Unit Planning: Instruction
For 2011-2012 (FY12)
Science Division

Executive Summary

- The Science Division added 28 transfer sections FY10 to accommodate enrollment growth.
- Energy Management continued to grow with the addition of a fast-track cohort, continued growth in the regular program and the first year of the Resource Management option.
- Water Conservation Technician program grew as the first cohort entered the second year of coursework and a new first-year cohort enrolled.
- Science is operating at full capacity to meet student needs; transfer course fill rates were 95.8% in FY10 and 92.9% overall for the Division.
- The Science Division produced1167 FTE in FY10, representing a gain of 9.5% over FY09 (excluding College Now).
- Maintaining instructional excellence in Science courses will require stable staffing and funding.
- Continued growth in instructional areas will require additional full time faculty and support staff.
- Faculty and staff are committed to meeting Lane's mission and strategic directions through innovative curricula, student engagement, community involvement and sustaining our facilities, equipment and instructional resources.

Section I: Data Elements

The Science Division offers courses in the transfer disciplines of Anatomy and Physiology, Biology, Chemistry, Earth and Environmental Science, and Physics. Beginning in FY10 the pre-Engineering course of study was moved to the Math Division. 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 a new option in Resource Conservation Management. The new AAS degree in Water Conservation Technician completed its second year. The NEEI also supports a wide range of workshops, grants, continuing education certifications and customized courses.

Data elements tell an incomplete story about the work and results of teaching and learning in the Science Division. Faculty and staff facilitate instructional activities and student engagement that change the lives of our students.

Classbuilder data for sections (based on CRNs) are distorted by the inclusion CRNs for "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. 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.

This year we are reporting some data by subject prefixes rather than regrouping courses into actual discipline groups within Science. Reporting by subject prefixes is done as a time-saving method. Using subject prefixes combines Anatomy and Physiology courses into Biology (BI prefixes) and groups General Science (GS) courses, usually paired with Geology and Environmental Science. In actuality GS courses are distributed among all the Science Disciplines.

Division and Discipline Level: Sections and Student FTE

Overall student FTE in transfer courses increased 6.6% from the previous year. Among transfer areas, Anatomy and Physiology (A&P) and Earth and Environmental Sciences (EES) grew the most. These areas added distance learning or hybrid courses. NRG/WATR FTE increased dramatically, with a 50.4% increase in FTE. Overall, including College Now, the Division earned 1292.4 FTE, for a 9.5% gain over FY09.

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. College Now courses are supported by Science faculty liaisons. College Now sections decreased from 61 in FY09 to 55 in FY10 with a 6% reduction in FTE. Classbuilder data report an overall gain in FTE for Science, including College Now, of 7.8%.

Enrollment management: effects of enrollment surge

The FY10 enrollment growth in Science leveled off somewhat from the dramatic increases of the previous year. This was largely due to reaching the maximum for classes in most disciplines. The total increase in transfer FTE was affected by moving the Engineering course of study to the Math Division. When Engineering FTE is excluded, the transfer gain in Science calculates to 8.3%.

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

DISCIPLINES	05-06	06-07	07-08	08-09	09-10	%Chg 0 09 to 10	05-06	06-07	07-08	08-09	09-10	%Chg 09 to 10
A&P	53	51	51	55	67	21.8%	160.4	156.1	162.2	187.3	210.9	12.6%
Biology	104	109	99	110	117	6.4%	305.5	319.1	303.9	345.1	370.5	7.4%
Chemistry	76	68	78	77	82	6.5%	168.0	166.0	166.3	183.2	190.0	3.7%
Engineering	5	6	6	6	0	-100.0%	9.0	12.0	11.6	15.5	0.0	-100.0%
EES	36	33	32	39	44	12.8%	84.7	102.0	105.3	127.1	152.8	20.2%
Physics	33	35[2]	34	37	36	-2.7%	70.0	87.8	89.1	105.1	102.2	-2.7%%
TOTAL SCIENCE TRANSFER	**307**	**302**	**301**	**324**	**346**	**6.8%**	**797.6**	**843.0**	**838.4**	**963.3**	**1026.4**	**6.6%**
NRG Mgt/WATR[1]	22	23	23	32	53	65.6%	39.2	37.6	48.1	80.2	120.6	50.4%
Co-op	19	17	20	16	21	31.3%	16.7	12.8	20.1	22.6	20.2	-10.8%
TOTAL SCIENCE	**348**	**342[2]**	**344**	**372**	**420**	**12.9%**	**853.5**	**893.3[2]**	**906.6**	**1066.1**	**1167.2**	**9.5%**
College Now	18	30	54	61	55	-9.8%	61.2	68.4	139.4	133.1	125.2	-6.0%
TOTAL SCIENCE W/COLLEGE NOW[3] (corrected)	**366**	**372**	**398**	**433**	**475**	**9.7%**	**914.7**	**961.7[2]**	**1045.9**	**1199.3**	**1292.4**	**7.8%**
Science total from Classbuilder Incl CN	406	441	499	561	581	3.6%	914.7	959.8	1045.9	1199.3	1294.4	7.8%
CottGr-Florence[4]	16	20	25	23	22	-4.3%	12.0	14.6	17.9	19.4	17.2	-11.5
TOTAL SCIENCE-GENERATED FTE	**383**	**392**	**423**	**456**	**497**	**9.0%**	**926.7**	**976.3**	**1063.8**	**1218.7**	**1309.6**	**7.5%**

