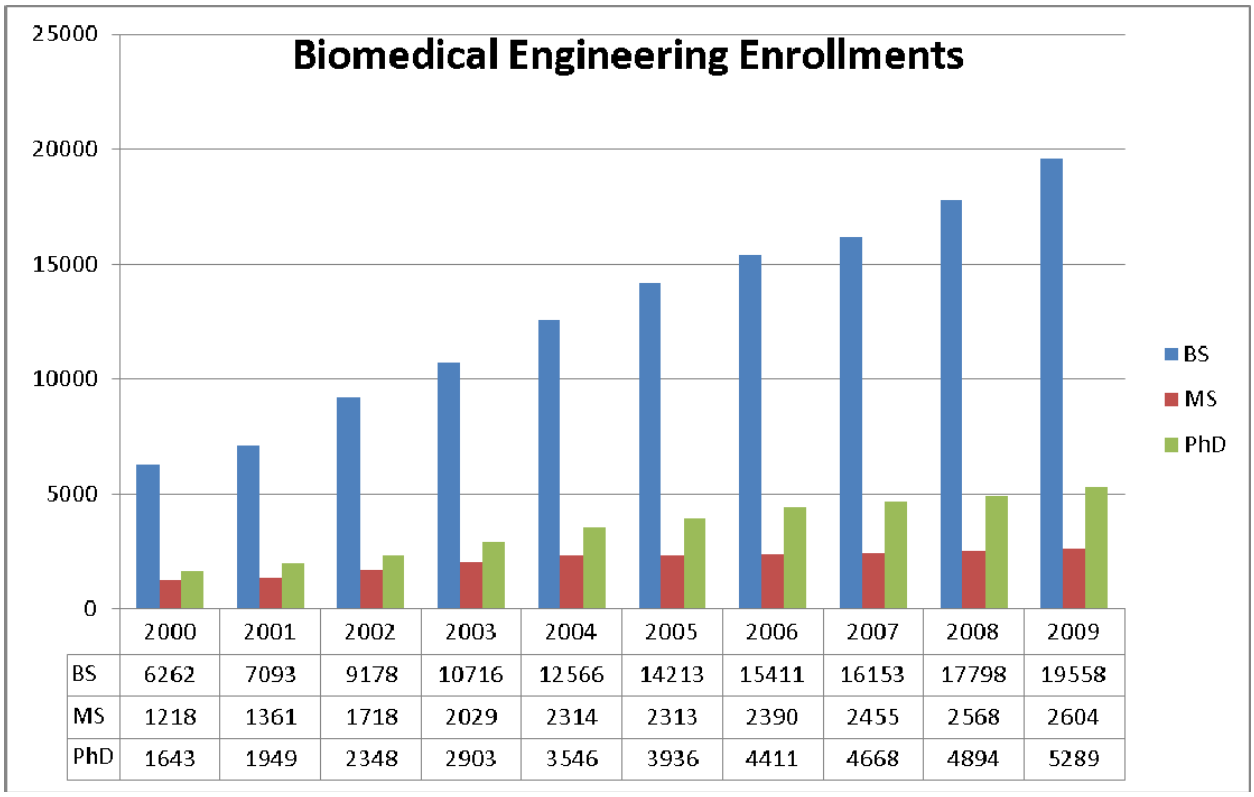
The Biomedical education and research at the University of Arkansas is currently embedded within the department of Biological and Agricultural Engineering which reports to both the College of Engineering and to the Dale Bumpers College of Agriculture and Food and Life Sciences. Undergraduate students have the opportunity to choose Biomedical Engineering as a concentration within a BS degree in Biological Engineering. This stream produces approximately ten such graduates per year. A MS degree in Biomedical Engineering was initiated in 2004 and was accredited by ABET (the national engineering accreditation board) in 2009. The number of graduates in this program range from two to three per year. Doctoral students can choose Biomedical Engineering as a research area but their degree is recognized within the Biological Engineering PhD concentration.

The numbers of graduates at all degree levels with biomedical concentration at the University of Arkansas have been much lower than the national averages. In the past ten years, enrollments at the national level in Biomedical Engineering programs have increased by more than 200% (Fig. 1) while the overall engineering enrollment increases during the same period have only been at the level of approximately 20%. Similar impressive increases in students have also occurred at the MS and PhD levels (Fig. 1). Significantly larger numbers of female students and faculty are attracted to this discipline because of the exciting career opportunities in the health care field as seen in Fig. 2. The time is right for the University of

Arkansas to re-examine its position on Biomedical Engineering and develop stand-alone degrees at all levels (BS, MS and PhD). This proposal is for creating a new Department of Biomedical Engineering. There are parallel proposals for creating a new undergraduate major in Biomedical Engineering and a new doctoral concentration in Biomedical Engineering within the existing PhD degree in Engineering. These two new degree programs will complement the existing MS degree and thereby create exciting educational opportunities in Biomedical Engineering for Arkansans at all levels.

