

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## 1. Program Description

### A. Description

The Biological Sciences curriculum provides a foundation for further study and careers in multiple fields within the life sciences. Our generalized courses give students majoring in other subjects a broad and comprehensive experience in biology. Our specialized courses serve students transferring to four-year, graduate, or professional schools; upon transfer, these students will be prepared for further study in a variety of disciplines, including but not limited to Botany, Cell/Molecular Biology, Ecology, Health Sciences, Marine Biology, Pharmacology, and Zoology. Many of our courses also provide essential skills to students completing our Biotechnology program. Subsequent careers in biotechnology, dentistry, medicine, nursing, research, teaching, among others, all rely on a strong background in the Biological Sciences.

### B. Program Student Learning Outcomes - Successful students in the program are able to:

1. Contrast scientific and non-scientific ideas
2. Formulate and evaluate a hypothesis
3. Discuss the mechanisms of and evidence for evolution
4. Outline the basic processes of the central dogma of molecular biology
5. Demonstrate mastery of key biological terms, processes, and techniques
6. Identify key entities at multiple levels of biological organization
7. Discuss the primary ethical issues related to biology
8. Describe the significance of protein production through genetic regulation to the field of biotechnology

### C. College Level Student learning Outcomes

1. Critical Thinking and Problem Solving
2. Communication
3. Information Competency

### D. Estimated Costs (Required for Certificate of Achievement ONLY)

	CA with AA Cost	CA with AS Cost
Enrollment Fees	\$1260	\$936
Books	est\$873	est\$942
Supplies	est\$21	est\$21
Total	est\$2154	est\$1899

### E. Criteria Used for Admission

### F. Vision

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

Ventura College will be a model community college known for enhancing the lives and economic futures of its students and the community.

## G. Mission

Ventura College, one of the oldest comprehensive community colleges in California, provides a positive and accessible learning environment that is responsive to the needs of a highly diverse student body through a varied selection of disciplines, learning approaches and teaching methods including traditional classroom instruction, distance education, experiential learning, and co-curricular activities. It offers courses in basic skills; programs for students seeking an associate degree, certificate or license for job placement and advancement; curricula for students planning to transfer; and training programs to meet worker and employee needs. It is a leader in providing instruction and support for students with disabilities. With its commitment to workforce development in support of the State and region's economic viability, Ventura College takes pride in creating transfer, career technical and continuing education opportunities that promote success, develop students to their full potential, create lifelong learners, enhance personal growth and life enrichment and foster positive values for successful living and membership in a multicultural society. The College is committed to continual assessment of learning outcomes in order to maintain high quality courses and programs. Originally landscaped to be an arboretum, the College has a beautiful, park-like campus that serves as a vital community resource.

## H. Core Commitments

Ventura College is dedicated to following a set of enduring Core Commitments that shall guide it through changing times and give rise to its Vision, Mission and Goals.

- Student Success
- Respect
- Integrity
- Quality
- Collegiality
- Access
- Innovation
- Diversity
- Service
- Collaboration
- Sustainability
- Continuous Improvement

## I. Degrees/Certificates

Program's courses are designed to articulate to UC and CSU for transfer students.

Associate in Arts Degree: Biological Sciences

Certificate of Achievement: Biological Sciences

Associate in Sciences Degree: Biological Sciences (Biotechnology or Plant Biotechnology Option)

Certificate of Achievement: Biological Sciences (Biotechnology or Plant Biotechnology Option)

Proficiency Award: Biotechnician

## J. Program Strengths, Successes, and Significant Events

## **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

The Biological Sciences curriculum provides a foundation for further study and careers in multiple fields within the life sciences. Many of our students successfully transfer to 4-year universities and professional programs, others, particularly those in the biotechnology programs, use the classes to help them achieve employment.

Ventura College's Biology Department started in 1955 with 2 members, Orley (Casey) Casella and Philander (Phil) Powers. Other full-time members have included Thomas (Tom) O'Neill, Donald (Don) Villeneuve, Bob Green, Jack Farrell, Jim Castren, Fred Lotter, Thor Willsrud, William (Bill) Fox, George Arita, Ann Colvin Redding, and William (Bill) Thieman. Current full-time members are Kamelia (Kammy) Algiers, Marta de Jesus, Robert (Robbie) Haines, Terry Pardee, and most recently, Ty Gardner in 2009.

In 1995, Bill Thieman started the biotechnology program, the first in the county, with the aid of a grant from the Hansen Foundation. He received a number of national (NSF, USDA, and Perkins) grants and California Community Colleges Chancellor's Office Grants (Fund for Student Success, Tech Prep) used to further develop the on-campus biotechnology program, and to build articulation/transfer projects with local high schools and universities in a variety of biology-related areas (Agricultural Science & Natural Resources Transfer Career Programs, Biotechnology Program, Environmental Science Programs, GIS Agri-Science Program, High School Science Teacher Training Matriculation Project). Bill has received several awards for his pioneering efforts including the Council for Resource Development (CRD) 2007 Campus Impact Award for Outstanding Non-Development Professional (national) and 2 California Community Colleges Student Success Awards in 1997 and 2001. VC's biotechnology program has benefited from donations (equipment and supplies) and liaisons with local biotechnology-related entities and individuals, and the presence since 1997 on-campus of the director of the statewide Economic and Workforce Development Network's (now Cal ABC's) biotechnology effort and the Central Coast Biotechnology Center (CCBC) due to the efforts of then Dean Robert Renger. Several VCCCD faculty and one manager have served as either the state-wide director and/or as the director of the CCBC (Robert Renger, Bill Thieman, Mary Pat Huxley, James Harber and Patricia Fausset). These grant-funded entities supplied local schools with biotechnology-related teaching materials for many years. This outreach effort led to many positive relationships with the teachers and high schools of the county. At present, the office of the state-wide director has been moved to American River College and the CCBC has been closed. The activities and opportunities these offices facilitated are generally missed. A small amount of local outreach to local high schools is still performed by the involvement of one faculty member in Pierce College's Amgen Kits project.

In 2005, Biology and Chemistry merged administratively, both departments had only 2 full-time faculty each, and shared a department chair (David Oliver). After hiring one more faculty member and when Prof. Oliver became Dean of the Math Sciences Division, Biology and Chemistry re-separated. In 2007, Anthropology joined Biology to form a larger department in life sciences at Ventura College. The Biology Department has been involved in collaborative ventures with CSUCI and UCSB. These have included selecting and mentoring students who were potential future teachers (with the UCSB Math Department's California Mathematics and Science Teaching Program which was partly funded by the University of California's Community Teaching Fellowship Program and by the NSF-funded California Alliance for Minority Participation), developing a new general education class on stem cells (BIOL/BIOT V42) for CSUCI's 2009 California Institute for Regenerative Medicine (CIRM) grant, and involvement in Ventura College's recent (2008-10) STEM grant from the Dept. of Education. We've recently heard that

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**

2011-2012

we have been included as participants in a new STEM grant awarded to CSUCI this year but do not yet know our role.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### K. Organizational Structure

President: Robin Calote

Executive Vice President: Ramiro Sanchez

Dean: David Oliver

Department Chair: Marta de Jesus

### Instructors and Staff

#### Full-Time Instructors

<b>Name</b>	<b>Kamelia Algiers</b>
Classification	Associate Professor
Year Hired	2006
Years of Work-Related Experience	
Degrees/Credentials	B.A. Biology, M.S. Biology

<b>Name</b>	<b>Marta de Jesus</b>
Classification	Professor
Year Hired	1996
Years of Work-Related Experience	Lab technician 3 yr, Postdoctoral research scholar 5 yr
Degrees/Credentials	B.S. Chemistry, C.Phil. Biology, Ph.D. Biology

<b>Name</b>	<b>Ty Gardner</b>
Classification	Assistant Professor
Year Hired	2009
Years of Work-Related Experience	
Degrees/Credentials	B.S. Wildlife Science, M.S. Biology

<b>Name</b>	<b>Robert Haines</b>
Classification	Associate Professor
Year Hired	2007
Years of Work-Related Experience	
Degrees/Credentials	B.A. Biology, M.A. Molecular, Cellular, and Developmental Biology

<b>Name</b>	<b>Terry Pardee</b>
Classification	Professor
Year Hired	1996
Years of Work-Related Experience	
Degrees/Credentials	B.S. Biology, M.S. Biology, Ph.D. Epidemiology (pending)

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### Part-Time Instructors

<b>Name</b>	<b>Eden Bellenson</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1999
<b>Degrees/Credentials</b>	B.S. Animal Science, M.S. Biological Sciences, MLS (ASCP)

<b>Name</b>	<b>Angela Chapman Kofron</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2008
<b>Degrees/Credentials</b>	Ph.D. Ecology

<b>Name</b>	<b>Elizabeth (Elzbet) Diaz de Leon</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1991
<b>Degrees/Credentials</b>	Masters Marine Science, Life Science CC Credential

<b>Name</b>	<b>Patricia Fausset</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2005 (Chemistry), 2010 (Biotechnology)
<b>Years of Work-Related Experience</b>	11 yr
<b>Degrees/Credentials</b>	Bachelors Chemistry, Masters Biochemistry

<b>Name</b>	<b>Suvi F. Flagan</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2008
<b>Degrees/Credentials</b>	B.S. Environmental Science and Engineering, M.S. Microbiology, M.S. Marine Science

<b>Name</b>	<b>Steve Gadbois</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1977
<b>Degrees/Credentials</b>	B.A. Biological Sciences, M.A. Biological Sciences, California Community College Instructor Credential

<b>Name</b>	<b>Mary Pat Huxley</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1987
<b>Degrees/Credentials</b>	Lifetime CCC Credential in Biological Sciences and Agriculture.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

	B.A. Biology; M.Sc. Genetics, Ed.D. Organization Change
--	---

<b>Name</b>	Kim Jesu
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	
<b>Degrees/Credentials</b>	Masters

<b>Name</b>	Keith Johnson
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	
<b>Degrees/Credentials</b>	DDS

<b>Name</b>	Ernest (Ernie) E. Lory
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1976
<b>Degrees/Credentials</b>	B.A. Biology with emphasis in microbiology, M.A Biology with emphasis in microbiology

<b>Name</b>	Michael (Mike) Riddle
<b>Classification</b>	Adjunct Professor (Professor Emeritus - Southwest College)
<b>Year Hired</b>	
<b>Degrees/Credentials</b>	AA Biology (VC), Masters

<b>Name</b>	Patty Saito
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2008
<b>Degrees/Credentials</b>	M.A. Biology

<b>Name</b>	Bryan Swig
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2006
<b>Degrees/Credentials</b>	Ph.D. Biology

<b>Name</b>	William J. Thieman
<b>Classification</b>	Professor Emeritus
<b>Year Hired</b>	1970
<b>Degrees/Credentials</b>	M.A. Zoology, CCC teaching credential (Biology), Administrative Credential

Technical Staff

<b>Name</b>	Sheena Billock
<b>Classification</b>	Instructional Laboratory Technician II

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**

2011-2012

Year Hired	2008
Years of Work-Related Experience	5 years as Research Technician, 3 years as Instructional Laboratory Technician
Degrees/Credentials	B.S. Biology, M.S. Biology

<b>Name</b>	<b>Will Smith</b>
Classification	Instructional Laboratory Technician II
Year Hired	2003
Years of Work-Related Experience	8
Degrees/Credentials	B.S. Biology



# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## 2. Performance Expectations

A. Program Student Learning Outcomes - Successful students in the program are able to:

1. Contrast scientific and non-scientific ideas
2. Formulate and evaluate a hypothesis
3. Discuss the mechanisms of and evidence for evolution
4. Outline the basic processes of the central dogma of molecular biology
5. Demonstrate mastery of key biological terms, processes, and techniques
6. Identify key entities at multiple levels of biological organization
7. Discuss the primary ethical issues related to biology
8. Describe the significance of protein production through genetic regulation to the field of biotechnology

B. Student Success Outcomes

1. The program will increase its retention rate from the average of the **program's** prior three-year retention rate. The retention rate is the number of students who finish a term with any grade other than W or DR divided by the number of students at census.
2. The program will increase its retention rate from the average of the **college's** prior three-year retention rate. The retention rate is the number of students who finish a term with any grade other than W or DR divided by the number of students at census.
3. The program will increase the student success rates from the average of the **program's** prior three-year success rates. The student success rate is the percentage of students who receive a grade of c or better.
4. The program will increase the student success rates from the average of the **college's** prior three-year success rates. The student success rate is the percentage of students who receive a grade of C or better.
5. Students will complete the program earning certificates and/or degrees.

C. Program Operating Outcomes

1. The program will aim for WSCH/FTEF above the 525 goal set by the district, when possible.
2. Inventory of instructional equipment is functional, current, and otherwise adequate to maintain a quality-learning environment. Inventory of all equipment over \$200 will be maintained and a replacement schedule will be developed. Service contracts for equipment over \$5,000 will be budgeted if funds are available. Any equipment that breaks and needs immediate repair or replacement will be handled through a contingency budget (Ramiro Sanchez).

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### D. Courses to Student Learning Outcomes Map

#### Course to Program-Level Student Learning Outcome Mapping (CLSLO)

**I:** This program-level student learning outcome is **INTRODUCED** in this course.

**P:** This program-level student learning outcome is **PRACTICED** in this course.

**M:** This program-level student learning outcome is **MASTERED** in this course.

Leave blank if program-level student learning outcome is not addressed.

Courses	PLSLO #1	PLSLO #2	PLSLO #3	PLSLO #4	PLSLO #5	PLSLO #6	PLSLO #7	PLSLO #8
ANAT V01	P	I	P	I	M	M		
ANPH V01	I	I	P	P	M	M		
BIOL V01	M	M	M	M	M	M	P	I
BIOL V01L	I	M	P	M	M	P	I	
BIOL V03	M	M	P	M	M	M	P	
BIOL V04	M	M	M	M	M	M	P	M
BIOL V10	M	I	I		M	P	M	
BIOL V12	M	I	P	M	M	M	P	I
BIOL V14	M	M	M		M	M	P	
BIOL V18	P	P	M	M	M	M	M	I
BIOL V23	M	M	P	M	M	M	P	I
BIOL V29	M	M	M	I	M	M	P	
BIOL V29L	P	M	P		P	M	P	
BIOL V30	M	P	P	M	M	M	M	M
BIOL V31	P	P	P	M	M	P	P	M
BIOL V32	P	P	P	M	M	M	P	M
BIOL V40	P	P	I	M	M	M	M	
BIOL V41	P	P	I	M	M	M	M	
BIOL V42	P	P	P	M	M	M	M	M
BIOL V88					M			
BIOL V89					M			
BIOL V90					M			
BIOL V95					M			
BIOL V96					M			
BIOT V18	P	P	M	M	M	M	M	I
BIOT V30	M	P	P	M	M	M	M	M
BIOT V31	P	P	P	M	M	P	P	M
BIOT V32	P	P	P	M	M	M	P	M
BIOT V42	P	P	P	M	M	M	M	M
MICR V01	P	P	I	M	M	M	I	P
PHSO V01	M	M	P	M	M	M	P	

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### 3. Operating Information

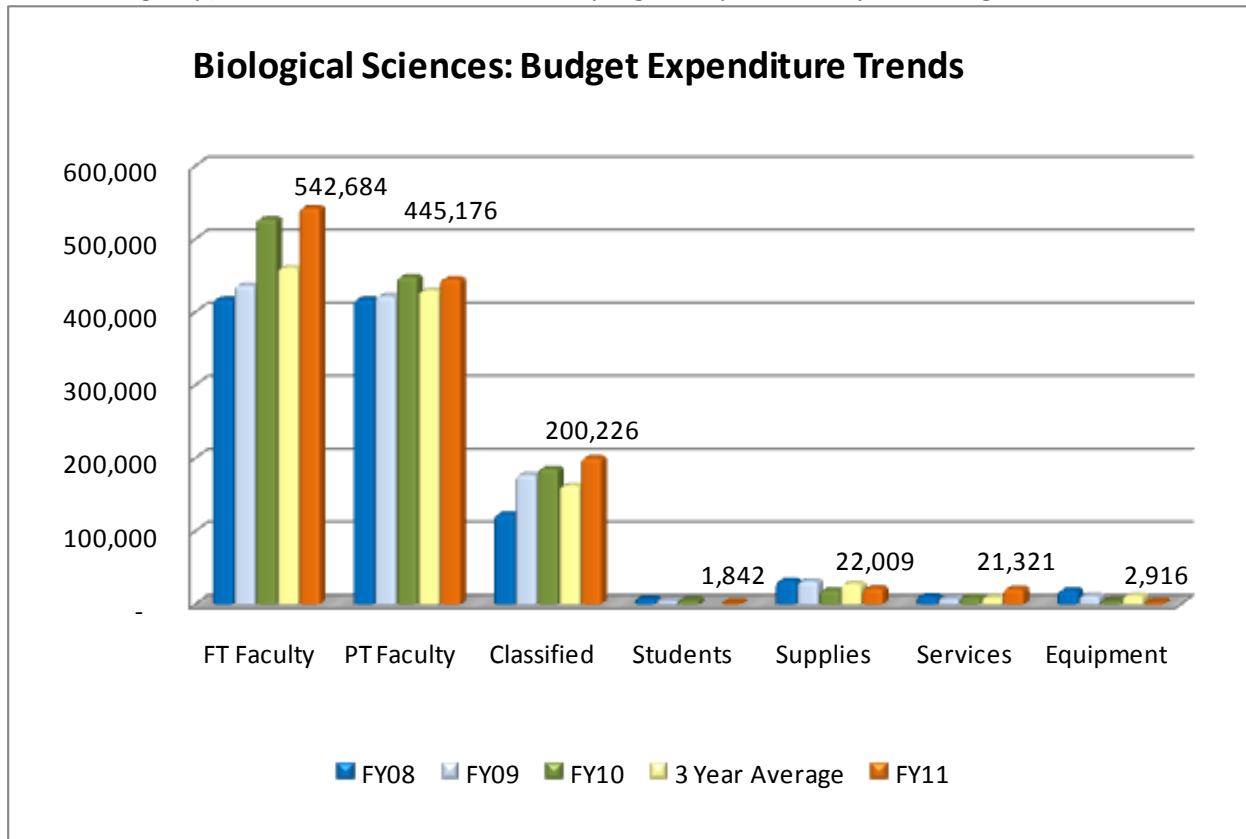
#### A1: Budget Summary Table

To simplify the reporting and analysis of the Banner budget detail report, the budget accounts were consolidated into nine expense categories. The personnel categories include employee payroll expenses (benefits). The “3 Year Average” was computed to provide a trend benchmark to compare the prior three year expenses to the FY11 expenses. The “FY11 College” expense percentages are included to provide a benchmark to compare the program’s expenses to the overall college expenses.

Category	Title	FY08	FY09	FY10	3 Year Average	FY11	FY11 Program	FY11 College
1	FT Faculty	417,445	436,720	527,420	460,528	542,684	18%	12%
2	PT Faculty	417,469	421,839	448,289	429,199	445,176	4%	-10%
3	Classified	123,439	177,419	185,615	162,158	200,226	23%	-1%
4	Students	7,261	5,177	5,462		1,842		10%
7	Supplies	32,247	31,644	19,399	27,763	22,009	-21%	24%
8	Services	10,550	7,752	9,406	9,236	21,321	131%	-17%
9	Equipment	19,089	11,560	4,544	11,731	2,916	-75%	-42%
	<b>Total</b>	<b>1,027,500</b>	<b>1,092,111</b>	<b>1,200,135</b>	<b>1,106,582</b>	<b>1,236,174</b>	<b>12%</b>	<b>0%</b>

#### A2: Budget Summary Chart

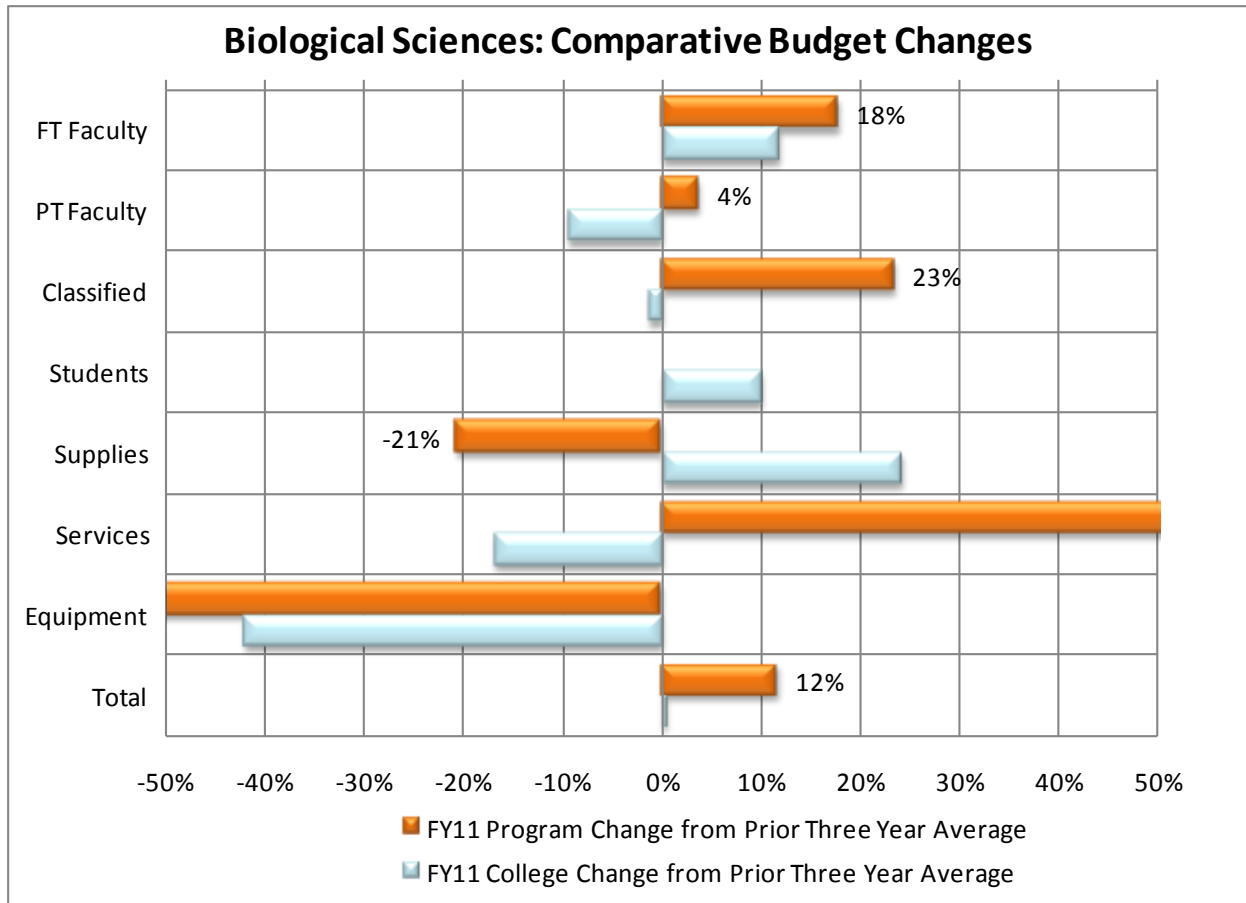
This chart illustrates the program’s expense trends. The data label identifies the FY11 expenses (the last bar in each group). The second-to-last bar is the program’s prior three year average.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### A3: Comparative Budget Changes Chart

This chart illustrates the percentage change from the prior three year average expense to the FY11 expenses. The top bar for each budget category represents the program's change in expenses and includes the data label. The second bar represents the college's change in expenses.