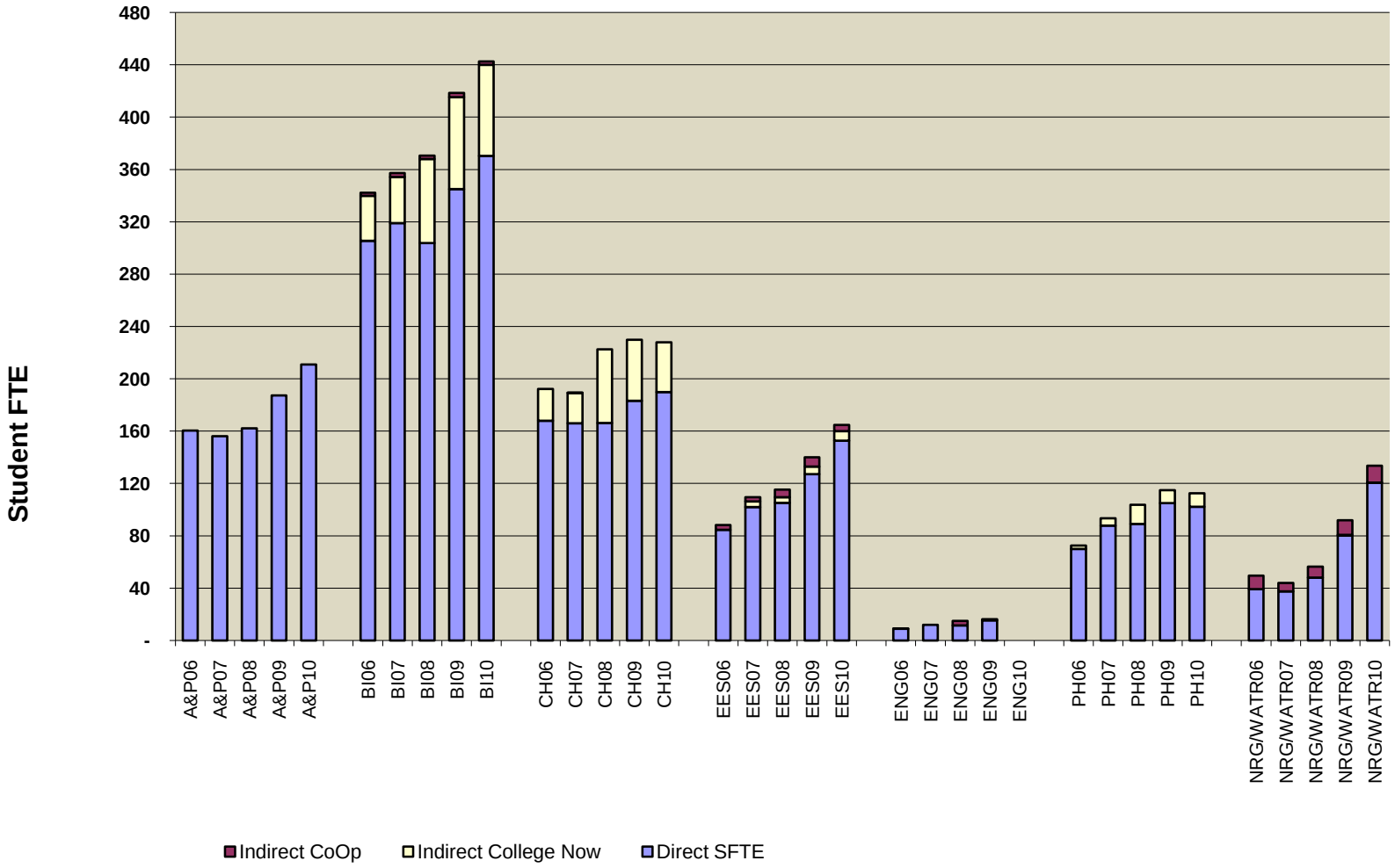
[1]NRG includes courses with the NRG, DRF, SUST, and WATR prefixes and a variety of X-prefixes for various workshops conducted by the NRG faculty. All FTE from NRG is accounted; in the section counts for NRG we have only included regular AAS classes. NRG Management receives tuition from its courses.

