Unit Planning: Instruction
For 2009-2010 (FY10)
Science Division

Executive Summary

- Science is operating at full capacity to meet student needs; fill rates were extremely high in FY08 (92.5%) and are continuing to be high in FY09.
- The Science Division produced 906.6 FTE in FY08, approximately 9% of the college's FTE total.
- The Science Division overall gained 1.7% in FTE over FY07, compared to the overall decrease in FTE for the college of 4.2%.
- For the transfer courses in Science, enrollment decreased less than 1% (less than 5 FTE), while cutting class seats by approximately 37 FTE; overall growth was not possible given the cuts in sections.
- Maintaining instructional excellence in Science courses will require stable staffing and funding.
- Growth in instructional areas will require additional full time faculty and support staff.
- Faculty and staff are committed to meeting Lane's mission and vision through innovative curricula, student support activities, marketing and outreach, and sustaining our facilities, equipment and instructional resources.
- The Science disciplines and operational areas of the Division present different strengths and challenges to maintain excellence and allow for growth and change.

Section I: Data Elements

Data elements tell an incomplete story about the work and results of teaching and learning in the Science Division. The numbers for enrollment, capacity, student success, costs and revenues at best fail to measure the true impacts of instructional activities and student engagement that change the lives of our students. The Science Division offers courses in the transfer disciplines of Anatomy and Physiology, Biology, Chemistry, Engineering, Earth and Environmental Science, and Physics. Prerequisite courses In biology and chemistry support a wide variety of health professions. The division also houses the Energy Management (NRG) program which offers an AAS degree in Energy Management with an option in Renewable Energy Management, and the new AAS degree in Water Conservation Technician, along with three continuing education certifications plus customized courses.

Where possible, we have analyzed data elements at the discipline level; and have also "drilled down" to assess the effects of course cuts. This work requires re-grouping courses at the prefix (subject code) level, since course prefixes are not a one-to-one match with discipline definitions in Science. Section counts are particularly muddied. Classbuilder data for sections are distorted by the inclusion of "shadow sections" which are built in Banner to allow for special enrollment cases in BioBonds; double counting of some chemistry lab sections; counting each independent study registration as a section; and other oddities. These inflated section counts have resulted in a misleading appearance of growth in sections. The data reported here have been aligned with our in-house counts of actual sections offered in each discipline, with independent studies and Co-op sections removed. Because the Energy program is self-supporting, we are reporting its data elements separately, when possible. Having these data reported separately in Classbuilder data would be a tremendous time-savings in preparing the Unit Plan.

The five-year look back and special analyses for the Science Division reveal:

- **The Science Division provides a wide variety of courses to meet AAOT lab science requirements for students; and multiple sections to meet prerequisites in health professions, science and engineering.**
- **The Science Division is operating at full capacity in many disciplines, with little room for additional growth in FTE.**

- **Our ability to add sections is limited by lack of space for some disciplines; and over-reliance in most disciplines on part-time faculty.**
- **Cutting sections in FY08 may have contributed to higher capacity (fill) rates.**
- **Cutting sections in FY08 resulted in losses in FTE in Biology, where 14% (11 sections) of the 100-level courses were cut.**
- **The addition of trailer sections in Physics, EES, and some Biology sequences have increased FTE and provided more options for students to complete requirements.**

1) Longitudinal Enrollment Data

Division and Discipline Level: Sections and Student FTE

Overall student FTE in transfer courses was down .5% (4.6 FTE) from the previous year. Declines in FTE can be attributed to cutting 13 sections; Biology suffered the largest decline, with a loss of 4.8% in FTE. College Now FTE doubled, accounting for most of the overall 9% gain in FTE attributed to the Science Division.

The Classbuilder Annual Comparison (no College Now) data indicate that overall, from FY07 to FY08 Science (including NRG) grew 8.3% in sections, with a corresponding 1.7% growth in FTE. Both numbers fail to accurately account for enrollment changes in Science. When section counts are corrected and NRG and Coop excluded, the transfer program in Science decreased 3 sections (-1.0%) and 4.6FTE (.5%). Further analysis reveals that the transfer program of the Science Division cut 13 sections with a capacity for 40.43 FTE; offsetting these cuts were the addition of 10 supplemental instruction sections with a total capacity of only 3.92 FTE. Of the 13 sections cut, 11 were in the Biology discipline.

Table 1 breaks down the student FTE by disciplines, and separates Energy Management, Co-op, College Now and science taught at the Cottage Grove and Florence satellite campuses. Approximately 32% of the Science FTE from satellite campuses derives from telecourses offered by Science Division faculty. College Now courses are supported by Science faculty liaisons. College Now sections increased from 30 in FY 07 to 54 in FY08.

Enrollment management: effects of course cuts in FY08

As the largest discipline in Science, offering 109 sections in FY07, Biology cut 11 sections of 100-level courses in FY08 to meet the college's budgetary limits. The majority of sections were in survey biology and marine biology. The loss of 14.1% of sections resulted in a loss of FTE of 5.5%, about 13 FTE. In the popular marine Biology sequence (cut three sections) capacity rose from 94% in FY07 to 104.9% in FY08. This indicates that we were unable to meet demand and that classrooms were overfilled. In the survey sequence (net 4 sections cut), capacity rose from 84.8% to 95.2%. Overall capacity in 100-level biology (excluding Biobonds) courses increased from 86.9% to 96.6%. While this "squeeze down" strategy has resulted in higher fill rates, the overall loss in FTE suggests that we cut too deeply. Having enough sections available in high-interest biology topics is an ongoing challenge. High enrollments this Fall term have prompted adding back Biology sections to meet demand for gen ed science courses.

EES discipline rebounded in FY07 after one very low-enrollment year attributed to adding a math prerequisite. Once the prerequisites were removed, students returned to the popular general education courses. EES cut a net of 1 section in FY08, for a -3.0% change. Capacity rose from 78.8% in FY07 to 95.4% in FY08, and overall, the discipline gained 3.2% in FTE. In addition, either due to the "squeeze down" in Science, or increased interest in geology, the majors' sequence experienced a 71.7% increase in FTE. High enrollments this Fall term have prompted adding back more EES sections to meet demand for gen ed science courses.

One section of classroom Astronomy 107 was cut in FY08 (-12.5%). FTE decreased by 11.8%, while the fill rate in the ASTR 107 courses increased from 70.4% in FY07 to 85.2% in FY08. Fill rates in the ASTR 121-2-3

sequence also grew from 68% in FY07 to 94.4% in FY08. The popularity of the Astronomy courses indicates that the number of sections should be restored.

Last year was the second year of the Physics with Calculus sequence (PH211-12-13) trailer sections. The trailers were possible due to the change in the prerequisites to Physics with calculus which were instituted by the Physics discipline beginning in FY07. Enrollments nearly doubled in 07 as a result. The change in FTE from FY07 to FY08 continued strong gains, with an 8.1% increase, and capacity increased from 68.1% in FY07 to 79.2% in FY08. Growth in trailer sections takes time to establish, as students become aware of the new options and fit the courses into their schedules.

Table 1. Annual Science Student FTE: Transfer disciplines separated from Energy Management, Co-op, College Now and satellite campuses; section counts corrected.

	Sections						**FTE**					
DISCIPLINES	03-04	04-05	05-06	06-07	07-08	%Chg 07 to 08	03-04	04-05	05-06	06-07	07-08	%Chg 07 to 08
A&P	50	52	53	51	51	0.0%	166.2	161.3	160.4	156.1	162.2	3.9%
Biology	108	109	105	109	98	-10.1%	320.4	310.9	305.5	319.1	303.9	-4.8%
Chemistry	65	77	76	68	78	14.7%	184.6	168.8	168.0	166.0	166.3	0.2%
Engineering	4	5	5	6	6	0.0%	7.4	8.1	9.0	12.0	11.6	-3.0%
EES	40	39	36	33	32	-3.0%	127.1	122.1	84.7	102.0	105.3	3.2%
Physics	35	35	33	35[2]	34	-2.9%	92.5	78.5	70.0	87.8	89.1	1.5%
TOTAL SCIENCE TRANSFER	**302**	**317**	**308**	**302**	**299**	**-1.0%**	**898.2**	**849.7**	**797.6**	**843.0**	**838.4**	**-0.5%**
NRG Mgt[1]	20	20	21	23	23	0.0%	32.0	34.1	39.2	37.6	48.1	27.8%
Co-op	17	18	19	17	20	17.6%	18.2	18.5	16.7	12.8	20.1	57.6%
TOTAL SCIENCE DIVISION	**339**	**355**	**348**	**342[2]**	**342**	**0.0%**	**948.4**	**902.3**	**853.5**	**893.3[2]**	**906.6**	**1.5%**
College Now	n/a	15	18	30	54	80.0%	38.0	48.4	61.2	68.4	139.4	103.8%
TOTAL SCIENCE W/COLLEGE NOW[3] (corrected)	**339**	**370**	**366**	**372**	**396**	**6.5%**	**986.36**	**950.64**	**914.66**	**961.71[2]**	**1045.93**	**8.8%**
Science total from Classbuilder	376	418	406	441	499	13.2%	986.4	950.6	914.7	959.8	1045.9	9.0%
CottGr-Florence[4]	13	15	16	20	25	25.0%	9.8	13.5	12.0	14.6	17.9	22.8%
TOTAL LCC SCIENCE-GENERATED FTE	**352**	**385**	**382**	**392**	**421**	**7.4%**	**996.12**	**964.10**	**926.67**	**976.30**	**1063.84**	**9.0%**

[1]NRG includes courses with the NRG, DRF, SUST, and WATR prefixes and a variety of X-prefixes for various workshops conducted by the NRG faculty. All FTE from NRG is accounted; we have only included regular AAS classes in the section counts for NRG. NRG Management receives tuition from its courses.

[2]06-07 section counts and FTE have been corrected to include a Physics section that is attached to the BDC in Classbuilder. This correction alters the %change from FY07 to FY08.

[3]Section counts are corrected to match actual Science Division courses taught. Independent studies are not counted; BioBonds shadow sections are removed.

[4]These classes are included to provide a full picture of Science FTE at Lane; approximately 32% of the FTE in this category is generated by Science Division distance learning classes.