Biomedical Engineering is a field at the interface of engineering, medicine and biological sciences. It combines the practical problem solving ability of engineering to diagnostic, monitoring, and therapy needs of medical sciences. Even though engineers have designed medical devices for a long time, Biomedical Engineering has only been established as a discipline within the past two decades.

The evolution of academic disciplines often follows the sequence of first being a multi-disciplinary program evolving into an interdisciplinary program and then becoming a discipline in itself with a variety of sub-disciplines. Biomedical Engineering has followed that path and is now widely recognized as a separate discipline within engineering. In the United States, an undergraduate degree in Biomedical Engineering is offered at 99 universities of which three are in the SEC, but none in Arkansas. The SEC schools offering Biomedical Engineering include the University of Tennessee, University of South Carolina and Vanderbilt.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BS	6262	7093	9178	10716	12566	14213	15411	16153	17798	19558
MS	1218	1361	1718	2029	2314	2313	2390	2455	2568	2604
PhD	1643	1949	2348	2903	3546	3936	4411	4668	4894	5289

Fig. 1- A ten year history of national enrollment trends in Biomedical Engineering. The data are from the "The

profiles of Engineering & Engineering Technology Colleges", ASEE 2009 Edition, American Sociey for Engineering Education, Washington, DC, 2010.

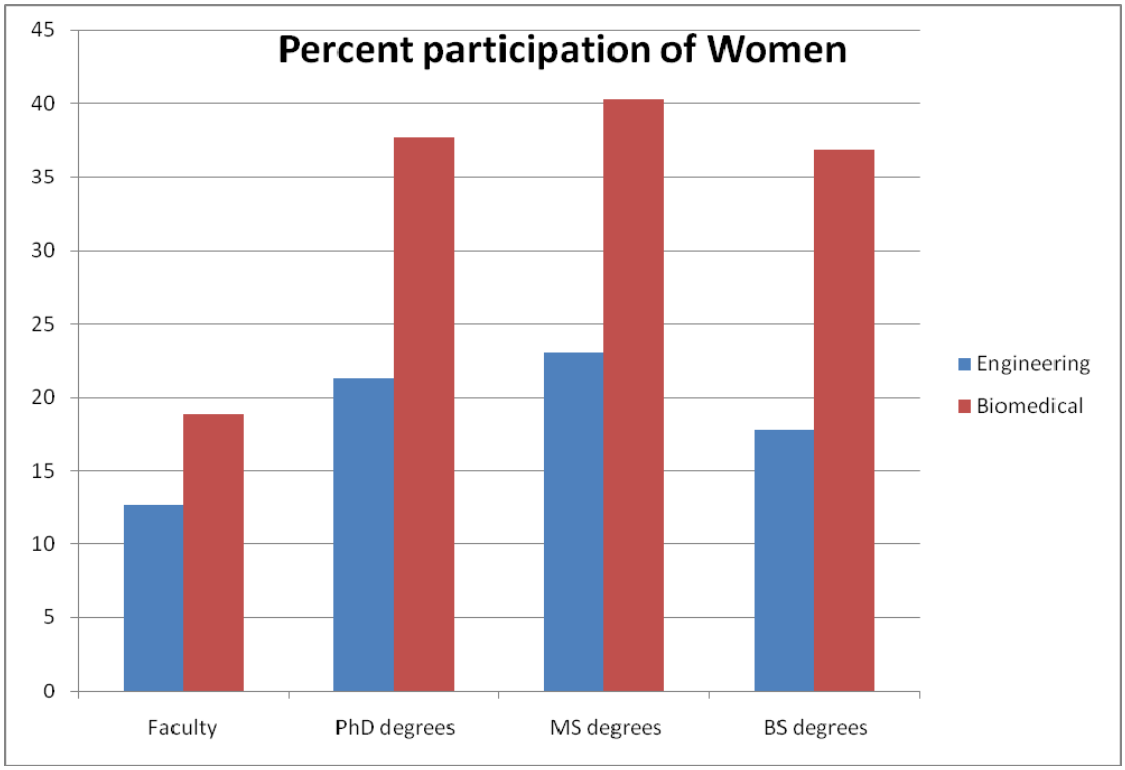


Table 1 presents the enrollment trend among Biomedical Engineering programs in our benchmark institutions that are ranked between 76 and 85 in the US News and World Report rankings and those institutions within the SEC that have Biomedical Engineering programs. Seven out of ten benchmark institutions and three out of twelve SEC institutions offer an undergraduate program in Biomedical Engineering. The enrollments range from 4% to 24% of all engineering enrollments in those institutions. The 24% number at Vanderbilt is unusual and likely due to the presence of an on-campus medical school. The median enrollment level in Biomedical Engineering is about 8% of the enrollment in the Engineering College. Using the median number and the current engineering enrollment at the University of Arkansas, the expected number of undergraduate students is 160 or approximately 40-45 graduates per year. If we use a more optimistic percentage of 10% and an expected undergraduate enrollment of 2500 in five years, we could have as many as 250 students enrolled in Biomedical Engineering or 55-60 graduates per year. The field attracts a large number of high ability students because it provides excellent preparation for entering medical school. Often, Biomedical Engineering programs are a bridge between engineering colleges and medical schools.

A strong doctoral program in Biomedical Engineering will open several collaborative opportunities with the medical school including potential joint faculty appointments and a joint MD/PhD program in medicine/engineering.