### A4: Budget Detail Report

The program's detail budget information is available in *Appendix A – Program Review Budget Report*. This report is a PDF document and is searchable. The budget information was extracted from the District's Banner Financial System. The program budget includes all expenses associated to the program's Banner program codes within the following funds: general fund (111), designated college equipment fund (114-35012), State supplies and equipment funds (128xx), and the technology refresh fund (445). The *Program Review Budget Report* is sorted by program (in alphabetical order) and includes the following sections: total program expenses summary; subtotal program expenses for each different program code; detail expenses by fund, organization and account; and program inventory (as posted in Banner). To simplify the report, the Banner personnel benefit accounts (3xxx) were consolidated into employee type benefit accounts (3xxx1 = FT Faculty, 3xxx2 = PT Faculty, 3xxx3 = Classified, etc.).

## **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

### A5: Interpretation of the Program Budget Information

The 18% increase in FT faculty expenditures reflected on charts A2 and A3 are due to the hiring of a full-time faculty member.

Hiring another laboratory technician led to an increase in the classified expenditures; the demand for courses in the biological sciences has led to an increase in offerings over the past four years.

Supplies and Equipment expenditures were markedly less in FY11 due to the ending of a two-year STEM grant that funded a major portion of the supplies and equipment needs during the years 2008-2010.

One major concern of the program is the inevitability that our autoclave (circa 1997) will completely fail and we will not be able to replace it. The instrument is showing error messages that indicate eminent failure. This instrument has a service contract with Getinge Signature Service; however, they informed us in 2001 that replacement parts are no longer available.

We also have a major facilities concern in the lack of air conditioning, and possible inappropriate ceiling venting, in the Biological Sciences labs and prep area. Temperatures in these areas get to unsafe levels on hot days, particularly in rooms that cannot be cooled by opening doors and windows. The room housing the cadavers has no doors or windows leading to the outside and regularly produces temperatures that leave the instructors soaked in sweat. The high temperatures also increase the concentration of formaldehyde gas, a known carcinogen that must be maintained at safe levels, as it is driven from solution in the cadaver preservative. We currently have proper ventilation taking place at the cadaver surface via table vents, but cool temperatures would help to reduce formaldehyde gas concentrations and provide a safer, more effective learning environment for our students.

We continue to have problems with the inadequate supply of electricity to the laboratory part of the building. Breakers are still popping every semester when student apparatus is turned on.

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review  
2011-2012**

**B1: Program Inventory Table**

This chart shows the inventory (assets) as currently posted in the Banner Financial System. This inventory list is not complete and will require review by each program. Based on this review an updated inventory list will be maintained by the college. A result of developing a complete and accurate inventory list is to provide an adequate budget for equipment maintenance and replacement (total-cost-of-ownership). The college will be working on this later this fall.

Item	Vendor	Org	Fund	Purchased	Age	Price	Perm Inv #	Serial #
SOMS0 Comprehensive Arm Musc.	Ward's Natural S	30021	111	9/3/2009	2	1,931	N00018875	hensive Musc. Arm
WF-56-6717-Human Leg and Por	Carolina Biologic	30021	12807	2/6/2008	3	508	N00018435	
043502 Calorimeter 115VAC 50/	Fisher Scientific	30021	12807	4/14/2008	3	986	N00018474	1341-0802-6803
043502 Calorimeter 115VAC 50/	Fisher Scientific	30021	12807	4/14/2008	3	539	N00018475	1341-0802-6802
Purair 20 Advanced Ductless Fur	Air Science USA	30021	12819	12/8/2008	3	7,459	N00018709	p62706
New MP35 Biopac Systems	BIOPAC System	30021	12807	11/8/2007	4	2,942	N00018386	MP35A707004089
New MP35 Biopac Systems	BIOPAC System	30021	12807	11/8/2007	4	2,942	N00018385	MP35A707004124
MP35U-W MP35 Biopac System-	BIOPAC System	30021	12807	11/8/2007	4	1,975	N00018384	MP35A707004096
Safe Imager Blue Light Transillu	Invitrogen Life T	30021	12845	11/27/2006	5	1,067	N00018061	
Safe Imager Blue Light Transillu	Invitrogen Life T	30021	12845	11/27/2006	5	1,163	N00018060	
Spectronic Colorometer	Sargent Welch	30021	12845	12/13/2006	5	926	N00018110	3DUJ209015
Spectronic Colorometer	Sargent Welch	30021	12845	12/13/2006	5	926	N00018113	3DUJ209016
Gravity convection Oven Model	VWR Scientific P	30021	12807	3/15/2006	5	1,533	N00011766	1021206
Spectronic Colorometer	Sargent Welch	30021	12845	12/13/2006	5	926	N00018112	3DUJ208009
Spectronic Colorometer	Sargent Welch	30021	12845	12/13/2006	5	926	N00018111	3DUJ209017
SRPDX10 Camcorder	Troxell Communi	30021	111	3/15/2005	6	2,100	N00011400	1327039
Hitachi CP-X885W	Troxell Communi	30021	111	12/13/2004	7	2,342	N00011321	G4H005065
Refrigerator, Merchandiser Mod	Global Equipme	34849	793	2/26/2009	2	2,326	N00018755	none reported
5 model of lysozyme w/ substra	3D Molecular De	34849	793	10/28/2008	3	1,264	N00018625	DNA12
Disarticulated Human Skeleton	Ward's Natural S	37310	129	1/29/2007	4	4,461	N00018154	N/
Skelton	Ward's Natural S	37310	129	10/19/2006	5	5,788	N00018053	N/
170-2525EDU Smart Spec Plus Sc	Bio-Rad Laborat	37171	126	5/24/2010	1	4,869	N00022056	273BR05930
ACS092 CPY-4 Canopy Assimilat	PP Systems Inte	37171	126	5/20/2010	1	2,977	N00022051	6
AGA002-PMR-NM PMR-5 Steady	PP Systems Inte	37171	126	5/20/2010	1	9,201	N00022053	0694/050
ACS025 SRC-1 Soil Respiration C	PP Systems Inte	37171	126	5/20/2010	1	1,191	N00022052	
12-071-404 Primo Star Microscop	Fisher Scientific	37171	126	8/10/2010	1	1,731	N00022157	3120002741
025-1874 Miracle-PE Spectrum C	Pike Technologi	37171	126	10/28/2010	1	2,397	N00022184	9.30025E+13
SB685ix Smart Board 685ix Inter	Touchboards	37171	126	9/13/2010	1	4,709	N00022163	SB685-R2-709641
12-071-404 Primo Star Microscop	Fisher Scientific	37171	126	8/10/2010	1	1,731	N00022155	3120002745
170-2525EDU Smart Spec Plus Sc	Bio-Rad Laborat	37171	126	5/24/2010	1	4,738	N00022057	273BR05919
LAB0523 Laboratory Setup	Soilmoisture Equ	37171	126	6/11/2010	1	18,444	N00022099	1164/1315
0505V1106 110 Volts 60Hz Comp	Soilmoisture Equ	37171	126	9/20/2010	1	5,048	N00022167	1144
12-071-404 Primo Star Microscop	Fisher Scientific	37171	126	8/10/2010	1	1,731	N00022156	3120002702

# **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

## B2: Interpretation of the Program Inventory Information

The equipment list provided by Banner is incomplete and does not accurately reflect the program's holdings. An inventory is underway to provide an accurate equipment list. A quick survey of existing equipment shows that biological sciences have nearly \$300,000 of equipment, approximately 20% of which was acquired through the STEM grant (2008-10).

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

C1: Productivity Terminology Table

<b>Sections</b>	A credit or non-credit class. Does not include not-for-credit classes (community education).
<b>Census</b>	Number of students enrolled at census (typically the 4 <sup>th</sup> week of class for fall and spring).
<b>FTES</b>	Full Time Equivalent Students A student in the classroom 15 hours/week for 35 weeks (or two semesters) = 525 student contact hours. 525 student contact hours = 1 FTES. Example: 400 student contact hours = $400/525 = 0.762$ FTES. The State apportionment process and District allocation model both use FTES as the primary funding criterion.
<b>FTEF</b>	Full Time Equivalent Faculty A faculty member teaching 15 units for two semesters (30 units for the year) = 1 FTE. Example: a 6 unit assignment = $6/30 = 0.20$ FTEF (annual). The college also computes semester FTEF by changing the denominator to 15 units. However, in the program review data, all FTE is annual. FTEF includes both Full-Time Faculty and Part-Time Faculty. FTEF in this program review includes faculty assigned to teach extra large sections (XL Faculty). This deviates from the district practice of not including these assignments as part of FTEF. However, it is necessary to account for these assignments to properly produce represent faculty productivity and associated costs.
<b>Cross Listed FTEF</b>	FTEF is assigned to all faculty teaching cross-listed sections. The FTEF assignment is proportional to the number of students enrolled at census. This deviates from the practice of assigning load only to the primary section. It is necessary to account for these cross-listed assignments to properly represent faculty productivity and associated costs.
<b>XL FTE</b>	Extra Large FTE: This is the calculated assignment for faculty assigned to extra large sections (greater than 60 census enrollments). The current practice is not to assign FTE. Example: if census > 60, 50% of the section FTE assignment for each additional group of 25 (additional tiers).
<b>WSCH</b>	Weekly Student Contact Hours The term "WSCH" is used as a total for weekly student contact hours AND as the ratio of the total WSCH divided by assigned FTEF. Example: 20 sections of 40 students at census enrolled for 3 hours per week taught by 4.00 FTEF faculty. $(20 \times 40 \times 3) = 2,400$ WSCH / 4.00 FTEF = 600 WSCH/FTEF.
<b>WSCH to FTES</b>	Using the example above: $2,400$ WSCH x 35 weeks = 84,000 student contact hours = $84,000 / 525 = 160$ FTES (see FTES definition). Simplified Formulas: $FTES = WSCH/15$ or $WSCH = FTES \times 15$
<b>District Goal</b>	Program WSCH ratio goal. WSCH/FTEF The District goal was set in 2006 to recognize the differences in program productivity.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

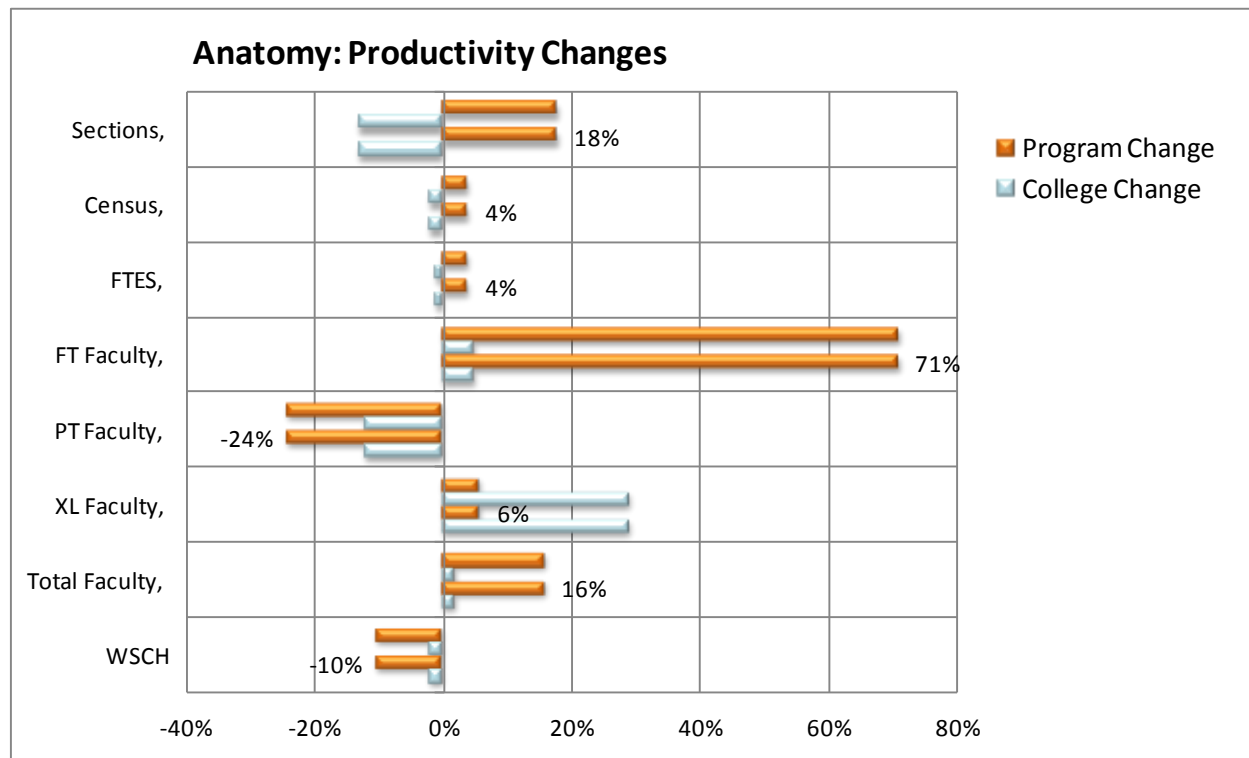
### C2: Productivity Summary Table - Anatomy

This table is a summary of the detail information provided in the *Program Review Productivity Report*. The “3 Year Average” was computed to provide a trend benchmark to compare the results of the prior three years to the FY11 results. The “FY11 College” percentages are included to provide a benchmark to compare the program’s percentages.

Anatomy							
Title	FY08	FY09	FY10	3 Year Average	FY11	Program Change	College Change
Sections,	16	15	20	17	20	18%	-13%
Census,	439	477	521	479	496	4%	-2%
FTES,	87	95	103	95	99	4%	-1%
FT Faculty,	0.48	0.48	1.60	0.85	1.45	71%	5%
PT Faculty,	1.23	1.15	0.60	0.99	0.75	-24%	-12%
XL Faculty,	0.60	0.50	0.60	0.57	0.60	6%	29%
Total Faculty,	2.31	2.13	2.80	2.41	2.80	16%	2%
WSCH	565	669	552	590	530	-10%	-2%

### C3: Comparative Productivity Changes Chart

This chart illustrates the percentage change from the prior three year average productivity to the FY11 productivity. The top bar for each budget category represents the program’s change in productivity and includes the data label. The second bar represents the college’s change in productivity.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

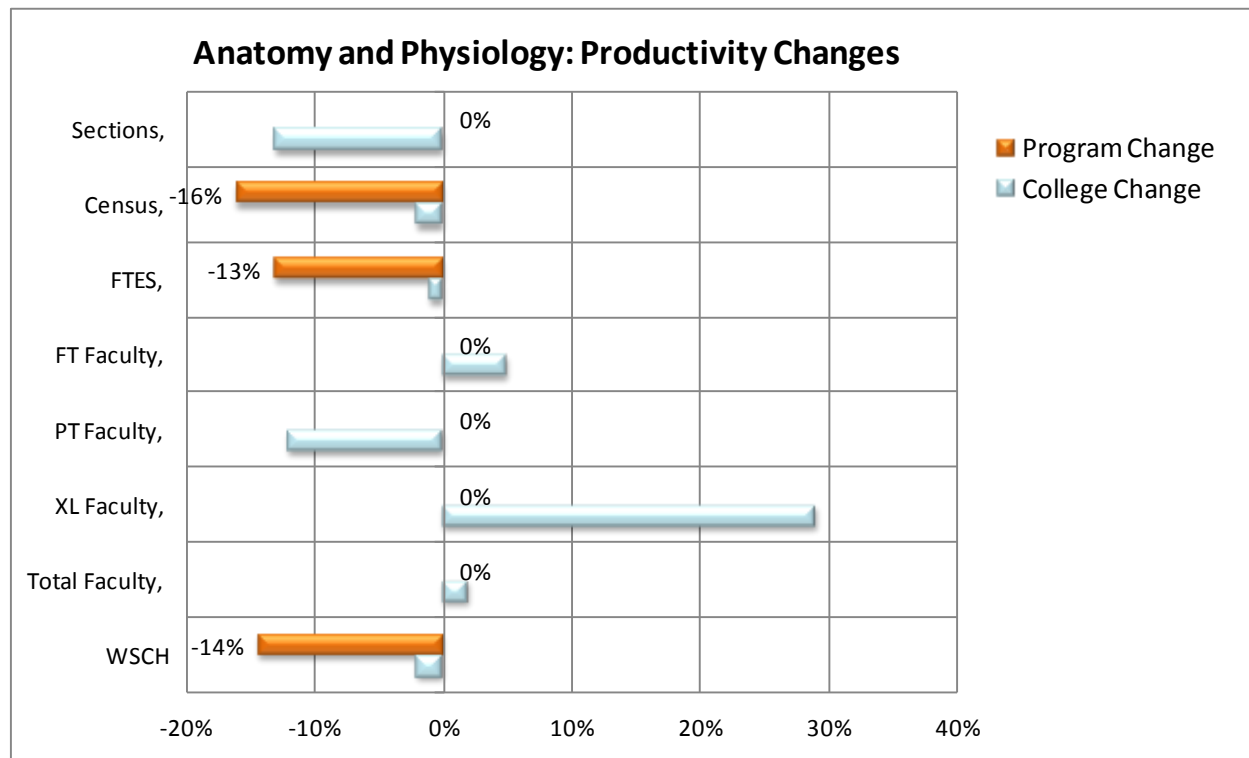
### C2: Productivity Summary Table – Anatomy and Physiology

This table is a summary of the detail information provided in the *Program Review Productivity Report*. The “3 Year Average” was computed to provide a trend benchmark to compare the results of the prior three years to the FY11 results. The “FY11 College” percentages are included to provide a benchmark to compare the program’s percentages.

Anatomy and Physiology							
Title	FY08	FY09	FY10	3 Year Average	FY11	Program Change	College Change
Sections,	2	2	2	2	2	0%	-13%
Census,	47	48	40	45	38	-16%	-2%
FTES,	14	14	12	14	12	-13%	-1%
FT Faculty,	-	-	-	-	-	0%	5%
PT Faculty,	0.50	0.50	0.50	0.50	0.50	0%	-12%
XL Faculty,	-	-	-	-	-	0%	29%
Total Faculty,	0.50	0.50	0.50	0.50	0.50	0%	2%
WSCH	420	420	360	420	360	-14%	-2%

### C3: Comparative Productivity Changes Chart

This chart illustrates the percentage change from the prior three year average productivity to the FY11 productivity. The top bar for each budget category represents the program’s change in productivity and includes the data label. The second bar represents the college’s change in productivity.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

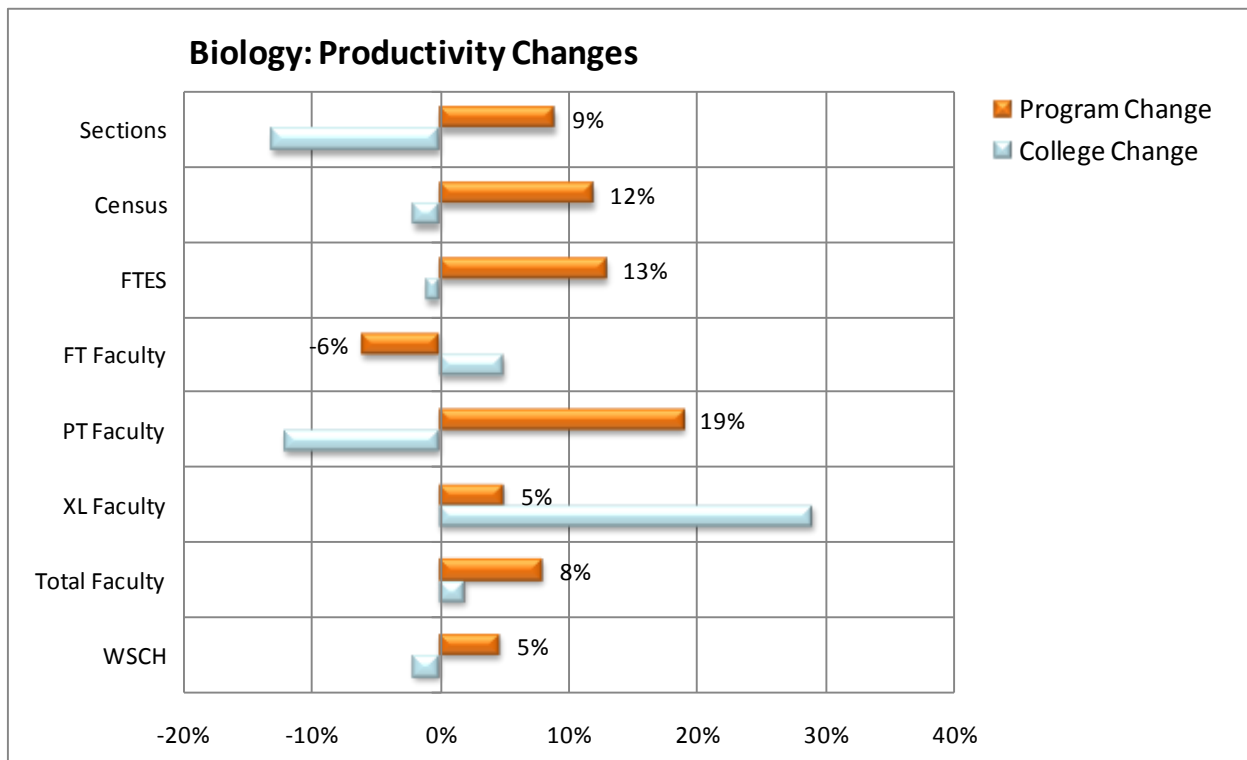
### C2: Productivity Summary Table - Biology

This table is a summary of the detail information provided in the *Program Review Productivity Report*. The “3 Year Average” was computed to provide a trend benchmark to compare the results of the prior three years to the FY11 results. The “FY11 College” percentages are included to provide a benchmark to compare the program’s percentages.