Fig. 1. Five Year Enrollment History

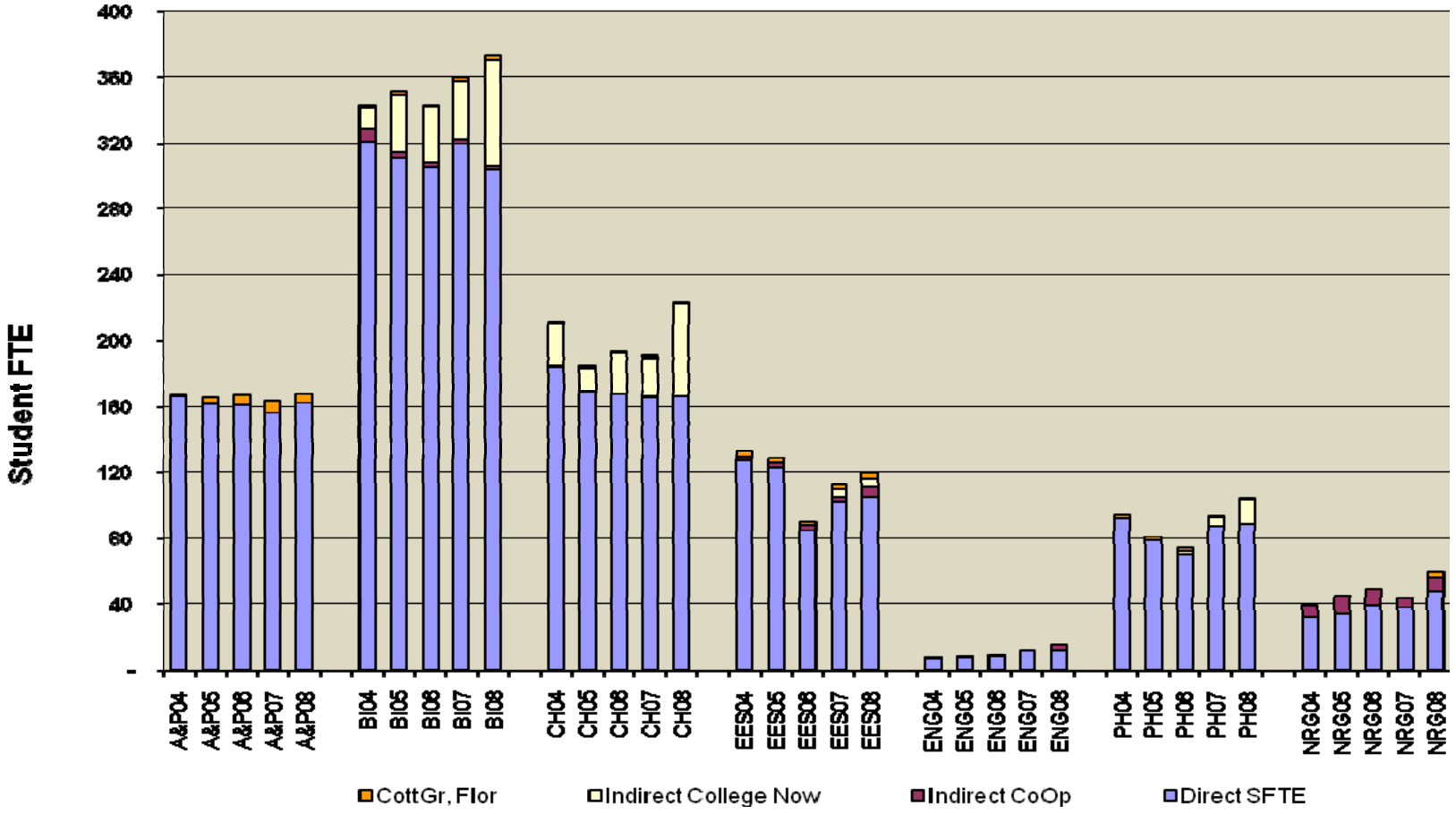
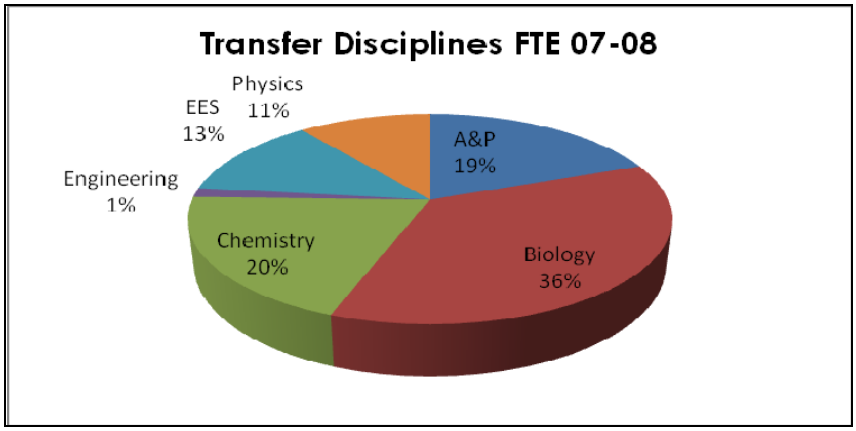


Fig. 2. Science Student FTE in Transfer Courses for 07-08



Student FTE/Faculty FTE ratio

The Student FTE/Faculty FTE ratios are approximations only and should be interpreted with caution. Notes from the Classbuilder drive explain that these represent "only contracted faculty positions (F1, F2 and F4) who had records in SIRASGN for Fall term 2007 (i.e., they were instructors assigned to Fall 07 course sections). Annual appointment percents for faculty (i.e., Faculty "FTE") were derived on 10/31/07. Please note that appointment percents for faculty can vary across terms -- and within terms -- as faculty assignments change during a year." These numbers appear to have little utility.

Table 2. Comparison of Student FTE/Faculty FTE ratios (Classbuilder data)

Department	Student FTE		Approximation of Faculty Appointment Percents for the Dept. ("FTE")		Approximate Ratio of {Student FTE} / {Faculty Appointment Percent}	
	FY07	FY08	FY07 (calculated 10/31/06)	FY08 (calculated 10/31/07)	FY07	FY08
Science (excluding Energy Management[5])	850.5	852.8	29.1	29.2	29.2	29.2
Energy Management	40.9	53.8	3.2	2.8	12.9	19.0
Science Total (including Energy Management)	**891.4**	**906.6**	**32.3**	**32.0**	**27.6**	**28.3**

Capacity Analysis (fill rate of class sections):

All areas showed gains in fill rates for FY08. EES and Physics experienced the highest increases. Early results for FY09 show extremely high increases as Science experiences its share of the college's 15.5% increase in enrollment.

Table 3 and Fig. 3 report trends in section counts and fill rates in Science. In order to make the capacity information more relevant, we have combined our accurate in-house counts of sections with the Classbuilder capacity percentages. Note that the percentages may be calculated using a different set of sections than the entire Science program. Overall the transfer program increased in fill rates from 83.2% in FY07 to 92.5% in FY08. EMPT fill rates in FY08 (based on enrollment) indicated rates of 96.3% for Fall, 92.8% for Winter, and 94.0% for Spring.

Table 3. Capacity rates[1] by Discipline for Science, FY04 – FY08

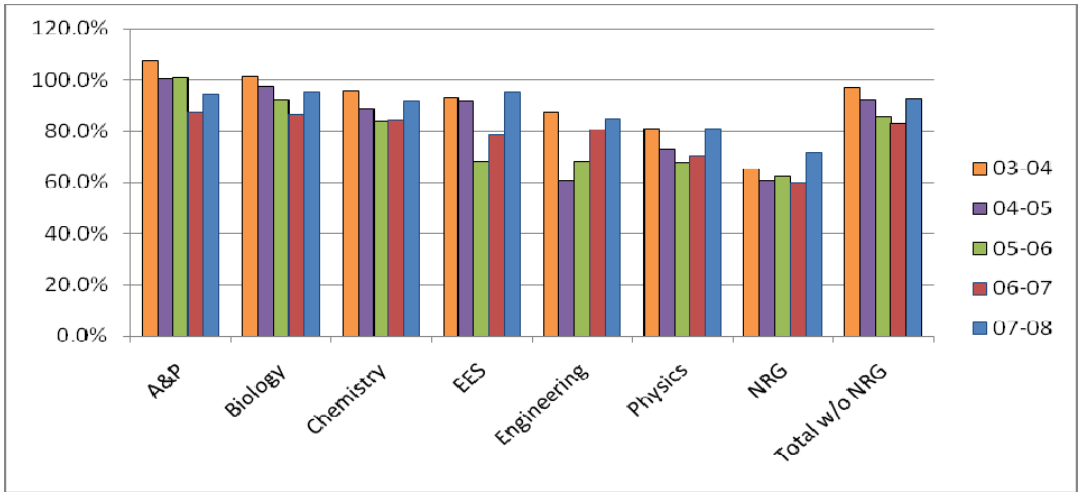
	Sections (using actual in-house counts)[3]						**Capacity %** (from Classbuilder data)[3]					
DISCIPLINES	03-04	04-05	05-06	06-07	07-08	%Chg 07 to 08	03-04	04-05	05-06	06-07	07-08	%change 07 to 08
A&P	50	52	53	51	51	0.0%	107.6%	100.6%	100.8%	87.4%	94.4%	8.0%
Biology	108	109	105	109	98	-10.1%	101.5%	97.9%	92.3%	86.7%	95.2%	9.9%
Chemistry	65	77	76	68	78	14.7%	95.8%	89.1%	84.0%	84.2%	91.9%	9.1%
EES	40	39	36	33	32	-3.0%	93.3%	91.8%	68.3%	78.8%	95.4%	21.1%
Engineering[2]	4	5	5	6	6	0.0%	87.5%	61.0%	68.4%	80.6%	84.7%	5.0%
Physics	35	35	33	35[2]	34	-2.9%	80.9%	73.2%	67.7%	70.2%	81.3%	15.8%
TOTAL SCIENCE TRANSFER	**302**	**317**	**308**	**302**	**299**[3]	**-1.0%**	**97.1%**	**92.1%**	**85.6%**	**83.2%**	**92.5%**	**11.2%**
NRG Mgt[1]	20	20	21	23	23	0.0%	65.2%	60.8%	62.6%	60.2%	71.6%	19.1%
TOTAL SCIENCE DIVISION Incl. NRG (w/o Co-op)	**322**	**337**	**329**	**325[2]**	**322**	**-0.9%**	**94.6%**	**90.3%**	**83.9%**	**81.6%**	**90.8%**	**11.4%**

[1]from Classbuilder: EXCLUDED were sections with a max capacity of less than 15, more than 60, or less than one-third full. In other words, INCLUDED in the Capacity Report are all sections with a max capacity of 15 to 60 AND were one-third or more full. Therefore the capacity percents do NOT represent the actual fill rates for all science sections, as tracked in the Enrollment Management Planning Tool (EMPT).

[2] Figures for Engineering have been adjusted to place ENGR 221 into the Physics group; this changes past year's numbers also.

[3]Although Science Transfer courses appear to have been reduced by only 3 sections, in actual potential seats, the reduction was 162 seats. 13 regular sections (312 seats) were offset by 10 supplemental instruction sections (150 seats).

Fig. 3. Capacity Rates by Discipline for Science, FY04 – FY08



2) Longitudinal Student Success Data

Student Completion and Success Percentages, FY08

Student completion and success percentages provide approximations for the percentage of students who remain enrolled in classes and who pass. The pass rate is taken as a percentage of those initially registered so is reduced by the number of student drops. As such, the percentage does not reflect the success of just those students who remained in the class. The numbers are reported here by discipline and non-majors (100-level introductory) classes and majors (200-level) classes. The overall completion rate for Science transfer courses (excluding Co-op and NRG) in FY08 was 91.77%, with a corresponding success rate of 84.16%. (Classbuilder, Revised 10-28-08) These represent slight increases over FY07.

In FY08 Science offered 18 sections of seven distance learning courses (not counting hybrid courses) including 10 sections of four telecourses and 8 sections of fully online courses. For telecourses, separate CRNS with small enrollment caps are held for Florence and Cottage Grove registrations; these are not counted here as separate sections. The revised Completion and Success Classbuilder data (10-28-08) reported that the completion rate for all distance learning Science courses averaged 83.76%; success rates averaged 76.38%. Both figures are significantly lower than the averages for all classes.

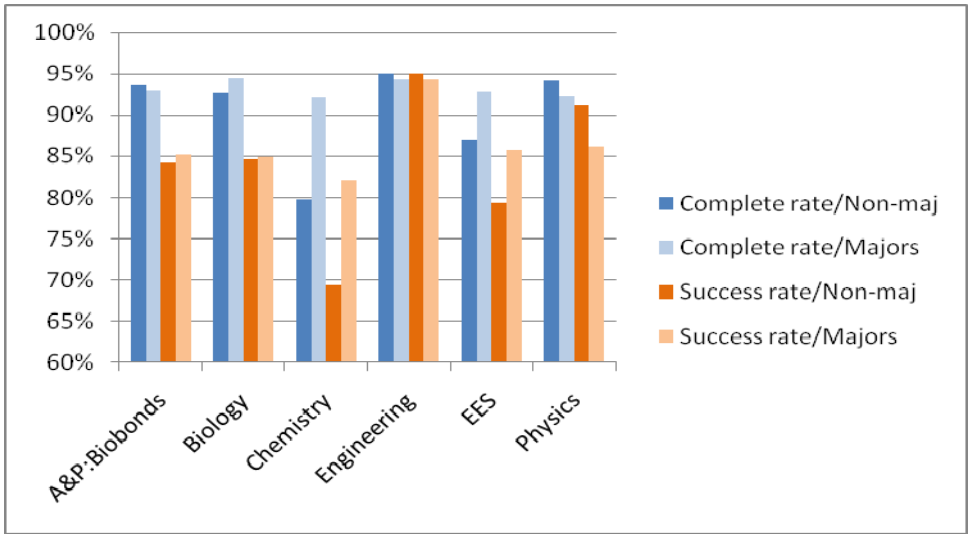
As part of its FY09 initiatives, the Biology discipline is converting BI101J —Unseen Life on Earth into an online course, with the possibility of increasing the class size with TA support. The online version will be taught for the first time Spring 09. Faculty member Elly Vandegrift is developing the online version with curriculum development funding. The addition of BI101J as an online course will provide students with an online three-course sequence in biology. Low completion and success rates for BI103L—Evolution and Diversity prompted a reexamination of the learning outcomes and activities to ensure that the course is taught at an appropriate level for 100-level students; faculty members Joe Russin and Patty Flatt are engaged in this work.