Table 1- Undergraduate Biomedical Engineering enrollments in benchmark institutions that have a separate degree in Biomedical Engineering*							2009 UGRD ENGR Enrollment	Biomed as % of UGRD Enrollment
	2005	2006	2007	2008	2009			
Arkansas	-	-	-	-	-		1,744	-
Clemson	0	19	66	130	157		3,621	4%
Houston	60	91	127	142	148		1,989	7%
Illinois Institute of Tech	124	136	123	136	131		1,217	11%
Mississippi St	-	-	-	-	-		2,252	-
New Mexico	-	-	-	-	-		1,179	-
Oregon State	105	110					3,685	0%
Syracuse	123	143	144	153	151		1,329	11%
Texas at Dallas	-	-	-	-	-		1,638	-
Tufts	0	9	20	29	39		738	5%
Washington State	72	72	58	65	71		1,859	4%
South Carolina	0	25	53	87	135		1,584	9%
Tennessee	174	163	170	151	164		2,202	7%
Vanderbilt	392	365	337	300	302		1,271	24%

* Enrollments determined from ASEE Survey Data

The new Department of Biomedical Engineering will be created in the College of Engineering that will consist of its own core faculty and joint faculty from other departments in engineering, sciences and the medical school.

The program can be initiated with four core faculty for which there is already adequate budget in the College of Engineering. We expect that at least a dozen other faculty in the college will seek joint appointments in this unit. A model for joint faculty could be that the teaching load of the faculty member for one out of three semesters will be determined by the Biomedical Engineering program. This requirement may fully or partially be met by offering cross-listed course(s) that benefit both the Biomedical Engineering students as well as students from the home department of the faculty member.

As enrollments in Biomedical Engineering rise, it is expected that more positions will be allocated to the program from among the new lines allocated to Engineering. An estimate of those needs is shown in Table 2.

The following program space has been identified to serve the needs of the new department. Some minor renovation and reconfiguration of the space will be needed to make it suitable for the new programs.

I. Space available due to relocating faculty from Engineering Hall to the former Biobased Building on Cato Springs Road
II. Administrative and faculty offices can be located on 3rd floor of Engineering Hall
III. Undergraduate laboratories for Biomedical Engineering can be located in the southwest corner of Engineering Hall
IV. The research laboratories can be housed in the Engineering Research Center.

Table 2 - Expected growth in students and faculty in Biomedical Engineering

Fiscal Year	Expected UG enrollment	Expected Graduate Enrollment	Additional Faculty needed
FY 12	None	None	None
FY 13	60	20	0
FY 14	100	30	1 Senior position of Department Head or Program Coordinator
FY15	150	40	2
FY 16	200	40	1

The resource requirements shown below are for creating a new Department of Biomedical Engineering. This new department will incorporate a new Bachelor of Science degree in Biomedical Engineering, an existing Master of Science degree in Biomedical Engineering, and a new Biomedical Engineering concentration for the PhD in Engineering.