[2]06-07 section counts and FTE have been corrected to include a Physics section that is attached to the BDC in Classbuilder.

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

[4]These classes are included to provide a full picture of Science FTE at Lane; approximately 40% of the FTE in this category is generated by Science Division distance learning classes. The remainder is generated by courses taught at the satellite campuses.

Fig. 1. Science Five Year Enrollment History



Student FTE/Faculty FTE ratio

The Student FTE/Faculty FTE ratios are approximations only and should be interpreted with caution. The Science transfer courses accommodated enrollments that exceeded course capacities in many sections.

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}		
	FY08	FY09	FY10	FY08 (calculated 10/31/07)	FY09 (calculated 10/31/08)	FY10 (calculated 10/31/09)	FY08	FY09	FY10
Science (excluding Energy Management[5])	852.8	992.9	1065.7	29.2	29.1	33.6	29.2	34.1	31.7
Energy Management	53.8	73.3	101.6	2.8	3.8	5.2	19.0	19.5	19.6
Science Total (including Energy Management)	**906.6**	**1066.1**	**1167.2**	**32.0**	**32.9**	**38.8**	**28.3**	**32.4**	**30.1**

Course Completion and Success Percentages, FY10

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. Both completion and success rates continued to rise slightly in FY10 compared to FY09. Completion and success rates exceeded the college average.

Table 3. Completion and Success Rates by Prefix Groupings, FY10

Prefix groupings	End Wk2 Total	Finish	Complete Rate	ABCP	Success Rate
AP	1577	1461	92.6%	1333	84.5%
BI/BOT/Z	2855	2685	94.0%	2444	85.6%
CH	1407	1292	91.8%	1161	82.5%
ENVS/G/GS	1198	1107	92.4%	1026	85.6%
ASTR/PH	699	641	91.7%	599	85.7%
NRG/WATR/SUST	1136	1074	94.5%	1044	91.9%
Total Science incl. Coop	8,872	8,260	93.1%	7,607	85.7%
College totals	112,864	103,952	92.1%	93,248	82.6%

Note: In FY10, Engineering courses moved to the Math Division so are not reported here.

Completion and Success for online classes

In FY10 Science increased its distance learning offerings by 68%, with an increase from 19 sections in FY09 to 32 sections in FY10. We offered 17 online sections and continued to offer 8 sections of our popular general science telecourses. In addition, we expanded our hybrid courses to 7 sections, including newly developed hybrid sections of AP 1, 2 and 3 which are prerequisites for many health professions programs. FTE increased 58% in distance courses compared to FY09. For telecourses, separate CRNS with small enrollment caps are held for Florence and Cottage Grove registrations; these are not included here as separate sections.

The Completion and Success Classbuilder data reported that the completion rate for all distance learning Science courses averaged 88.5%; success rates averaged 81.7%. Completion rates are lower than the Science average (92.9%); however, success rates are comparable. Most notable was the significantly lower success rate of 69.4% in hybrid classes. FY10 was the first full year in which we offered the AP sequence in the hybrid format. Faculty reported that many students were unclear about the expectations of the hybrid class. As a result, faculty advertised the different types of courses offered, presented these options to BioBonds students before entering the AP sequence, and revised both curriculum and scheduling of the hybrid sections for FY11. Faculty continues to enhance the hybrid courses with both audio and video podcasts and improvements to Moodle components, which appears to improve student learning in the hybrid format. Anecdotally, students appear to have a much better idea of hybrid instruction in Fall 2010, and faculty believe the completion and success numbers will be better in FY11 when compared to our first year with hybrid instruction in AP. We will continue to assess completion and success rates in distance learning sections. It should be noted that many factors affect student completion and success.

