

Physics Program Review

2011-2012

1. Program Description

A. Description

The strong emphasis in physics on fundamental concepts and problem solving makes it one of the most versatile majors available. The Physics major provides the basis for careers in applied physics and in interdisciplinary areas such as astronomy, biophysics, environmental science, oceanography, and scientific instrumentation.

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

1. Be able to observe naturally occurring, repeatable physical events and interactions and identify their physical origin.
2. Have the ability to establish cause and affect relationships between these interactions through progressive scientific modeling using a variety of mathematical techniques.
3. Have the ability to verify the model through systematic, scientific measurement.

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)

	Cost
Enrollment Fees	
Books	
Supplies	
Total	

E. Criteria Used for Admission

F. Vision

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

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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.

J. Program Strengths, Successes, and Significant Events

Physics has been the beneficiary of a STEM grant that provided books and collaborative study opportunities for students taking the physics sequence, exposure of the physics program to 2 evening classes comprised of current VC and K-12 students to the role of physics in science and technology, and purchase of two alternative energy demonstration units for classroom demonstration. The program continues to provide a stable gateway and pathway for students entering engineering and life science to receive uninterrupted, sequential, fully transferable algebra and calculus-based physics courses to UC and CSU schools. The physics program has surpassed the district 525 goal in FY11 by efficient scheduling and has success and retention rates above the college averages.

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K. Organizational Structure

President: Robin Calote

Executive Vice President: Ramiro Sanchez

Dean: David Oliver

Department Chair:

Instructors and Staff

Name	Quon, Steve W.	
Classification	Professor	
Year Hired	1991	
Years of Work-Related Experience	17	
Degrees/Credentials	B.S., M.A., Ph.D.	

Name	Doreo, David
Classification	Professor
Year Hired	1984
Years of Work-Related Experience	
Degrees/Credentials	B.S., M.S.

Name	
Classification	
Year Hired	
Years of Work-Related Experience	
Degrees/Credentials	

Name	
Classification	
Year Hired	
Years of Work-Related Experience	
Degrees/Credentials	

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2. Performance Expectations

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

1. Be able to observe naturally occurring, repeatable physical events and interactions and identify their physical origin.
2. Have the ability to establish cause and effect relationships between these interactions through progressive scientific modeling using a variety of mathematical techniques.
3. Have the ability to verify the model through systematic, scientific measurement.

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 maintain WSCH/FTEF above the 525 goal set by the district.
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.

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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
PHYS V01	M	M	M
PHYS V02A	M	M	M
PHYS V02AL	M	M	M
PHYS V02B	M	M	M
PHYS V02BL	M	M	M
PHYS V03A	M	M	M
PHYS V03AL	M	M	M
PHYS V03B	M	M	M
PHYS V03BL	M	M	M
PHYS V04	M	M	M
PHYS V04L	M	M	M
PHYS V05	M	M	M
PHYS V05L	M	M	M
PHYS V06	M	M	M
PHYS V06L	M	M	M
PHYS V88	M	M	M
PHYS V89	M	M	M
PHYS V90	M	M	M

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3. Operating Information

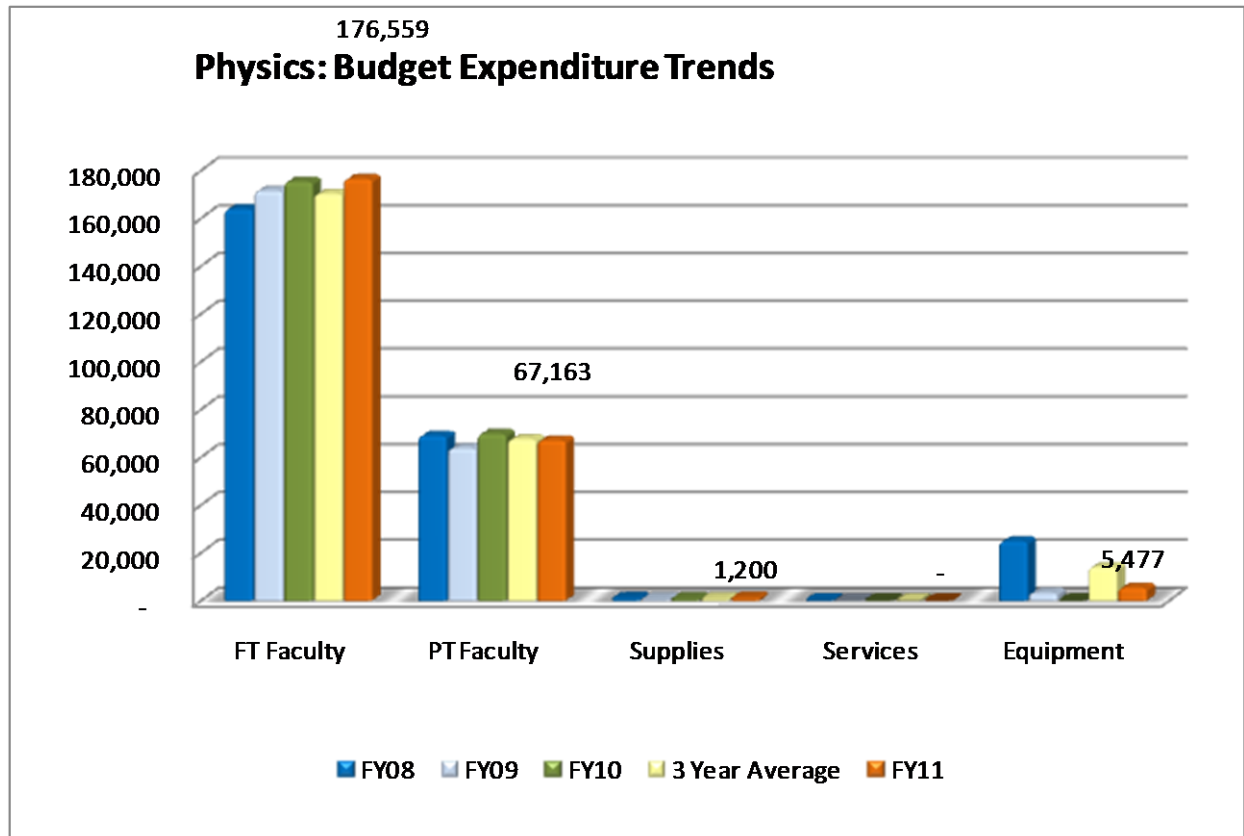
A1: Budget Summary Table

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	163,930	171,603	175,430	170,321	176,559	4%	12%
2	PT Faculty	69,083	63,881	69,914	67,626	67,163	-1%	-10%
7	Supplies	1,019	728	888	878	1,200	37%	24%
8	Services	200	100	100	133	-	-100%	-17%
9	Equipment	24,942	3,239	-	14,091	5,477	-61%	-42%
	Total	259,174	239,551	246,332	248,352	250,399	1%	0%

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.