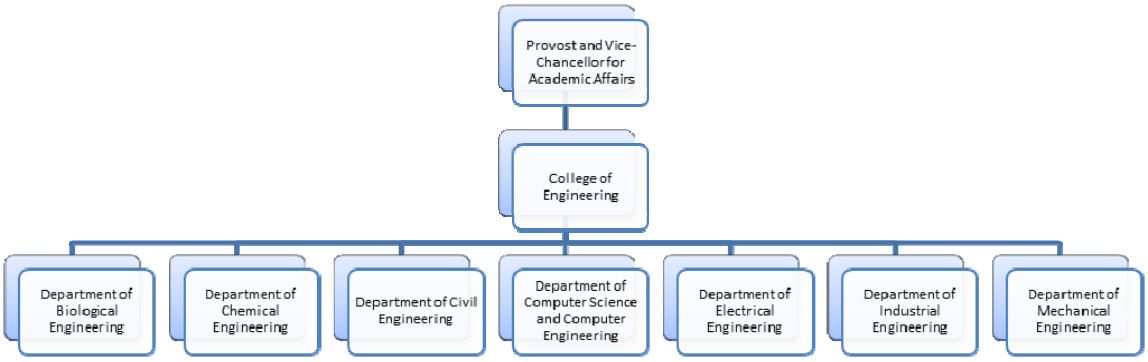
Resource Requirements

	1st Year (in dollars)	2nd Year (in dollars)	3rd Year (in dollars)
Staffing (Number)			
Administrative/Professional	50,000	50,000	50,000
Full-time Faculty	460,000	570,000	690,000
Part-time Faculty	300,000	300,000	300,000
Graduate Assistants	300,000	350,000	400,00
Clerical	25,000	25,000	25,000
Fulbright College Faculty			
Equipment & Instructional Materials	40,000	40,000	40,000
Library	18,250	12,000	13,000
Other Support Services			
Supplies/Printing	10,000	10,000	10,000
Travel	40,000	40,000	40,000
Distance Technology	0	0	0
Other Services (Research Expenditures)	$600,000	$750,000	$900,000
TOTAL	**$1,843,250**	**$2,147,000**	**$2,468,000**

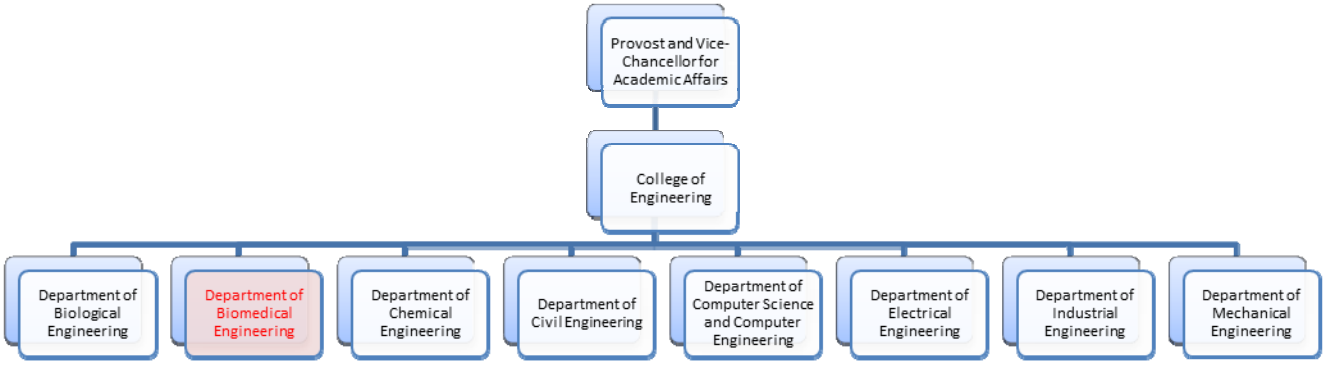
Planned Funding Sources

	1st Year (in dollars)	2nd Year (in dollars)	3rd Year (in dollars)
New Student Tuition and Fees #students*15 hrs/sem*(tuition+fees($257.35))*2 semesters	$231,615 30 students	$386,025 50 students	$1,158,075 150 students
New State General Revenue	$0	$0	$0
Redistribution of State General Revenue From the Department of Biological and Agricultural Engineering To the Department of Biomedical Engineering	$533,000	$533,000	$533,000
External Grants/Contracts	$1,200,000	$1,500,000	$1,800,000
Other Funding Sources (Endowment and Gifts)	$20,000	$20,000	$20,000
TOTAL	**$1,984,615**	**$2,439,025**	**$3,511,075**

Current Organizational Chart



Proposed Organizational Chart



5. BOARD OF TRUSTEES APPROVAL

Provide the date that the Board approved the proposed administrative unit.

6. ADDITIONAL INFORMATION REQUESTED BY ADHE STAFF