Capacity Analysis (fill rate of class sections):

The Science Division added 28 sections in the transfer program. Energy Management added 12 sections to meet enrollment growth, in addition to new courses added to Energy and to Water Conservation (2nd year courses). Maintaining manageable class sizes is a key element in sustaining quality learning and working environments.

Table 4 report trends in section counts and fill rates in Science. We have used the Science Division's accurate in-house counts of sections combined with the Classbuilder capacity percentages In order to make the capacity information more relevant for Division planning. The capacity percentages are calculated using a somewhat different set of sections than the entire Science program. Based on Classbuilder data, the Science transfer program decreased in fill rates from 96.7% in FY09 to 95.8% in FY10. EMPT fill rates in FY10 for transfer courses (based on student enrollment) indicated rates of 100.3% for Fall, 95.9% for Winter, and 93.6% for Spring. In Fall10 for FY11, the EMPT fill rate for transfer courses was 98.9%, remaining very high.

Capacity rates for the new Water Conservation Technician AAS program were significantly lower in FY10 (58.8% compared to 81.8% in FY09, the first year of the program). FY10 was the first year for running the second year courses and the program had a smaller than expected second-year cohort of students. This group experienced the "growing pains" of the new program. As a result of student feedback, program instructors have revised some curricula and are working to ensure that students understand the intent of the program which is employment as a technician in the demand side of the water industry, focusing on residential, commercial, industrial and agricultural end-uses for water. Faculty and staff are also developing a more locally based advisory committee to work with the program and to increase cooperative education

internships for students. Early indications in FY11 are that these efforts are resulting in higher retention.

Table 4. Capacity rates[1] for Science, FY06 – FY10

	Sections (using actual in-house counts)						**Capacity %** (from Classbuilder data)[1]					
	05-06	06-07	07-08	08-09	09-10	%Chg 09 to 10	05-06	06-07	07-08	08-09	09-10	%Chg 09 to 10
SCIENCE TRANSFER	307	302	301	324	346[3]	+7.1%	85.6%	83.3%	92.6%	96.7%	95.8%	-0.9%
NRG/WATR[2]	22	23	23	32	53	+64.5%	62.0%	60.2%	72.0%	75.7%	75.8%	+0.1%
TOTAL without cont ed sections	329	325	324	356	399	+12.1%	83.9%	81.7%	90.8%	94.5%	92.9%	-1.7%
TOTAL SCIENCE from Classbuilder summary	n/a	n/a	n/a	n/a	n/a	n/a	83.2%	81.4%	90.2%	92.8%	91.0%	-1.9%

[1]percentages 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] Excluded from NRG/WATR section counts are the continuing education workshops, etc. that have non-standard enrollments. Included are credit courses with NRG/SUST/WATR/DRF prefixes that are required for AAS degree programs. Capacity rates for NRG/WATR may be distorted by the inclusion of continuing education courses is the percentages.

[3]In FY10, Engineering moved to Math, resulting in a loss of 7 sections previously counted in Science. The net increase of sections in FY10 was actually 28 sections added.

Table 5. EMPT fill rates, end of Fall terms, FY07 – FY10

Fill rates	EMPT Data/Science			
	Fall 2007	Fall 2008	Fall 2009	Fall 2010
Transfer Science courses	96.3%	94.5%	100.3%	98.9%

Revenues/FTE and Costs/FTE

The financial information in Classbuilder at subject levels provides a somewhat confusing picture of the Division's budget, actual costs and revenues. The "crosswalk" method used for FY10 differs from prior years, so comparisons with last year's Unit Plan Table 6 and 7 are not possible. For Science, subject codes do not map directly onto disciplines, since many have multiple prefixes. The cost per FTE at the subject level is overly dependent on the pay level of individuals assigned to courses and does not reflect specific 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. The Energy Management program is self-sufficient and funded by outside gifts, grants and contracts. For this reason, we have separated the NRG/WATR career technical programs from the transfer program where possible. The data presented here are lifted directly from IRAP Classbuilder data, with the addition of some calculated totals. These data should be used with caution and are most meaningful in comparison among divisions, programs, and the college as a whole.