Table 4. Completion and Success for Non-majors and Majors, FY08[1]

	Completion Rate		Success Rate	
	Non-Majors	Majors	Non-Majors	Majors
A&P and Biobonds	93.62%	92.95%	84.24%	85.15%
Biology	92.80%	94.39%	84.58%	84.91%
Chemistry	79.80%	92.16%	69.36%	82.00%
Engineering	95.00%	94.29%	95.00%	94.29%
EES	87.06%	92.86%	79.41%	85.71%
Physics	94.15%	92.26%	91.22%	86.20%
Transfer total	**91.19%**	**92.86%**	**83.37%**	**85.69%**
% change from FY07	**+.72%**	**+1.49%**	**+.75%**	**+1.11%**

[1]The detailed numbers for each discipline were completed prior to receiving the revised Completion and Success rates on 10-28-08. Differences would be minor so a new analysis was not completed.

Fig. 4. Completion and Success for Non-majors and Majors, FY08



3) Budget

General Fund

General Fund Allocation
Actual Costs of Unit Operation
Revenues (Course Fees, etc.)
Cost per Student FTE: add comparison data when available and appropriate

The financial information in the Classbuilder data elements for the Division at subject levels provides a confusing picture of the Division's budget, actual costs and revenues. The course prefix "crosswalk" method used for the data elements fails to provide an accurate accounting since several disciplines have multiple subject codes. As a result the cost per student FTE calculations (Table 6) are too flawed to be very useful. The cost per FTE at the subject level is overly dependent on the pay level of individuals assigned to courses and does not reflect actual costs involved in generating FTE. The problem is exacerbated when other costs are estimated and apportioned among subject prefixes. In addition, the high costs of the Energy Management program drive up the Division level costs per FTE artificially. The Energy Management program is self-sufficient and funded by outside gifts, grants and contracts.

Table 5. Classbuilder data: Direct Faculty costs and Division total costs per FTE, 07-08.

Subject prefix	Direct Fac Costs	FTE tied to Faculty	Faculty costs/FTE	Direct Division costs/FTE	Direct Division revenues/FTE
ASTR	26,709	23.0	1,162	1,971	$5,471
BI	1,320,038	441.7	2,988	3,940	4,843
CH	560,381	162.9	3,441	4,383	4,594
ENGR	9,856	1.9	5,080	6,003	5,047
ENVS	No data	---	---	---	4,668
G	187,495	53.0	3,539	4,475	5,033
GS	15,940	41.8	381	1,191	4,936
PH	270,294	66.9	4,043	4,946	4,718
Total Transfer courses	**2,390,711**	**791.2**	**3,077**	**3,954**	
DRF	3,973	2.7	1,483	2,293	5,350
NRG/XNRG/XRH	243,957	43.8	5,572	11,109	11,591
Total Science FAC costs	**2,638,647**	**837.6**	**3,150**	**4,323**	**5,118**
Total Science Direct costs[1]	**3,621,030**				
Total Science Revenues	**5,352,738**				

[1]Direct costs do not include "overhead" costs of non-FTE producing elements of the college budget, which would naturally raise the costs attributed to generating FTE.

The Science Advisory Committee, Interim Dean, and support staff are engaged in re-aligning the Division budget to provide timely and accurate costs and revenues tied to Discipline categories. We could use actual costs from the F08 Division budget and expenditures and relating these costs and associated revenues from tuition, fees and state reimbursement to the FTE generated by the Science disciplines. If these data are needed at a later time, the Interim Dean will undertake the analysis.

Other community support (in-kind, donations, cooperative worksites,….)

The Energy Management program has numerous community partners from public and private industry.

4) Division planning parameters

Limits to growth

Science faculty and staff are committed to increasing student FTE by increasing enrollments in existing classes and capturing FTE from existing services provided by the Science Resource Center. Last year we targeted increases in the course fill rate in all disciplines. Table 6 indicates how we did in FY08 and so far in FY09 in meeting our benchmark of 90% or better. Data are derived from the Classbuilder capcity data and the EMPT data, which includes all classes and sets class size for most sections at 24.

Table 6. Measures of "fill-rates" for FY07, FY08, and early FY09.

	FY07 Classbldr	FY08 Classbldr	% change	FY08/Fall term	FY09/Fall term
Transfer courses	83.2%	92.5%	11.2%	96.31%	99.79%

The high FY09 Fall fill rate reflects on increase in credit programs' FTE for the college of 15.5%. The majority of science classes are overfilled. We added back 4 sections from the cuts made in FY08 to accommodate the enrollment increases. Additional sections could have been added and filled in the popular 100-level courses, as well as Biobonds, A&P and the majors' biology course, BI 211.

Balancing growth against resources is extremely difficult. Adding sections in Biobonds and potentially in A&P in Fall and Winter, along with sabbatical leaves, has created a staffing shortage for Spring. Adding Physics sections to accommodate increases in the NRG management program has also resulted in the need to hire new part-time faculty. Finding qualified faculty who will teach only a few sections a year is becoming increasingly difficult. Fulltime faculty members are taxed to mentor new faculty and oversee curricular standards. In addition, adding lab courses places increased demand for materials and laboratory prep work and clean up. The lab support staff for science has not increased to meet the growth in variety and number of sections being offered each term. Finally as more students use course study materials and equipment, wear and tear increases. The division lacks adequate budget to maintain high costs equipment and to replace materials and supplies used in multiple sections of courses.

Expected budget to work within

The Science Division engaged in setting a zero-based budget for administration and instruction for FY08. Through discipline and SAC discussions, we set priorities for spending to achieve internal goals, such as marketing and outreach, and professional development for staff members. We are committed to optimizing the resources we have. For FY09 we will continue evaluating our budget estimates for disciplines and operations, so that faculty and staff have a clear idea of the funding available to support instructional activities and so that fees are adequate to meet our expenses.

For FY09, having a set budget for Part-time faculty is very useful for our planning throughout the year.

Support needed to sustain excellence or to grow

The college's poor fiscal situation is well-documented. We are all aware of the severe constraints for replacing faculty, staff and management vacancies; and for adding new positions. Nonetheless, some positions will be hired over the next two to three years. As the college considers how to prioritize hiring decisions, here are some factors to consider regarding adding faculty and staff in the Science Division:

- Costs per FTE for transfer credit programs are typically lower than for career technical programs.
- Direct costs per FTE for science courses are less than the college average direct costs per FTE.
- Revenues per FTE for science courses exceed the direct costs per FTE.
- Many career technical programs have prerequisite courses in the sciences, especially those in health careers.
- Having a scientifically literate citizenry is a national goal.
- Capacity rates, course completion rates and course success rates in Science courses are consistently high.
- Adding sections for existing courses takes advantage of curriculum and resources already in place.
- Majors in any science or engineering major need to take multiple science courses and other requirements in preparation for transferring to four-year colleges.

In other words, increasing the capacity of the Science Division to maintain excellence and to grow its programs is good for the college's long term fiscal sustainability. We provide critical course work to support numerous career technical programs; and to prepare students for careers in science and engineering.

Section III lists the identified needs for:

1. full-time faculty in A&P, EES and Physics
2. full-time support staff, in Life Science support and in the SRC to support student learning
3. support staff for Physics, to increase use of equipment and materials among part-time faculty
4. recurring technology support, moving existing Tech Fund supported positions to the general fund
5. ongoing "04" personnel funding for online TAs for BI 102I and for other emerging large-enrollment online classes

Each staffing need has been costed at the net new costs to the college. This method accounts for current part-time faculty or "04" staff, and offsets the projected costs of contracted faculty or permanent classified staff. Converting existing funding for part-time and temporary staff into fulltime personnel does more than buy more hours for the college workforce. Contracted, permanent faculty and staff engage in sustaining all aspects of the learning environment. For faculty, students benefit from having teachers who are committed fully to the learning program and who are available for office hours, study sessions, and other student support activities. The division and college benefit from having more people to serve on critical committees and work groups. For support staff, the students benefit from having a well-trained person, consistently managing and maintaining learning resources. The division and college benefit from increased efficiencies and productivity of a well-trained work force.

A plan for improving the unit planning process

By Bert Pooth and Dennis Gilbert

Every year, faculty and staff invest a considerable amount of time in the unit planning process. This is a frustrating activity for a variety of reasons. But, despite the frustration, we feel compelled to engage in unit planning because it is the only avenue for expressing the needs of our disciplines and divisions. Unfortunately, there is no similar avenue for addressing college-wide issues. This is one of the sources of frustration, as discussed below.

Chief among the other sources of frustration is the fact that there is little return on the investment. There is virtually no feed-back and only when we are "awarded" funding for some project do we get any indication that our hard work has received any sort of attention. And all too often, all we get is turned down.

After a moment's disappointment at not receiving the funds needed for a worthwhile project or resource, we feel another source of frustration. We wonder, "How was this decision arrived at? Who made this decision? Why are administrators making most of these decisions when they are so far removed from the learning process, and those of us intimately involved with it just wait to learn the fate of our initiatives?"

An additional problem with current process is the narrowness of its scope. This has two components: a temporal one and an institutional one.

Pretending that all needs and objectives can be addressed with an annual planning process is unrealistic. Many problems or goals can't be addressed in such a narrow time frame. Instead, they require implementation of long-range, multi-faceted plans. Other issues can, and should be dealt with in shorter cycles.

And, returning to the notion of having a means of addressing college-wide issues, it is unrealistic to propose that the needs and goals of a unit are entirely independent of what goes on across the rest of the college. Limiting planning so that it stays within the boundaries of given units makes true, worthwhile planning impossible.

For these reasons, we propose the establishment of a task force to review the planning process and make recommendations for processes that are at once more comprehensive and more efficient.

To engage in this work in a meaningful manner, thoughtful members of the college community will need the time to examine problems arising from the current system, review best practices employed elsewhere, and design meaningful and useful planning for Lane. This will require appropriate reassignment time for those involved.

Section II: Accomplishments for 07-08

1. Managed enrollment effectively: Science disciplines carefully evaluated capacity (fill) rates and the number of sections offered. Overall, including College Now and Energy Management, Science FTE increased 9% in FY08, largely due to the 100% increase in College Now FTE. When College Now is excluded (and FY07 FTE is corrected), Science FTE increased only 1.5%. FTE growth was limited by cutting 13 science sections (potentially 40.4 FTE) in the transfer program. Biology suffered cuts of 11 sections (14.1%) in the 100-level courses, with an overall loss of 5.5% FTE. The cuts here and elsewhere on campus may be partly responsible for the increase in fill rates in science transfer courses from 83.2% in FY07 to 92.5% in FY08 (Classbuilder data). Fill rates increased in every discipline; increases exceeding 10% occurred for EES and Physics.

2. Provided new courses and learning opportunities for students. Ch 114 Forensic Chemistry, ENVS 184 Global Climate Change, CH 112S Supplemental Instruction for Biobonds, and CH 221S Supplemental Instruction for General Chemistry were offered. An online BI 231 was piloted for students in the active military, but enrollment was insufficient to offer the course. The Energy Management program gained approval for the Water Conservation Technician program. NEEI gained the rights to present the National Sustainable Building Advisor's Certification Program (NaSBAP) which will begin Fall 08 as a non-credit offering. Five new GIS modules were developed and implemented in six science sections as part of the NSF MAPS GIS project.

