

General Information Template for Academic Program Review

Degree Area and Level:

B.S. in Genetics (CIP 26.0801) at North Carolina State University

UNC Tomorrow Report:

As the Report highlights, “in the U.S. only about 16% of undergraduate degrees are awarded in the “STEM” fields while in China more than 50% of undergraduate degrees are in these fields.” Graduates of this program would possess the necessary skill set to enhance our global readiness (UNC Tomorrow Recommendation, 4.1) in developing 21st Century skills while enhancing global competitiveness. Research in Genetics is predicted to be in the forefront of many new medical advances that will aid in contributing to the improvement in health and wellness of all people and communities in our state (UNC Tomorrow Recommendation 4.5).

Role of Program in Relation to State and Regional Needs:

Ronald Cannon, PhD with the Department of Health & Human Services writes in his letter of recommendation, “One only has to perform a cursory search of colleges and universities across the US and Canada to know that an undergraduate degree in genetics is valuable and in high demand. Our institute, as well as numerous other biotech companies in the Research Triangle Park, would welcome an increase of BS graduates specifically educated in the field of genetics.”

From the Duke University Department of Biology - “The study of heredity and gene action is one of the most rapidly developing fields of biology. A thorough understanding of genetics is essential to modern advances in agriculture, medicine, and many industrial fields dealing with biological diversity. The information content of genetic sequences is enormous and is rapidly becoming a major tool in tracing evolutionary lineages and in reassessing biological classification. There is a growing demand for geneticists in pure and applied research. Developments in biotechnology have shown the potential for using genetic techniques for synthesis of complex proteins, for improving crop plants and animals, and for generating novel strains of fungi and bacteria. In addition, gene therapy whereby defective genes are replaced by intact copies is becoming a medical reality. These developments have created a large demand for geneticists. More traditional fields such as genetic counseling, plant and animal breeding, and teaching at the college level continue to provide a wide range of employment opportunities. Many students are now choosing to combine their studies of genetics with related fields such as business or public policy, with a view to managerial positions in the biotechnology fields, or with a view to positions in government and law.”

<http://biology.duke.edu/undergrad/requirements/concentrations/genetics.html>

US Labor Department Analysis:

- *Summary* – The Occupational Supply Demand System puts this degree program in a broad category of Biological/Life Sciences so demand results are not specific to a Genetics degree.

According to the OSDS, “Employment of biological scientists is projected to grow 9 percent over the 2006-16 decade, about as fast as the average for all occupations, as biotechnological research and development continues to drive job growth. The Federal Government funds much basic research and development, including many areas of medical research that relate to biological science. Recent budget increases at the National Institutes of Health have led to large increases in Federal basic research and development expenditures, with research grants growing both in number and dollar amount. Nevertheless, the increase in expenditures has slowed substantially and is not expected to match its past growth over the 2006-16 projection period. This may result in a highly competitive environment for winning and renewing research grants.”

Source: http://www.occsupplydemand.org/OSD_UnitOfAnalysis.aspx?CLUSCODE=095A-15&ST=NC&PathNo=1

– 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	Licensing	Self-Empl
19-1021	Biochemists and Biophysicists	Doctoral degree	Faster than average	\$72,550		2.5%
19-1022	Microbiologists	Doctoral degree	Average	\$57,670		2.7%
19-1023	Zoologists and Wildlife Biologists	Bachelor's degree	Average	\$51,260		2.6%
19-1029	Biological Scientists, All Other	Doctoral degree	Faster than average	\$68,860	State	3.2%
19-1099	Life Scientists, All Other	Bachelor's degree	Faster than average	\$64,760		2.7%

Occupational Projections - North Carolina							
SOC code	Occupation	Employment			Average Annual Openings		
		Est 2006	Proj 2016	Change	Growth	Replace	Total
19-1021	Biochemists and Biophysicists	851	1,052	23.6%	20	17	37
19-1022	Microbiologists	276	328	18.8%	5	6	11
19-1023	Zoologists and Wildlife Biologists	375	414	10.4%	4	8	12
19-1029	Biological Scientists, All Other	1,322	1,600	21.0%	28	27	55
19-1099	Life Scientists, All Other	915	1,202	31.4%	29	28	57
25-1000	Teachers Postsecondary	40,723	54,538	33.9%	1,382	682	2,063
	Total	44,462	59,134	33.0%	1,467	768	2,235