Table 6. Classbuilder data: Revenue/FTE details (no differential fees charged)

Subj Subject Description	Total Student Credits	Total Student FTE	Credit Tuition (allocated by credits) ($)	Non-Credit Tuition (allocated by student FTE) ($)	State Support (allocated by student FTE) ($)	Mandatory and other Student Fees ($)	Other Sources ($)	Grant Revenue ($)	Total Revenue ($)	Total Revenue per FTE ($)
ASTR Astronomy	798	22.7	62,947		42,746				105,693	4,662
BI Biology	17,807	641.8	1,404,629		1,210,061	6,506			2,621,196	4,084
BOT Botany	92	3.0	7,257		5,619				12,876	4,321
CH Chemistry	6,281	225.4	495,450		425,006	8,192		13,490	942,138	4,180
ENVS Envir Science	1,012	40.0	79,827		75,460				155,288	3,880
G Geology	2,545	83.4	200,752		157,294	1,970			360,015	4,316
GS General Science	1,494	50.3	117,848		94,919				212,767	4,227
PH Physics	2,457	86.9	193,810		163,931	490			358,231	4,120
Z Zoology	160	5.2	12,621		9,767				22,388	4,322
[1]Transfer Total		1158.7							4,790,592	4,134
NRG Energy Management	2,946	89.5	232,383		168,701	11,039	439,840	56,829	908,793	10,158
SUST	258	7.5	20,351		14,161				34,512	4,595
WATR	749	24.6	59,082		46,460	1,808	50,574	13,855	171,778	6,972
XCST Construction - Ext Lrng		0.6	-	335	1,112				1,447	2,453
XHE Health - Ext Lrng		0.8	-	465	1,546				2,011	2,453
XNRG Energy Management - Ext Lrng		10.4	-	5,900	19,610	1,283	51,236		78,029	7,503
XRH Refriger/Heating - Ext Lrng		0.3	-	159	528	35	1,379		2,101	7,503
[1]CT Total		133.7							1,198,671	8,965
SCIENCE TOTAL	36,599	1,292.4	2,886,957	6,859	2,436,922	37,506	563,095	84,173	6,015,511	4,654
LANE TOTAL	416,632	14,964.2	33,869,323	761,162	27,925,455	3,246,289	1,329,358	6,107,520	74,651,804	4,989

[1]These are calculated numbers; totals do not match the Science Total from Classbuilder; a mystery.
[2]XCST and XHE are consistently attributed to Science. These continuing education activities appear to belong to other Divisions.

Table 7. Classbuilder data: Revenues, Direct Faculty costs and Total Costs per FTE, 08-09.

COST PER FTE 2008-09 IRAP	By Subject codes	Student FTE for REV[1]	Total Revenue ($)	Total Revenue/ FTE ($)	Student FTE for costs[1]	Direct costs/FTE (excl grants)	Overhead & Direct costs/FTE
Sci	BI Biology	588.5	2,677,237	4,550			
Sci	BOT Botany	3.1	14,939	4,804			
Sci	Z Zoology	8.4	40,430	4,807			
	BI/BOT/Z				523.2	2,695	5,770
Sci	CH Chemistry	227.3	1,039,098	4,572	194.1	3,043	5,447
Sci	ENGR Engineering	19.0	96,723	5,099	2.6	2,532	4,822
Sci	ENVS Environmental Sci	32.9	143,848	4,375			
Sci	G Geology	71.4	342,163	4,796			
	G/ENVS (EES)				96.5	2,423	4,711
Sci	GS General Science	47.6	220,726	4,638	20.3	1,246	3,262
Sci	ASTR Astronomy	20.8	108,203	5,200			
Sci	PH Physics	88.5	408,899	4,620			
	PH/ASTR				99.4	3,307	5,530
Transfer total		1107.5	5,092,266	4,598	936.0	2,772	5,512
Sci	NRG Energy Management	55.0	606,453	11,022	62.0	3,779	29,394
Sci	SUST	8.3	40,909	4,941	8.0	847	21,197
Sci	WATR	10.4	79,003	7,633	10.0	3,936	10,650
Sci	XCST Const - Ext Lrng[2]	0.8	2,294	2,904			
Sci	XHE Health - Ext Lrng[2]	2.4	7,086	2,904			
Sci	XNRG - Ext Lrng	14.3	130,161	9,128			
Sci	XRH Refriger/Heating	0.8	2,178	2,904			
CT total		92.0	868,084	9,436	80.0	3,516	26,183
Science Total		1,199.3	5,760,783	4,804	1,016.0	2,813	7,120
Lane Total		12,823.0	66,226,743	5,164	10,840	2,877	7,274