Biology							
Title	FY08	FY09	FY10	3 Year Average	FY11	Program Change	College Change
Sections	54	52	59	55	60	9%	-13%
Census	2,001	2,273	2,570	2,281	2,555	12%	-2%
FTES	216	242	279	246	277	13%	-1%
FT Faculty	2.16	2.16	1.97	2.10	1.96	-6%	5%
PT Faculty	2.71	2.76	3.41	2.96	3.52	19%	-12%
XL Faculty	1.15	1.40	1.75	1.43	1.50	5%	29%
Total Faculty	6.02	6.32	7.13	6.49	6.98	8%	2%
WSCH	538	574	587	569	595	5%	-2%

### C3: Comparative Productivity Changes Chart

This chart illustrates the percentage change from the prior three year average productivity to the FY11 productivity. The top bar for each budget category represents the program’s change in productivity and includes the data label. The second bar represents the college’s change in productivity.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

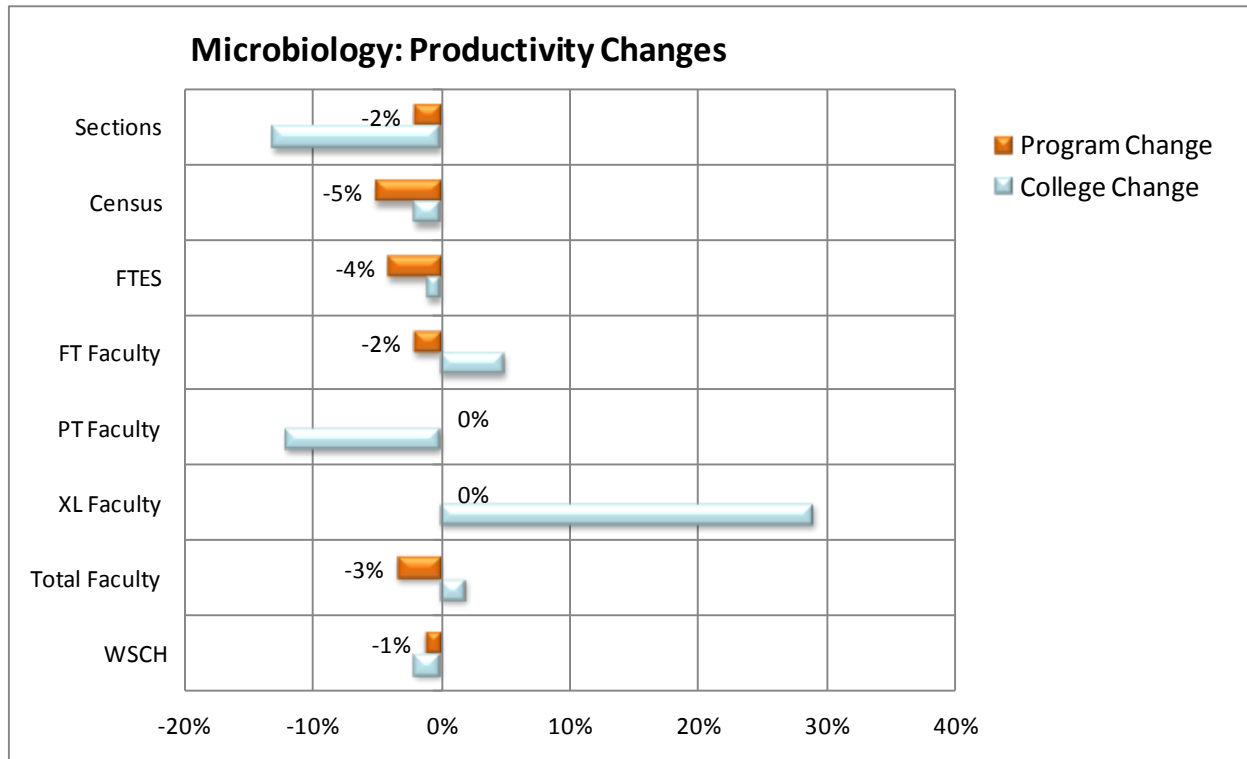
### C2: Productivity Summary Table - Microbiology

This table is a summary of the detail information provided in the *Program Review Productivity Report*. The “3 Year Average” was computed to provide a trend benchmark to compare the results of the prior three years to the FY11 results. The “FY11 College” percentages are included to provide a benchmark to compare the program’s percentages.

Microbiology							
Title	FY08	FY09	FY10	3 Year Average	FY11	Program Change	College Change
Sections	15	14	14	14	14	-2%	-13%
Census	335	325	358	339	324	-5%	-2%
FTES	67	65	71	67	64	-4%	-1%
FT Faculty	1.08	1.00	1.00	1.03	1.00	-2%	5%
PT Faculty	0.75	0.75	0.75	0.75	0.75	0%	-12%
XL Faculty	0.10	-	-	-	-	0%	29%
Total Faculty	1.93	1.75	1.75	1.81	1.75	-3%	2%
WSCH	521	557	609	555	549	-1%	-2%

### C3: Comparative Productivity Changes Chart

This chart illustrates the percentage change from the prior three year average productivity to the FY11 productivity. The top bar for each budget category represents the program’s change in productivity and includes the data label. The second bar represents the college’s change in productivity.



**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

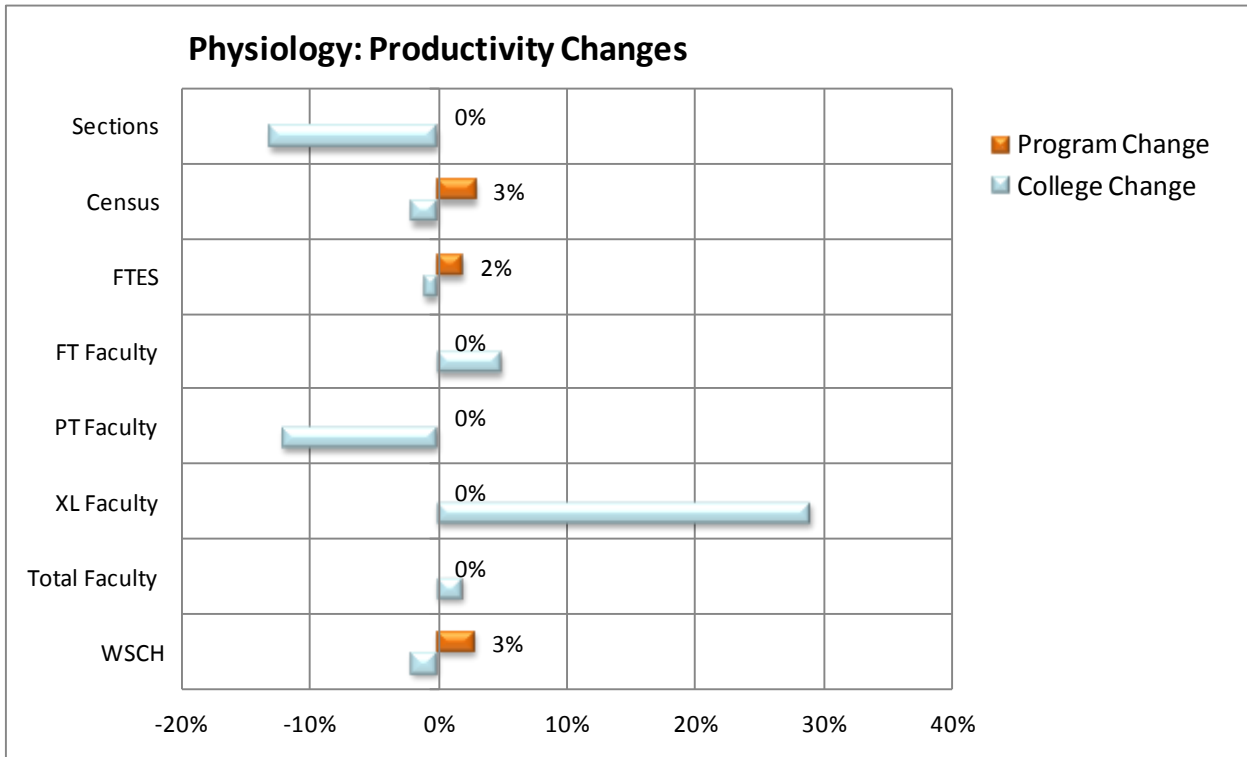
**C2: Productivity Summary Table - Physiology**

This table is a summary of the detail information provided in the *Program Review Productivity Report*. The “3 Year Average” was computed to provide a trend benchmark to compare the results of the prior three years to the FY11 results. The “FY11 College” percentages are included to provide a benchmark to compare the program’s percentages.

Physiology							
Title	FY08	FY09	FY10	3 Year Average	FY11	Program Change	College Change
Sections	14	14	14	14	14	0%	-13%
Census	331	354	365	350	359	3%	-2%
FTES	65	70	72	69	71	2%	-1%
FT Faculty	0.63	0.63	0.63	0.63	0.63	0%	5%
PT Faculty	0.93	0.93	0.93	0.93	0.93	0%	-12%
XL Faculty	0.40	0.40	0.40	0.40	0.40	0%	29%
Total Faculty	1.96	1.96	1.96	1.96	1.96	0%	2%
WSCH	497	536	551	528	543	3%	-2%

**C3: Comparative Productivity Changes Chart**

This chart illustrates the percentage change from the prior three year average productivity to the FY11 productivity. The top bar for each budget category represents the program’s change in productivity and includes the data label. The second bar represents the college’s change in productivity.



**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

C4: Interpretation of the Program Productivity Information

Anatomy (ANAT) productivity data is incorrect and cannot be interpreted; however, the productivity of this discipline has been well-above the district 525 expectations.

Anatomy and Physiology (ANPH) has had relatively consistent productivity but experienced a slight drop in census enrollment in 2011. This course generally has approximately 24 students and consists of a lecture (3 hrs) and lab (6hrs). This course cannot meet the listed 525 goal, but provides the necessary prerequisite for students in the paramedic program at Ventura College as well as a few other programs (e.g. Kinesiology) at schools such as CSU Northridge. This course is unavailable at Oxnard; Ventura College is therefore the only school in this geographic region that offers this prerequisite course.

Biology's productivity has been trending upward, which shows the high demand for biology courses. Sections have increased 9% while the college saw a decrease of 13%; the count at census was up 13% while the college saw a downtrend of 2%; and FTES increased 13% though college overall decreased 1%. Full time faculty hours decreased 6% due to one FT faculty member having release time, and a corresponding increase in part time faculty of 19% reflects the need to meet the demand of students. Overall faculty went up by only 8%. The efficiencies of the biological sciences department put in place in recent years are also reflected in the numbers. The 9% increase in the number of sections has led to a 12% increase in FTES produced. Efficiency is aided by having extra large lecture sections that support multiple labs.

Microbiology has maintained a constant number of sections over the past 4 years. The WSCH ratio has also remained relatively constant due to the limitations to the number of lab students allowed in each section.

Physiology: Fiscal Year 2011 saw a 3% improvement in productivity in physiology as compared to the three year FY08-FY10 average. The WSCH ratio for FY 2011 is 686, 2% above the past three years' average of 670 and well above the district goal of 500 (137% of district goal). It is important that the data on Human Physiology be examined for accuracy, specifically the part time and full time instructor teaching loads.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### D1: District WSCH Ratio Productivity Table

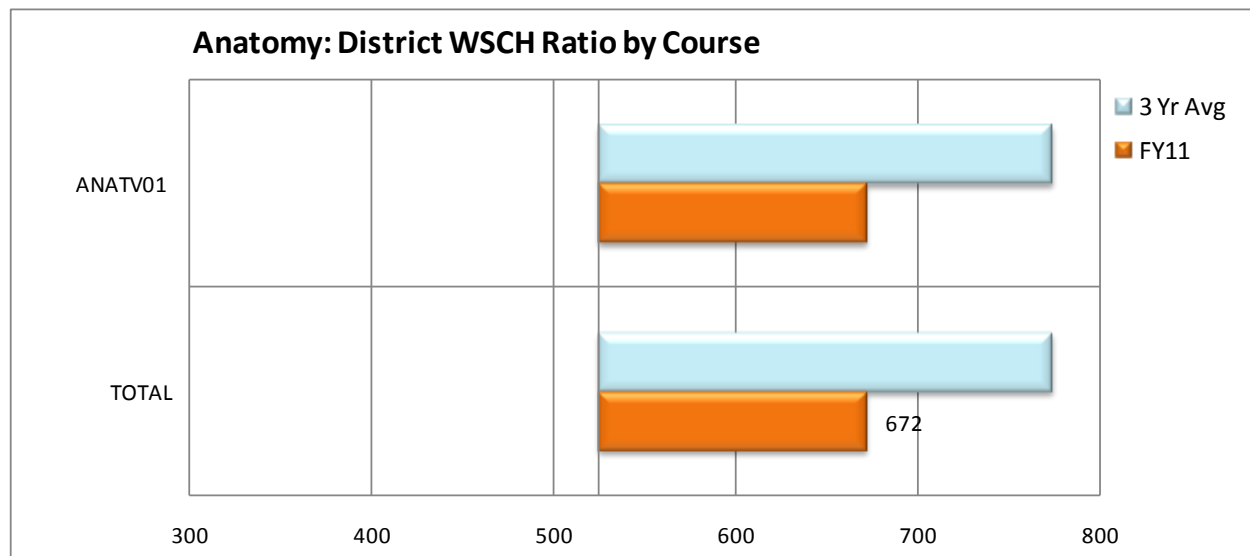
This table shows the District WSCH ratio (WSCH/FTEF) for each course by year for this program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table distributes FTEF to all cross-listed sections (proportional to census enrollment) but does not include the associated faculty costs of extra large assignment.

District WSCH Ratio = WSCH / (PT FTE + FT FTE).

District WSCH Ratio: Weekly Student Contact Hours/(FT FTE+PT FTE)										
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal	
ANATV01	General Human Anatomy	769	874	704	774	672	-13%	550	122%	
<b>TOTAL</b>	<b>Annual District WSCH Ratio</b>	<b>769</b>	<b>874</b>	<b>704</b>	<b>774</b>	<b>672</b>	<b>-13%</b>	<b>550</b>	<b>122%</b>	

### D2: District WSCH Ratio Productivity Chart

This chart illustrates the course level District WSCH ratio. The top bar shows the program's three year average. The second bar shows the program's FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### D3: College WSCH Ratio Productivity Table

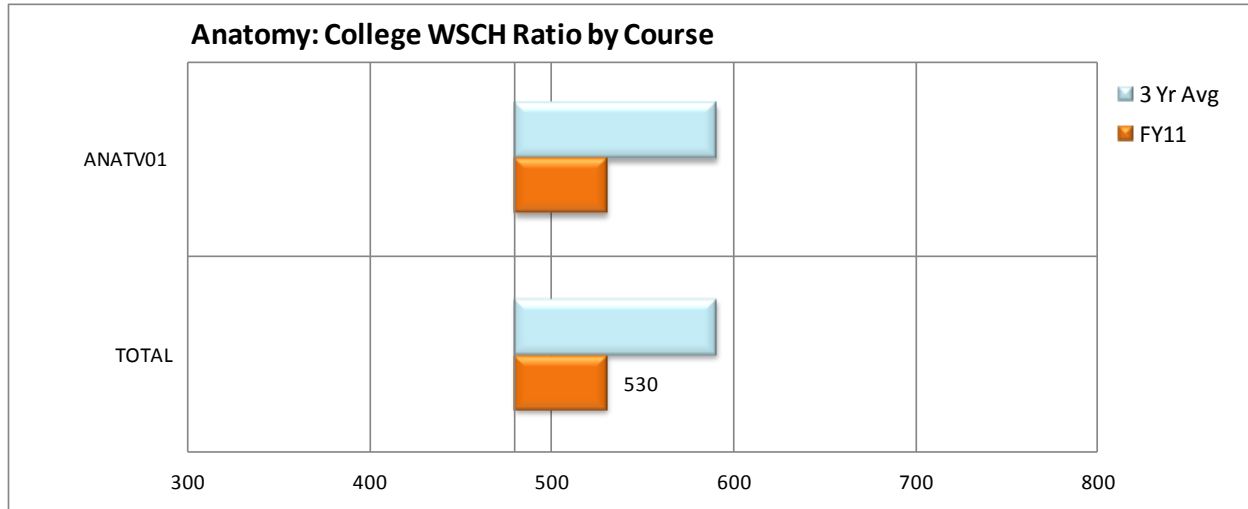
This table shows the College's WSCH ratio (WSCH/FTEF) for each course by year for the program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table includes the associated faculty costs of extra large sections. Faculty teaching extra large sections are paid stipends equal to 50% of their section FTE assignment for each group of 25 students beyond the first 60 students (calculated in this table as XL FTE). This College WSCH Ratio is a more valid representation of WSCH productivity. The College WSCH Ratio will be used in the program review process.

College WSCH Ratio = WSCH / (PT FTE + FT FTE + XL FTE)

College WSCH Ratio: Weekly Student Contact Hours/(FT FTE + PT FTE + XL FTE)									
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal
ANATV01	General Human Anatomy	565	669	552	590	530	-13%	550	122%
<b>TOTAL</b>	<b>Annual College WSCH Ratio</b>	<b>565</b>	<b>669</b>	<b>552</b>	<b>590</b>	<b>530</b>	<b>-10%</b>	<b>550</b>	<b>96%</b>

### D4: College WSCH Ratio Productivity Chart

This chart illustrates the course level College WSCH ratio. The top bar shows the program's three year average. The second bar shows the FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart. The computation used for the College WSCH Ratio includes XL FTE (extra-large sections) and the assignment of FTEF to all cross-listed sections (proportional to census enrollment).





## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### D1: District WSCH Ratio Productivity Table

This table shows the District WSCH ratio (WSCH/FTEF) for each course by year for this program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table distributes FTEF to all cross-listed sections (proportional to census enrollment) but does not include the associated faculty costs of extra large assignment.

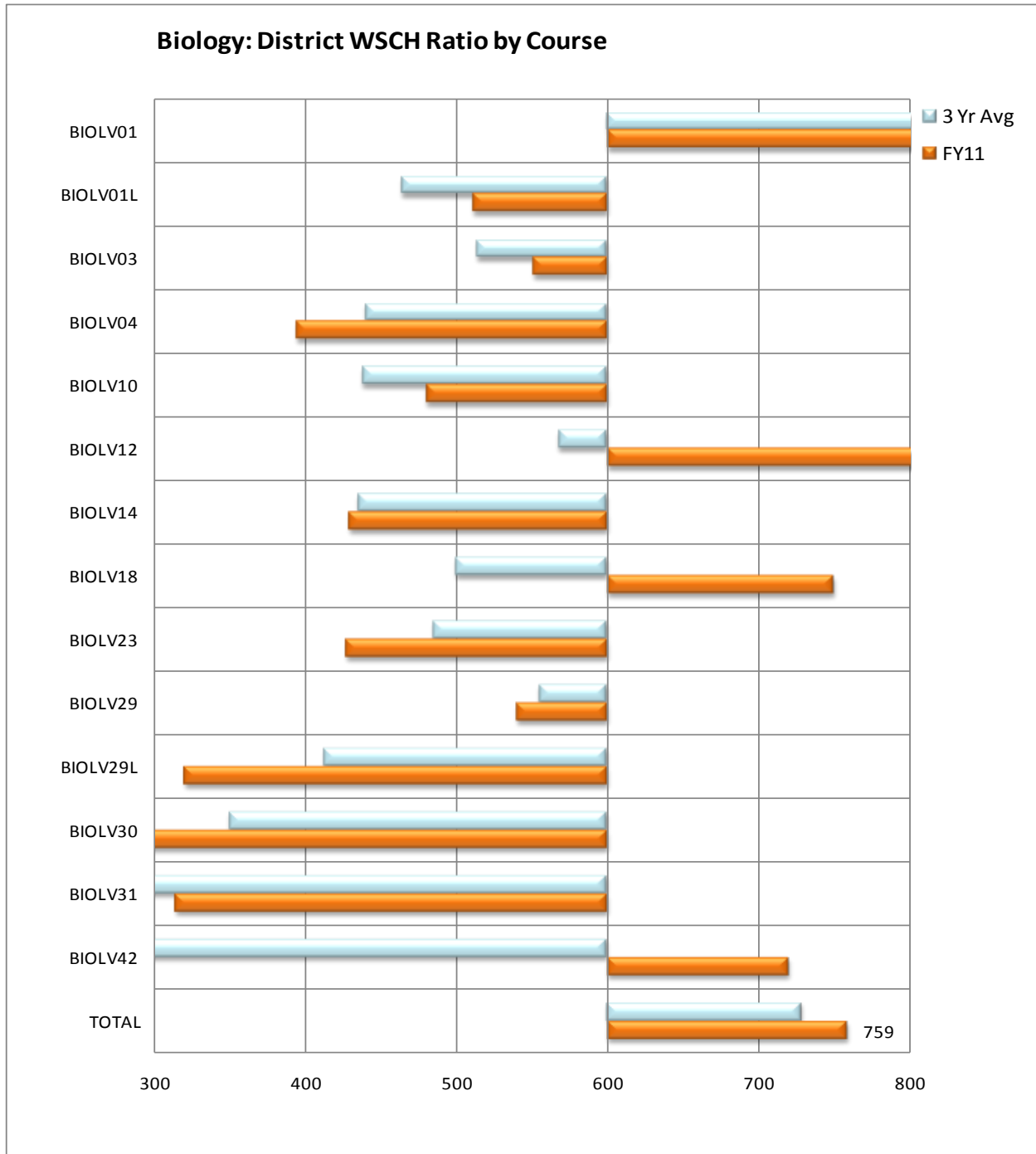
District WSCH Ratio = WSCH / (PT FTE + FT FTE).

District WSCH Ratio: Weekly Student Contact Hours/(FT FTE+PT FTE)									
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal
BIOLV01	Principles of Biology	1,345	1,545	1,669	1,520	1,530	1%	600	255%
BIOLV01L	Principles of Biology Lab	428	482	481	464	511	10%	600	85%
BIOLV03	Organismal&Environmntl Biolo	461	495	585	514	551	7%	600	92%
BIOLV04	Cell & Molecular Biology	504	396	428	440	394	-11%	600	66%
BIOLV10	Intro to Environmental Issues	390	510	345	438	480	10%	600	80%
BIOLV12	Principles of Human Biology	293	563	848	568	1,050	85%	600	175%
BIOLV14	Field Biology	459	406	441	435	429	-2%	600	71%
BIOLV18	Human Heredity	450	330	720	500	750	50%	600	125%
BIOLV23	Plant Biology	-	-	485	485	427	-12%	600	71%
BIOLV29	Marine Biology	540	525	600	555	540	-3%	600	90%
BIOLV29L	Marine Biology Lab	460	340	440	413	320	-23%	600	53%
BIOLV30	Biotech & Molecular Biology	345	240	465	350	285	-19%	600	48%
BIOLV31	Methds: Biotech&Molecular Bic	166	185	203	185	314	70%	600	52%
BIOLV42	Contemp Issues in Cell Biology	-	-	-	-	720	0%	600	120%
<b>TOTAL</b>	<b>Annual District WSCH Ratio</b>	<b>665</b>	<b>739</b>	<b>779</b>	<b>729</b>	<b>759</b>	<b>4%</b>	<b>600</b>	<b>127%</b>

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### D2: District WSCH Ratio Productivity Chart

This chart illustrates the course level District WSCH ratio. The top bar shows the program's three year average. The second bar shows the program's FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### D3: College WSCH Ratio Productivity Table

This table shows the College's WSCH ratio (WSCH/FTEF) for each course by year for the program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table includes the associated faculty costs of extra large sections. Faculty teaching extra large sections are paid stipends equal to 50% of their section FTE assignment for each group of 25 students beyond the first 60 students (calculated in this table as XL FTE). This College WSCH Ratio is a more valid representation of WSCH productivity. The College WSCH Ratio will be used in the program review process.