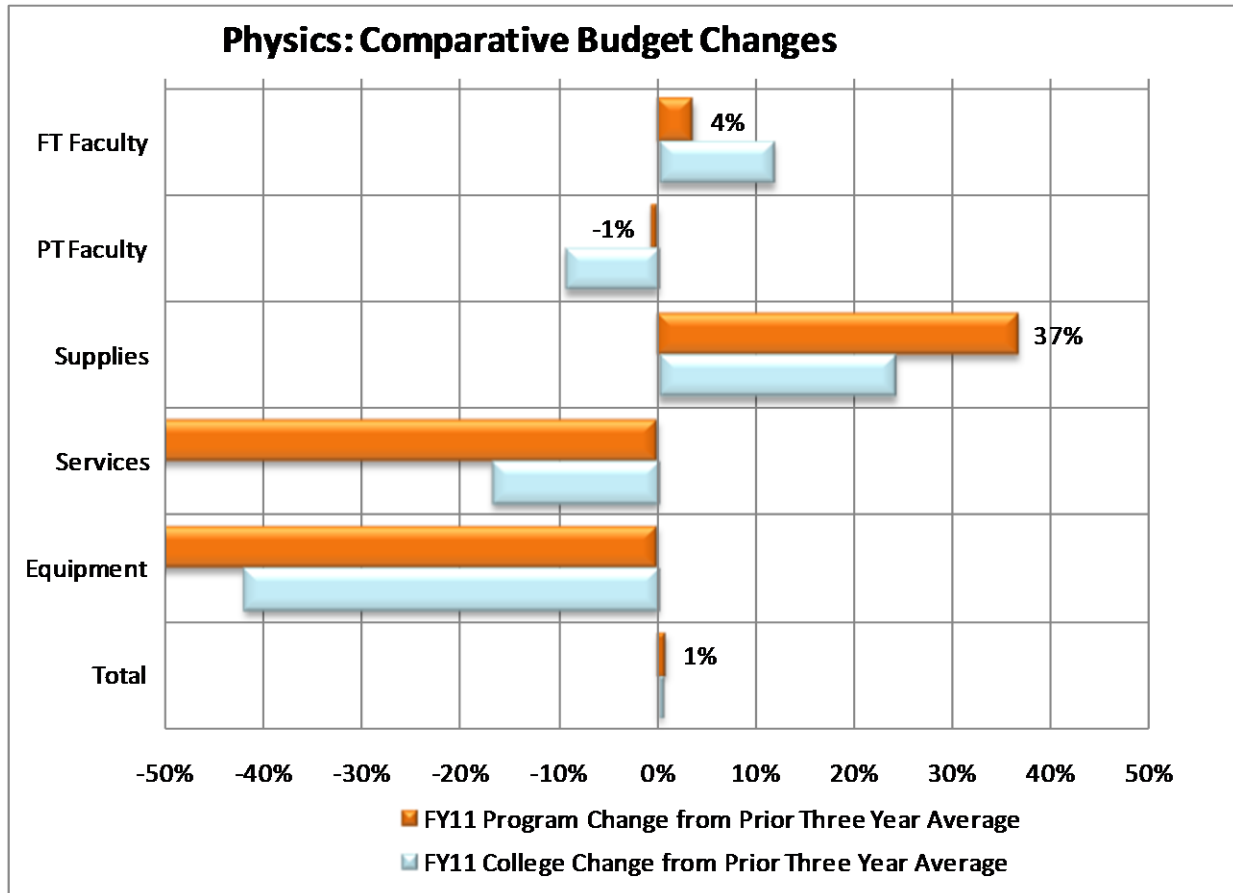


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A3: Comparative Budget Changes Chart

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.).

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A5: Interpretation of the Program Budget Information

The program shows a 4% increase in average FT faculty expenditures over the last three years lagging the college average expenditures over the same period by 8%. This represents step and column increases only.

The supplies budget shows a 37% increase over the average of the past three years due to a slight increase in annual funding.

Equipment expenditures were markedly less in FY11 due to the ending of a two-year STEM grant that funded a major portion of the equipment needs in Physics primarily in FY8. There was no expenditure of equipment funds in FY'10.

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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 #
MP35 New Bio Pac System-Retu	BIOPAC System	30182	12807	6/6/2008	3	1,945	N00018507	MP35A712004534
mm0039000a 50x-1000x Magnifi	Microscopes Inc	30182	12807	2/4/2008	3	1,448	N00018377	715145
mm0039000a 50x-1000x Magnifi	Microscopes Inc	30182	12807	2/4/2008	3	1,448	N00018378	710576
mm0011000a 100x-1000x Magni	Microscopes Inc	30182	12807	2/4/2008	3	2,061	N00018379	718229
Model 8125-Low Dispersion Sta	Perkin Elmer LL	30182	12807	4/23/2008	3	1,482	N00018485	8125
						8,383		

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.

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C1: Productivity Terminology Table

Sections	A credit or non-credit class. Does not include not-for-credit classes (community education).
Census	Number of students enrolled at census (typically the 4 th week of class for fall and spring).
FTES	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.
FTEF	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.
Cross Listed FTEF	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.
XL FTE	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).
WSCH	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.
WSCH to FTES	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 $WSCH = FTES \times 15$
District Goal	Program WSCH ratio goal. WSCH/FTEF The District goal was set in 2006 to recognize the differences in program productivity.