3. Supported student retention and success: Student use of the Science Resource Center continued to grow exponentially. SRC staff and the SRC coordinator, Star Glass, served 1,150 students last year, compared to 780 in 06-07 (numbers represent only those who "signed in") and generated about 27 FTE, nearly half of all tutoring FTE at the college, compared to 18.35 FTE in 06-07. The SRC also provided testing services to students, administering about 700 tests per term. Faculty members wrote numerous letters of recommendation for program admittance and scholarships, supporting the academic careers of our students. New SI courses also supported student retention and success in general chemistry and BioBonds.

4. Received 570 hours of curriculum development funds through Unit Planning initiatives to support course improvements and new courses: a Biology sustainability-themed survey course; development of Unseen Life as a distance learning course; enhancements to Physics 100-level courses; and course development in the Water Conservation Technician program.

5. Supported sustainability curricula: Energy Management developed initial courses for the Water Conservation Technician AAS degree, which enrolled its first students this Fall. A Science Division work group lead by Claudia Owen identified a sustainability course of study in science and proposed a Sustainability Emphasis Award in Science, pending stakeholder review and approval from the Division. Bert Pooth will develop a sustainability-themed biology emphasis course, supported by curriculum development funding. Faculty in Chemistry and Energy Management received funding from the Meyer Fund for a Sustainable Environment, in partnership with UO, to develop Green Chemistry labs for General Chemistry and develop GIS modules and mini-courses for Water Conservation and water resources. All of this work supports the college sustainability value.

6. Provided student research opportunities: A Physics faculty member oversaw Lane's participation in the NSF-funded UCORE program, in which Lane students engage in paid summer research opportunities at UO and then return and catalyze interest in physical science at Lane for which they continue to be supported through UCORE.

7. Enhanced technical infrastructure for student learning: added resources for printing, testing, and computer-aided learning in the Student Resource Center; adopted new software in support of learning; maintained aging equipment; upgraded and replaced hardware and data ports;

enhanced safety and access for computer use in the SRC and in classrooms; expanded use of the science server for students; and implemented technical trainings for staff in-house to support instruction.

8. Increased marketing and outreach efforts and gained visibility for Science: Our Marketing and Outreach Team led marketing and outreach efforts, supported by staff member Tana Stuart. Faculty and staff participated in the Fall Welcome Table, Lane Preview Night, Lane Youth Career Fair, the Cottage Grove Career Fair, the Springfield Latino/Latina College Information Night, and the emerging Springfield High School Science and Math Academy. We developed an e-newsletter for area high school counselors and science teachers. As part of their course work, Lane science students assisted with the Mt Pisgah fall mushroom show and spring wildflower show. Chemists hosted a week of activities for National Chemistry Week. The Division hosted the Child Care Center Art Show in December. We planned and offered our first Summer Academy course, Science in the Field: Exploring Science Careers, a two-week field camp for high school juniors and seniors but failed to get sufficient enrollment. We will build on our efforts in 08-09.

9. Grew College Now connections: FTE generated by College Now Science courses doubled in 07-08 compared to the previous year. Science offers over 54 sections of College Now science courses for credit (compared to 30 sections the prior year) and contributed 139.4 FTE (compared to 68.4 FTE in 06-07). Science FTE accounts for 15% of the total 925.9 FTE Lane earned from the College Now program last year. Faculty members maintain active relationships with their high school colleagues.

10. Supported professional development and shared expertise: Faculty organized, gave presentations and participated in numerous local, regional and national professional conferences and workshops. On campus, science faculty and staff were leaders and presenters for Faculty Connections, *physics x* and Physics Student Congress, Lane Peace and Democracy Conference, National Sustainability Conference at Lane, and the Spring Conference. Beyond Lane, faculty and staff attended and presented at the NSF-sponsored BioQUEST conference (Missouri), the ORCA Network (Mexico), the Ocean Sciences meeting (Florida), the League for Innovation Conference (Denver), Washington College Chemistry Teachers Association, the 20th Biennial Conference on Chemical Education, the Green Chemistry in Education Workshop at UO, the NW Bio Conference, Oregon Facilities Management Conference (Portland), Green Professionals Conference (Portland), Building Workforce Partnership (Los Angeles), Collaboration for Quality Jobs (Denver), and Fall and Spring Oregon American Association of Physics Teachers meetings (Gresham and Eugene). Three Science faculty members were awarded sabbatical leaves: Jerry Hall and Stan Swank for Fall 2008, and Gail Baker for Fall 2009. Faculty in the Water Conservation Technician program and Chemistry received two Meyer Fund for a Sustainable Environment grants, in partnership with UO. Energy Management faculty also received a Community College Workforce Development Grant to develop an Introduction to Sustainability course at Kennedy High School in Cottage Grove. Faculty and staff completed professional development activities to stay current with their skills and gain new skills, including: expertise with Banner systems, CERT training, safety training, cultural competency training, software and hardware training, communications skills, customer service skills, and knowledge of international workforce development.

11. Implemented transparent systems for scheduling and staffing, budgeting, and part-time seniority in science. The Responsibility Matrix for Scheduling and Staffing was adopted and implemented, providing clear guidelines for discipline, support staff and administrative roles in scheduling and staffing. Disciplines and support staff engaged in setting discipline level budgets and in learning how to use Banner expense data effectively to manage costs. A new database for tracking part-time seniority and multiple accrual families was developed for implementation in 08-09.

Section III: Goals and Initiatives

The themes for the Science Division's plans for FY10 are
(1) optimizing sustainable access for students and options for quality learning; and
(2) optimizing the curricula and resources we already have (continuing from FY09).

For this year's plan, the process followed by the Division was:

- Review of 08-09 funded initiatives and other opportunities, and Unit Plan components and timelines at Fall Division In-service.
- Initial brainstorming of challenges, opportunities and ideas at Fall Division In-service.
- Two Unit Plan Open Houses were held to share ideas, provide assistance, week of Oct. 6.
- Discipline summaries and input for Section III requested; due by Oct. 24, 2008.
- SAC hosted Brown Bag #1 to review and discuss discipline ideas, Oct. 17.
- Three Unit Plan Open Houses were held to share ideas, provide assistance, week of Oct. 20.
- SAC hosted Brown Bag #2 to review ideas submitted for Section III, Oct. 24, 2008.
- Analysis, writing, and editing incorporating Brown Bag sessions and discipline plans and summaries.
- E-mail of draft of Unit Plan Section III to all Division members, Oct. 28; deadline for comments by Oct. 30.

The Science Division is strongly committed to the comprehensive mission of Lane Community College. The majority of goals and initiatives are aimed at improving instructional programs to better meet students' needs for access and to provide more options—in terms of pedagogies, schedules, and topics—for learning and retention. At the same time, we recognize that sustaining excellence and sustaining future growth of instructional programs will be dependent upon increasing contracted faculty and classified staff to provide stable support for student success. In our discipline-level and division-level conversations, we view the goals and initiatives proposed here *as a package* that provides for a sustainable future, with increased enrollment and retention in Science programs. Many of the goals and initiatives represent long term planning by disciplines and by the Division as a whole. These plans also informed the development of two NSF grant proposals prepared by Division faculty over the summer. Summaries of both grants are attached as appendices to this Plan. We expect to hear in February or March if the proposals were successful.

The initiatives that we will put forward in January will address achievable and sustainable goals for the Division, with short term expenses that will result in improved quality and net revenues in the long term.

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
Optimize sustainable access for students and options for quality learning			
1. Manage enrollment effectively Use Enrollment Mgt. Planning Tool to add/cut classes efficiently to optimize enrollment **Outcome: Optimize enrollment, with sustainable levels of faculty and support staff**	Assess effects of cutting sections Add sections where demand is high, as feasible Add trailer sections where demand is high, as feasible	ongoing EES, BI, Biobonds: Plan additions for FY10 PH201-202-203 series trailer BI 211-212-213, evaluated	Enrollment enhancement funds for additional sections
2. Increase retention among science majors, especially biology/pre-med/pre-pharm students (Rapid Transfer) **Outcome: Increase % of students taking 12 hours or more each term; enrollment gains; higher retention and transfer rates**	Reduce conflicts between timing of majors' courses, to develop scheduling pathways. Develop multiple tracks for majors in physics, geology, chemistry and biology. Work with advisors, all disciplines within Science and other critical divisions (Math) as necessary. Distribute Science major "Rapid Transfer" advising sheets in first term science major courses, in EOR Packets, and other appropriate venues; and to counseling and advising staff. Track enrollment gains in Biology, O-Chem and Gen Physics.	Develop work team, W09 Address immediate scheduling issues, Sp09 Complete advising sheets, summer 09 Implement, summer, fall 09 FY10	Initiative: ancillary work to support summer meetings, multi-disciplinary team
3. Increase sustainability-related courses in support of sustainability in learning goals. **Outcome of all: More sustainability curricula,**	Offer newly developed Biology emphasis course in sustainability	Sp09 or F09, possibly Sp10	No new costs; or could be enrollment enhancement
	Approve and market Science Sustainability Award	By W09	

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
increased student FTE in sustainability topics	Redesign Intro to Sustainability to be an AAOT course, take to curriculum committee	Fall 2008 Offer more sections in Spring 2009 if approved	PT faculty funding
	Develop a field ecology course, that includes travel to national and international ecologically significant sites	Develop, Sp09 – F09 Offer Sp10 and/or Summer 10, possibly as a Spring Break course, or short course	Initiative: CD, Biology Discipline
	Implement Green Chemistry innovations from Meyer Fund for a Sustainable Environment	Sp09 – W10, finalize new labs for consistency throughout curriculum; share with College Now faculty	Initiative: CD, Chemistry Discipline
	Develop additional EES sustainability course/s such as Natural Hazards, Alternative Resources, Water Crisis	Develop 1 course by W10 or W11	Initiative: CD, EES Discipline
	Create a small but efficient wet or water lab that demonstrates water-efficient technologies and practices.	FY10	Donations from industry, WATR program
4. Increase online learning options for students. **Outcome: More options for students to succeed; enrollment increases**	Increase enrollments in online courses, where feasible, and with TA support when appropriate. Add new online courses.	In place for BI101I, Swank, W09 Environmental Science and Water Conservation courses, FY09 and FY10	TA support for large enrollment classes SIF: Water Conservation Initiative: CD, EES Discipline
	Develop online chemistry preparatory course: Convert existing course materials to online format Add online section to class schedule	 Sp10 F10	Initiative: CD, Chemistry Discipline

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
5. Enhance curricula to support Health Professions, including online options **Outcome: Increased support for Health Professions students, and less stress in completing prerequisites; increased enrollment**	Develop online CH112 course: Convert existing course materials to online format Add online section to class schedule	 F09 W10	Initiative: CD, Chemistry Discipline
	Revise BioBonds Study Skills course: Review existing course material Obtain input from A&P and EL faculty Identify content areas needing support Write learning outcomes Develop course materials Add one section to class schedule	 F09 W10 Sp10 F10	Initiative: CD, Chemistry Discipline
	Work with Health Professions to develop online or hybrid options for A&P as appropriate -Explore developing an A&P 100 level to meet needs of PTA , EMT, fitness specialist programs	By end of 2009 determine feasibility of option (1) and/or (2) below: 1)Offer online/hybrid Bi231 F09 Develop online –hybrid for Bi232 for winter Develop online –hybrid for Bi233 for spring 2) Develop 100 level A&P sequence for implementation for FY10	Initiative: Reassignment time, A&P Discipline
	Develop open source image bank for A&P online classes	Acquire needed materials for creation of image band to be used in house and for online courses Hire work study student to assist in collection	Initiative: Perkins request for purchase of material, A&P Discipline
	Develop hybrid stress-physiology class	Develop for implementation	Initiative: CD, A&P