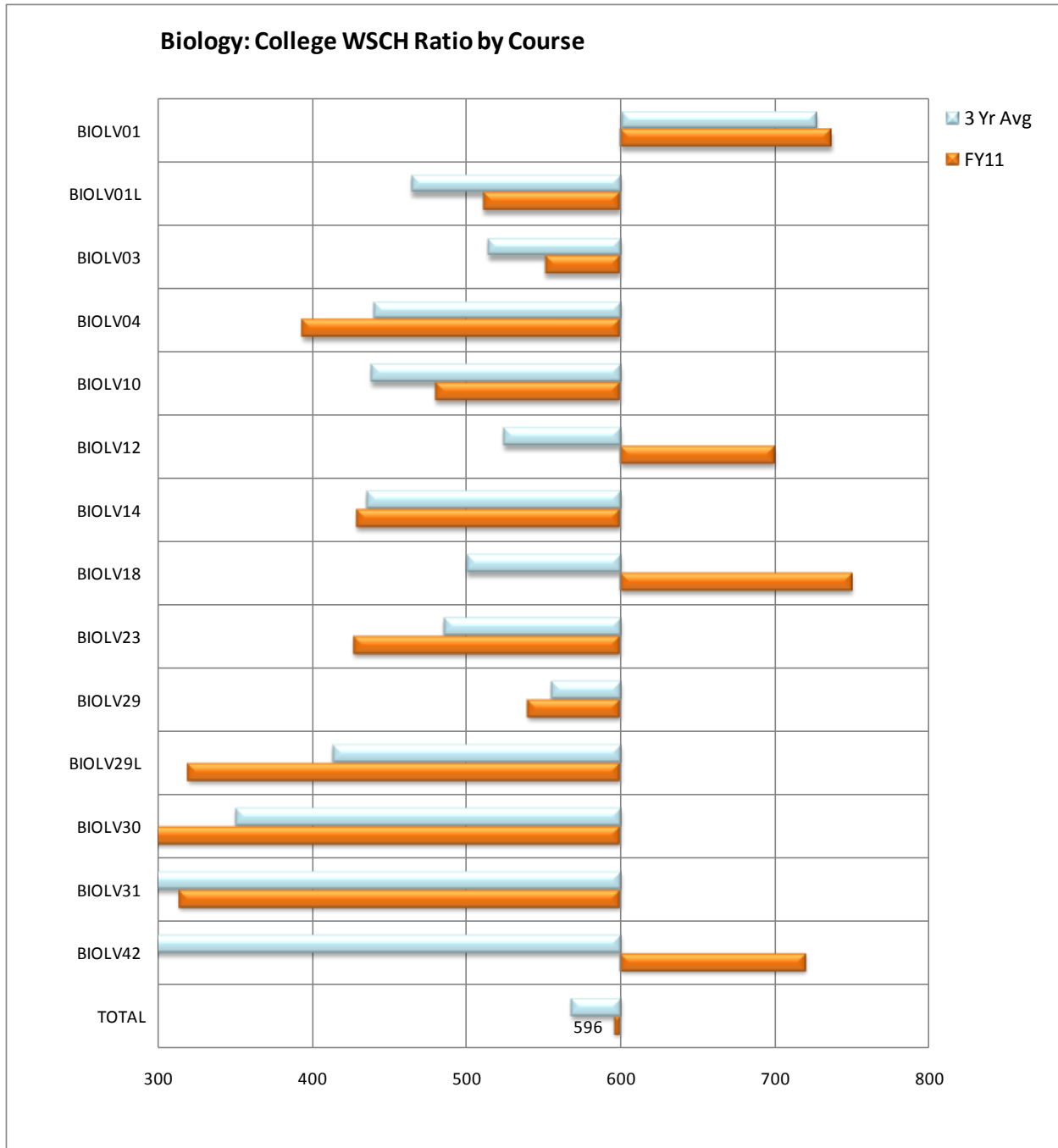
College WSCH Ratio = WSCH / (PT FTE + FT FTE + XL FTE)

College WSCH Ratio: Weekly Student Contact Hours/(FT FTE + PT FTE + XL FTE)									
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal
BIOLV01	Principles of Biology	714	744	723	727	737	1%	600	123%
BIOLV01L	Principles of Biology Lab	428	482	481	464	511	10%	600	85%
BIOLV03	Organismal&Environmntl Biolo	461	495	585	514	551	7%	600	92%
BIOLV04	Cell & Molecular Biology	504	396	428	440	394	-11%	600	66%
BIOLV10	Intro to Environmental Issues	390	510	345	438	480	10%	600	80%
BIOLV12	Principles of Human Biology	293	563	678	524	700	34%	600	117%
BIOLV14	Field Biology	459	406	441	435	429	-2%	600	71%
BIOLV18	Human Heredity	450	330	720	500	750	50%	600	125%
BIOLV23	Plant Biology	-	-	485	485	427	-12%	600	71%
BIOLV29	Marine Biology	540	525	600	555	540	-3%	600	90%
BIOLV29L	Marine Biology Lab	460	340	440	413	320	-23%	600	53%
BIOLV30	Biotech & Molecular Biology	345	240	465	350	285	-19%	600	48%
BIOLV31	Methods: Biotech&Molecular Bi	166	185	203	185	314	70%	600	52%
BIOLV42	Contemp Issues in Cell Biology	-	-	-	-	720	0%	600	120%
<b>TOTAL</b>	<b>Annual College WSCH Ratio</b>	<b>538</b>	<b>575</b>	<b>587</b>	<b>568</b>	<b>596</b>	<b>5%</b>	<b>600</b>	<b>99%</b>

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### D4: College WSCH Ratio Productivity Chart

This chart illustrates the course level College WSCH ratio. The top bar shows the program's three year average. The second bar shows the FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart. The computation used for the College WSCH Ratio includes XL FTE (extra-large sections) and the assignment of FTEF to all cross-listed sections (proportional to census enrollment).



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

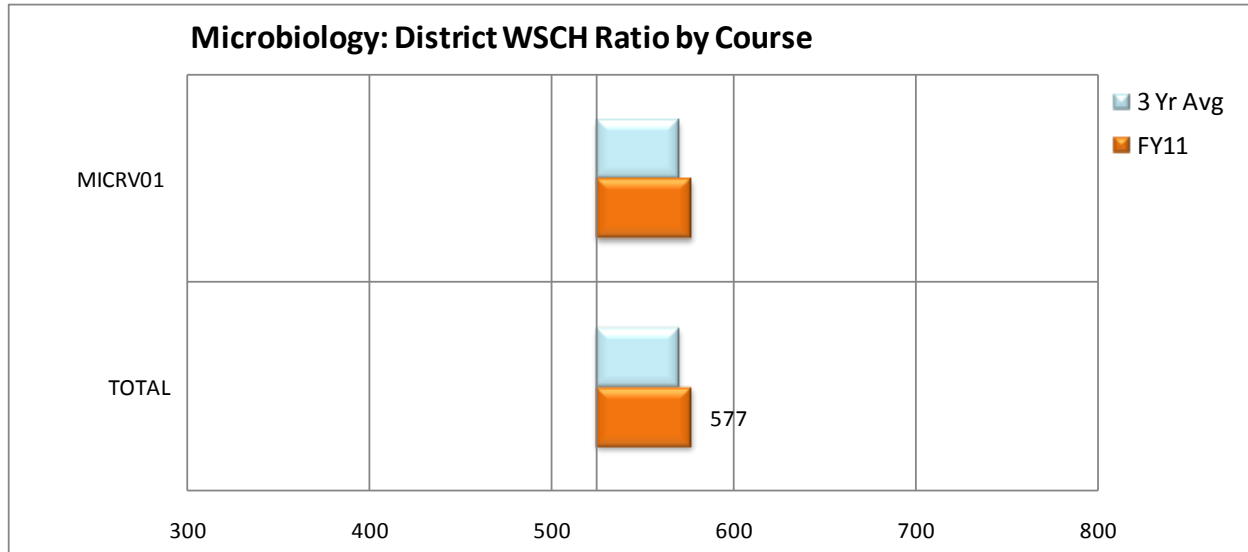
### D1: District WSCH Ratio Productivity Table

This table shows the District WSCH ratio (WSCH/FTEF) for each course by year for this program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table distributes FTEF to all cross-listed sections (proportional to census enrollment) but does not include the associated faculty costs of extra large assignment. District WSCH Ratio = WSCH / (PT FTE + FT FTE).

Microbiology									
District WSCH Ratio: Weekly Student Contact Hours/(FT FTE+PT FTE)									
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal
MICRV01	General Microbiology	547	554	610	570	577	1%	480	120%
<b>TOTAL</b>	<b>Annual District WSCH Ratio</b>	<b>547</b>	<b>554</b>	<b>610</b>	<b>570</b>	<b>577</b>	<b>1%</b>	<b>480</b>	<b>120%</b>

### D2: District WSCH Ratio Productivity Chart

This chart illustrates the course level District WSCH ratio. The top bar shows the program's three year average. The second bar shows the program's FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### D3: College WSCH Ratio Productivity Table

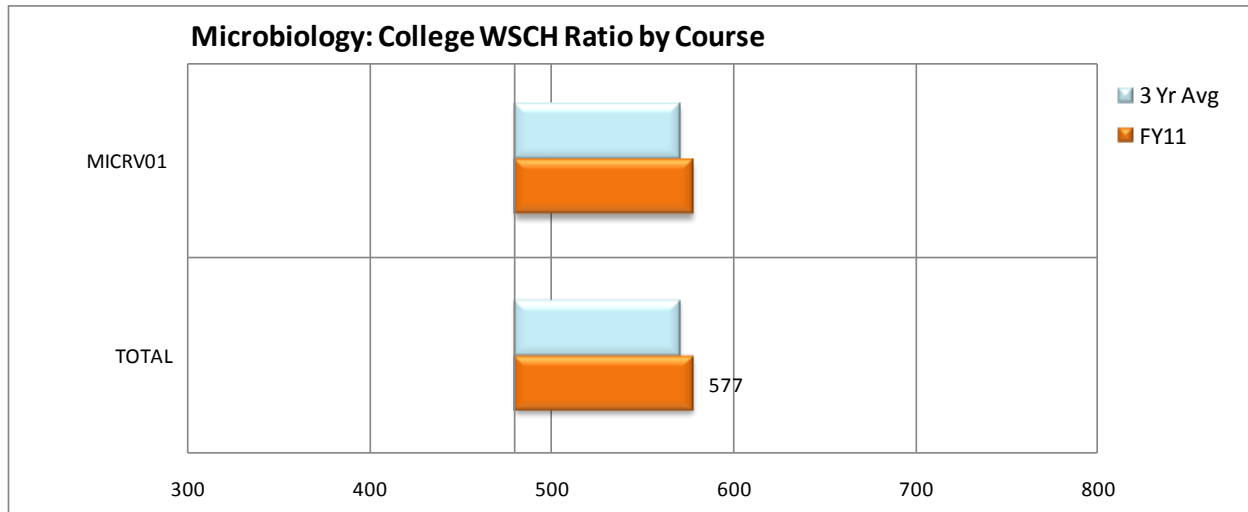
This table shows the College's WSCH ratio (WSCH/FTEF) for each course by year for the program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table includes the associated faculty costs of extra large sections. Faculty teaching extra large sections are paid stipends equal to 50% of their section FTE assignment for each group of 25 students beyond the first 60 students (calculated in this table as XL FTE). This College WSCH Ratio is a more valid representation of WSCH productivity. The College WSCH Ratio will be used in the program review process.

$$\text{College WSCH Ratio} = \text{WSCH} / (\text{PT FTE} + \text{FT FTE} + \text{XL FTE})$$

Microbiology									
College WSCH Ratio: Weekly Student Contact Hours/(FT FTE + PT FTE + XL FTE)									
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal
MICRV01	General Microbiology	547	554	610	570	577	1%	480	120%
<b>TOTAL</b>	<b>Annual College WSCH Ratio</b>	<b>547</b>	<b>554</b>	<b>610</b>	<b>570</b>	<b>577</b>	<b>1%</b>	<b>480</b>	<b>120%</b>

### D4: College WSCH Ratio Productivity Chart

This chart illustrates the course level College WSCH ratio. The top bar shows the program's three year average. The second bar shows the FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart. The computation used for the College WSCH Ratio includes XL FTE (extra-large sections) and the assignment of FTEF to all cross-listed sections (proportional to census enrollment).



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

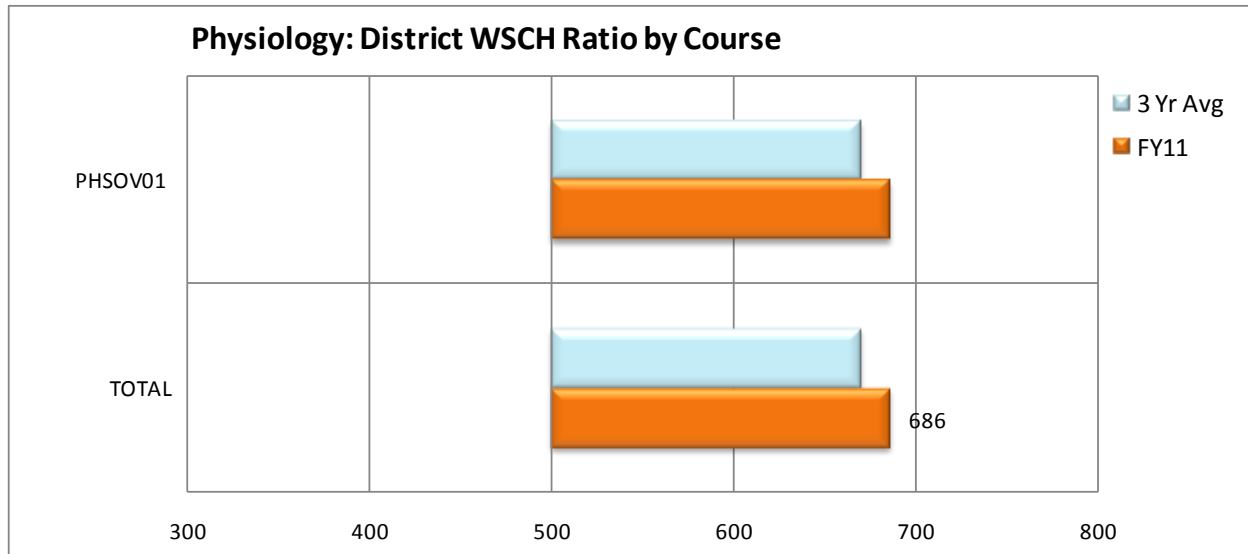
### D1: District WSCH Ratio Productivity Table

This table shows the District WSCH ratio (WSCH/FTEF) for each course by year for this program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table distributes FTEF to all cross-listed sections (proportional to census enrollment) but does not include the associated faculty costs of extra large assignment. District WSCH Ratio = WSCH / (PT FTE + FT FTE).

District WSCH Ratio: Weekly Student Contact Hours/(FT FTE+PT FTE)									
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal
PHSOV01	Intro to Human Physiology	633	678	699	670	686	2%	500	137%
<b>TOTAL</b>	<b>Annual District WSCH Ratio</b>	<b>633</b>	<b>678</b>	<b>699</b>	<b>670</b>	<b>686</b>	<b>2%</b>	<b>500</b>	<b>137%</b>

### D2: District WSCH Ratio Productivity Chart

This chart illustrates the course level District WSCH ratio. The top bar shows the program's three year average. The second bar shows the program's FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### D3: College WSCH Ratio Productivity Table

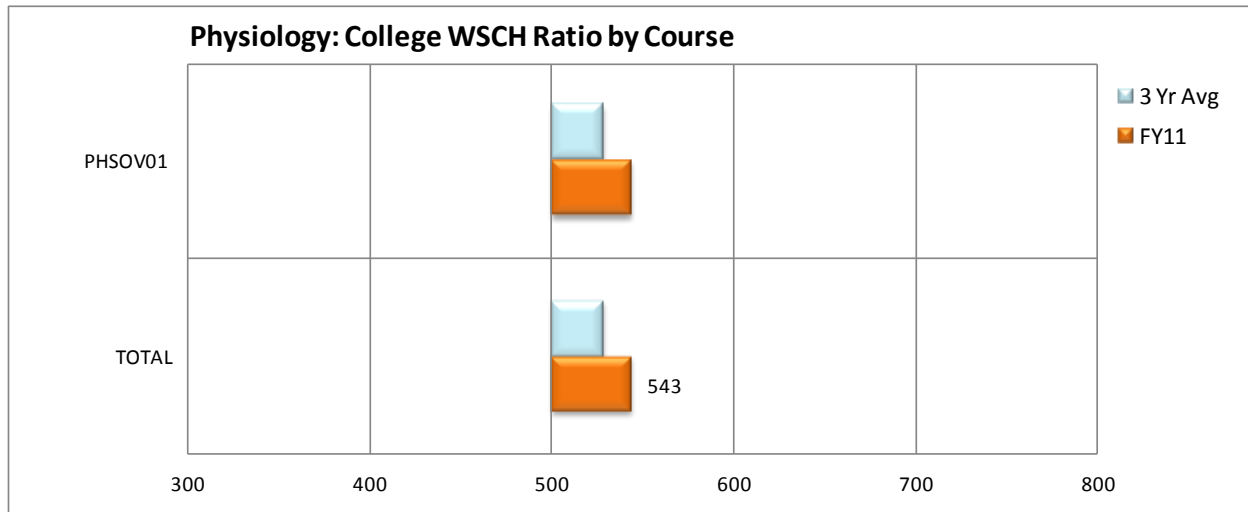
This table shows the College's WSCH ratio (WSCH/FTEF) for each course by year for the program. Courses not offered during FY11 (last year) or without faculty load (independent study) are excluded. Because these are ratios, the combined average is computed using total WSCH and total FTEF (not the average of ratios). The formula used in this table includes the associated faculty costs of extra large sections. Faculty teaching extra large sections are paid stipends equal to 50% of their section FTE assignment for each group of 25 students beyond the first 60 students (calculated in this table as XL FTE). This College WSCH Ratio is a more valid representation of WSCH productivity. The College WSCH Ratio will be used in the program review process.

College WSCH Ratio = WSCH / (PT FTE + FT FTE + XL FTE)

Physiology									
College WSCH Ratio: Weekly Student Contact Hours/(FT FTE + PT FTE + XL FTE)									
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal
PHSOV01	Intro to Human Physiology	497	536	551	528	543	2%	500	137%
<b>TOTAL</b>	<b>Annual College WSCH Ratio</b>	<b>497</b>	<b>536</b>	<b>551</b>	<b>528</b>	<b>543</b>	<b>3%</b>	<b>500</b>	<b>109%</b>

### D4: College WSCH Ratio Productivity Chart

This chart illustrates the course level College WSCH ratio. The top bar shows the program's three year average. The second bar shows the FY11 WSCH ratio. The axis represents the District WSCH ratio goal set in 2006. The program's (or subject's) total WSCH ratio is shown as the TOTAL at the bottom of the chart. The computation used for the College WSCH Ratio includes XL FTE (extra-large sections) and the assignment of FTEF to all cross-listed sections (proportional to census enrollment).





# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## D5: Productivity Detail Report

The program's detail productivity information is available in *Appendix B – Program Review Productivity Report*. This report is a PDF document and is searchable. The productivity information was extracted from the District's Banner Student System. The productivity information includes all information associated with the program's subject codes. The *Program Review Productivity Report* is sorted by subject code (alphabetical order) and includes the following sections: productivity measures and WSCH ratios by course by year.

## D6: Interpretation of the Program Course Productivity Information

According to the data provided, Anatomy is at 122% of the district productivity WSCH/FTEF ratio data. ANPH data are missing.

BIOL V01 and V01L: Biology V01L is a lab course that takes place in a room with 24 seats and therefore cannot meet the WSCH goal of 600. Although BIOL V01L falls below its WSCH this is more than offset by the efficiency of the unlinked BIOL V01 lecture. Furthermore, the current efficiency of this course illustrates that it is in high demand and could continue to fill and achieve a high efficiency even if sections were added.

BIOL V03 and V04: To reach the 525 goal of 600 WSCH Ratio requires a student population of 54 students per semester (in 2 lab sections), or 34 students per semester (in 1 lab section). In the past this was not achievable as class size was set at 24 per section. We've recently approached the goal in BIOL V03 by taking a few more students per section. BIOL V04 offered in Spring contains many of the students from the previous Fall's BIOL V03, but not all, as some leave for early transfer, etc. Thus its population tends to be a little smaller and fluctuate more than BIOL V03.

BIOL V10 is somewhat dependent on the size of the room to which it is assigned for scheduling purposes and reflects fluctuations in the students in the ESRM program (serves also as ESRM V01). It reached a high in FY09. Compared to the 3Y average, FY11 demonstrated some growth and is at 80% of WSCH ratio goal.

BIOL V12 has experienced a great deal of growth with Patty Saito as instructor in a successful online format so that it exceeds the 525 goal of 600 WSCH Ratio. The downturn in FY11 reflects the college revising the maximum class size limit downwards.

BIOL V14

BIOL V18 has experienced a great deal of when it was allowed to change class size. It now exceeds the 525 goal of 600 WSCH Ratio.

BIOL V23 Biology started teaching this class in FY09 (co-listed as AG V03), although 2 of our instructors taught it prior to this date when it was listed as AG V03 (only). It cannot achieve its 525 goal of 600 WSCH Ratio. Current class size is set at 24 because of the laboratory setting (to reach the goal would require 35 students per semester) which gives a calculation of 68% of the 525 goal as possible. In that light, this class is successfully reaching the possible fraction of the goal.

## **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

BIOL V29 is close to the 525 goal (90%). Its high point occurred in FY10.

BIOL V29L is another laboratory-based class that cannot achieve the 525 goal of 600 WSCH Ratio. It is one of our lowest performing classes in BIOL despite being linked to a better performing class (BIOL V29). None of the lecture students have to take this lab and these numbers probably reflect that choice.

BIOL V30 enrollments have reflected some local business and economic downturns. We have found the composition of the recent student body has changed compared to that of a few years ago due to CSUCI opening biotechnology programs. This year's enrollment is up compared to last year (data not shown) and will be close to the 525 goal of 600 WSCH Ratio.

BIOL V31 enrollments have also reflected some local business and economic downturns. Last year's enrollment was up compared to the previous year. With this year's change to the class in the number of units, thus fewer required night-time commitments, the Biology Dept. will see if enrollment will increase.

BIOL V42 was a new offering of the department last year. It has already exceeded the 525 goal of 600 WSCH Ratio.

MICR V01, microbiology, is operating at a productivity level which is 120% of the District and College WSCH ratios of 480. As a prerequisite for the nursing program, Microbiology is a popular course, and its sections run at capacity every semester. Since the same number of sections is offered every semester, the productivity numbers are essentially constant.