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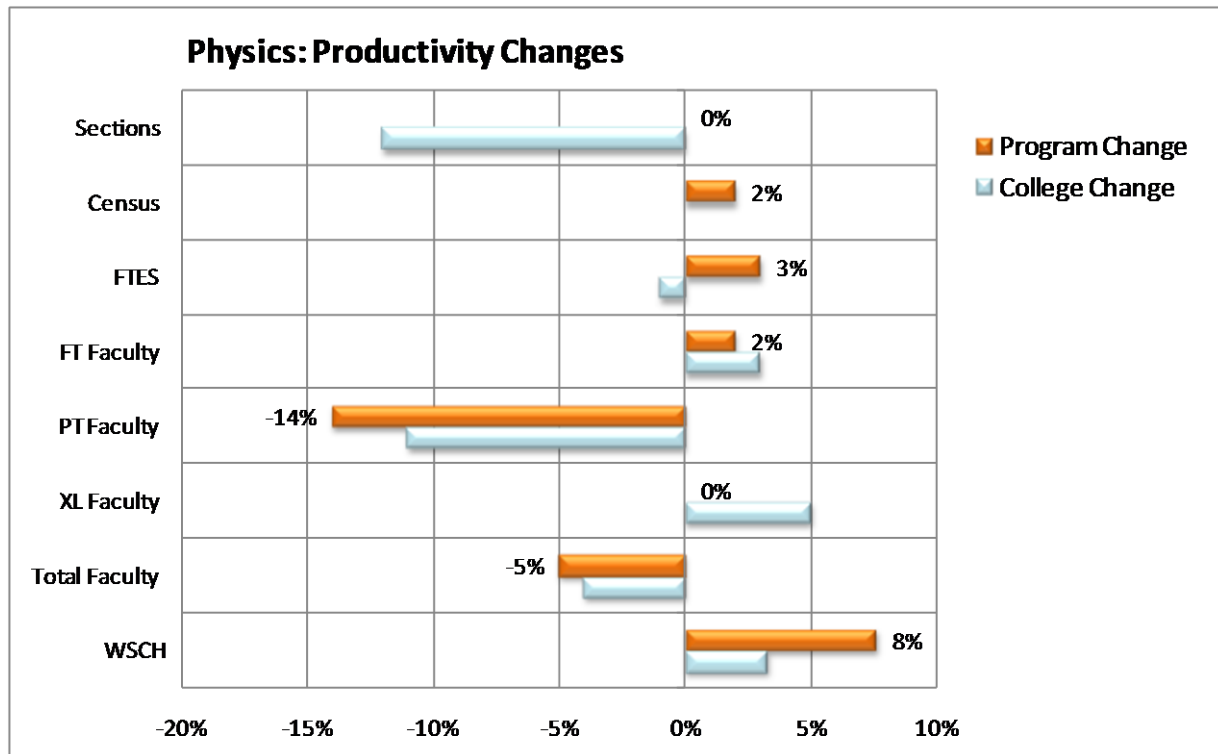
C2: Productivity Summary Table

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.

Title	FY08	FY09	FY10	3 Year Average	FY11	Program Change	College Change
Sections	29	29	32	30	30	0%	-12%
Census	603	586	638	609	624	2%	0%
FTEs	84	82	90	86	88	3%	-1%
FT Faculty	1.52	1.43	1.52	1.49	1.52	2%	3%
PT Faculty	1.25	1.17	1.07	1.16	1.00	-14%	-11%
XL Faculty	-	-	-	-	-	0%	5%
Total Faculty	2.76	2.59	2.59	2.65	2.52	-5%	-4%
WSCH	457	475	521	487	524	8%	3%

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.



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C4: Interpretation of the Program Productivity Information

The C2 Chart and the C3 Graph indicate that the program offerings have remained relatively constant over the prior three years average while the number of sections offered by the college has decreased by 12% over the same period. The Physics Program WSCH has increased by 8% relative to the College increase of 3%.

The Physics Department has not added any FT Faculty to its staff since 1991 which accounts for the stable number of FT faculty. P/T faculty only instruct Physics V01 and V01L (Elementary Physics). Since the number of sections for that course has remained constant, it is surprising to see that the number of P/T Faculty has decreased by 14%, that is, the two do not correlate.

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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).

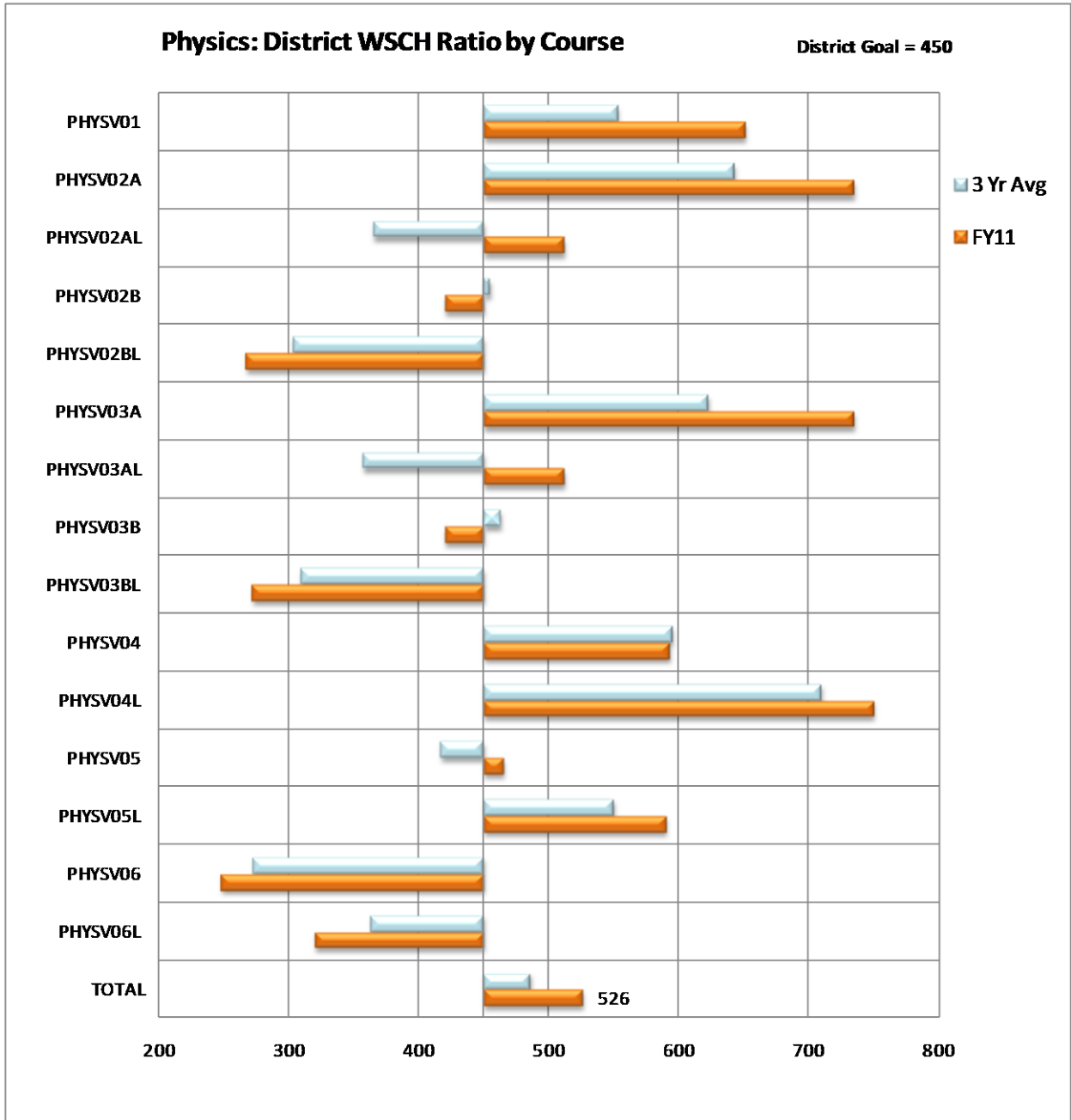
District WSCH Ratio: Weekly Student Contact Hours/(FT FTE+PT FTE)										
Course	Title	FY08	FY09	FY10	3 Yr Avg	FY11	Change	Dist Goal	% Goal	
PHYSV01	Elementary Physics	449	551	696	553	651	18%	450	145%	
PHYSV02A	General Physics I	540	555	795	643	735	14%	450	163%	
PHYSV02AL	General Physics I Laboratory	360	370	362	365	512	40%	450	114%	
PHYSV02B	General Physics II	555	390	435	455	420	-8%	450	93%	
PHYSV02BL	General Physics II Laboratory	369	270	280	303	267	-12%	450	59%	
PHYSV03A	Gen Physics I: Calculus-Based	540	555	795	623	735	18%	450	163%	
PHYSV03AL	Gen Physics I Lab: Calculus	360	370	347	357	512	43%	450	114%	
PHYSV03B	Gen Physics II:Calculus-Based	555	390	435	463	420	-9%	450	93%	
PHYSV03BL	Gen Physics II Lab:Calc-Based	371	270	280	309	272	-12%	450	60%	
PHYSV04	Mechanics	615	585	585	595	593	0%	450	132%	
PHYSV04L	Mechanics Laboratory	730	720	680	710	750	6%	450	167%	
PHYSV05	Electricity & Magnetism	405	458	388	417	465	12%	450	103%	
PHYSV05L	Electricity & Magnetism Lab	540	600	510	550	590	7%	450	131%	
PHYSV06	Optics, Heat & Modern Physics	263	240	315	273	248	-9%	450	55%	
PHYSV06L	Optics,Heat&Modern Physics La	350	320	420	363	320	-12%	450	71%	
TOTAL	Annual District WSCH Ratio	458	477	524	486	526	8%	450	117%	