Wage Trends - North Carolina							
SOC Code	Occupation	Median Annual Wage					Change
		2004	2005	2006	2007	2008	2004 to 2008
19-1021	Biochemists and Biophysicists	\$56,940	\$66,420	\$69,750	\$65,010	\$72,550	27.4%
19-1022	Microbiologists	\$50,320	\$51,930	\$51,860	\$51,110	\$57,670	14.6%
19-1023	Zoologists and Wildlife Biologists	\$45,400	\$45,580	\$48,660	\$50,310	\$51,260	12.9%
19-1029	Biological Scientists, All Other	\$58,230	\$66,340	\$65,120	\$69,470	\$68,860	18.3%
19-1099	Life Scientists, All Other	\$52,410	\$58,820	\$65,270	\$62,250	\$64,760	23.6%
25-1042	Biological Science Teachers, Postsecondary	\$53,290	\$56,530	\$60,720	\$60,960	\$61,480	15.4%

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* – Not offered at any other institution in the system.
- *Private universities* – Not offered at any other institution in the State.

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.

Campus enrollment and degrees awarded by similar programs at the Bachelor level:

(Based on two CIP digits – 26 for Genetics)

Enrollment			Academic Year						
			Fall 05	Spr 06	Fall 06	Spr 07	Fall 07	Spr 08	Fall 08
NCSU	Biology/Biological Sciences, General	BS	624	654	635	661	698	730	749
	Biochemistry	BS	221	230	215	239	232	243	233
	Botany/Plant Biology	BS	27	28	25	29	21	16	16
	Microbiology, General	BS	118	120	109	110	93	92	88
	Zoology/Animal Biology	BS	163	176	189	177	177	193	199

Number of Degrees Awarded			Academic Year		
			2005-2006	2006-2007	2007-2008
NCSU	Biology/Biological Sciences, General	BS	259	264	266
	Biochemistry	BS	91	82	81
	Botany/Plant Biology	BS	23	13	20
	Microbiology, General	BS	53	48	53
	Zoology/Animal Biology	BS	65	70	64

System Average of enrollment and degrees awarded in this degree area at the Bachelor level:

(Based on two CIP digits - 26 for Genetics - over the last 3 Academic Years, Fall 2005-Spring 2008)

System Average		
	Enrollment per Semester	Degrees Awarded per Year
ASU	64	19

ECSU	73	24
ECU	91	46
FSU	54	18
NCA&T	103	29
NCCU	67	35
NCSU	244	97
UNC-A	80	17
UNC-C	166	57
UNC-CH	299	126
UNC-G	125	29
UNC-P	82	54
UNC-W	123	56
WCU	82	24
WSSU	28	8
System Average	112	43

Campus Degree Programs added in the past three years:

- *Bachelor*
 - BS Agricultural Science (06/08/2007)
 - BA German Studies (06/08/2007)
 - BA Leadership in the Public Sector (08/11/2006)
 - BS Bioprocessing Science (10/13/2006)
 - BA Design Studies (03/16/2007)
- *Master*
 - MS Analytics (02/09/2007)
 - MAT - Master of Arts in Teaching (10/17/2008)
 - MA Anthropology (08/11/2006)
 - MGIM - Master of Global Innovation Management (01/11/2008)
- *Doctoral*
 - PhD Fisheries and Wildlife Sciences (01/12/2007)

Degree Programs discontinued in past three years:

- *Bachelor*
 - BS Health Occupations Education (03/20/2009)
- *Master*
 - MS Agricultural and Resource Economics (03/20/2009)
 - MEd in Special Education, Behavior Disorders (03/20/2009)
 - MS Behaviorally/Emotionally Handicapped (03/20/2009)
 - MEd Mentally Handicapped (03/20/2009)
 - MS Mentally Handicapped (03/20/2009)

- MEd Specific Learning Disabilities (03/20/2009)
- MS Specific Learning Disabilities (03/20/2009)
- MS School Psychologist (05/11/2007)
- *Doctoral*
 - PhD School Psychologist (05/11/2007)