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	and market as a bridge between A&P and heath professions	summer 09	discipline
	Pursue development of a first year experience	Form a team to work on the development of a Health Professions FYE ; submit application for the new learning community	Initiative: CD, A&P discipline Or Title III initiative?
	Develop support for pre-pharm/pre-med majors	Develop a special topics or seminar class Develop marketing for pre-med, pre-pharm	Initiative: CD, A&P discipline
6. Physics Discipline enhancements to curriculum. **OUTCOME: Comprehensive improvements to curriculum to increase student success; net revenue to college in long term**	Resurrect Principles of Technology and link to Advanced Technology programs: Curriculum development Collaboration with AT faculty and counselors/advisors	FY10	Comprehensive initiative proposals will be developed Short term expense Net revenue to college in long term
	Resurrect and enhance infrastructure for Science Modeling Labs: Curriculum development Training Science faculty, counselors/advisors	FY10	Short term expense Net revenue to college in long term
	Further integrate, in a scalable and sustainable way, pedagogical advances in curriculum and use of equipment: Curriculum development Equipment purchases	FY10	Short term expense Net revenue to college in long term
	Create better alignment and mutual support at all levels with math curriculum:	FY10	Short term expense Net revenue to college in long term

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	Collaboration with Math faculty Curriculum development		
	Create "Applied Physics Calculations" class for learning math in a physics context to gain entry into Math 95: Collaboration with Math faculty Curriculum development	FY10	Short term expense Net revenue to college in long term
	Create math study modules for intervention and help when students in PH 211, who have had calculus, fail in the Calculus Concept Inventory: Collaboration with Math faculty Curriculum development	FY10	Short term expense Net revenue to college in long term
	Create math study modules for intervention and help when students fail in the Basic Skills Diagnostic Inventory: Collaboration with Math faculty Curriculum development	FY10	Short term expense Net revenue to college in long term
	Enhance astronomy curriculum, equipment, and online resources: Curriculum development Equipment purchases	FY10	Short term expense Net revenue to college in long term
	Develop multi-disciplinary thermodynamics course for majors: Curriculum development Equipment purchases	FY10	Short term expense Net revenue to college in long term
	Develop linked-course Learning Communities: Collaboration with faculty outside Physics	FY10	Short term expense Net revenue to college in long term
	Update Electrical Fundamentals Curriculum: Curriculum development Equipment purchases	FY10	Short term expense Net revenue to college in long term

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	Leverage equipment building opportunity with UCORE interns: Collaboration with physical science faculty Curriculum development Materials and supplies	FY10	Short term expense Net revenue to college in long term
7. Additional curricular enhancements **Outcome: Improved student success and more options for completing AAOT and other program requirements**	Curriculum development for "Universal Access" in Biology	FY10	Initiative: CD, Biology Discipline
	Explore adding topical course offerings in Earth and Environmental Sciences to attract a wider variety of students into science: Meteorology, the Fossil Record	Explore demand, FY09 FY10 initiative for FY11	Long term increase in Student FTE
	Develop preparatory course for general chemistry: Identify chemistry content areas needing support Write learning outcomes Develop course materials Add one section to class schedule	 F09 W10 Sp10 F10	Initiative: Chemistry Curriculum Development
Technology needs: hardware, software, staffing			
8. Maintain and improve technology for student learning. Provide adequate, stable staffing for supporting technology. **Outcome: Maintain and improve technology for learning**	Maintenance of existing computers and printers Replacement of outdated computers and printers	FY10 FY10	$28,805 (est.) $80,300 (est.)
	Enhance technology for instruction: 10 Starboards Ceiling mounted projection system & computer New computers, printer	FY10	$20,700 (est.)
	Replace out-of-date interfaces and	FY10	Short term expense

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	sensors for Physics instruction in Rm119; and complete the set of interfaces and sensors in Rm144. Purchase, Train faculty, Organize storage		Net revenue to college in long term
	Move Tech Fund supported staff to General Fund	W09 Budget request to ASA Sp09 Budget approval Sp09-Su09 Hiring processes, if necessary	Net additional Sal/OPE[1] Current .5 FTE plus "1039" staff converted to 1.0 FTE, Tech support +$894 to $12,312 depending upon level
Adequate staffing and funding to support instructional excellence or growth			
9. Provide adequate, stable staffing for instructional **Outcome: Program enhancements, student success, growth in offerings, instructional excellence; net revenue in long term.**	Hire full-time faculty for disciplines that lack sufficient FT faculty to meet accreditation standards; or, to sustain excellence or sustain growth.	FT EES faculty for FY10 FT PH faculty #1 for FY10 FT PH faculty #2 for FY 10 FT A&P/Bio faculty for FY 11 FT NRG/WATR faculty for FY10	Net additional Sal/OPE[2]: +$35,166 +$35,166 +$35,166 +$36,221 +$35,166
10. Provide adequate, stable staffing for instructional support. **Outcome: Program enhancements, student success, support for program expansion, instructional excellence**	Life Science support, including wetlab Physics Support staff to serve greater use of equipment in labs and demos and higher enrollment SRC: Instructional Specialist Front office, fulltime Admin. Assistant	Hiring process, Sp09 to begin work in FY10.	Net additional Sal/OPE[3] +$18,823 "1039" or .5 FTE, depending on level $17,000 - $18,000 (est.) Convert current hourly employees to .5 FTE = +$7092 Increase from .8 FTE to 2.0 FTE

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
Adequate capital outlay funding to support instructional excellence or growth			
11. Provide capital outlay funding to replace worn or inoperative science equipment. **Outcome: Maintenance of equipment investments, instructional excellence**	Chemistry Equipment Repair and Replacement: Repair FTIR = Fourier Transform Infrared Spectrometer Replace GC = gas chromatograph	 Fall 2009 Fall 2009	Chemistry Capital Outlay Initiative
12. Enhance instruction: Research vessel for marine biology (Zodiac Aluminum Passenger Vessel) **Outcome: Expanded learning opportunities and boating opportunities for students and staff**	Attend boat shows and visit harbors. Browse boating magazines and websites. Check on Craigslist for good deals. Buy cool hats and life vests. Develop instructional plan for using the boat. Raise funds for buying and maintaining the boat.	Boat selected by May, 2010	Fundraising or gift through Foundation
Assessment			
13. Implement assessment of student learning outcomes and gather student input for program improvements **Outcome: Using assessment results to improve educational programs and increase student satisfaction**	Implement pre and post testing in all EES classes to evaluate student progress Develop other assessment tools and plans	Fall 2008 Winter 2008	Assessment project support?
	Survey students to determine more student-friendly names for Geology and Environmental Science courses	EES coordinator will develop and implement survey, W09	
	Physics assessment to improve math preparation and alignment	FY10	Short term expense Net revenue to college in long term
Revenue Enhancements			
14. Continue to implement marketing and outreach efforts	Offer a for-credit summer academy for high school students, based on our	W09 – Sp09 planning and marketing	

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
for recruitment **Outcome: Increase in number of high school students beginning college science classes at Lane; increased FTE**	non-credit academy in summer 08 (insufficient enrollment to offer). Continue to attend fairs and preview night; continue e-newsletter to schools. Improve marketing materials.	Mostly in Sp09 F08-Sp09	
15. Develop additional FTE generating opportunities, serving community needs and interests. **Outcome: Enhanced service to the community; increased FTE**	Offer community short courses and local experts seminars (with FTE) Offer focused summer short courses for professionals and community members, with aggressive marketing Develop Increased extended learning FTE collection [SRC, fieldtrips, others]	Develop work team to research and recommend opportunities Develop one new offering for Summer 09 Ongoing	Self-supporting activities Initiative: 50 hours CD, multi-disciplinary team Self-supporting activities
16. Redesigning SRC funding and FTE generation **Outcome: More efficient operations; increased FTE**	Work team continues to assess needs and propose solutions Make recommendations to ASA thru Executive Dean McNair	Ongoing work team Sp09	Recommendations may involve budget request
17. Encourage and implement sustainability behaviors (green purchasing, life cycle costing, expanded native landscaping, etc.) **Outcome: Fiscal and operational sustainability**	Reduce use of paper thru duplex printing and increased e-communication Implement building systems efficiencies Implement native landscaping design for old satellite space	Ongoing. W09 – Sp10 Plan for space by Sp09	No new funds. Facilities Management support needed. Groundskeeping and Biology cooperative project.
18. Review Unit Planning process	Work team formed to discuss and prepare a report on planning needs	FY10	Recommendations involve release time.

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
Outcome: More efficient and effective planning of the appropriate scope; Fiscal and operational sustainability	not covered in the current unit planning framework, including appropriate feedback on how and why awards for funding are made, the award process, appropriate planning cycles (rather than the uniform one-year cycle), incentives for efficiencies, planning for severe college-wide financial problems, college-wide processes generally. Advocate for convening College-wide taskforce on appropriate planning.		Long term savings and improved morale likely.

[1]Goal #8: Move Tech Fund supported staff to General Fund. Current technology support staff is funded by the Tech Fund. These positions should move to the General Fund in FY10. Combining the two half positions into one FTE at LvlA, Step 9 would cost an additional $894 over current costs; at LvlA, Step 18, the difference is $12,312.

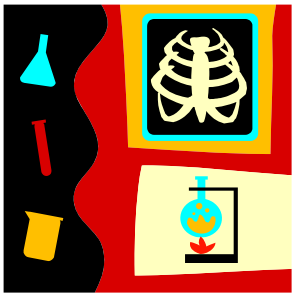
[2]Goal #9: Provide adequate, stable staffing for instructional. Full-time faculty positions are calculated at Step 8. The costs of part-time faculty are calculated at Step 12, the average level for PT faculty in Science. For each FT position, 9 sections of PT costs are included.

[3]Goal #10: Provide adequate, stable staffing for instructional support. Support positions are currently fragmented by numerous "1039" positions, creating the need for more supervision, repetitive training, and a less reliable workforce. The cost estimates here would move most positions to regular classified staff, using the "1039" costs to offset the proposed recurring costs. Actual costs would depend on the level of the new positions.

Discipline and Operations Summaries

Discipline and operations summaries were drafted by individual faculty and staff and represent their candid assessments of strengths, challenges, goals and needs. Specific goals and initiatives are listed in Section III and will be the basis for initiative requests.

Anatomy and Physiology



The 07-08 accomplishments of the Anatomy and Physiology discipline include recruiting and mentoring three new part time faculty, implementation of a faculty resource manual which includes learning outcomes and laboratory materials for all our anatomy and physiology classes, and acquisition of Carl Perkins funds both to improve classroom learning and out of class access for students to materials. The Perkin funds will (1) purchase needed laboratory equipment, (2) anatomical models for use in the Science Resource Center to improve student access and (3) StarBoards for two of our classrooms. One goal of the current year is to fine tune the learning outcomes for our anatomy and physiology classes and begin working on standardized learning outcomes for microbiology. A&P faculty are participating in the new Strategic Investment Fund project to develop online versions of health professions' support courses. We also continue to work closely with the Health Professions Division which included ongoing dialog with program coordinators and serving on hiring committees.

Part of our discipline's strength is our culture of mentoring our part time faculty to insure the quality of student learning experiences and support new faculty in being successful. Expansion in health careers programs, due to increasing interest in health careers as well as the addition of new programs such as the physical therapy technician, are creating increased demand for the prerequisite courses provided by A&P. As we expand, it has becomes a challenge for the full time faculty to provide the support and oversight needed to mentor our part time faculty. Last year we offered 50 sections of A&P/microbiology and 17 sections of BI 112/Biobonds. Of our A&P classes 56% are taught by part time instructors and of our BI 112 classes, 67%. We have addressed this issue by the development of our faculty resource manual for our anatomy and physiology instructors. Biobonds faculty have addressed this issue by holding a one day retreat in the summer, regular term meetings and sharing a common packet which is updated annually. However maintaining program quality in a sequence remains a critical challenge. This is also a statewide issue and our faculty facilitated a roundtable discussion on at a regional meeting to begin a dialog on this issue.