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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.



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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.

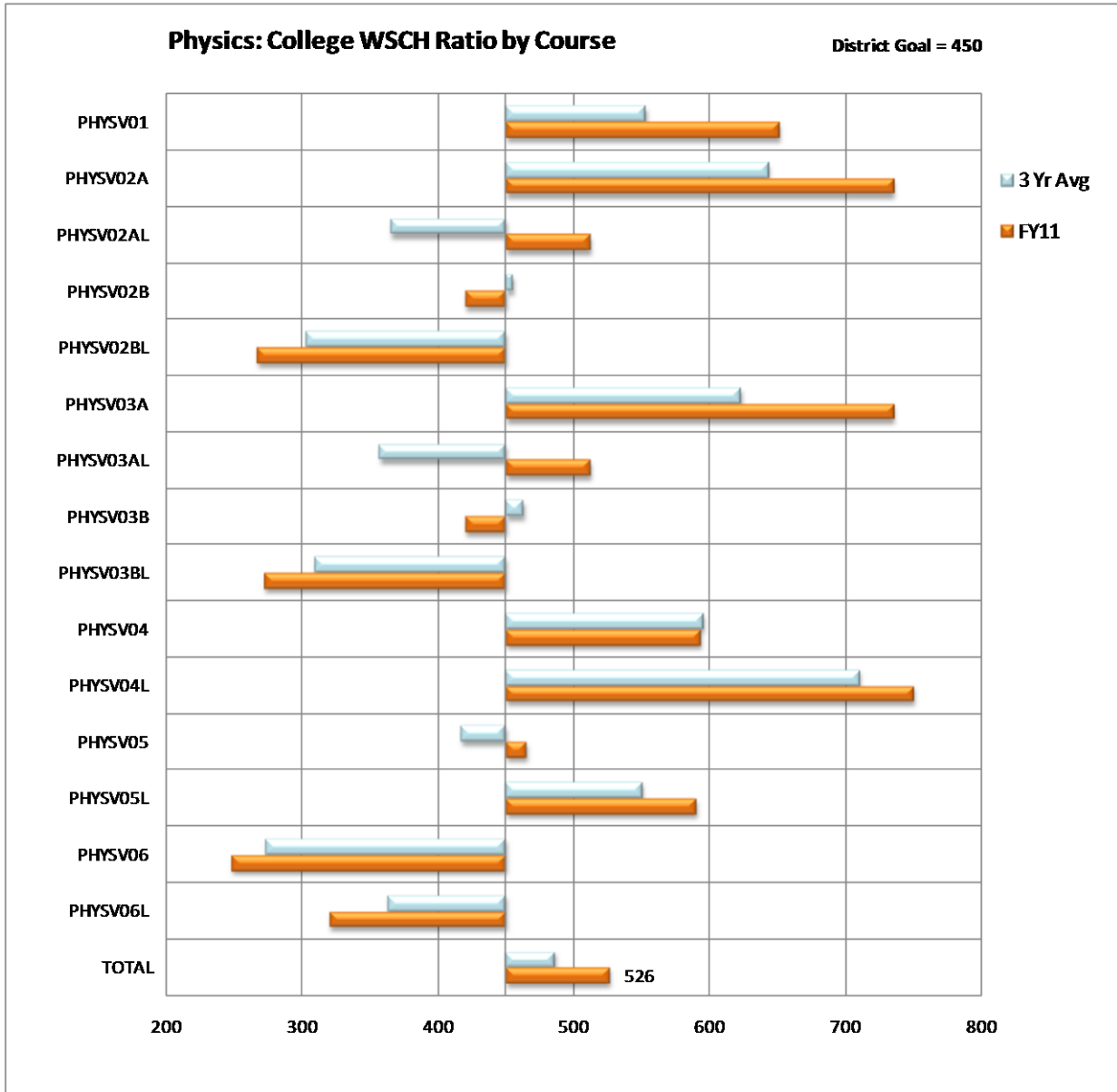
College WSCH Ratio = $WSCH / (PT\ FTE + FT\ FTE + XL\ FTE)$