PHSO V01: Fiscal Year 2011 saw a 3% improvement in productivity in physiology as compared to the three year FY08-FY10 average. The WSCH ratio for FY 2011 is 686, 2% above the past three years' average of 670 and well above the district goal of 500 (137% of district goal). It is important that the data on Human Physiology be examined for accuracy, specifically the part time and full time instructor teaching loads.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### E1: Student Success Terminology

<b>Census</b>	Number of students enrolled at Census (typically the 4 <sup>th</sup> week of class for fall and spring). Census enrollment is used to compute WSCH and FTES for funding purposes.
<b>Retain</b>	Students completing the class with any grade other than W or DR divided by Census Example: 40 students enrolled, 5 students dropped prior to census, 35 students were enrolled at census, 25 students completed the class with a grade other than W or DR: Retention Rate = 25/35 = 71%
<b>Success</b>	Students completing the class with grades A, B, C, CR or P divided by Census Excludes students with grades D, F, or NC.

### E2: Student Success Summary

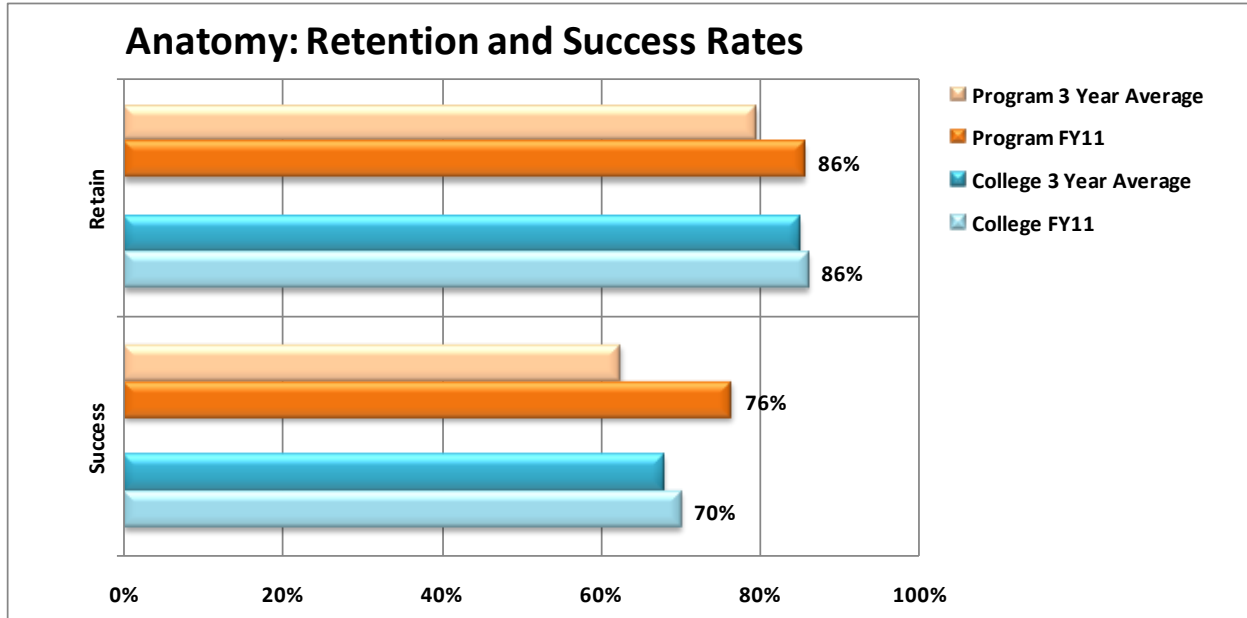
The following two tables summarize the detail information provided in the *Appendix C - Program Review Student Success Report*. The first table shows the number of students. The second table shows the percentage of students. Both tables show the distribution of student grades by year for the program (subject). They show the number of students who were counted at census, completed the class (retention), and were successful. The “3 Year Average” was computed to provide a trend benchmark to compare the prior three year expenses to the FY11 success measures. The “College” success percentages are included to compare the results of the program to the results of the college.

Anatomy												
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
ANAT	FY08	79	81	83	-	34	54	92	-	423	331	243
ANAT	FY09	114	109	78	-	25	54	82	-	462	380	301
ANAT	FY10	137	121	64	-	25	46	112	-	505	393	322
ANAT	3 Year Avg	110	104	75	-	28	51	95	-	463	368	289
ANAT	FY11	159	146	61	-	13	27	69	4	479	410	366
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
ANAT	FY08	19%	19%	20%	0%	8%	13%	22%	0%		78%	57%
ANAT	FY09	25%	24%	17%	0%	5%	12%	18%	0%		82%	65%
ANAT	FY10	27%	24%	13%	0%	5%	9%	22%	0%		78%	64%
ANAT	3 Year Avg	24%	22%	16%	0%	6%	11%	21%	0%		79%	62%
ANAT	FY11	33%	30%	13%	0%	3%	6%	14%	1%		86%	76%
<b>College</b>	<b>3 Year Avg</b>	<b>33%</b>	<b>19%</b>	<b>12%</b>	<b>5%</b>	<b>5%</b>	<b>10%</b>	<b>15%</b>	<b>2%</b>		<b>85%</b>	<b>68%</b>
College	FY11	33%	20%	13%	3%	5%	10%	14%	2%		86%	70%

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

## E3: Retention and Success Rates

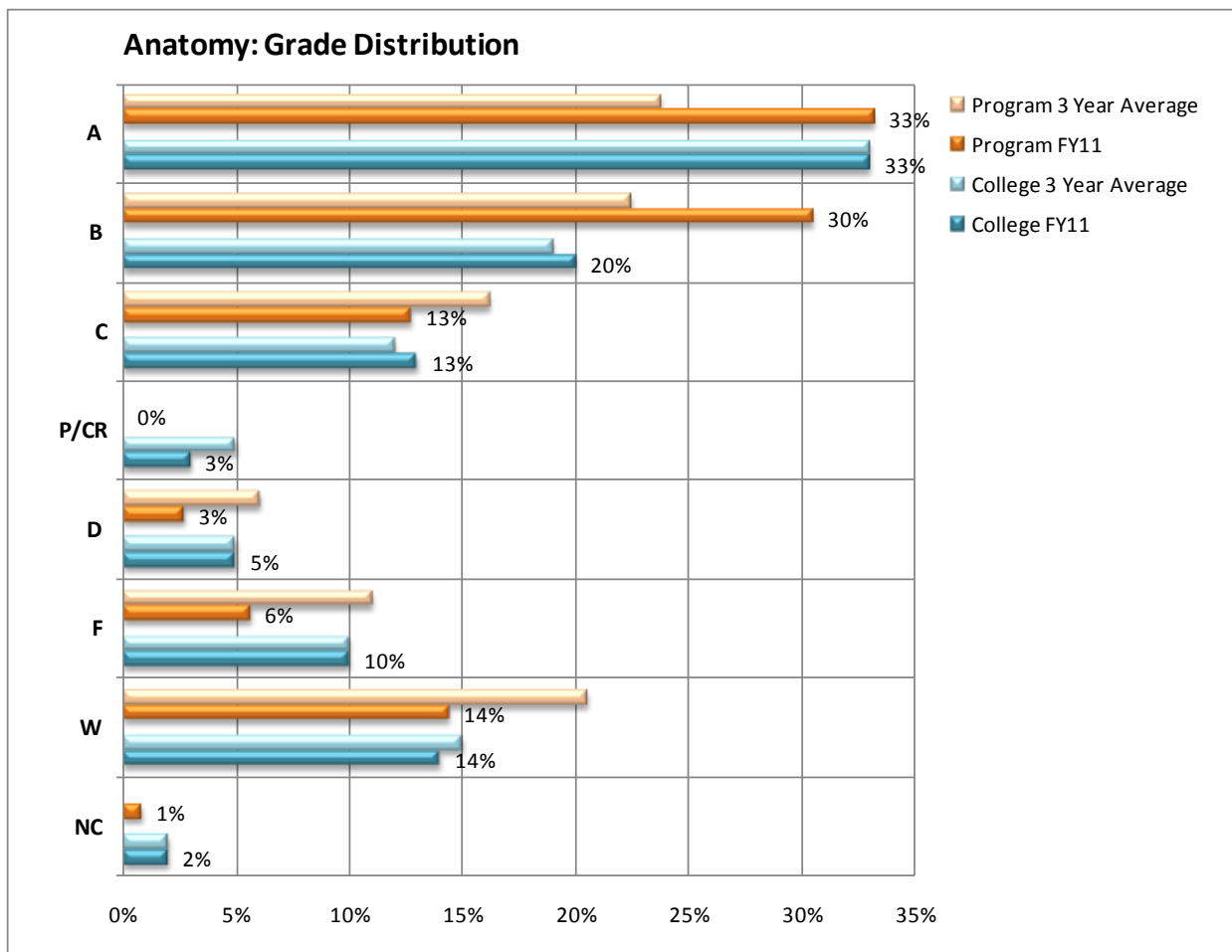
This chart illustrates the retention and success rates of students who were counted at census. Each measure has four bars. The first bar represents the program's prior three year average percent. The second bar shows last year's (FY11) percent. The third and fourth bars represent the overall college percents.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### E4: Grade Distribution

This chart illustrates the program's distribution of grades (by subject). Each grade has four bars. The first bar represents the program's prior three year average percent of grades. The second bar shows last year's (FY11) grade distribution percents. The third and fourth bars represent the overall college distribution percents.



### E5: Student Success Detail Report

The program student success detail information is available in *Appendix C – Program Review Student Success Report*. This report is a PDF document and is searchable. The student success information was extracted from the District's Banner Student System. The student success information includes all information associated with the program's subject codes. The *Program Review Student Success Report* is sorted by subject code (alphabetical order) and includes the following sections: comparative summary and course detail by term. The following table defines the terminology.

## **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

### E6: Interpretation of Program Retention, Student Success, and Grade Distribution

Retention and success rates for ANAT are very high for a science class. Our instructors work diligently to instill a love of learning and work ethic in our students. ANAT instructors will be meeting to discuss pedagogy and to determine if any changes need to be made in course rigor and/or grade assignment.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### E2: Student Success Summary

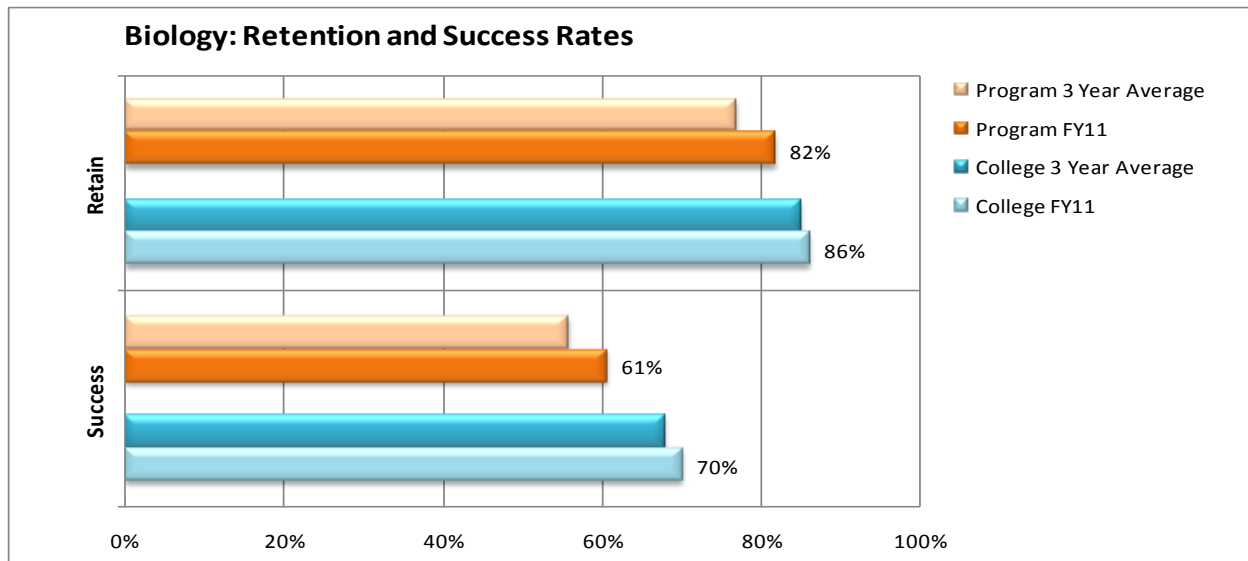
The following two tables summarize the detail information provided in the *Appendix C - Program Review Student Success Report*. The first table shows the number of students. The second table shows the percentage of students. Both tables show the distribution of student grades by year for the program (subject). They show the number of students who were counted at census, completed the class (retention), and were successful. The “3 Year Average” was computed to provide a trend benchmark to compare the prior three year expenses to the FY11 success measures. The “College” success percentages are included to compare the results of the program to the results of the college.

Biology												
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
BIOL	FY08	307	342	371	7	161	268	470	3	1,933	1,458	1,027
BIOL	FY09	331	446	472	1	191	238	537	1	2,218	1,680	1,250
BIOL	FY10	383	495	554	11	209	336	534	1	2,523	1,989	1,443
BIOL	3 Year Avg	340	428	466	6	187	281	514	2	2,225	1,709	1,240
BIOL	FY11	446	575	493	10	188	333	461	12	2,518	2,057	1,524
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
BIOL	FY08	16%	18%	19%	0%	8%	14%	24%	0%		75%	53%
BIOL	FY09	15%	20%	21%	0%	9%	11%	24%	0%		76%	56%
BIOL	FY10	15%	20%	22%	0%	8%	13%	21%	0%		79%	57%
BIOL	3 Year Avg	15%	19%	21%	0%	8%	13%	23%	0%		77%	56%
BIOL	FY11	18%	23%	20%	0%	7%	13%	18%	0%		82%	61%
College	3 Year Avg	33%	19%	12%	5%	5%	10%	15%	2%		85%	68%
College	FY11	33%	20%	13%	3%	5%	10%	14%	2%		86%	70%

### E3: Retention and Success Rates

This chart illustrates the retention and success rates of students who were counted at census. Each measure has four bars. The first bar represents the program’s prior three year average percent. The second bar shows last year’s (FY11) percent. The third and fourth bars represent the overall college percents.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

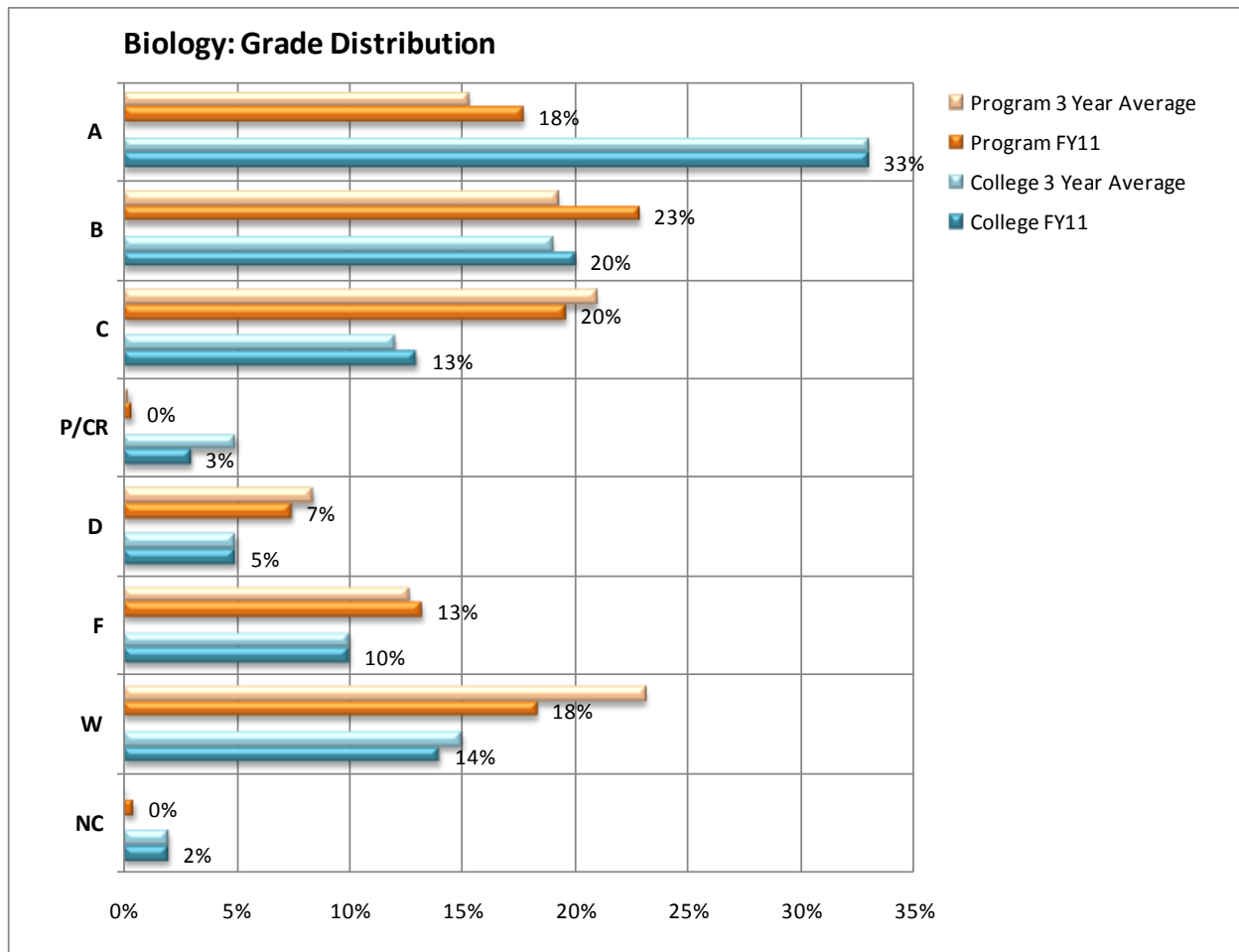


### E4: Grade Distribution

This chart illustrates the program's distribution of grades (by subject). Each grade has four bars. The first bar represents the program's prior three year average percent of grades. The second bar shows last year's (FY11) grade distribution percents. The third and fourth bars represent the overall college distribution percents.



**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review  
2011-2012**



**E5: Student Success Detail Report**

The program student success detail information is available in *Appendix C – Program Review Student Success Report*. This report is a PDF document and is searchable. The student success information was extracted from the District’s Banner Student System. The student success information includes all information associated with the program’s subject codes. The *Program Review Student Success Report* is sorted by subject code (alphabetical order) and includes the following sections: comparative summary and course detail by term. The following table defines the terminology.

# **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

## E6: Interpretation of Program Retention, Student Success, and Grade Distribution

In FY 11, Biology is doing slightly better in retention and success rates as compared to the previous 3 year program average. Success and retention rates for the program are only slightly lower than the college and given the rigorous nature of science courses, this is commendable.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

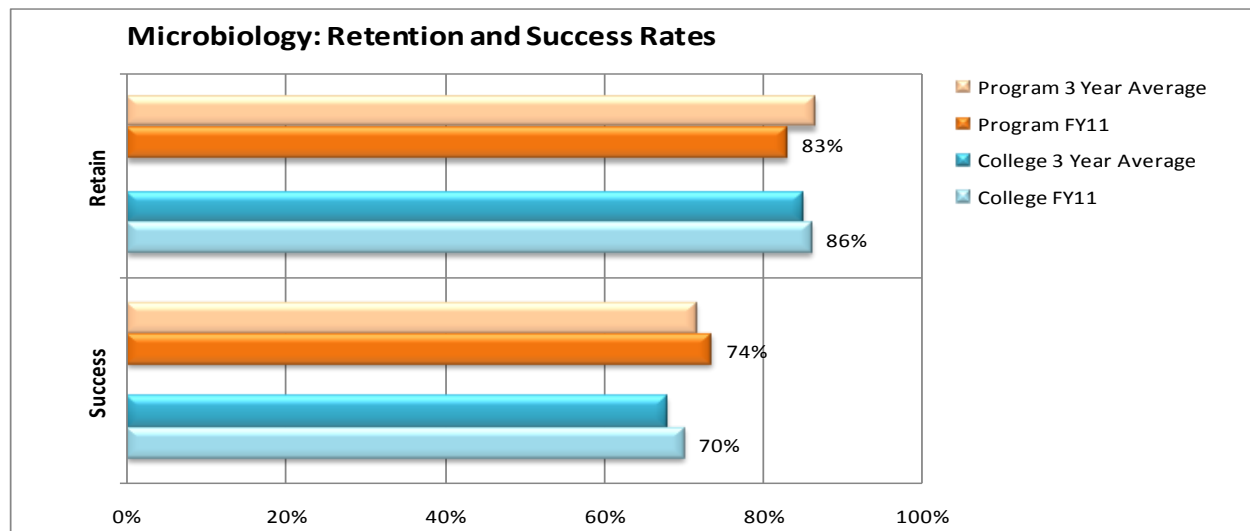
### E2: Student Success Summary

The following two tables summarize the detail information provided in the *Appendix C - Program Review Student Success Report*. The first table shows the number of students. The second table shows the percentage of students. Both tables show the distribution of student grades by year for the program (subject). They show the number of students who were counted at census, completed the class (retention), and were successful. The “3 Year Average” was computed to provide a trend benchmark to compare the prior three year expenses to the FY11 success measures. The “College” success percentages are included to compare the results of the program to the results of the college.