A continual challenge for us is meeting student demand. Our classes fill rapidly and currently we are not able to meet the demand for BI 112 sections. Over the last 5 years the fill rate (capacity rate) for BI 112 sections has averaged over 101%. We have effectively managed our offering of BI 231, the first of the sequence, so that it has had a fill rate of over 103.8% in FY08, and has a five-year average fill rate of 102.7%. This means that many A&P sections are overfilled, which places added stress on faculty and students. If we meet the demand for Biobonds we also need to increase our offerings of BI 231 - 233. **This future growth may be limited by having enough qualified A&P faculty, classroom space, support personnel and resources to support student learning.**

A goal of the current year is to determine how our learning outcomes for content, skills and issues can be met in an online format (fully online vs hybrid class). One faculty member is on sabbatical this term researching online delivery and other members are attending an online learning class supported through the Strategic Investment Fund. Online or hybrid classes may help offset classroom space challenges. However, if online classes increase our enrollment the number of full time faculty will not be sufficient to maintain program oversight. In addition continued growth will place increased demands for tutoring in the Science Resource Center, study materials for in and out of class use, staff to prepare the labs, and computer support. In FY08, A&P courses had a 93% completion rate and 85% success rate. Retention and success relies heavily upon such student support.

Biology

Accomplishments and strengths: Biology courses represent 36% of the Division's student FTE; in FY08 Biology courses earned 304 FTE, down 4.8% from the previous year. Biology provides a wide range of 100-level Biology courses to meet general education AAOT and direct transfer needs. These courses not only attract and retain students; for many, these are their first college science course. For FY08, completion rates for the 100-level courses averaged 92.8% and success rates averaged 84.6%. Majors' courses have equally high capacity, completion and success rates. Biology is the largest cohort of science majors that feeds these other disciplines. Capacity rate for Biology overall was 95.2% in FY08.

The Biology faculty is engaged in continual course improvements and developing new curriculum. This year, faculty members are developing a new Biology emphasis class with a sustainability focus; converting a long-time telecourse to an online course; and revising outcomes and curriculum in two emphasis courses to better meet the Biology curriculum grid for 100-level classes. Full-time faculty members are mentoring several new part-time faculty and are working with part-time faculty on courses revisions where needed.

The wet-lab is an invaluable resource for a variety of biology courses and numerous other classes including geology and photography courses. All of the marine biology emphasis classes and many of the General Biology classes make extensive use of the lab via experiments and interpretation of animal behaviors. In addition, it is visited regularly by school groups, the child-care facility and various students who view the organisms just for pleasure and stress relief.

The wet-lab houses 8 to 10 working aquaria as well as an array of investigative tools. The aquaria are home to diverse communities of organisms, including those found in both warm water and cold water marine ecosystems and fresh water and terrestrial ecosystems. Fish, sea anemones, clams, crabs, sea stars and sea urchins are among the many living organisms available for study. Every fall, a number of salmon eggs are hatched and raised in the wet lab with the young fish eventually being released in the Alton Baker Park area of the Willamette River. Fresh water systems including aquaria of fish, turtles, slugs, and amphibians are regularly set up to view these organisms. Terrariums and other hands-on exhibits are also available as viewing exhibits and experimental tanks.

Challenges and limitations: Offering such a wide range of courses presents challenges for lab preparation, materials management, scheduling and staffing. For four-credit lab courses, each course meets six hours a week; this is a significant scheduling challenge.

Each term (F, W,Sp) Biology offers 28 to 30 sections and a large diversity of topics, anywhere from 12 to 16 subjects, throughout the day and evening and during the week and weekends. The majority of these courses is a lab course requiring materials and set-up, often unique to one or two classes. Even in different sections of the same course there are often different requirements when the sections are each taught by different part-time instructors. Diversity of courses in each term requires a large spectrum of laboratory preparation and equipment. Coordinating the demands from different instructors to provide specific lab set ups should be a fully recognized and supported position.

The Division supports additional part time hours for maintaining the aquaria in the Wetlab, a valuable resource for marine biology and other science courses. Maintaining the Wetlab requires regular chemical and hardware (plumbing) management, cleaning, feeding, and other services. The resources needed for maintenance have come from a variety of areas. Every year, there are times when we find ourselves scrambling to prevent a collapse of the delicate ecosystems in our tanks. Finding the money to pay our part-time employee is particularly challenging, but that is only part of the funding problem.

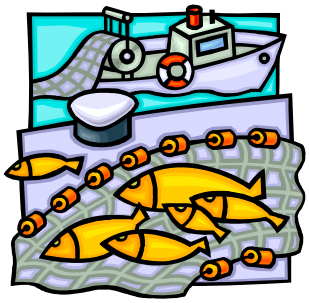
Typically, we find that the Biology Discipline and/or Science Division funds must be pulled to be able to meet the needs of the wet-lab, making these unavailable for other purchases.

Recently we tried to stabilize funding for the wet-lab by charging students in marine and other biology courses an extra wet-lab fee. There were problems with this approach. For the last two years, some fees at year-end have not been rolled forward for the summer months. For FY09, we were required to reduce the number of biology sections taught. The effect was lowering the over-all enrollment, and therefore, reducing the amount of wet-lab fee money collected.

Urgent needs: In order to coordinate these varying demands a knowledgeable Instructional Specialist is needed. This person provides the organization and resources in a timely way for students to have a successful and meaningful lab experience. To sustain this level of quality and quantity that has been a key attraction for students the Instructional Specialist should be in the recurring budget for Science. Biology cannot grow and maintain instructional excellence without permanent support staff in place. A full time Instructional Specialist is needed to assist our Life Science Lab Coordinator to maintain these broad offerings. Currently this position is an hourly position for less than .5 FTE in the Life Science Stockroom. A full time Instructional Specialist position would also maintain the Wetlab which is central to the marine biology courses, the most popular choices of students. The Wetlab is the center piece of the marine biology courses and requires daily care. Course fees for marine biology are not sufficient to maintain the equipment and pay for Wetlab upkeep.

In the 2007-08 year, the cost of regular operation of the wet-lab was $7071 (payroll and supplies). In the coming year, a similar sum (plus the cost of inflation) will be required. Last year an additional $500.00 was needed for emergency funds (new light bulbs, plumbing repairs, etc.) We already know we will need to replace the gravel in the large tank this year, and, like any complex lab, there are often unforeseen expenses.

Because the wet-lab is an indispensable pedagogical tool in the Science Division as well as a resource to the college as a whole, (both as a teaching tool and as a visual enhancement) our long-term goal is to secure consistent, reliable funding from the college to support it. In addition to dedicated funding, another way to provide this service is to have a full-time employee that can serve the needs of both the stock room and the wet lab. The hiring of one employee would provide more consistency with knowing the operations and set ups of the labs and aquaria. The knowledge gained by this person would increase every year and therefore fewer resources would be needed for training new personnel and fewer turnovers of workers would occur. A permanent full-time position would help mainstream needed funding and would alleviate concerns associated with variable course fee moneys. This individual worker would be fully trained in all aspects of the stock room and wet lab and would be a valuable asset to the department.



Because technology is an integral component of the Biology pedagogy/ teaching methodology, it is essential for this equipment to be maintained and replaced on a regular schedule. Use of computers in the classroom by instructors and students provide students with the most up-to-date ways to participate in doing science. The computers are used for data entry and analysis (Excel), for group lab reports (Word) and for sharing data, use of the Science Server, as well as internet resources. Instructional use of Starboards has elevated the presentation ability to be interactive and available to students.

Biology's variety of successful field courses expands more fully into new terrain, literally and figuratively. Expanding course offering to different course formats (weekend courses, Spring break courses) would attract additional students. The field course to Costa Rica has been successfully taught in 2006 and 2008. It has given students an opportunity to experience field biology and scientific inquiry in a tropical setting, which also affords students an opportunity to increase their cultural competency and global awareness of ecological challenges. The course format can be utilized as a model for other field

courses that can be offered both nationally and internationally. Potential for similar courses in Alaska and Baja Mexico are being considered.

In order to have support for growth of these and any other additional biology courses new full-time faculty are needed.

Chemistry

Positive Developments: Chemistry is going green! Meyer grant funds are supporting the discipline's yearlong project of developing sustainable (green) laboratory modules. The grant has a curriculum development component and a dissemination component. Current labs are being assessed and revised, and new green labs are being developed and tested for introductory and general chemistry at both the college and high school level. Experiments that are appropriate for College Now, for high school chemistry, or for other programs, will be shared as they become available. This project supports Lane's institutional value of sustainability. Chemistry faculty presented at professional conferences and wrote for professional publications. The discipline celebrated National Chemistry Week 2007 in an effort to increase student awareness of chemistry and to attract more students to our courses. Chemistry showed an increase in College Now enrollment from 23 FTE to 56 FTE this year. New courses offered were CH221S CHPS Chemistry Problem Solving for General Chemistry and CH112S Biobonds Study Skills.

Challenges and Limits: Time is a major limiting factor. Along with other Science disciplines, the chemistry discipline used the Responsibility Matrix for scheduling, Banner expense data for managing costs, and the part-time seniority database for staffing decisions. We also devoted time to Unit Planning and mentoring part-time faculty. Projected expansion of Health Careers programs and increased enrollment will push the limits of our discipline. Currently, impacted areas are staffing; student support in the Science Resource Center; classroom and laboratory space; teaching resources; and support personnel in the main office, SRC, physical science stockroom, and computer support (see Division staffing initiatives).

The chemistry discipline is proposing expanding online courses as a means of meeting student demand and containing instructional costs (see chemistry curriculum development initiative). An accidental unlinking of general chemistry labs and lectures has given General Chemistry instructors a focal point for increasing efforts to standardize the curriculum, ensuring that students can move seamlessly through the three-term sequence. We will use this opportunity to see how standardizing our curriculum might be implemented in other large enrollment lab classes. Elimination of capital outlay budget requests and lack of adequate repair and maintenance budgets have caused a decline in the condition of our classrooms, labs, and instructional equipment (see chemistry capital outlay initiative). Other challenges are high textbook costs and under-prepared students. Lane's budget climate and increased general institutional support for entrepreneurial spirit should push us to seek revenue generating proposals, such as textbook rental and grants. Advising and Counseling should be encouraged to provide a positive view of chemistry. Under-prepared students can be assisted by non-lab preparatory and/or science study skills classes (see chemistry curriculum development initiative), improving efficiency by increasing FTE without further impact on limited facilities.

Chemistry Critical Needs and Goals – Initiatives for FY10 (see section III)

1) Chemistry Curriculum Development Initiative: (a) Preparatory class for general chemistry; (b) Biobonds Study Skills class revision; and, (c) Online Biobonds and/or chem prep course

2) Chemistry Capital Outlay Initiative: Repair and replacement of laboratory equipment

Earth and Environmental Sciences

Accomplishments and strengths: The Earth and Environmental Sciences discipline has a vibrant, dedicated pool of part-time faculty. We have recently developed three new courses including ENVS 184 Global Climate Change which was taught in Fall 2007 as a 199 course and will be taught again this spring with its new number. The discipline had a productive year in FY08 and is looking to being more productive FY09. EES expanded both the number of courses and the fill rate in individual courses in FY08 and these trends are continuing in the first two terms of FY09. To serve increased Fall 08 enrollment, the discipline added trailer sections of G102 and ENVS 183. We plan to add another section of ENVS 181 in Winter 09 and G101 in Spring 09. The discipline is a natural home for sustainability topics. Three of our faculty participated in the initiative to develop a Sustainability Track in Science. Additional online courses and support of sustainability courses in our discipline is another area we are pursuing. One of our faculty members will be taking Sustainability Infusion training and then passing on that knowledge to other interested faculty within the division.