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
PHYSV01	Elementary Physics	449	551	696	553	651	18%	450	145%
PHYSV02A	General Physics I	540	555	795	643	735	14%	450	163%
PHYSV02AL	General Physics I Laboratory	360	370	362	365	512	40%	450	114%
PHYSV02B	General Physics II	555	390	435	455	420	-8%	450	93%
PHYSV02BL	General Physics II Laboratory	369	270	280	303	267	-12%	450	59%
PHYSV03A	Gen Physics I: Calculus-Based	540	555	795	623	735	18%	450	163%
PHYSV03AL	Gen Physics I Lab: Calculus	360	370	347	357	512	43%	450	114%
PHYSV03B	Gen Physics II: Calculus-Based	555	390	435	463	420	-9%	450	93%
PHYSV03BL	Gen Physics II Lab: Calc-Based	371	270	280	309	272	-12%	450	60%
PHYSV04	Mechanics	615	585	585	595	593	0%	450	132%
PHYSV04L	Mechanics Laboratory	730	720	680	710	750	6%	450	167%
PHYSV05	Electricity & Magnetism	405	458	388	417	465	12%	450	103%
PHYSV05L	Electricity & Magnetism Lab	540	600	510	550	590	7%	450	131%
PHYSV06	Optics, Heat & Modern Physics	263	240	315	273	248	-9%	450	55%
PHYSV06L	Optics, Heat & Modern Physics Lab	350	320	420	363	320	-12%	450	71%
TOTAL	Annual College WSCH Ratio	458	477	524	486	526	8%	450	117%

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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).



D5: Productivity Detail Report

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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

The D2 Chart shows mixed WSCH/FTEF ratios with the average at 526 which is above the district 450 goal. Considering the laboratory size is limited to 24 students due to safety concerns, this is a remarkable efficiency. Inefficiencies are noted for PHYS V02BL and of PHYS V03BL is incorrectly reported since the courses are co-listed. PHYS V06/V06L is the third course in a three semester sequence required for physics majors and some engineering majors and is generally small due to attrition through the series. Labs are capped at 24 due to laboratory equipment limitations.

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E1: Student Success Terminology

Census	Number of students enrolled at Census (typically the 4 th week of class for fall and spring). Census enrollment is used to compute WSCH and FTES for funding purposes.
Retain	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%
Success	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.

Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
PHYS	FY08	274	132	83	1	18	20	70	-	598	528	490
PHYS	FY09	223	138	85	-	12	25	86	-	569	483	446
PHYS	FY10	248	122	97	2	19	33	102	-	623	521	469
PHYS	3 Year Avg	248	131	88	1	16	26	86	-	597	511	468
PHYS	FY11	258	132	102	-	13	24	78	2	609	531	492

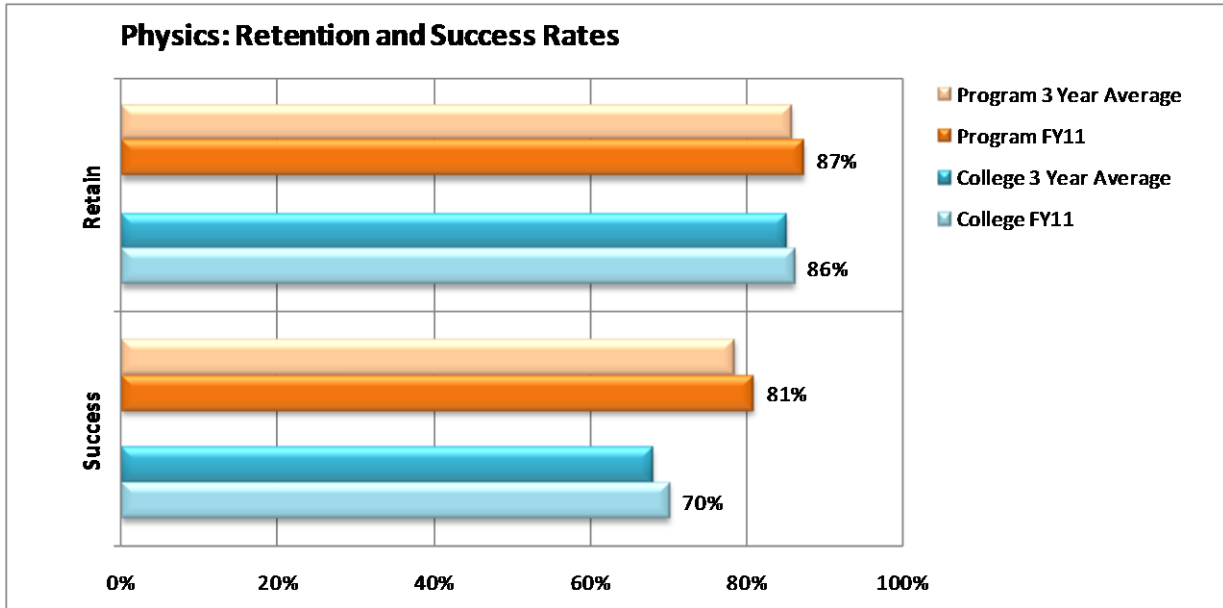
Subject	Fiscal Year	A	B	C	P/CR	D	F	W	NC	Census	Retain	Success
PHYS	FY08	46%	22%	14%	0%	3%	3%	12%	0%		88%	82%
PHYS	FY09	39%	24%	15%	0%	2%	4%	15%	0%		85%	78%
PHYS	FY10	40%	20%	16%	0%	3%	5%	16%	0%		84%	75%
PHYS	3 Year Avg	42%	22%	15%	0%	3%	4%	14%	0%		86%	78%
PHYS	FY11	42%	22%	17%	0%	2%	4%	13%	0%		87%	81%
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%

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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.