Microbiology												
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
MICR	FY08	92	67	69	-	34	23	29	1	315	286	228
MICR	FY09	99	88	43	-	16	27	42	-	315	273	230
MICR	FY10	112	73	58	-	19	29	58	-	350	291	243
MICR	3 Year Avg	101	76	57	-	23	26	43	-	327	283	234
MICR	FY11	118	82	33	-	11	19	54	-	317	263	233
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
MICR	FY08	29%	21%	22%	0%	11%	7%	9%	0%		91%	72%
MICR	FY09	31%	28%	14%	0%	5%	9%	13%	0%		87%	73%
MICR	FY10	32%	21%	17%	0%	5%	8%	17%	0%		83%	69%
MICR	3 Year Avg	31%	23%	17%	0%	7%	8%	13%	0%		87%	72%
MICR	FY11	37%	26%	10%	0%	3%	6%	17%	0%		83%	74%
College	3 Year Avg	33%	19%	12%	5%	5%	10%	15%	2%		85%	68%
College	FY11	33%	20%	13%	3%	5%	10%	14%	2%		86%	70%

### E3: Retention and Success Rates

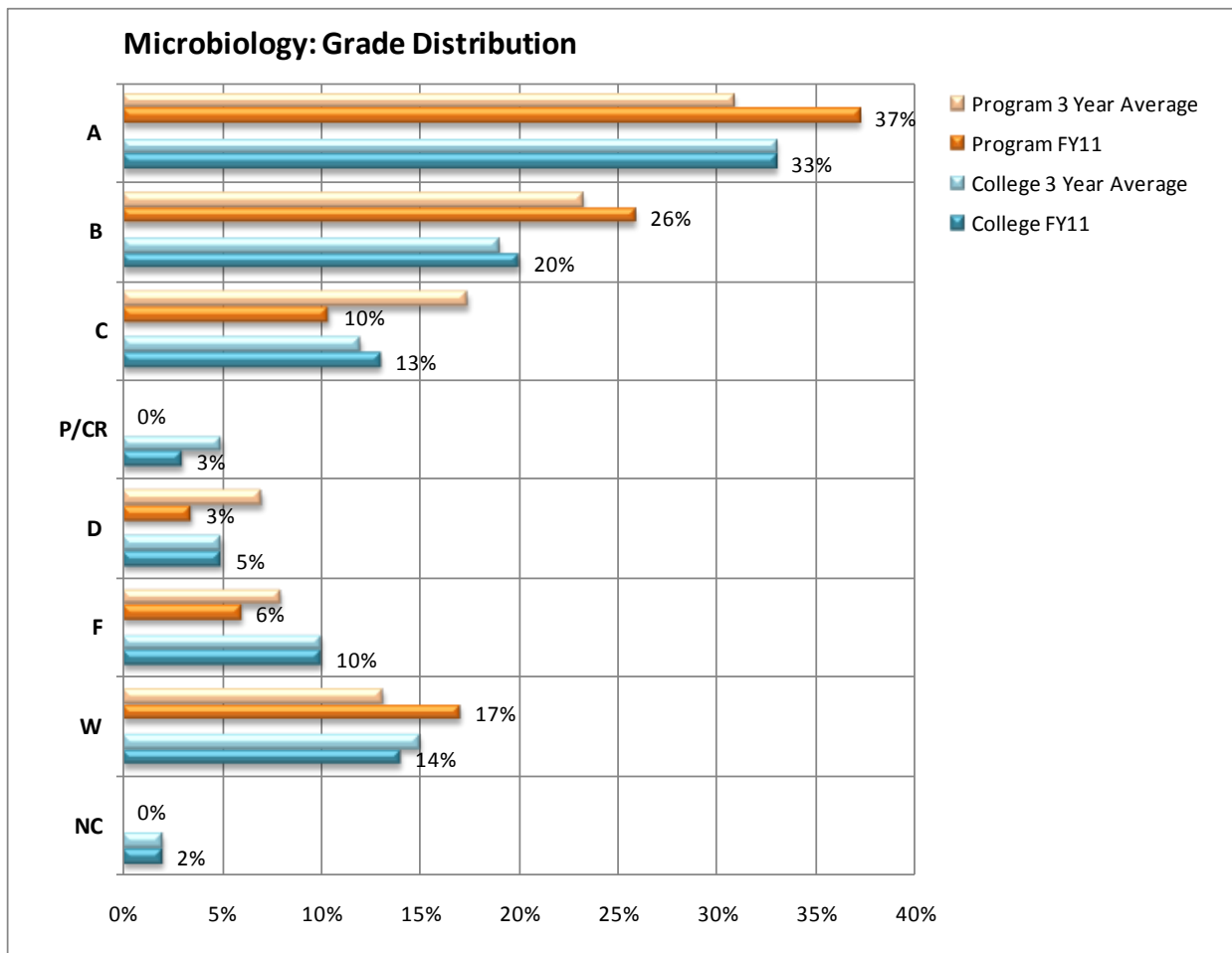
This chart illustrates the retention and success rates of students who were counted at census. Each measure has four bars. The first bar represents the program’s prior three year average percent. The second bar shows last year’s (FY11) percent. The third and fourth bars represent the overall college percents.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### E4: Grade Distribution

This chart illustrates the program's distribution of grades (by subject). Each grade has four bars. The first bar represents the program's prior three year average percent of grades. The second bar shows last year's (FY11) grade distribution percents. The third and fourth bars represent the overall college distribution percents.



### E5: Student Success Detail Report

The program student success detail information is available in *Appendix C – Program Review Student Success Report*. This report is a PDF document and is searchable. The student success information was extracted from the District's Banner Student System. The student success information includes all information associated with the program's subject codes. The *Program Review Student Success Report* is sorted by subject code (alphabetical order) and includes the following sections: comparative summary and course detail by term. The following table defines the terminology.

## **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

### E6: Interpretation of Program Retention, Student Success, and Grade Distribution

Retention and success rates for Microbiology are not significantly different from those of the College overall. Since the overwhelming majority of Microbiology students (approximately 94% in informal surveys) intend to become nurses, and since many people's health will depend on these students' knowledge and abilities, it is critically important that we do not relax academic rigor in our efforts to increase student retention or success. Given the challenging nature of this course, in fact, current retention and success rates seem surprisingly high.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### E2: Student Success Summary

The following two tables summarize the detail information provided in the *Appendix C - Program Review Student Success Report*. The first table shows the number of students. The second table shows the percentage of students. Both tables show the distribution of student grades by year for the program (subject). They show the number of students who were counted at census, completed the class (retention), and were successful. The “3 Year Average” was computed to provide a trend benchmark to compare the prior three year expenses to the FY11 success measures. The “College” success percentages are included to compare the results of the program to the results of the college.

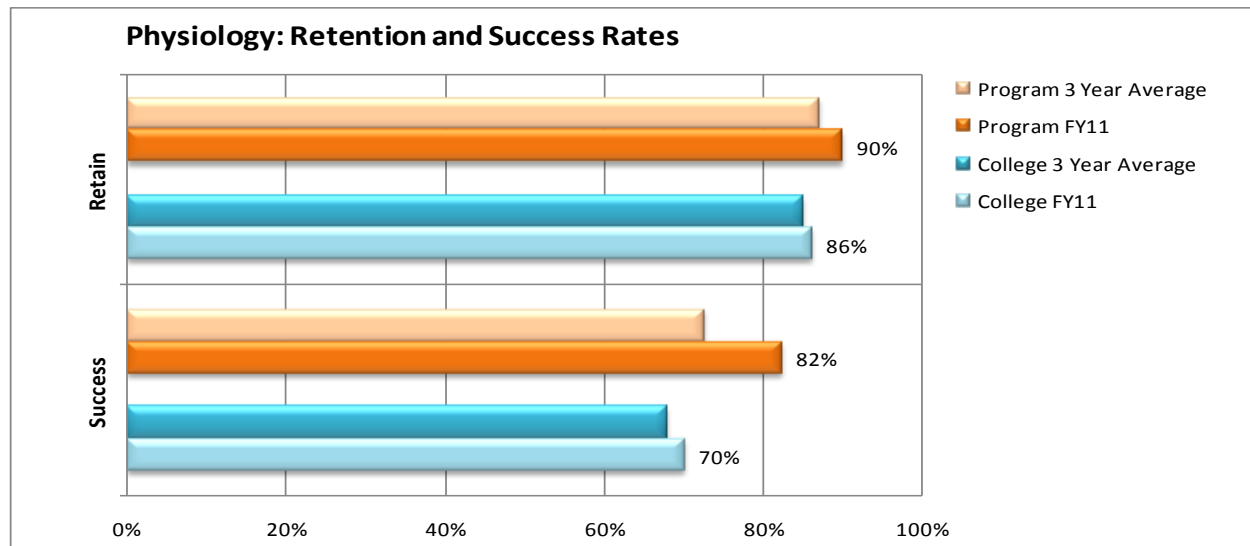
Physiology												
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
PHSO	FY08	70	90	77	-	20	20	41	-	318	277	237
PHSO	FY09	72	102	66	-	22	37	43	-	343	299	240
PHSO	FY10	77	102	80	-	18	28	49	-	354	305	259
PHSO	3 Year Avg	73	98	74	-	20	28	44	-	338	294	245
PHSO	FY11	102	121	69	-	14	11	36	2	355	319	292

Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
PHSO	FY08	22%	28%	24%	0%	6%	6%	13%	0%		87%	75%
PHSO	FY09	21%	30%	19%	0%	6%	11%	13%	0%		87%	70%
PHSO	FY10	22%	29%	23%	0%	5%	8%	14%	0%		86%	73%
PHSO	3 Year Avg	22%	29%	22%	0%	6%	8%	13%	0%		87%	72%
PHSO	FY11	29%	34%	19%	0%	4%	3%	10%	1%		90%	82%
College	3 Year Avg	33%	19%	12%	5%	5%	10%	15%	2%		85%	68%
College	FY11	33%	20%	13%	3%	5%	10%	14%	2%		86%	70%

### E3: Retention and Success Rates

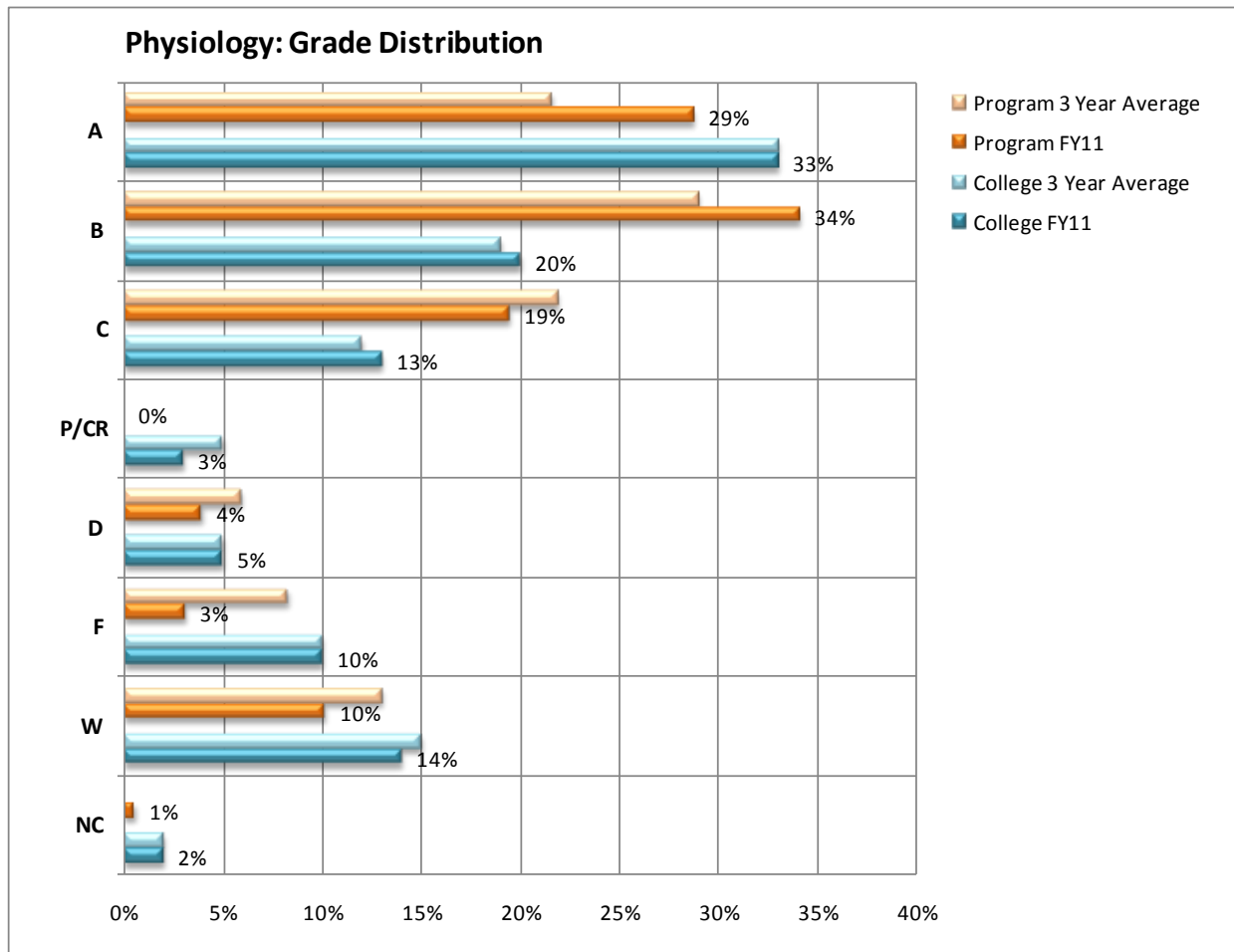
This chart illustrates the retention and success rates of students who were counted at census. Each measure has four bars. The first bar represents the program’s prior three year average percent. The second bar shows last year’s (FY11) percent. The third and fourth bars represent the overall college percents.



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### E4: Grade Distribution

This chart illustrates the program's distribution of grades (by subject). Each grade has four bars. The first bar represents the program's prior three year average percent of grades. The second bar shows last year's (FY11) grade distribution percents. The third and fourth bars represent the overall college distribution percents.



### E5: Student Success Detail Report

The program student success detail information is available in *Appendix C – Program Review Student Success Report*. This report is a PDF document and is searchable. The student success information was extracted from the District's Banner Student System. The student success information includes all information associated with the program's subject codes. The *Program Review Student Success Report* is sorted by subject code (alphabetical order) and includes the following sections: comparative summary and course detail by term. The following table defines the terminology.

## **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

### E6: Interpretation of Program Retention, Student Success, and Grade Distribution

The retention rate in Human Physiology for FY 2011 was at 90%, higher than the college level of 86% and up from the FY 2008-2010 three year average of 87%. Likewise, the success rate for Human Physiology for FY 2011 was at 82%, well above the 70% college level for FY 2011 and up from the three year Human Physiology FY 2008-2010 average of 72%. These changes reflect improvements in both retention as well as success rates of students while increasing overall efficiency. More students are being served by the same number of teaching sections (14) in FY 2011 as compared to the FY 2008-2010 average, and concomitantly the retention and success rates have been increasing. More grades of A and B were given in FY '11 than in the program three year average, but the number of A grades continues to be below the college average both for FY '11 as well as the three year average. More B grades were earned in FY '11 than both the three year average as well as the college numbers, perhaps due to the quality of the students enrolled in FY '11.

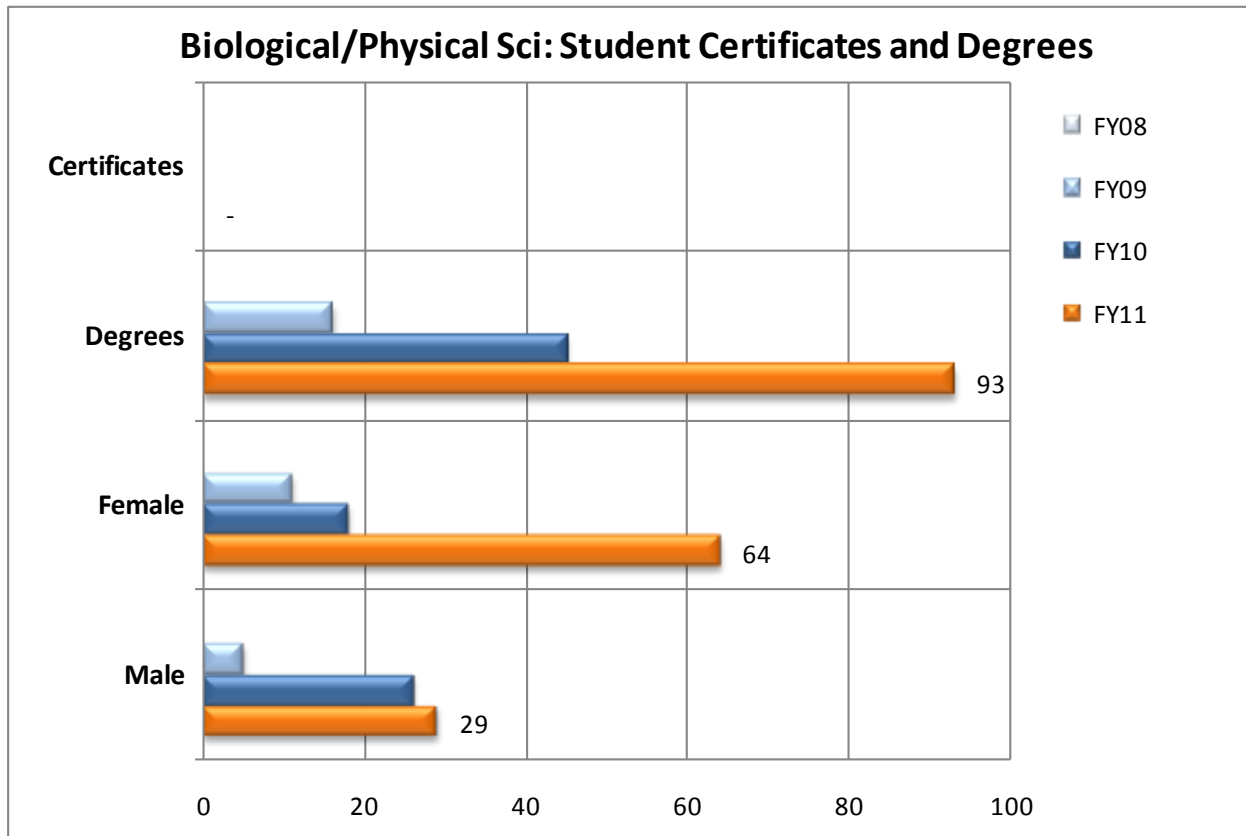


## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### F1: Program Completion – Student Awards

This table shows the number of students who completed a program certificate or degree during the fiscal year. Gender distribution is included. The following chart illustrates this information.

Program	FY	Certificates	Degrees	Female	Male
Biological & Physical Sci	FY08	-	-	-	-
Biological & Physical Sci	FY09	-	16	11	5
Biological & Physical Sci	FY10	-	45	18	26
Biological & Physical Sci	FY11	-	93	64	29
<b>Total Awards in 4 Years</b>		-	<b>154</b>	<b>93</b>	<b>60</b>

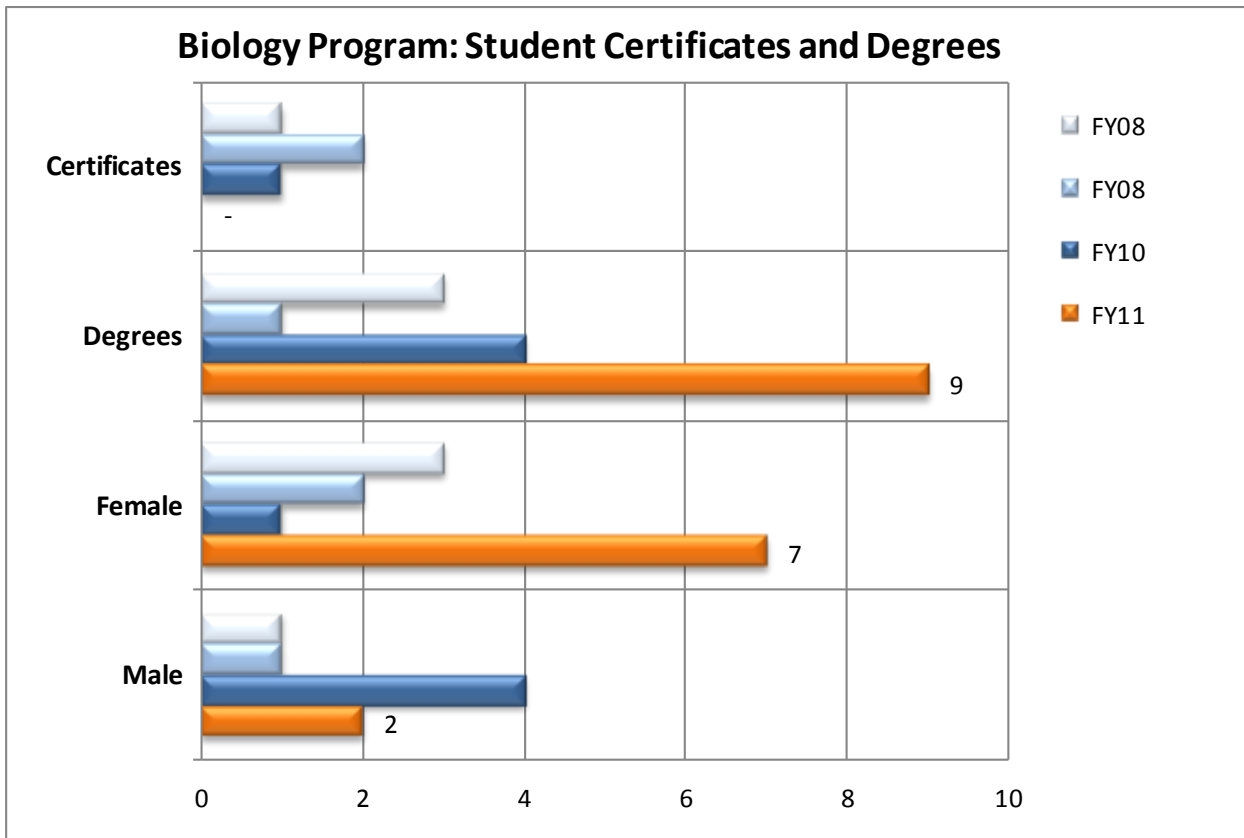


**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

F1: Program Completion – Student Awards

This table shows the number of students who completed a program certificate or degree during the fiscal year. Gender distribution is included. The following chart illustrates this information.

Biology Program					
Program	FY	Certificates	Degrees	Female	Male
Biology Program	FY08	1	3	3	1
Biology Program	FY08	2	1	2	1
Biology Program	FY10	1	4	1	4
Biology Program	FY11	-	9	7	2
<b>Total Awards in 4 Years</b>		<b>4</b>	<b>17</b>	<b>13</b>	<b>8</b>



F2: Interpretation of the Program Completion Information

The number of degrees in FY11 is at an all-time high representing a more than 200% increase over the prior year. There are more females enrolled in the program which may be due to the gender bias in higher education.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### G1: Student Demographics Summary Tables

This table shows the program and college census enrollments for each demographic category. It also shows the average age of the students. The program FY11 results can be compared to its prior three year average, the college FY11 results, and the college prior three year average.