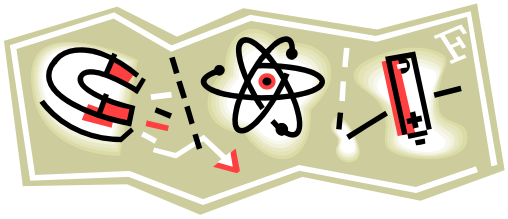
Challenges and Needs: With our current faculty being entirely part-time faculty, the Earth and Environmental Sciences discipline has nearly reached its maximum capacity in terms of the variety and number of course we can offer. Our main goal for FY09 is to improve the sustainability of our program by having our faculty assess and improve existing courses. We are implementing an initial assessment procedure in our courses and will be adding more assessment as the year goes on. We plan to examine the articulation of environmental science courses and reorganize them to better meet degree requirements for Environmental Studies and Environmental Science majors at UO and OSU. Any new courses would need to be carefully considered in terms of having the resources and faculty to support them.

Since losing the one full-time faculty member to lead the Science Division, 100% of the courses in the Earth and Environmental Science discipline are taught by part-time faculty. The part-time faculty pool currently has 9 members most of whom have taught at LCC for more than four years. One of the part-time faculty serves as coordinator, with a limited number of paid hours to oversee the entire program. To ensure the sustainability of the EES program, the discipline needs at least one full-time faculty member and should have two to be in parity with Physics. Last year, 75 students reported they were majoring in Geology and Environmental Science, which is more than Physics and Chemistry, combined (17 majoring in Physics and 54 in Chemistry -- Classbuilder data).

Another challenge for our discipline is the apparent obscurity of our course titles for beginning level geology courses. We plan to develop surveys to determine student-friendly names for G101 Earth's Dynamic Interior, G102 Earth's Dynamic Surface and G103 Evolving Earth.

Physics

Accomplishments and strengths: Our discipline courses are PH 101,2,3; GS 104; PH 091,2; ASTR 107; ASTR 121,2,3; GS 110,210; PH 201,2,3; PH 211,2,3; and ENGR 221. GS 110,210 and PH 091,2 were not offered in FY08. Also, the fall section of in-class ASTR 107 was cut. Overall in FY08, physics courses increased 2% in registrations, 2.4% in student credit hours, and 1.5% in student FTE, despite a 2.9% decrease in the number of sections (one section). Thus we maintained and increased last year's increases in enrollment of 24%, in student credit hours of 28.9%, in student FTE of 26.2%.



In the calculus-based general physics sequence (PH211,2,3) which nearly doubled enrollment in FY07, enrollment increased an additional 8.1% in student FTE. These increases validated the wisdom of our two-year effort led by DG to change traditional calculus pre-requisites and to schedule the main sections starting in fall with a trailer section in the winter. The

next largest previous enrollment increase had occurred by creating a full astronomy series, which DG led to approval. This increase was based primarily on offering more sections, and this validates - as more than a one-time effect - our assessment of demand for this full three-term sequence and changing it from three to four credits. In FY08, the three-course astronomy sequence for non-majors continued to attract more students, with an increase of 29.6% in registrations and 29.4% in student FTE. Fill rates in the three-course sequence grew from 68% in FY07 to 94.4% in FY08.

PH 201,2,3 continued as strong as before, but the inevitable attrition led to the familiar weak enrollment in PH 203. PB continued his efforts in curriculum development for the sequence and his teaching continued to help reverse elements of a bad reputation this sequence has had from the unevenness of faculty members teaching and their very different styles, who were never-the-less working hard to teach the classes without a standard curriculum, standard labs or knowledge of the available lab equipment, and a generally inadequate infrastructure. In FY09, we are experimenting with adding a trailer section of PH201 in winter term.

Adjunct faculty members, drawn increasingly from newly graduated or graduate student ranks, continued to inspire students by their closeness to physics research and gender diversity. The majority of kinds of physics courses continue to be taught only by adjunct faculty members, a practice we realize is considerably short of the standard set by the American Association of Physics Teachers.

Other accomplishments last year included: There were small gains in curriculum development. We implemented Math skills assessment instruments and initiated conversations with Math faculty members. There was movement toward physics requirements in the physical therapy assistant program. The UCORE internship program, of which DG is Lane liaison, had another successful year. The interim dean is supportive of the discipline, a welcome change. Physics took an active part in processes to directly engage potential new students in campus-wide events. PB has established good contacts with high schools as College Now representative. DG attended the major physics education conference over the summer. He maintained the physics x "class" for another year, and organized the first successful Physics Student Congress at the end of spring term. PB served on the college-wide Assessment team and participated in a highly successful general education assessment project in spring term.

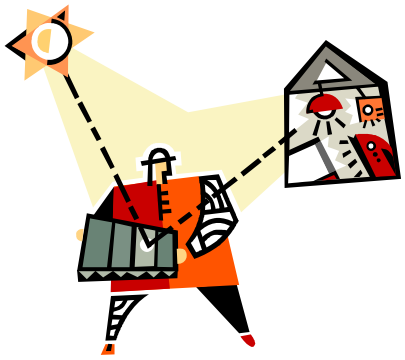
Already this year, enrollment has increased in all areas in which classes are given. The fall enrollment validates the re-establishment of the in-class section of ASTR 107; though, the one-term ASTR 107 is weaker than expected, while the three-term ASTR 121,2,3 series is starting out strong. Energy Management has doubled its enrollment leading to the expectation of new sections of PH 101,2 in winter and spring. The Physics discipline permanent faculty played a crucial role in leading the division-wide multi-disciplinary NSF STEP program grant.

Challenges and Limitations: The permanent faculty played, and will continue to play, an essential role in leading and ensuring systemic improvements in the quality of the program and realization of significant increases possible in enrollment. The main limitation to more major enrollment gains is the lack of sufficient permanent physics faculty members. For years the division has recognized the need for two more physics positions and calculations have been made showing a net increase in revenue is likely in addition to improving access and quality. Increasingly, it is difficult to find qualified adjuncts. In spring 2008, an adjunct replacement for DG could not be found so he could not take release time he earned. In fall 2008, a new replacement could not be found for an adjunct colleague who could not continue, and a recently retired part time faculty member returned to teach GS 104. We face a backlog of need for curriculum maintenance and updating, caused by long-standing systemic understaffing. There is a lack of staff resources to advance the Principles of Technology or Science Modeling Lab classes. In general, we are in a situation where our curriculum is not yet fully replicable, sustainable, or fully up-to-date. Much of our equipment is old, incomplete, disorganized, and/or not fully integrated into the curriculum. In terms of staffing, there are insufficient permanent positions and insufficient classified support if we were to fully integrate equipment into the curriculum. Efforts to enhance curriculum development and equipment have been limited by use of Carl Perkins, Tech Fee funds and the

centralization of course lab fees for other purposes than direct support for instruction. While the discipline enjoys good relations internally and within Science and among the faculty generally, morale is challenged by discouraging administration leadership priorities and processes, the lack of incentives for financial success, and the undermining of the traditional social contract between the administration and other employees in the college.

Urgent Physics Discipline needs are addressed in Section III and our initiative proposals.

Energy Management Program



Accomplishments and strengths: The Energy Management, Renewable Energy Program, and the Northwest Energy Education Institute continually have a positive impact on Division/College FTE generation in spite of not receiving general fund support. The programs are supported largely by external funding and by receiving tuition and fees for their courses. Fall 08, the program introduced our new Water Conservation Technician program. Water Program enrollment is at capacity which demonstrates that our forward thinking staff and advisory committee are on target in terms of growth in the building resource conservation industry. Also in fall 08 the Energy Management program nearly doubled its enrollment which again increased its contribution to the division/college FTE generation.

The Energy Program is proposing a new Energy Management Degree option titled Resource Conservation Management Technician (RCM). This option responds to the need of a multi disciplinary technician that will manage waste stream through-put for organizations like community colleges, universities, school districts, and government. Private industry will be attracted to RCM graduates as they begin to see the advantages of conserving resources. The "option" approval process is not as intensive as the "new AAS degree" process therefore, the program anticipates a Fall 09 start timeline, if internal approvals and funding sources for the new option can be secured.

The program submitted two National Science (NSF) ATE grant pre-proposals in April 08 which received "encouraged to submit full proposals" comments by all evaluators. Full proposals were written and submitted by the October 16th NSF deadline. Both proposals are designed to significantly increase program FTE using distance learning delivery platforms.

Additional FTE is generated by the program through professional development opportunities offered to the national energy industry and regional public. An example is the National Sustainable Building Advisors Program (NaSBAP) which was launched fall 08. The NaSBAP is a Lane non-credit course that offers a national certification.

The Energy Program Director is in part responsible for deliverables cited in the newly acquired Strategic Investment Fund provided by the state. The program will be involved in the sustainability deliverables by coordinating the following:

- Expanding the Water Conservation Technician program through distance learning
- Expanding the Energy Management Program through distance learning
- Developing curriculum sustainability curriculum as it relates to the energy industry
- Develop renewable energy and energy efficiency modules that can be incorporated into traditional building industry disciplines taught at the community college level.
- Assist with developing a relationship between the Oregon Solar Energy Industries Association, traditional plumbing and electrical apprentice programs and the Lane LRT and SOL degree programs.
- Develop a ground-coupled heat pump certification program

The Energy Program director has been recruited by the American Association of Community Colleges (AACC) to serve as a mentor in the very successful AACC NSF MentorLinks Program. The program pairs institutions that have discipline experience with those who are interested in staring similar programs. Lane will be working with West Virginia University on an energy project. The mentor commitment is for three years.

The Program Director has made numerous conference presentations speaking about the "green Jobs" industry and employment potential within this growing profession. Other presentations have been to institutions who are interested in developing degree programs using the Lane Energy Program as a model. The director has encouraged participation in the distance learning model as defined in the NSF ATE proposals mentioned above.

Challenges and Limits: As mentioned above our programs are growing in spite of, or possibly because of our independent funding model. Independence gives the program the needed flexibility to participate in the energy and water industries at a level not found in traditionally funded programs. Consequently, staff has the flexibility and program support to attend conferences and workshops that enhance their discipline knowledge and industry contacts. They participate on industry related boards and committees that lead to a deeper understanding of industry needs and important network relationships leading to student employment.

Critical Needs for FY10: The energy program has an opportunity to significantly grow into the extremely active energy efficiency, renewable energy, and water conservation industries. The program has only one full-time faculty and it is becoming increasingly more difficult to find and retain competent adjunct faculty. The critical needs are:

- Fulltime Renewable Energy faculty
- Fulltime Water Conservation faculty
- Fulltime Energy Management faculty
- Fulltime Administrative Support
- Classroom and lab facilities for new courses
- Continued support for distance learning development

Science Resource Center

During the academic year 2007-2008, the Science Resource Center (SRC) supported student success and retention, serving 1,151 documented students (and possibly many others who were not registered), and generating 27 FTE through tutoring services during the year. Over 700 exams per term were administered to students. The SRC also continued to provide students with a wide variety of discipline specific media, specimens, models, tools, and other equipment. Installation of 30 new computers that are completely matched and a new printer enhanced technical infrastructure for student learning, and decreased back-up time.

The strength of the SRC is also its challenge – enhancing student success leads to greater use of the facility. The pedagogical diversity of seven science disciplines, the sheer floor area in square footage, and the number of people served daily involve complexity of supervision and coordination. Managing the facilities and supervising student employees are additional levels of responsibility. The greatest limitation for the SRC is inadequate staffing in the face of increasing number of students; increasing number of instructors requesting services (including part-time instructors); and increasing number and type of services requested. Current SRC staff members have been overtaxed for too long. They cannot take mandated breaks or participate fully in Division activities without limiting hours and quality of SRC operation and services rendered.

Goals for 2009-2010 include examining and adjusting hours of operation to match student use patterns and allow SRC staff to attend Division meetings and do other tasks, such as maintenance of model and specimen inventory. In addition, we have devised new testing procedures and will test them this year with both students and instructors both inside Lane and for others outside our college. The Social Science testing Center has taken over some testing for Science courses this year. An additional work station has been set-up to provide proximity and faster service. This year Perkins grant funding to A&P will be used to purchase models for exclusive use by students in the SRC, instead of sharing and transporting to and from classrooms. These additional resources will ease the burden on limited staff. Sharing space and personnel with Disability Services and the Math Division are also potential avenues to explore. A Division task force has begun to meet and will develop recommendations. This year we are placing more tutors for students to use, with support from the Learn and Earn program and Federal Work Study funding.