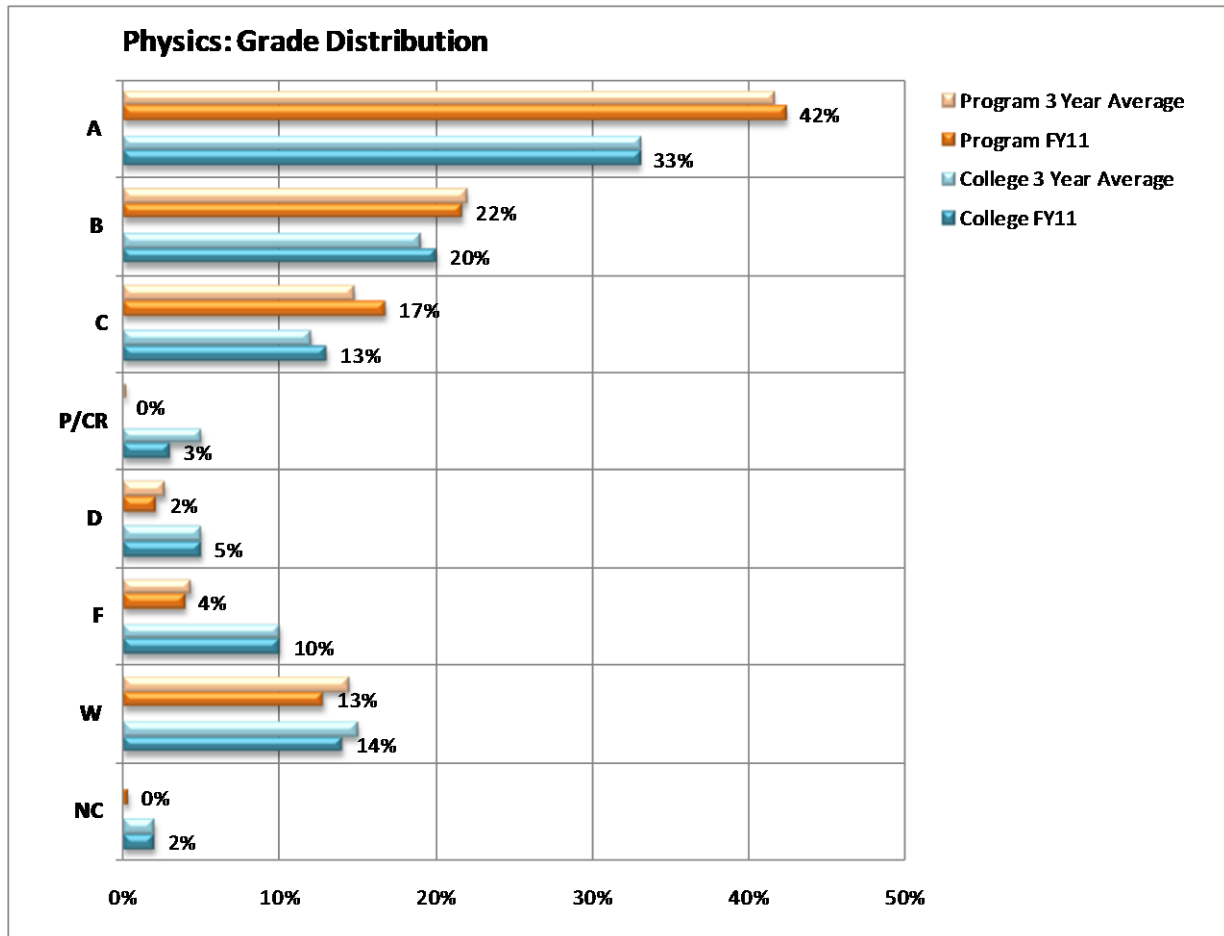


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E4: Grade Distribution

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.

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

Student retention rate in Physics are slightly higher than the prior three-year average of the program and roughly equivalent to the college. Grade distributions are nearly equivalent to the average of the program's prior three years; however there are significantly more A's (42%) than the college average with A's (33%). The distribution is not a normal distribution and may indicate grade inflation or easily attainable expectations. Further study is needed. For example, in some of the courses the homework grading is being evaluated using a publisher online homework grading and tracker site, WileyPLUS. This site allows students multiple tries at homework problems and then assigns grades according to student performance. The intent is to measure student performance using a system outside the control of the Instructor, thus giving an independent assessment of student performance.

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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.

No certificates or degrees.

F2: Interpretation of the Program Completion Information

NA

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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.

Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
PHYS	FY08	207	218	55	15	4	27	2	70	164	431	3	25
PHYS	FY09	245	176	38	11	7	29	5	58	133	435	1	24
PHYS	FY10	240	228	49	10	3	33	5	55	141	481	1	23
PHYS	3 Year Avg	231	207	47	12	5	30	4	61	146	449	2	24
PHYS	FY11	232	257	42	14	-	22	1	41	173	436	-	22
College	3 Year Avg	11,806	11,169	988	1,005	217	827	403	2,302	15,888	12,694	134	27
College	FY11	13,034	10,566	977	1,040	196	886	402	1,688	15,734	13,014	40	24

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

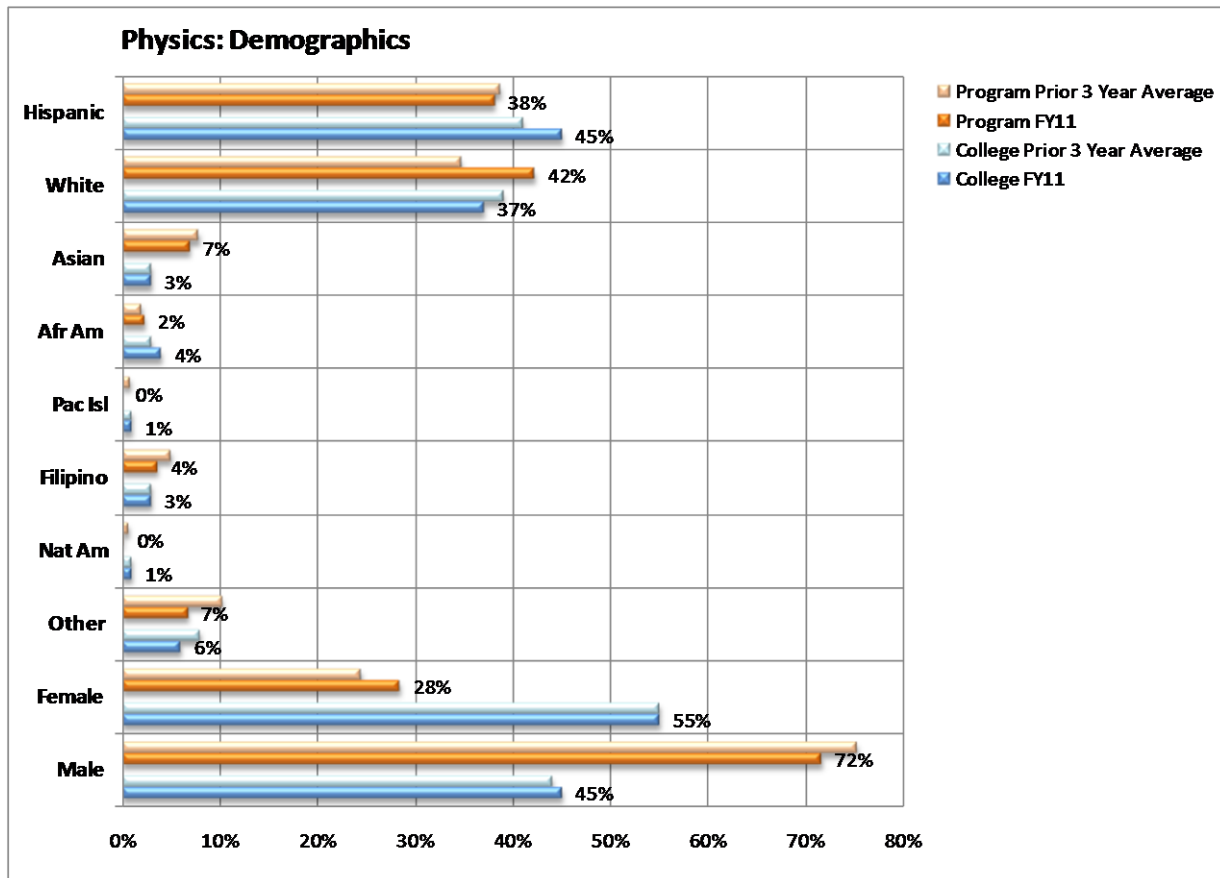
Subject	FY	Hispanic	White	Asian	Afr Am	Pac Isl	Filipino	Nat Am	Other	Female	Male	Other	Avg Age
PHYS	FY08	35%	36%	9%	3%	1%	5%	0%	12%	27%	72%	1%	25
PHYS	FY09	43%	31%	7%	2%	1%	5%	1%	10%	23%	76%	0%	24
PHYS	FY10	39%	37%	8%	2%	0%	5%	1%	9%	23%	77%	0%	23
PHYS	3 Year Avg	39%	35%	8%	2%	1%	5%	1%	10%	24%	75%	0%	24
PHYS	FY11	38%	42%	7%	2%	0%	4%	0%	7%	28%	72%	0%	22
College	3 Year Avg	41%	39%	3%	3%	1%	3%	1%	8%	55%	44%	0%	27
College	FY11	45%	37%	3%	4%	1%	3%	1%	6%	55%	45%	0%	24