Anatomy													
Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
ANAT	FY08	153	159	17	19	6	31	3	35	308	114	1	28
ANAT	FY09	145	183	21	14	7	51	5	36	343	115	4	28
ANAT	FY10	189	195	27	10	6	39	6	33	367	137	1	26
<b>ANAT</b>	<b>3 Year Avg</b>	<b>162</b>	<b>179</b>	<b>22</b>	<b>14</b>	<b>6</b>	<b>40</b>	<b>5</b>	<b>35</b>	<b>339</b>	<b>122</b>	<b>2</b>	<b>27</b>
<b>ANAT</b>	<b>FY11</b>	<b>173</b>	<b>197</b>	<b>21</b>	<b>12</b>	<b>4</b>	<b>44</b>	<b>4</b>	<b>24</b>	<b>361</b>	<b>118</b>	<b>-</b>	<b>27</b>
College	3 Year Avg	11,806	11,169	988	1,005	217	827	403	2,302	15,888	12,694	134	27
<b>College</b>	<b>FY11</b>	<b>13,034</b>	<b>10,566</b>	<b>977</b>	<b>1,040</b>	<b>196</b>	<b>886</b>	<b>402</b>	<b>1,688</b>	<b>15,734</b>	<b>13,014</b>	<b>40</b>	<b>24</b>

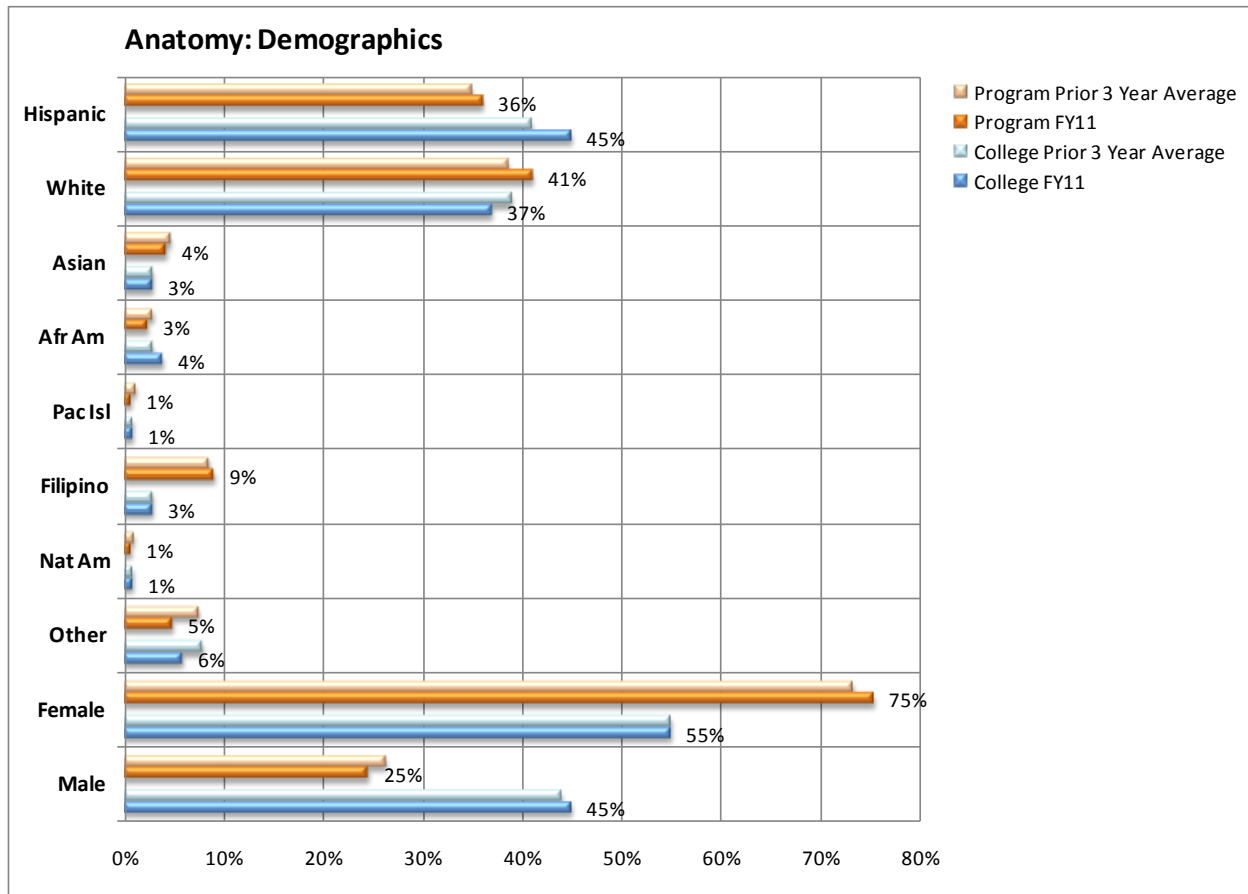
This table shows the program and college percentage of census enrollments for each demographic category.

Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
ANAT	FY08	36%	38%	4%	4%	1%	7%	1%	8%	73%	27%	0%	28
ANAT	FY09	31%	40%	5%	3%	2%	11%	1%	8%	74%	25%	1%	28
ANAT	FY10	37%	39%	5%	2%	1%	8%	1%	7%	73%	27%	0%	26
<b>ANAT</b>	<b>3 Year Avg</b>	<b>35%</b>	<b>39%</b>	<b>5%</b>	<b>3%</b>	<b>1%</b>	<b>9%</b>	<b>1%</b>	<b>8%</b>	<b>73%</b>	<b>26%</b>	<b>0%</b>	<b>27</b>
<b>ANAT</b>	<b>FY11</b>	<b>36%</b>	<b>41%</b>	<b>4%</b>	<b>3%</b>	<b>1%</b>	<b>9%</b>	<b>1%</b>	<b>5%</b>	<b>75%</b>	<b>25%</b>	<b>0%</b>	<b>27</b>
College	3 Year Avg	41%	39%	3%	3%	1%	3%	1%	8%	55%	44%	0%	27
<b>College</b>	<b>FY11</b>	<b>45%</b>	<b>37%</b>	<b>3%</b>	<b>4%</b>	<b>1%</b>	<b>3%</b>	<b>1%</b>	<b>6%</b>	<b>55%</b>	<b>45%</b>	<b>0%</b>	<b>24</b>

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### G2: Student Demographics Chart

This chart illustrates the program's percentages of students by ethnic group. . Each group has four bars. The first bar represents the program's prior three year percent. The second bar shows last year's (FY11) percent. The third and fourth bars represent the overall college percents.



### G3: Student Demographics Detail Report

The program student success detail information is available in *Appendix D – Program Review Student Demographics Report*. This report is a PDF document and is searchable. The student success information was extracted from the District's Banner Student System. The student demographic information includes all information associated with the program's subject codes. The *Program Review Student Demographics Report* is sorted by subject code (alphabetical order) and includes the following sections: comparative summary by year, and detail demographics by term and course.

### G4: Interpretation of the Program Demographic Information

Most demographic data for Anatomy are not significantly different than the corresponding College data. Two potentially significant exceptions to this may be found in this program's lower Hispanic:white ratio and this program's higher female:male ratio. The lower Hispanic:white ratio is likely due to broader educational trends that are beyond the scope of this program or this document to address. The higher

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**

2011-2012

female:male ratio likely reflects a higher female:male ratio in Nursing programs; if so, it is also beyond the scope of this program or this document to address.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### **G1: Student Demographics Summary Tables**

This table shows the program and college census enrollments for each demographic category. It also shows the average age of the students. The program FY11 results can be compared to its prior three year average, the college FY11 results, and the college prior three year average.

Biology													
Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
BIOL	FY08	710	823	69	54	6	68	31	172	1,230	697	6	26
BIOL	FY09	914	850	76	62	20	83	38	175	1,337	879	2	25
BIOL	FY10	1,024	1,015	73	70	29	84	25	203	1,549	968	6	24
<b>BIOL</b>	<b>3 Year Avg</b>	<b>883</b>	<b>896</b>	<b>73</b>	<b>62</b>	<b>18</b>	<b>78</b>	<b>31</b>	<b>183</b>	<b>1,372</b>	<b>848</b>	<b>5</b>	<b>25</b>
<b>BIOL</b>	<b>FY11</b>	<b>1,103</b>	<b>949</b>	<b>97</b>	<b>70</b>	<b>23</b>	<b>83</b>	<b>38</b>	<b>155</b>	<b>1,605</b>	<b>913</b>	<b>-</b>	<b>24</b>
College	3 Year Avg	11,806	11,169	988	1,005	217	827	403	2,302	15,888	12,694	134	27
<b>College</b>	<b>FY11</b>	<b>13,034</b>	<b>10,566</b>	<b>977</b>	<b>1,040</b>	<b>196</b>	<b>886</b>	<b>402</b>	<b>1,688</b>	<b>15,734</b>	<b>13,014</b>	<b>40</b>	<b>24</b>

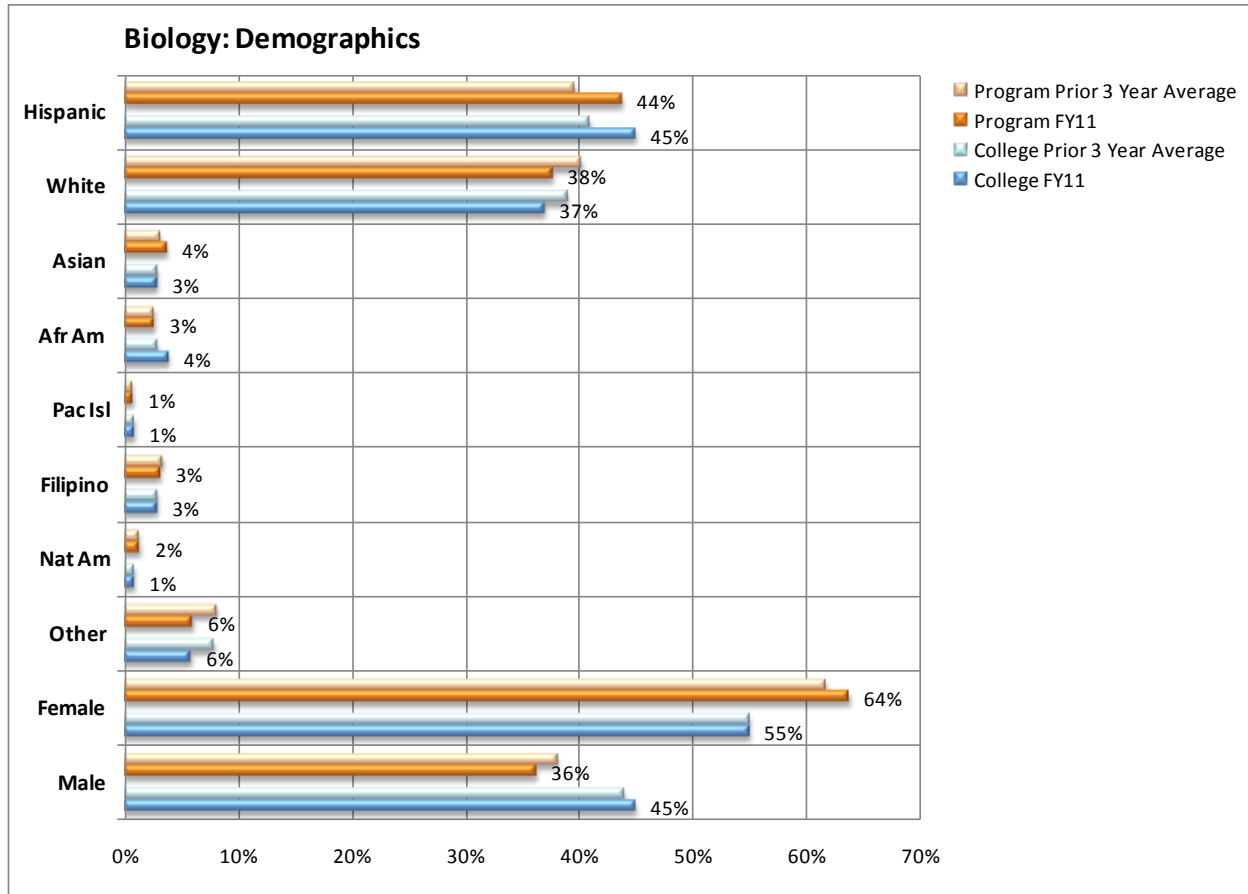
This table shows the program and college percentage of census enrollments for each demographic category.

Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
BIOL	FY08	37%	43%	4%	3%	0%	4%	2%	9%	64%	36%	0%	26
BIOL	FY09	41%	38%	3%	3%	1%	4%	2%	8%	60%	40%	0%	25
BIOL	FY10	41%	40%	3%	3%	1%	3%	1%	8%	61%	38%	0%	24
<b>BIOL</b>	<b>3 Year Avg</b>	<b>40%</b>	<b>40%</b>	<b>3%</b>	<b>3%</b>	<b>1%</b>	<b>4%</b>	<b>1%</b>	<b>8%</b>	<b>62%</b>	<b>38%</b>	<b>0%</b>	<b>25</b>
<b>BIOL</b>	<b>FY11</b>	<b>44%</b>	<b>38%</b>	<b>4%</b>	<b>3%</b>	<b>1%</b>	<b>3%</b>	<b>2%</b>	<b>6%</b>	<b>64%</b>	<b>36%</b>	<b>0%</b>	<b>24</b>
College	3 Year Avg	41%	39%	3%	3%	1%	3%	1%	8%	55%	44%	0%	27
<b>College</b>	<b>FY11</b>	<b>45%</b>	<b>37%</b>	<b>3%</b>	<b>4%</b>	<b>1%</b>	<b>3%</b>	<b>1%</b>	<b>6%</b>	<b>55%</b>	<b>45%</b>	<b>0%</b>	<b>24</b>

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### G2: Student Demographics Chart

This chart illustrates the program's percentages of students by ethnic group. . Each group has four bars. The first bar represents the program's prior three year percent. The second bar shows last year's (FY11) percent. The third and fourth bars represent the overall college percents.



### G3: Student Demographics Detail Report

The program student success detail information is available in *Appendix D – Program Review Student Demographics Report*. This report is a PDF document and is searchable. The student success information was extracted from the District's Banner Student System. The student demographic information includes all information associated with the program's subject codes. The *Program Review Student Demographics Report* is sorted by subject code (alphabetical order) and includes the following sections: comparative summary by year, and detail demographics by term and course.

### G4: Interpretation of the Program Demographic Information

The biology program generally reflects the college data with a slight skew in the gender data that is possibly attributable to the pre-nursing students.

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### **G1: Student Demographics Summary Tables**

This table shows the program and college census enrollments for each demographic category. It also shows the average age of the students. The program FY11 results can be compared to its prior three year average, the college FY11 results, and the college prior three year average.

Microbiology													
Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
MICR	FY08	103	125	20	8	1	25	5	28	254	61	-	31
MICR	FY09	80	127	19	8	4	40	1	36	250	58	7	29
MICR	FY10	118	133	20	10	4	39	3	23	288	62	-	29
<b>MICR</b>	<b>3 Year Avg</b>	<b>100</b>	<b>128</b>	<b>20</b>	<b>9</b>	<b>3</b>	<b>35</b>	<b>3</b>	<b>29</b>	<b>264</b>	<b>60</b>	<b>2</b>	<b>30</b>
<b>MICR</b>	<b>FY11</b>	<b>102</b>	<b>144</b>	<b>15</b>	<b>5</b>	<b>2</b>	<b>24</b>	<b>-</b>	<b>25</b>	<b>268</b>	<b>49</b>	<b>-</b>	<b>27</b>
College	3 Year Avg	11,806	11,169	988	1,005	217	827	403	2,302	15,888	12,694	134	27
<b>College</b>	<b>FY11</b>	<b>13,034</b>	<b>10,566</b>	<b>977</b>	<b>1,040</b>	<b>196</b>	<b>886</b>	<b>402</b>	<b>1,688</b>	<b>15,734</b>	<b>13,014</b>	<b>40</b>	<b>24</b>

This table shows the program and college percentage of census enrollments for each demographic category.

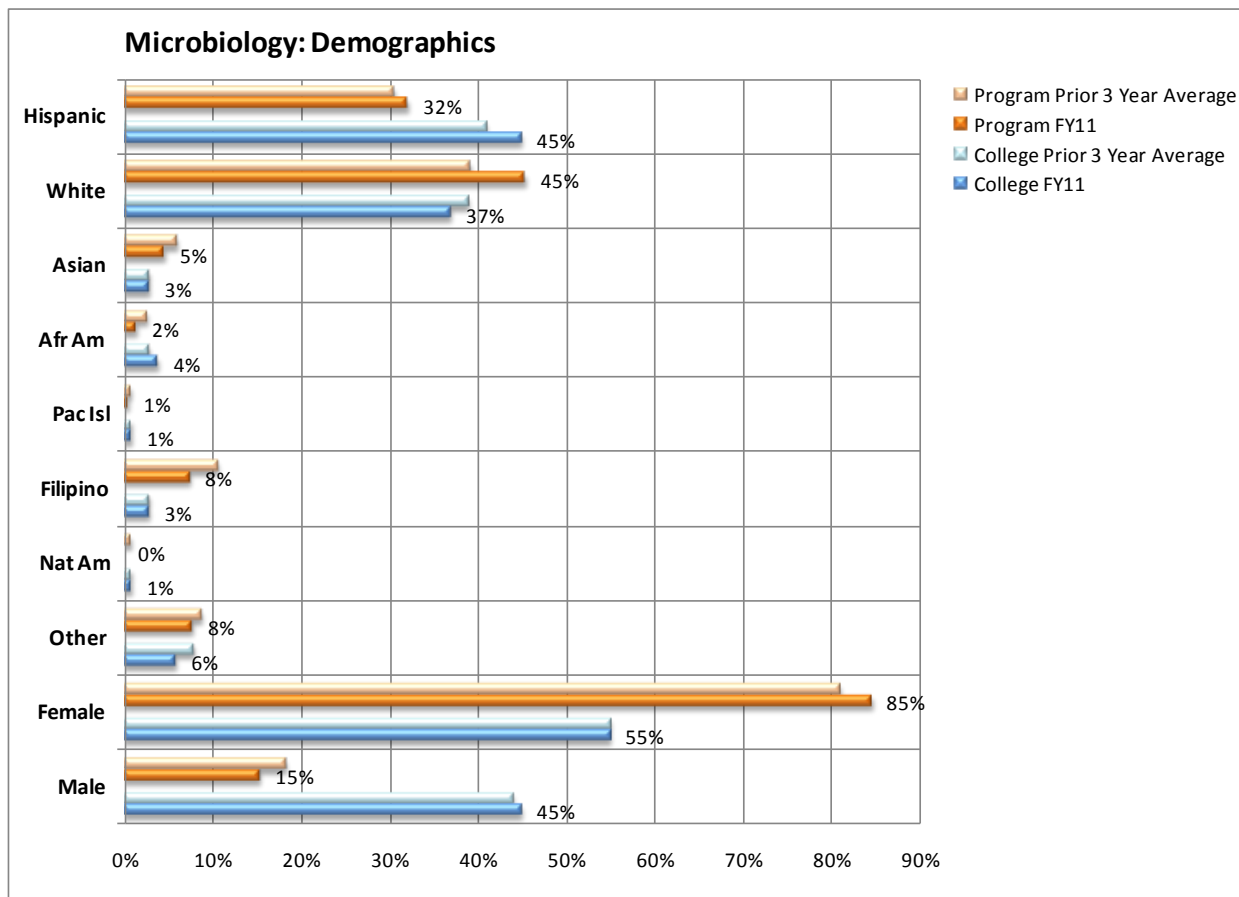
Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
MICR	FY08	33%	40%	6%	3%	0%	8%	2%	9%	81%	19%	0%	31
MICR	FY09	25%	40%	6%	3%	1%	13%	0%	11%	79%	18%	2%	29
MICR	FY10	34%	38%	6%	3%	1%	11%	1%	7%	82%	18%	0%	29
<b>MICR</b>	<b>3 Year Avg</b>	<b>31%</b>	<b>39%</b>	<b>6%</b>	<b>3%</b>	<b>1%</b>	<b>11%</b>	<b>1%</b>	<b>9%</b>	<b>81%</b>	<b>18%</b>	<b>1%</b>	<b>30</b>
<b>MICR</b>	<b>FY11</b>	<b>32%</b>	<b>45%</b>	<b>5%</b>	<b>2%</b>	<b>1%</b>	<b>8%</b>	<b>0%</b>	<b>8%</b>	<b>85%</b>	<b>15%</b>	<b>0%</b>	<b>27</b>
College	3 Year Avg	41%	39%	3%	3%	1%	3%	1%	8%	55%	44%	0%	27
<b>College</b>	<b>FY11</b>	<b>45%</b>	<b>37%</b>	<b>3%</b>	<b>4%</b>	<b>1%</b>	<b>3%</b>	<b>1%</b>	<b>6%</b>	<b>55%</b>	<b>45%</b>	<b>0%</b>	<b>24</b>



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review 2011-2012

### G2: Student Demographics Chart

This chart illustrates the program's percentages of students by ethnic group. . Each group has four bars. The first bar represents the program's prior three year percent. The second bar shows last year's (FY11) percent. The third and fourth bars represent the overall college percents.



### G3: Student Demographics Detail Report

The program student success detail information is available in *Appendix D – Program Review Student Demographics Report*. This report is a PDF document and is searchable. The student success information was extracted from the District's Banner Student System. The student demographic information includes all information associated with the program's subject codes. The *Program Review Student Demographics Report* is sorted by subject code (alphabetical order) and includes the following sections: comparative summary by year, and detail demographics by term and course.

### G4: Interpretation of the Program Demographic Information

Most demographic data for Microbiology are not significantly different than the corresponding College data. Two potentially significant exceptions to this may be found in this program's lower Hispanic:white

## **Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review**

2011-2012

ratio and this program's higher female:male ratio. The lower Hispanic:white ratio is likely due to broader educational trends that are beyond the scope of this program or this document to address. The higher female:male ratio likely reflects a higher female:male ratio in Nursing programs; if so, it is also beyond the scope of this program or this document to address.

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## 4. Performance Assessment

### A1: Program-Level Student Learning Outcomes

Program-Level Student Learning Outcome 1	Performance Indicators
Contrast scientific and non-scientific ideas	Students will recognize the fundamental characteristics of scientific investigation including the steps of the classic scientific method. Students will be able to determine where non-scientific ideas fail to replicate this process by determining if ideas about natural systems rely on supernatural causation and/or lack testable hypotheses.
<b>Operating Information</b>	
This PLO has not yet been assessed, but can be assessed in future terms in a number of our courses including majors and non-majors courses.	
<b>Analysis – Assessment</b>	
Not currently available	

Program-Level Student Learning Outcome 2	Performance Indicators
Formulate and evaluate a hypothesis	Students in BIOL V01L write a paper in a scientific paper format. Papers are checked to determine if students address both null and alternative hypotheses in both the Introduction and Discussion sections
<b>Operating Information</b>	
102/208 student performed at the excellent level, clearly stating and analyzing both a null and alternative hypothesis. All instructors noted that most students that did not meet the excellent criteria performed at the satisfactory level. Students generally had more difficulty with the null hypothesis because this was their first exposure to the term.	
<b>Analysis – Assessment</b>	
We need to increase the amount of hypothesis testing performed by the students in BIOL V01L. We have already begun to increase student exposure by increasing the use of null hypotheses in labs throughout the term. We need to assess this SLO in other courses to see if students retain this knowledge as they progress through the program.	

Program-Level Student Learning Outcome 3	Performance Indicators
Discuss the mechanisms of and evidence for evolution	Students will be able to list and explain or list and contrast mechanisms of evolution (e.g. natural selection and genetic drift). Students will be able to provide examples of evidence that supports evolutionary theory. Such examples may be general (e.g. transition fossils) or specific (e.g. the features of <i>Tiktaalik roseae</i> that are recognized as transitional between Sarcopterygian fish and tetrapods).