[1]Note that the FTE numbers are different for revenues and costs. Another mystery.
[2]XCST and XHE are consistently attributed to Science. These continuing education activities appear to belong to other Divisions.

Limits to growth

Balancing growth against resources is extremely difficult. 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 addition of hours for our Life Science support staff person has helped immensely in FY11; this assistance was lacking in FY10. Likewise, permanent staffing in the Science Resource Center remained limited to one staff member in FY10; a part-time testing support person is assisting in FY11. This facility provides tutoring, group study space and testing services for 1000s of students each term. Finally as more students use instructional materials and equipment, wear and tear increases. The division has not received additional M&S funds to maintain high costs equipment and to replace materials and supplies used in the increased number of sections of courses.

Expected budget to work within

M&S funding for FY11 will fall short of instructional needs. Through discipline and SAC discussions, we set priorities for spending to achieve internal goals, such as providing adequate instructional materials and activities, marketing and outreach, and professional development for staff members. We are committed to optimizing the resources we have. For FY11 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.

Support needed to sustain excellence and to grow

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

We are all aware of the severe constraints for replacing faculty, staff and management vacancies; and for adding new positions. The Science Division experienced one FT retirement in FY10, and anticipates additional retirement announcements in FY11. As the college considers how to prioritize hiring decisions, here are some factors to consider regarding replacing and 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 (excluding overhead).
- Many career technical programs have prerequisite courses in the sciences, especially those in health careers.
- Having a scientifically literate citizenry is a national priority.
- 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 major will take multiple science courses and other requirements in preparation for transferring to four-year colleges.

Section III lists the identified needs for:

1. full-time faculty in all Science areas.
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

The Division recommends costing new positions 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 and fully committed work force.

Section III: Goals and Initiatives

The Science Division is strongly committed to the comprehensive mission and core values of Lane Community College. For the past three years, the themes for the Science Division's plans have been

(1) optimizing sustainable access for students and options for quality learning; and
(2) optimizing the curricula and resources we already have.

For the FY 12 Unit Plan, the Division is maintaining those themes and emphasizing four of Lane's newly adopted strategic directions:

- **A liberal education approach for student learning**
- **Optimal student preparation, progression and completion**
- **Online learning and educational resources**
- **A sustainable learning and working environment**

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 success. At the same time, we recognize that sustaining excellence and future growth of instructional programs will be dependent upon increasing contracted faculty and classified staff to provide stable support for student success and sustainable learning and working environments. In our discipline and division-level conversations, we view the goals and initiatives proposed here *as a package* that provides for a sustainable future, with increased enrollment, engagement and retention in Science programs. The goals and initiatives represent long term planning by disciplines and by the Division as a whole.

The initiatives that we will put forward in January will address achievable and sustainable outcomes for FY12, in support of the strategic directions. Initiatives represent short term investments in the long term success of our students and the long term sustainability of the college.

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

- Introduce Unit Plan components and timelines at Fall Division In-service, Sept. 22.
- Disciplines work on plans, Oct. 15 – Nov. 15, with leadership from Science Advisory Committee representatives.
- Unit Plan work session held on Oct. 29.
- Section III table and Discipline summaries, due Nov.15
- Review of Section III table and technology needs at Division meeting, Nov. 19
- Compilation of data elements, Section III table and discipline summaries
- Initiatives prepared for submission, Nov. 22 – Jan. 29

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**	Meet enrollment demands within the limits of staffing and room capacity. Staff with existing PT and FT faculty and staff within contractual agreements using overloads as applicable. Add trailer sections where demand is high, as feasible Add online sections where demand is high, as feasible	Ongoing Plan additions for FY12	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**	Rapid Transfer concept: 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 SOAR Packets, and other appropriate venues; and to counseling and advising staff. Track enrollment gains in Biology, O-Chem and Gen Physics.	Continue work on this FY11 to FY12	Initiative: ancillary work to support summer meetings, multi-disciplinary team Coordinate with TRiO STEM staff and with Science academic advisor and counselor.