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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 ethnic and gender distribution in Physics is consistent with the average of the prior three years; however, somewhat different than the college as a whole. Significantly, it is to be noted that the same ethnic and gender distribution is seen in private industry, meaning that the physics program fits the industrial norm.

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4. Performance Assessment

A1: Program-Level Student Learning Outcomes

Program-Level Student Learning Outcome 1	Performance Indicators
1. Be able to observe naturally occurring, repeatable physical events and interactions and identify their physical origin.	Students are given semester exams that include multiple choice questions involving physical events, interactions, and identification of their physical origin. Goal: 75% of the students will achieve exam scores of 75% or better
Operating Information	
This Program Level SLO has not yet been evaluated. Data-base needs to be gathered.	
Analysis – Assessment	
This Program Level SLO has not yet been evaluated. Data-base needs to be gathered.	

Program-Level Student Learning Outcome 2	Performance Indicators
2. Have the ability to establish cause and affect relationships between these interactions through progressive scientific modeling using a variety of mathematical techniques.	Students will be assigned homework problems throughout the semester using an independent online homework grading system such as WileyPLUS (WileyPLUS.com). Goal: 75% of the students will achieve cumulative homework score of 75% or better
Operating Information	
This Program Level SLO has not yet been evaluated. Data-base needs to be gathered.	
Analysis – Assessment	
This Program Level SLO has not yet been evaluated. Data-base needs to be gathered.	

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Program-Level Student Learning Outcome 3	Performance Indicators
3. Have the ability to verify the model through systematic, scientific measurement.	75% of the students will achieve lab grades of 80% or better
Operating Information	
The data presented in E-6 does not clearly separate lab performance from lecture performance. Therefore, an independent lab assessment is needed.	
Analysis – Assessment	
For Phys V04, Newton’s 2 nd Law experiment occurs at the 4 th semester week and is an early experiment using scientific modeling. It is a formative indicator of experimental technique. The operating information indicate that the stated goal of 75% or higher at the “A” level was exceeded. Similar formative milestones need to be developed at other points in the course as well as for other physics labs. This would form a data base for a cumulative assessment.	

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Program-Level Student Learning Outcome 3	Performance Indicators
Operating Information	
Analysis – Assessment	

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4B: Student Success Outcomes

Student Success Outcome 1	Performance Indicators
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.	The program will increase the retention rate by 2% or more above the average of the program's retention rate for the prior three years.
Operating Information	
Physics' prior three year average retention rate was 86%. Physics' FY11 retention rate was 87%. (3E2 and 3E3)	
Analysis – Assessment	
The Physics program made positive progress in retention when comparing FY11 with its prior 3-year average. We believe that the goal of 2% retention increase has a limit. As 100% retention is approached, it would be unfeasible to assume that the retention rate can increase indefinitely by 2%.	

Student Success Outcome 2	Performance Indicators
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.	The program will increase the retention rate by 2% or more above the average of the college retention rate for the prior three years.
Operating Information	
The college prior three year average retention rate was 85%. Physics' FY11 retention rate was 87%. (3E2 and 3E3)	
Analysis – Assessment	
The Physics retention rate in FY 11 was 2% greater than the college average for the prior three years.	
The Physics Department is on track with serving the needs of the students and improving student retention. It was observed that several students in physics took advantage of the student support services provided by the STEM grant which made available to students a textbook lending program, counseling, collaboration and research opportunities, as well as MESA which provided travel and conference funds for students to attend the annual MESA conference on the East coast where students were able to met potential employers in engineering. Other student support services included financial aid and instructor office hours. The Division has and continues to use a scheduling matrix is used to prevent conflicts with single section major's classes in the Math-Science division.	