College Now

Lane's Science faculty from Biology, Chemistry, EES and Physics works with high school faculty to offer over 54 high school sections for college credit. Lane earned 926 FTE from the College Now program in FY08, and Science contributed 139 FTE or 15% of that figure. This was an increase of 103.8% over FY07. The Division works closely with our high school colleagues. The Science Resource Center is available to College Now students for studying and completing class projects. Discipline contacts are: Paul Bunson, Physics; Stacey Kiser, Biology; Gary Mort, Chemistry; and Claudia Owen, EES.

Appendix A:

Advancing the Community of Science and Engineering Scholars (ACSES)
Lane Community College, Eugene, OR

Project Objectives and Plans

Lane Community College's ACSES program will meet the goals of the S-STEM program by increasing retention and success of students completing their associate degrees and/or transferring directly to four-year institutions in biology, chemistry, environmental science, geology, physics, or engineering within a three-year time span. In doing so, the program will provide ***access*** to science and engineering careers to a larger number of academically talented science and engineering students with financial need. The program will create a community of science and engineering scholars and support these students with scholarships, coordinated student services, and activities specially designed to meet the program's objectives. By providing full financial aid to academically talented students at Lane Community College, ACSES will increase the numbers of STEM students who transfer and ultimately complete their baccalaureate degrees.

The ACSES program is specifically designed to assist students with completing their science, math, and general education requirements within three years. This financial and programmatic assistance will increase significantly the likelihood that students will complete a baccalaureate degree in a reasonable period of time (five to six years). During the course of the grant, the ACSES program will provide up to 98 scholarships, with 24 scholarships specifically designated for incoming high school graduates in Lane County. By targeting this group, we will provide an incentive for academically talented and financially needy local youth to pursue studies in STEM disciplines. (This goal of including high school students is especially important in that Lane County's household income is greater than those of only three states [American Community Survey, 2002].)

ACSES's program's objectives are consistent with current initiatives at Lane to implement a comprehensive student services program, based on research and best practices for retention and success, as follows:

1. Increase the fall-to-fall persistence rate of full-time science and engineering scholarship students to 75%, compared to the college baseline figure of 53%, the average fall-to-fall persistence rate for cohorts of full-time first-year students from fall 2003 through fall 2006.

2. Increase the percentage of full-time science and engineering scholarship students who transfer (with or without a degree) within three years to 60% compared to the college baseline average transfer rate of 20% (Cohort analysis, 2000 – 2004, IRAP).

3. Increase the "college and career readiness" of full-time science and engineering scholarship students, as measured by pre- and post-surveys and a readiness portfolio.

Table 1. Current and ACSES services and activities

Conditions Critical for Student Success (Tinto, 2006)	Current Lane Services	ACSES services and activities
Expectation	**Collegewide:** SOAR: Student Orientation and Advanced Registration Testing and Placement Career and Employment Services College Now relationships	Scholarships as incentives to success NSF Scholar designation 2-day orientation: ACSES Expectations Focused career planning, including

Conditions Critical for Student Success (Tinto, 2006)	Current Lane Services	ACSES services and activities
	Student Recruitment and Outreach	academic pathways College and university visits
Advice	**Science Division:** Academic Advising Articulation agreements Informal faculty mentoring **Collegewide:** TRiO SSS program Other advising and counseling Student Web portal	Individual academic plan Specialized advising sheets Formal faculty mentoring within discipline Annual transcript evaluation by mentor and advisor
Support	**Science Division:** Letters of recommendation for students Referrals to college services **Collegewide:** ASLCC Legal Services Community Center for Family Counseling Counseling Department Cultural and Community Resources Disability Services Financial Aid and Scholarships Multi-cultural Center Student Veteran's Resource Center Student Web portal Substance Abuse Prevention Program TRiO SSS program Veterans Educational Benefits Women's Program (Transitions to Success).	Full financial support for ACSES scholars Scheduling pathways for majors ACSES team monitors and encourages progress Support from members of the ACSES cohorts
Involvement	**Science Division:** Majors' Party in spring Study groups SRC environment Community activities, internships Green Chem Club Physics Congress (discussion group) **Collegewide:** Student Life and Leadership Service Learning	Cohort activities and relationships College and community service University faculty and graduate student connections University speakers and seminars
Learning	**Science Division:** High quality science and engineering curriculum Learning Communities Project-based learning	Tools for Success in Science (supplemental instruction) Targeted Advanced Seminars Cohort study groups Completing academic milestones

Conditions Critical for Student Success (Tinto, 2006)	Current Lane Services	ACSES services and activities
	Advanced Seminars Cooperative Education Study groups Science Resource Center (staff and peer tutoring) Field trips Supplemental instruction	Conference opportunities Research internships, such as U-CORE and individual university research labs On the job internships Developing readiness portfolio

Table 5. ACSES services and activities according to conditions for student success

Conditions Critical for Student Success (Tinto, 2006)	ACSES services and activities		
	All scholars (continuous)	First-year cohort	2nd year/returning students cohort
Expectation	Scholarships as incentives to success NSF Scholar designation	2-day orientation: ACSES Expectations Focused career planning, including academic pathways	College and university visits
Advice	Formal faculty mentoring within discipline Annual transcript evaluation by mentor and advisor	Individual academic plan Specialized advising sheets	Connections with university advising
Support	Full financial support for ACSES scholars Scheduling pathways for majors ACSES team monitors and encourages progress Support from members of the ACSES cohorts		
Involvement	Cohort activities and relationships	University speakers and seminars	College and community service Connections with University faculty and graduate students
Learning	Targeted Advanced Seminars Cohort study groups Completing academic milestones Developing readiness portfolio	Tools for Success in Science (supplemental instruction)	Conference opportunities Research internships, such as U-CORE, SPUR and individual university research labs On the job internships

ACSES activities that will be specially developed and implemented for the scholar cohorts include:
Summer orientation: ACSES Expectations
- 2 day workshop prior to Fall term
- Build community among scholars and mentors and identify cohorts within each discipline.

- Activities include: academic advising via Student Orientation and Registration (SOAR), speakers from the scientific community, and team-building.

Scheduling pathways for majors
- analyze and schedule majors' courses in order to reduce the conflicts between class, so that students can complete their science requirements for transfer as efficiently as possible.

Completing academic milestones:
- identify key milestones for each discipline, and indicate these for students in their individual educational plans; students who reach milestones will be acknowledged and rewarded by opportunities such as joining Phi Theta Kappa (the official honor society for two-year colleges), or attending a conference or other science/engineering activity.

Conference opportunities
- Support to attend regional or national conferences such as Ecological Society of America, American Chemical Society or American Physical Society
- Available on a competitive basis for scholars involved in research, internships or related activities

First Year Experience: Tools for Success in Learning Science
- Team-taught modular course required of first year scholars.
- Instruction in areas of:
    - critical reading
    - scientific writing
    - data analysis
    - introduction to academic and career pathways in STEM disciplines.

Developing readiness portfolios
- Includes a statement of career goals, transcripts, resumes, scholarship and application essays, letters of references, conferences attended, presentations, papers published, among other things

Appendix B:

Increasing STEM Enrollment and Success: Leveraging Multidisciplinary Synergy and Best Practices (ISES)

Project Summary

Lane Community College's (Lane) multidisciplinary project, Increasing STEM Enrollment and Success: Leveraging Multidisciplinary Synergy and Best Practices (ISES) meets the goals of the NSF STEP program. ISES will directly impact the intellectual growth of students and enhance the social and emotional growth of students to enter and successfully complete STEM programs of study. Deep and transformative learning and reflection on that learning builds solid confidence that success is possible and worthwhile in STEM programs. ISES is optimally situated in a community college environment, in which the primary focus of the faculty is teaching and the science faculty is in one organizational unit. The four multidisciplinary activities of the ISES project will shift the culture of teaching and learning and build capacity within the Science Division to sustain such efforts to further engage students in STEM disciplines, opportunities, and career. As a comprehensive approach, the project's activities are designed to increase enrollment, improve retention by enhancing the quality of learning and ease of navigating science programs at Lane, and ultimately, increase graduation and transfer rates to baccalaureate programs.

The Intellectual Merit of the ISES project is its solid grounding in research and best practices for teaching and learning, drawing on the work of physics educators and other teaching experts and integrating best practices into the reflective practice of Lane's outstanding science faculty. The project also builds on a solid foundation of research and practice in student services areas and will coordinate with the Title III project, *Engaging Success*, which begins this year. The program activities build on the Noel-Levitz Success formula for postsecondary students' success: Success = student engagement, student learning, and student satisfaction, by ensuring that student engagement in meaningful learning is the centerpiece of their community college science preparation.

The **Broader Impacts** of ISES are: (1) developing a replicable model of curricular enhancements for community colleges and other integrated science divisions; (2) implementing best practices across the science curriculum; (3) applying an academic pathways approach that builds on the community college bridging role and capitalizes on our existing networks; and, (4) introducing students to scientific modeling in a variety of disciplines early in their academic careers, building foundational skills in research and critical thinking.

Program Objectives

1. Increase the number of students successfully completing STEM majors' courses at Lane by 15% by 2014.
2. Increase the percentage of STEM students completing their associate degrees in science within 3 years from 8% percent to 20% percent by 2014; and
3. Increase the percentage of STEM students successfully transferring (with or without degrees) to four-year colleges and universities within 3 years from 9% percent to 25% percent by 2014.

Table 4. Science Division and ISES majors sections, registrations and FTE

	Sections		Registrations		FTE	
	05-06	06-07	05-06	06-07	05-06	06-07
Science division, all transfer programs, 100 and 200 level courses	271	274	5357	5848	799	843
ISES disciplines (counting majors courses only)	83	94	1391	1671	161	181
ISES disciplines, declared majors[2]					481 students	570 students
ISES disciplines, matriculating					254	272

majors[3] headcount			students	students

[2]Declared majors are defined as those who self-select on of the Science Majors' codes when they apply to Lane or annually update their registration information.
[3]Matriculating majors are defined as those who had earned credit in 2 of 3 courses in a majors' (200-level) sequence in the prior year OR had earned credit in any 5+ courses among the majors' sequences during two years (prior and designated years). Differences in the number of declared engineering majors and actual matriculating engineering majors accounts for a large part of the differences between the two sets of numbers.

Increasing STEM Enrollment and Success: Leveraging Multi-Disciplinary Synergy and Best Practices (Timeline Summary of Activity)

I	**Inspiring interest in STEM**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
I-A	Establish three multi-disciplinary theme-based science classes in a learning communities linked with writing.	x	+E	...	...	...
I-B	Establish a comprehensive, balanced set of new learning communities linked to STEM-program courses and a balanced set of special interest courses that encourage enrollment in STEM-program courses.		x	x +E	+E	...
II	**Best Practices Collaboration**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
	Best Practices Seminar leads comprehensive enhancement of curriculum elements, pedagogical frameworks, and assessment instruments.	x+Q	x+Q	x+Q	x+Q	+Q
III	**Create Broad Modeling Study Opportunities**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
III-A	Establish Science Modeling Labs (SMLs) on a large scale.	x	x+Q	x+Q	x+Q	+Q
III-B	Establish an Introduction to Systems Analysis/Modeling and Introduction to Scientific Computing Courses.			x	+Q	...
IV	**Rapid Transfer**	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**
	Establish the means for students to visualize, plan, and realize successful rapid progress through STEM transfer programs.	x	x +E	+E	...	...

NOTE: "x" indicates year(s) of major work; "+E" indicates enhancement in learning environment contributing directly to increased STEM enrollment; "+Q" indicates enhancement in learning environment contributing directly to increasing ratio of successful progress in Science/Engineering classes; "..." indicates continuation of enhancement.

Budget notes: Total request, over five years = $997,237. Indirect to college = $99,634
Salaries and OPE: $813,046, Travel: $38,557, M&S: $6,000, Evaluation consultant: $40,000