General Information Template for Academic Program Review

Degree Area and Level:

Bachelor of Science in Biomedical Engineering at North Carolina A&T State University (CIP 14.0501)

Addressing UNC Tomorrow:

This proposed program would address several Recommendations within the UNC Tomorrow Report including the components to enhance Our Global Readiness (Recommendation 4.1), Our Communities and Their Economic Transformation (Recommendation 4.4), Our Health (Recommendation 4.5), Our University's Outreach and Engagement (Recommendation 4.7).

Role of Program in Relation to State and Regional Needs:

According to the proposal this degree program, "responds to the need for biomedical engineering graduates. Over the last ten years, biomedical engineering has been the fastest growing discipline in engineering. Enrollment data from the American Association of Engineering Societies clearly shows that the undergraduate and graduate enrollment in biomedical engineering program in the United States has tripled in the last ten years, compared to a relatively negligible growth in cumulative enrollment in other engineering disciplines."

US Labor Department Analysis:

- *Summary* –Additional national information available: Biomedical engineers are expected to have 21 percent employment growth over the projections decade, much faster than the average for all occupations. The aging of the population and the focus on health issues will drive demand for better medical devices and equipment designed by biomedical engineers. Along with the demand for more sophisticated medical equipment and procedures, an increased concern for cost-effectiveness will boost demand for biomedical engineers, particularly in pharmaceutical manufacturing and related industries. However, because of the growing interest in this field, the number of degrees granted in biomedical engineering has increased greatly. Biomedical engineers, particularly those with only a bachelor's degree, may face competition for jobs. Unlike many other engineering specialties, a graduate degree is recommended or required for many entry-level jobs.
http://www.occsupplydemand.org/OSD_Main.aspx?ST=NC

- *Summary Data* – Source: U.S. Department of Labor and America's Career InfoNet

Occupational Characteristics - North Carolina

SOC Code	Occupation	Minimum Educ Level	2006-2016 Growth	2008 Wages
17-2031	Biomedical Engineers	Bachelor's degree	Much faster than average	$70,710

Occupational Projections - North Carolina

		Employment			Average Annual Openings		
SOC code	Occupation	Est 2006	Proj 2016	Change	Growth	Replace	Total
17-2031	Biomedical Engineers	572	790	38.1%	22	13	35

Wage Trends - North Carolina

		Median Annual Wage					Change
SOC Code	Occupation	2004	2005	2006	2007	2008	2004 to 2008
17-2031	Biomedical Engineers	$57,990	$70,570	$68,600	$73,570	$70,710	21.9%

Benchmarks for Wage Trends (all occupations)	2004	2005	2006	2007	2008	Change 2004 to 2008
North Carolina Median Wage	$26,690	$27,160	$27,980	$28,950	$29,860	11.9%
North Carolina Mean Wage	$33,960	$34,460	$35,520	$36,900	$38,230	12.6%
National Median Wage	$28,770	$29,430	$30,400	$31,410	$32,390	12.6%
National Mean Wage	$37,020	$37,870	$39,190	$40,690	$42,270	14.2%

Availability of Program Statewide (Enrollment and Degrees Awarded in Last 3 Years):

- *Public universities*

Enrollment			**Academic Year**						
			Fall 06	Spr 07	Fall 07	Spr 08	Fall 08	Spr 09	Fall 09
NCSU	Biomedical/Medical Engineering	BS	100	126	117	128	102	118	90

Number of Degrees Awarded			**Academic Year**		
			2005-2006	2006-2007	2007-2008
NCSU	Biomedical/Medical Engineering	BS	36	44	44

- *Private universities* – Source: Occupational Supply Demand System

Number of Degrees Awarded	**Academic Year**		
	2005-2006	2006-2007	2007-2008
Duke University	114	118	110

Available in Online or Distance Format from UNC institutions:

Not Available.

Available or not from Academic Common Market:

North Carolina does not participate in the ACM at the undergraduate level.

NC A&T State University Campus enrollment and degrees awarded in similar programs at the Bachelors level:

(*Based on two CIP digits – 14 CIP is the summary group for Engineering under which Biomedical Engineering is a program)*

Enrollment			**Academic Year**						
			Fall 06	Spr 07	Fall 07	Spr 08	Fall 08	Spr 09	Fall 09
NCA&T	Agricultural/Biological Engineering and Bioengineering	BS	11	9	12	17	17	22	26
	Architectural Engineering	BS	61	67	75	89	81	87	79
	Chemical Engineering	BS	26	28	37	40	44	52	52
	Civil Engineering, General	BS	24	27	45	50	51	55	54
	Computer Engineering, General	BS	18	19	28	42	40	50	51
	Electrical, Electronics and Communications Engineering	BS	122	122	114	118	134	130	122
	Engineering Physics	BS	4	5	5	3	0	0	1
	Mechanical Engineering	BS	86	88	112	118	116	116	122
	Industrial Engineering (NEW)	BS	82	80	68	71	62	61	70
	Surveying Engineering (NEW)	BS	N/A	N/A	3	8	13	16	13

Number of Degrees Awarded			Academic Year		
			2006-2007	2007-2008	2008-2009
NCA&T	Agricultural/Biological Engineering and Bioengineering	BS	4	5	4
	Architectural Engineering	BS	22	22	27
	Chemical Engineering	BS	16	10	14
	Civil Engineering, General	BS	9	9	14
	Computer Engineering, General	BS	5	3	7
	Electrical, Electronics and Communications Engineering	BS	52	23	41
	Engineering Physics	BS	0	0	2
	Mechanical Engineering	BS	30	22	39
	Industrial Engineering (NEW)	BS	21	24	23
	Surveying Engineering (NEW)	BS	N/A	2	2

Campus Average of enrollment and degrees awarded in this degree area at the Bachelors level:
(*Based on two CIP digits – 14 CIP is the summary group for Engineering under which Biomedical Engineering is a program - over the last 3 Academic Years, Fall 2006-Fall 2009)*

Campus Average			
	Number of Active Programs	Enrollment per Semester	Degrees Awarded per Year
ECU	1	57	21
NCA&T	10	53	15
NCSU	15	203	69
UNCA	1	12	3* in 2008-2009
UNCC	4	148	68
WCU	1	18	7
	Campus Average:	82	30.5

NCA&T Campus Degree Programs added in the past three years:

- *Bachelor*
  - BS Atmospheric Sciences and Meteorology (11/09/2007)
- *Master*
  - MS Information Technology (09/07/2007)
- *Doctoral*
  - Ph.D. Computational Science and Engineering (01/08/2010)

NCA&T Degree Programs discontinued in past three years:

- *Bachelor*
  - BS Visual Arts, Art Education (03/20/2009)
  - BS Music Education (03/20/2009)
  - BS Romance Languages and Literatures, French Secondary Education (03/20/2009)
  - BS Romance Languages and Literatures, Spanish Secondary Education (03/20/2009)
- *Master*
  - MS English Education (03/20/2009)
  - MS Mathematics Education (03/20/2009)
  - MS History Education (03/20/2009)
- *Doctoral*
  - N/A