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Student Success Outcome 3	Performance Indicators
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 at census who receive a grade of C or better.	The program will increase student success rate by 2% or more above the program's average student success rate for the prior three years.
Operating Information	
Further data required	
Analysis – Assessment	
Further data required	

Student Success Outcome 4	Performance Indicators
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 at census who receive a grade of C or better.	The program student success will increase by 5% over the average of the college's student success rate for the prior three years.
Operating Information	
Further data required	
Analysis – Assessment	
Further data required	

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Student Success Outcome 5	Performance Indicators
Students will complete the program earning certificates and/or degrees.	Increase the number of students earning a certificate to a minimum of 20% of the number of students enrolled in second-year courses.
Operating Information	
No certificates or degrees. Students taking physics normally transfer to their major such as engineering.	
Analysis – Assessment	
NA	

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C. Program Operating Outcomes

Program Operating Outcome 1	Performance Indicators
The program will maintain WSCH/FTEF above the 525 goal set by the district.	The program will exceed the efficiency goal of 525 set by the district by 2%.
Operating Information	
WSCH/Faculty FTE ratio data is reported in 3D3 and 3D4 and indicates an efficiency of 526; this exceeds the District's WSCH Ratio goal of 526	
Analysis – Assessment	
Efficiency is operating at the upper limit. Laboratory sections are suppose to be capped at 32 because of limitations in laboratory space and equipment. Phys V04 and V05 have been limited to single lab sections to support single section lecture enrollments of 40. Consequently, the lab sections have been overfilled for years	

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..	A current inventory of all equipment in the program will be maintained.
Operating Information	
The Banner inventory list is out of date and needs to be reviewed (3B1)	
Analysis – Assessment	
The inventory list through Banner is out of date and does not contain most equipment used in the program. Records of equipment have been held within the Department itself in the past. This needs to be corrected with an updated Banner inventory list. An on-site inventory is being conducted in Fall 2011 and hereafter inventory maintenance will be an ongoing activity.	

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Program Operating Outcome 3	Performance Indicators
<p>The Physics program will continue to improve its curriculum and learning environment by reviewing curriculum and assessing equipment needs including demonstration units and laboratory experiment apparatus to assure that student needs are being met.</p>	<p>The review of curriculum will be guided by the course-level and program –level SLO evaluation process and student’s success in meeting SLOs. Equipment needs will be assessed by following broad trends in instructional physics and engineering.</p>
Operating Information	
<p>The Physics department assesses course-level and program-level SLOs to determine the effectiveness of instruction and to guide changes in curriculum. The program utilizes Pasco computer data acquisition equipment. This equipment needs to be periodically updated according to improvements in computers, data-acquisition sensors, and support apparatus in order to provide students with up-to-date laboratory learning techniques.</p>	
Analysis – Assessment	
<p>A requested capital list for Academic 2012 has been drawn up based on the above indicators and information. This will be reflected in a request for Program Review capital equipment.</p>	

Program Operating Outcome 4	Performance Indicators
Operating Information	
Analysis – Assessment	

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5. Findings

Finding 1:

Physics has met or exceeded District goals for retention and student success. This has been achieved through a combination of expanding enrollment through the online learning venue; applying proven formative learning measures; and supporting peer-to-peer learning through cohort study groups.

Finding 2

The Physics Department seeks to add one F/T faculty member to its existing 2 F/T faculty in order to prepare for retirement attrition to take place in a few years. No new F/T physics faculty has been added since 1991. In addition to learning the pedagogy of teaching the course offerings in physics, astronomy, and physical science, the prospective candidate will presumably be groomed to take eventually take over the Department Head duties. The prospective new F/T physics faculty person will replace most of the existing P/T teaching positions

Finding 3

Key Physics capital equipment including computer data acquisition boxes and air tracks used for motion experiments need to be replaced.

Relative to the Program's prior three year average the physics equipment expenditures for FY11 decreased by (-) 61%. This compares to the College decrease of (-) 42%. The annual budget for the Program is \$1500 which is insufficient to purchase sets of capital equipment items.

Finding 4

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6. Initiatives

Initiative Curriculum Improvement

Use Desire to Learn (D2) as class organizer.

Improve curriculum using publisher tools such as WileyPLUS Homework Grader and Tracker system, textbook updates, and other teaching aids such as Youtubes and online physics simulators.

Initiative ID Physics 00

Links to Finding 1

E-1 to E-3

The Physics Department seeks to improve its high success (81%) and retention (87%) rates by supplementing courses with D2L resources and publisher resources for increased student learning.

Benefits

Students will have more learning resources to draw from in the courses. Using independent grading systems such as WileyPLUS Homework Grader and Tracker System will provide the Instructor with another means of assessing student progress.

Request for Resources None

Funding Sources None required

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.)	

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Initiative: Addition of 1 F/T Faculty Position

The Physics/Astronomy Department seeks to add one F/T faculty member to its existing 2 F/T faculty

Initiative ID : Physics 01

Links to Finding 2

A-1 to A3

In order to prepare for retirement attrition to take place in a few years Physics/Astronomy needs to add a new F/T faculty position to maintain its F/T faculty count, and to groom the new faculty person to take over the responsibilities of Department Head. No new F/T physics/astronomy faculty has been added since 1991. The 2 existing F/T members will be retiring over the next few years synchronously. This means that unless there is a new F/T person in place and serving as Department Head, the Department could be facing a situation of no Department Head and zero F/T faculty.

Benefits:

The addition of a Physics/Astronomy F/T faculty position will prevent an abrupt transition to a Department without a Department Head and zero F/T faculty which would certainly not best serve students. Nearly all engineering and technical majors at the college need some if not most of the physics courses offered at the College in order to transfer to UC and CSU. All these programs would be significantly impacted if there were not a viable functioning Physics/Astronomy Department

Request for Resources: The Physics/Astronomy Department seeks to add one F/T faculty member

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)	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.)	

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Initiative: Equipment

Replace key core laboratory data acquisition instrumentation and support equipment.

Initiative ID: Physics 02

Links to Finding 3:

A1 to A5

The Physics Department runs on an annual budget of \$1500 which supports about \$188,000 worth of equipment, that is, the Department maintains its capital equipment that it uses for classroom instruction with annual budget equal to less than 1% of the net capital equipment inventory value while all the while meeting or exceeding District goals for retention and student success. This is remarkable by any measure.

There are key core laboratory data acquisition interface boxes and support equipment used in most of the physics courses that are at end of useful life, or have degraded sufficiently to affect laboratory measurement results. They include Pasco computer interface boxes, air tracks, motion carts, and power supplies. Some of these items have not been replaced for over 15 years.

Benefits

Capital equipment funding would prevent contraction of lab experiments due to equipment failure, and improved control over unwanted errors in measurement due to worn out apparatus. This will improve student satisfaction in laboratory experience as well as strengthen their scientific measurement skills.

Request for Resources

Physics requests an allotment of \$26,000 to purchase replacement laboratory equipment near end of service life.

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)	X
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

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Initiative

Initiative ID

Links to Finding 4

Benefits

Request for Resources

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)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

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6A: Initiatives Priority Spreadsheet

The following blank tables represent Excel spreadsheets and will be substituted with a copy of the completed Excel spreadsheets. **The program's initiatives will be entered into the Excel spreadsheets by resource category and consolidated into division and college-wide 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												

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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												

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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.)

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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.)

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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.