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

Operating Information
This PLO has not yet been assessed, but can be assessed in future terms in a number of our courses including majors and non-majors courses.
Analysis – Assessment
Not currently available

Program-Level Student Learning Outcome 4	Performance Indicators
Outline the basic processes of the central dogma of molecular biology	Students will be able to determine complimentary DNA, mRNA, and tRNA, and amino acid sequences (using a table) from a given DNA sequence and correctly associate these outcomes with the processes of DNA replication, transcription, and translation.
Operating Information	
This PLO has not yet been assessed, but can be assessed in future terms in a number of our courses including majors and non-majors courses.	
Analysis – Assessment	
Not currently available	

Program-Level Student Learning Outcome 5	Performance Indicators
Demonstrate mastery of key biological terms, processes, and techniques	BIOLV01 - Homework assignments on Mastering Biology were given in the form of BioFlix Activity. They were: Tour of an Animal Cell – Organelle Functions and Tour of a Plant Cell – Organelle Functions. Students answered questions with the use of animations. The goal was set for 70% students to achieve a C (70%) or higher. PHSO V01- Students were required to answer ten questions on an exam or quiz related to conduction of nerve impulses and neuronal transport. (Other examples of Performance Indicator data may be found in other CLOAS at the SLO Sharepoint site, under Biology Department.)
Operating Information	
In BIOLV01, 384/463 (83%) performed at C level (70%) or higher. This was a sum of 4 lecture courses taught by 3 different lecture instructors. PHSO V01- 47% of students from 6 physiology sections performed at the desired outcome level of 80% or higher on the ten questions. Students performed better on a 10 question quiz than on 10 questions from a larger multiple choice exam of nearly 80 questions. (Other examples of Operating Information data may be found in other CLOAS at the SLO Sharepoint site, under Biology Department.)	

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

Analysis – Assessment
<p>BIOLV01 - Students who completed the assignment generally did well beyond the goal on the assessment so the goal can be set higher.</p> <p>We need to work on increasing student participation on the assignment in general. Many students were not starting the HW assignments. This semester, all lecture instructors have added an extra credit 2 pts assignment in the beginning of the semester (first 2 weeks) to get students to log onto and start doing Mastering Biology. This may help increase student participation in the HW assignments</p> <p>PHSO V01- Many students have difficulty understanding difficult and complex physiological mechanisms. Study habits and time on task of many students are not appropriate to the achievement of desired success. Students require increased study time and improved study skills.</p> <p>(Other examples of Analysis-Assessment data may be found in other CLOAS at the SLO Sharepoint site, under Biology Department.)</p>

Program-Level Student Learning Outcome 6	Performance Indicators
<p>Identify key entities at multiple levels of biological organization</p>	<p>ANATV01-Ten questions were selected from a laboratory practicum in ANAT V01. Students were given one minute to answer two questions. Questions consisted of tagged skeletal landmarks located at multiple stations around the room.</p> <p>BIOL V04: a selected set of multiple choice exam questions on cell structure and function were chosen.</p> <p>BIOLV14 –Lab practical focused on identification of plants and animals. The lab practical was 40 questions in the form of pictures, live organisms (plants, animals), as well as prepared specimens (ex: jars) for identification purposes. The goal was set for 70% students to achieve a C (70%) or higher.</p> <p>BIOL V23/AG V03: a selected set of multiple choice questions were selected from weekly Tests (#5 &amp; #6) on plant structure were selected.</p> <p>(Other examples of Performance Indicator data may be found in other CLOAS at the SLO Sharepoint site, under Biology Department.)</p>

Operating Information
<p>In ANAT V01 70.5% of 166 students from 9 anatomy sections (taught by four different instructors) achieved 80% or greater success at indentifying skeletal landmarks.</p> <p>BIOL V04: 70.6% of the students in 2 sections achieved a C level or higher.</p> <p>BIOLV14 - I found that 66.7% of students (14/21) performed at C (70%) level or higher BIOL V23/AG V03: 68.8% of the students achieved a C or higher.</p> <p>(Other examples of Operating Information data may be found in other CLOAS at the SLO Sharepoint site, under Biology Department.)</p>

Analysis – Assessment
<p>ANATV01-Students, at least within the pre-health track, are succeeding at a high level on lab practical examinations where they identify structures learned in that course. This SLO needs to be evaluated in other courses and at other levels of organization.</p> <p>BIOL V04: The students are learning this basic set of information needed for success with the class. Of course</p>

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

it would be better to have a higher percentage. Revision of the activities before the exam will be examined.  
BIOLV14 - My scores on this assessment were very bimodal, which suggests I should have a practice quiz or a smaller version of the quiz earlier in the semester (or more practice) to prepare students who did not perform well. My findings, however, was very close to the original goal. One more student with a 70% or higher would have put me at my goal.

BIOL V23/AG V03: The non-majors students in this class have very different backgrounds and reasons for attending this class. Some come in with other college science course experience but many come in with no such experience. To be more helpful, particularly for the ones with little or no background, revision of the activities before the exam will be examined.

(Other examples of Analysis-Assessment data may be found in other CLOAS at the SLO Sharepoint site, under Biology Department.)

Program-Level Student Learning Outcome 7	Performance Indicators
Discuss the primary ethical issues related to biology	Students will recognize how humans interact with biological organization at multiple levels (e.g. stem cell harvesting and research or the extraction and use of fossil fuels) and discuss the consequences of these interactions to society.
<b>Operating Information</b>	
This PLO has not yet been assessed, but can be assessed in future terms in a number of our courses including majors and non-majors courses. This course is a primary focus of BIOL V10 Introduction to Environmental Issues.	
<b>Analysis – Assessment</b>	
Not currently available	

Program-Level Student Learning Outcome 8	Performance Indicators
Describe the significance of protein production through genetic regulation to the field of biotechnology	70% of students will answer appropriately to an exam short answer question on change in outcomes for patient population having a specific disease (such as hemophilia) that now has a product available that is made in a genetically based biological system.
<b>Operating Information</b>	
<b>Analysis – Assessment</b>	
Not currently available	

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### 4B: Student Success Outcomes

Student Success Outcome 1	Performance Indicators
The program will attempt to address changes to its retention rate if required. We will attempt to improve retention rates as needed.	The program will monitor the retention rate and address any concerns that arise.
<b>Operating Information</b>	
Institutional researcher will provide needed data.	
<b>Analysis – Assessment</b>	
Analysis is needed.	

Student Success Outcome 2	Performance Indicators
The program will increase its retention relative to the retention rate if required.	The program will monitor the retention rate and address any concerns that arise.
<b>Operating Information</b>	
Institutional researcher will provide needed data.	
<b>Analysis – Assessment</b>	
Analysis will be needed when data are available.	

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**

2011-2012

<b>Student Success Outcome 3</b>	<b>Performance Indicators</b>
The program will monitor the student success rates relative to the average of the <b>program's</b> prior three-year success rates.	The program will monitor the student success rate and address any concerns that arise.
<b>Operating Information</b>	
Institutional researcher will provide needed data.	
<b>Analysis – Assessment</b>	
Analysis will be needed when data are available.	

<b>Student Success Outcome 4</b>	<b>Performance Indicators</b>
The program will increase the student success rates from the average of the <b>college's</b> prior three-year success rates. The student success rate is the percentage of students at census who receive a grade of C or better.	The program student success will increase by 5% over the average of the <b>college's</b> student success rate for the prior three years.
<b>Operating Information</b>	
Institutional researcher will provide needed data.	
<b>Analysis – Assessment</b>	
Analysis will be needed when data are available.	



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

Student Success Outcome 5	Performance Indicators
Students will complete the program earning certificates and/or degrees.	Increase the number of students earning a certificate.
<b>Operating Information</b>	
According to the data students have earned 21 degrees or certificates (13 in Biology, 8 in Biotech) in the last 4 years. Many of our students do not seek degrees but instead seek transfer opportunities or to earn the pre-requisites for health programs such as nursing.	
<b>Analysis – Assessment</b>	
Many of our students that take multiple courses in our program are not currently served by a degree or certificate ate of achievement. We will study the option of providing a certificate to students that complete the common pre-health sequence including BIOL V01, BIOL V01L, ANAT V01, PHSO V01, and MICR V01. Such a certificate may help the students visualize their pathway to their chosen profession and therefore increase student retention and success.	

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### C. Program Operating Outcomes

Program Operating Outcome 1	Performance Indicators
The program will strive to reach and maybe exceed WSCH/FTEF above the 525 goal set by the district when possible.	The program will reach the efficiency goal set by the district.
<b>Operating Information</b>	
<b>Analysis – Assessment</b>	
Some of our courses cannot meet the 525 goal set by the district. Many of our lab sections are held in rooms with a cap of 24 yet a course of this size cannot meet the 525 goal. We suggest that goals for lab sections be reevaluated with the 24 student cap in mind. We will attempt to retain efficiencies where we can (e.g. ANAT and BIOL V01) by linking multiple labs to a single lecture or by having large lectures that offset unlinked labs. In general our program performs efficiently and is in need of additional sections to meet student demand.	

Program Operating Outcome 2	Performance Indicators
Inventory of instructional equipment is functional, current, and otherwise adequate to maintain a quality-learning environment. Inventory of all equipment over \$200 will be maintained and a replacement schedule will be developed. Service contracts for equipment over \$5000 will be budgeted if funds are available.	A current inventory of all equipment in the program will be maintained. Equipment having a value over \$5000 will have a service contract. A schedule for service life and replacement of outdated equipment will reflect the total cost of ownership.
<b>Operating Information</b>	
The inventory list is out of date and needs to be reviewed (3B1).	
<b>Analysis – Assessment</b>	
Not possible at this time.	

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

<b>Program Operating Outcome 3</b>	<b>Performance Indicators</b>
We will maintain a safe learning environment.	Chemical levels (e.g. Formaldehyde) will be maintained at safe levels as defined by HHS and OSHA. Equipment will be maintained to provide a safe classroom and preparation area environment.
<b>Operating Information</b>	
Formaldehyde safety standards changed in June 2011. We need to assess our current level of exposure within and outside of the cadaver room for both students and faculty/staff.	
<b>Analysis – Assessment</b>	
We have not yet performed an evaluation of current formaldehyde levels. We will do this and address other safety issues as they arise.	

<b>Program Operating Outcome 4</b>	<b>Performance Indicators</b>
The Biology program will continue to improve its curriculum and learning environment, The program should review curriculum and assess equipment needs including maintenance to assure student needs are being met.	The review of curriculum is to be guided by the course-level and program-level SLO evaluation process and students' success in meeting SLOs. New equipment needs will be assessed by following trends in biological and biotechnological pedagogy and analysis.
<b>Operating Information</b>	
The Biology Department assesses course-level, and will be assessing program-level SLOs to determine the effectiveness of instruction and to inform changes in curriculum. Equipment needs will be identified and discussed as we become aware of changes.	
<b>Analysis – Assessment</b>	
We have just started the process of accumulating SLO data, so we do not have sufficient data to make an analysis of this Program Operating Outcome. Departmental meetings will serve as forums for discussion about potential new equipment acquisitions.	

<b>Program Operating Outcome 5</b>	<b>Performance Indicators</b>
The program will maintain a full-time to part-time ratio of one-to-one or greater.	Full-time FTEF/Part-time FTEF ratio will be greater than 1.
<b>Operating Information</b>	
The current ratio of 5.04 Full-time FTEF to 6.38 Part-time FTEF (total of all 3C2 data from ANAT, BIOL, MICR, and PHSO sets, but not including the XL data at present) is less than 1.0.	
<b>Analysis – Assessment</b>	
We have not met our goal, so we will be applying for additional full-time faculty when possible and reasonable.	

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## 5. Findings

### Finding 1

Biology's highest financial concern is our aging and inadequate building infrastructure, and the aging of our capital equipment. We have 2 safety-related concerns: monitoring air quality and air-conditioning/better ventilation for our students and staff (Section A5, Program Operating Outcome 3), and inevitable equipment failures (eg: the autoclave – Section A5) that also would greatly reduce our ability to serve the college. In addition, we continue to have electrical system problems in the Biology lab areas as mentioned in several previous Program Reviews.

### Finding 2

At this time and under these current budget conditions, we may not request more full-time staffing as we hired one new FT faculty member in 2009 and an additional technical staff member recently (Section A5). However, we need more full-time instructional staff (Sections 3C2 & 3C3 and Program Operating Outcome 5).

### Finding 3

To address the need to discuss and collaborate on curriculum and SLO data, as well as discuss equipment needs, the Biology Department has set up regularly-scheduled monthly department meetings. When needed, departmental meetings are called more often. (Program Outcome 4)

### Finding 4

Biology has ranked 6 initiatives (in the next section of the document). Most of these are for new equipment.

- 1) New Body Model (largely for ANAT, ANPH and PHSO classes)
- 2) Improve demonstration microscopy (largely for MICR classes)
- 3) Revise activities leading up to and/or supporting assignment (for BIOL V01L classes) – Fish tank chillers
- 4) Natural skeletal materials and an x-ray viewer
- 5) Plant dryer and larger plant presses
- 6) Parscore system

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## 6. Initiatives

### Initiative 1

Health and safety of students and staff and the viability of the program at risk due to aging and inadequate building infrastructure, and the aging of our capital equipment.

### Initiative ID

### Links to Finding 1

Section A5, Program Operating Outcome 3

### Benefits:

Better health for all personnel (students and staff) in Life Sciences lab areas. Continued operation of the Biology Program for the foreseeable future.

### Request for Resources

Equipment

Monitoring equipment for formaldehyde levels in cadaver area, air conditioning/ventilation for all laboratory areas.

### Funding Sources

111 funds should be used for the monitoring equipment

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	X
Requires other resources (grants, etc.)	

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

**Initiative 2**

A full-time member of the Biology instructional staff

**Initiative ID**

**Links to Finding 2**

Sections 3C2 & 3C3 and Program Operating Outcome 5

**Benefits:**

**Request for Resources**

Equipment

None

**Funding Sources**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

**Initiative 3**

Regularly discuss and collaborate on curriculum and SLO data, as well as discuss equipment needs

**Initiative ID**

**Links to Finding 3**

Program Operating Outcome 4

**Benefits:**

**Request for Resources**

Equipment

None

**Funding Sources**

No new resources are required (use existing resources)	X
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

**Initiative 4 -1**

New Body Model (largely for ANAT, ANPH and PHSO classes)

**Initiative ID**

**Links to Finding 4**

Suggested by Mike Riddle (ANPH) on the CLOAS for ANPH V01, this would augment and eventually replace the current dilapidated model for these classes. Terry Pardee gave an estimate of \$8000 for this item. Section 2C2, Program –Level SLO 5 and 6, Program Operating Outcome 2

**Benefits:**

This model would benefit ANPH, ANAT, and PHSO courses. A full body model would be utilized daily for the majority of the term by up to 100 students a day. The model would see use in instructor demonstration, group learning, and examinations.

**Request for Resources**

Equipment

**Funding Sources**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	



# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## Initiative 4-2

Improve demonstration microscopy in a variety of classes

### Initiative ID

#### Links to Finding 4

Suggested by Robert Haines in the CLOAS for MICR V01, purchase of a higher-quality camera for displaying microscope images to students in the Microbiology laboratory would be an improvement for curriculum (estimated cost of \$2000 each). This has been revised to ask for 2 units if possible, as other instructors have mentioned the utility of this kind of equipment for other classes as well. Section 2C2, Program –Level SLO 5 and 6, Program Operating Outcome 2

#### Benefits

Students' retention of visual information, their success at oil-immersion microscopy, and their interpretation of experimental observations and data would all improve with the instructor's ability to display higher quality images in the Microbiology and other laboratories.

#### Request for Resources

Equipment

#### Funding Sources

Please check one or more of the following funding sources.

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## Initiative 4-3

Revise activities leading up to and/or supporting assignment (for BIOL V01L classes)

## Initiative ID

### Links to Finding -4

Suggested by Kamelia Algiers and Ty Gardner in the CLOAS for BIOL V01L: One possible addition to the fish lab could buy more time for instruction. Fish tank chillers (2@\$333 each) could keep the 10 and 17 degree aquaria at their assigned temperatures.

Cost: 2 of Pacific Coast Imports 113 HP mini aquarium chillers at \$333 ea = \$666

Section 2C2, Program –Level SLO 1, Program Operating Outcome 2

### Benefits

Although this would slightly alter the experiment it would save time required for acclimation and potentially reduce both shock on the fish and error in the data associated with changes in temperature or fish condition as a result of shock. Instructors would have more time to discuss the scientific method, interpretation of the results, and graph construction.

### Request for Resources

Equipment

### Funding Sources

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software))	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

**Initiative 4-4**

Revise Activities (largely for ANAT, ANPH and PHSO classes)

**Initiative ID**

**Links to Finding -4**

Suggested by Eden Bellenson, Ty Gardner, Keith Johnson, and Terry Pardee in the CLOAS for ANAT V01. Purchase of additional natural skeletal materials and an x-ray viewer to provide students with much needed hands-on materials for study and an important teaching tool and clinical component to the anatomy lab. Estimated cost for skeletal materials: \$5000. Section 2C2, Program –Level SLO 5 and 6

**Benefits**

Would provide students with much needed hands-on materials for study and the x-ray viewer would be an important teaching tool and clinical component to the anatomy lab.

**Request for Resources**

Equipment

**Funding Sources**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software))	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

## Initiative 4-5

Activities leading up to assignment: (largely for BIOL V14 and V23 classes)

## Initiative ID

### Links to Finding -4

Suggested by Kamelia Algiers. Herbarium specimens with native plants provided to students in the lab would help them learn to identify the list of native plants and learn them in the laboratory a week or two before their assessment. We currently have a specimen cabinet in storage and have some paper for mounting specimens. But we do not have a plant dryer, we need larger and more plant presses (we currently have one small one). But the most important resource here would be personnel as making the plant specimens would be very time intensive. Estimated cost for 3 standard plant presses (shipping/handling/tax included) \$300. Hardware supplies to construct dryer \$100.

Program –Level SLO 5 and 6, Program Operating Outcome 2

### Benefits

Herbarium specimens with native plants provided to students in the lab would help them learn to identify the list of native plants and learn them in the laboratory a week or two before their assessment.

### Request for Resources

Equipment and personnel

### Funding Sources

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

**Initiative 4-6**

Recommend purchase of a Parscore system to better enable SLO & other course assessments and improve the quality of the information gathered.

**Initiative ID**

**Links to Finding 4**

Suggested by Marta de Jesus in the CLOAS from BIOL V04 and BIOL V23. This is a proposal to department, division and college (may be a college-wide change). Because this proposal is not just for the department, this proposal was placed as #6 on our list. Program –Level SLO 5 and 6, Program Operating Outcome 2.

**Benefits** Parscore systems are a more modern version of Scantrons (same company) and can help us gather data more quickly and effectively from our students as well as provide better information on what our students are learning and/or have confused. Such a system can be used to help generate SLO assessment reports from multiple choice data efficiently.

**Request for Resources**

Equipment and training

A verbal estimate for a departmental Parscore system from company representative: \$6600 (for a scanner and single computer with software). Additional costs need to be included for training faculty. Further information from the vendor is available including a sample quote on the Biology Department portion of the college’s SLO Sharepoint site.

**Funding Sources**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	X
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	
Requires other resources (grants, etc.)	

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### 6A: Initiatives Priority Spreadsheet

The following blank tables represent Excel spreadsheets and will be substituted with a copy of the completed Excel spreadsheets.

#### Personnel –Faculty Requests

Other	Program	Program Priority (0, 1, 2, 3...)	Division Priority (R,H,M,L)	Committee Priority (R, H, M, L)	College Priority (R, H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost	No New Resources Requested	General Fund	Other
1												
2												
3												
4												
5												

#### Personnel – Other Requests

Personnel - Other	Program	Program Priority (0, 1, 2, 3...)	Division Priority (R,H,M,L)	Committee Priority (R, H, M, L)	College Priority (R, H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost	No New Resources Requested	New General Funds	Other
1												
2												
3												
4												
5												

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### Computer Equipment and Software

Equipment - Computer Related	Program	Program Priority (0, 1, 2, 3...)	Division Priority (R,H,M,L)	Committee Priority (R, H, M, L)	College Priority (R, H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost	No New Resources Requested	Technology Fund	Other
1												
2												
3												
4												
5												

### Other Equipment Requests

Equipment	Program	Program Priority (0, 1, 2, 3...)	Division Priority (R,H,M,L)	Committee Priority (R, H, M, L)	College Priority (R, H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost	No New Resources Requested	Equipment Fund	Other
1												
2												
3												
4												
5												

### Facilities Requests

Facilities	Program	Program Priority (0, 1, 2, 3...)	Division Priority (R,H,M,L)	Committee Priority (R, H, M, L)	College Priority (R, H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost	No New Resources Requested	Facilities Fund	Other
1												
2												
3												
4												
5												

## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### Other Resource Requests

Other Resources	Program	Program Priority (0, 1, 2, 3...)	Division Priority (R, H, M, L)	Committee Priority (R, H, M, L)	College Priority (R, H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost	No New Resources Requested	General Fund	Other
1												
2												
3												
4												
5												

#### 6B: Program Level Initiative Prioritization

All initiatives will first be prioritized by the program staff. If the initiative can be completed by the program staff and requires no new resources, then the initiative should be given a priority 0 (multiple priority 0 initiatives are allowed). All other initiatives should be given a priority number starting with 1 (only one 1, one 2, etc.).

#### 6C: Division Level Initiative Prioritization

The program initiatives within a division will be consolidated into division spreadsheets. The dean may include additional division-wide initiatives. All initiatives (excluding the '0' program priorities) will then be prioritized using the following priority levels:

**R:** Required – mandated or unavoidable needs (litigation, contracts, unsafe to operate conditions, etc.).

**H:** High – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

**M:** Medium – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

**L:** Low – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

#### 6D: Committee Level Initiative Prioritization

The division's spreadsheets will be prioritized by the appropriate college-wide committees (staffing, technology, equipment, facilities) using the following priority levels.

**R:** Required – mandated or unavoidable needs (litigation, contracts, unsafe to operate conditions, etc.).

**H:** High – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

**M:** Medium – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

**L:** Low – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)



## Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

2011-2012

### 6E: College Level Initiative Prioritization

Dean's will present the consolidated prioritized initiatives to the College Planning Council. The College Planning Council will then prioritize the initiatives using the following priority levels.

**R:** Required – mandated or unavoidable needs (litigation, contracts, unsafe to operate conditions, etc.).

**H:** High – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

**M:** Medium – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

**L:** Low – approximately 1/3 of the total division's initiatives by resource category (personnel, equipment, etc.)

**Biological Sciences (Anatomy, Biology, Biotechnology,  
Microbiology, Physiology) Program Review**  
2011-2012

7A: Appeals

After the program review process is complete, your program has the right to appeal the ranking of initiatives.

If you choose to appeal, please complete the form that explains and supports your position. The appeal will be handled at the next higher level of the program review process.

7B: Process Assessment

In this first year of program review using the new format, programs will be establishing performance indicators (goals) for analysis next year. Program review will take place annually, but until programs have been through an entire annual cycle, they cannot completely assess the process. However, your input is very important to us as we strive to improve, and your initial comments on this new process are encouraged.