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
Develop curricula and programs in support of sustainability concepts; and develop and steward Lane's outdoor instructional laboratories and critical habitats for students and the community			
3. Increase sustainability-related curricula in support of sustainability in learning goals. **Outcome of all: More sustainability curricula, increased student FTE in sustainability topics, increased student interest in science.**	Develop and implement Science Sustainability course of study and Science Sustainability Award Submit for SAC and/or Division/Stakeholders approval Submit for Curriculum and Sustainability & Learning committee approvals	W11 Sp11 Fall 11	Enrollment enhancement; no new costs.
	Apply for approval of ENVS 182, 183 and 184 as sustainability focused courses	W11	No funds needed.
	Update and enhance ENVS 183 to accommodate needs of Sustainability Coordinator AAS degree, to update current issues and data, to incorporate active learning and develop new labs, to add 3 pillars of sustainability.	FY 12	Initiative: CD funds, Perkins, EES Discipline
	Begin development of Watershed Science AAS and Watershed Science course of study for AAOT, with potential Pathways Certificate for Natural Resources.	FY 12 (initial steps in W, Sp 11)	Initiative: CD funds, EES and Biology Disciplines
	Develop a field ecology course with diversity emphasis that includes travel to national and international ecologically significant sites including Alaska and further development of our Costa Rica course; possibly as interdisciplinary learning community with Spanish immersion and/or	FY 12	Initiative: CD, Biology Discipline

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	international student enrollment. Develop BI 103D, Seabirds and Mammals course to Baja California.		
	Develop sustainable chemistry course	FY12 Teach in Fall 12	Initiative: CD, Chemistry Discipline
	Complete development and curriculum approval for Geologic Hazards course (3 credit online course with optional 1 credit lab).	Develop in FY11, get approvals in W 11, teach in W12	CD funds awarded for FY 11, EES Discipline
	Develop a 4th option in Energy Management for Controls Technician Develop a Resource Conservation Management Certificate	FY 12 FY 12	Additional courses funded outside of General Fund
4. 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	Ongoing.	No new funds. Facilities Management support needed. Groundskeeping and Biology cooperative project.
5. Stewardship of outdoor learning laboratories and increasing visibility for sustainability branding for science. **Outcome: Long term sustainable learning and working environment for students and community**	Ensure that Native Landscaping and other critical habitats are recognized and maintained for learning. Engage in leadership roles on college committees for master planning and for sustainability in learning. Work with community groups in planning activities.	Ongoing.	Faculty and staff leadership.

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
Enhance curricula and develop new curricula for quality learning, including online and hybrid courses.			
6. Increase online learning options for students. **Outcome: More options for students to succeed; high quality online offerings; enrollment increases.**	Assess online and hybrid options for AP courses. Assess learning outcomes and update online version of BI 101J, Unseen Life on Earth.	FY 12 FY 12	Initiative: CD, A&P Discipline
	Convert an existing Marine Biology course to a hybrid format	FY 12	Initiative: CD, Biology Discipline
	Develop online chemistry preparatory course: Convert existing course materials to online format; add to class schedule	FY 12 Teach FY 12	Initiative: CD, Chemistry Discipline
	Develop online CH112 course: Convert existing course materials to online format; add to class schedule	FY 12 Teach Winter, Spring FY 12	Initiative: CD, Chemistry Discipline
	Continue development of hybrid and online NRG core courses.	FY 12	Funded through NSF LANES grant.
7. Enhance curricula to support Health Professions, including online options **Outcome: Increased support for Health Professions students, and less stress in completing prerequisites; increased enrollment**	Pursue development of a first year "science for health professions" experience.	Implementation Summer 12	Initiative: CD, A&P discipline Or Title III initiative
8. Enhance curriculum in disciplines. **OUTCOMES: Comprehensive improvements**	Resurrect Principles of Technology and link to Advanced Technology programs: Curriculum development Collaboration with AT faculty and	FY12 (Assumes additional permanent faculty staffing)	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
to curriculum to increase student success; net revenue to college in long term **Improved student success and more options for completing AAOT and other program requirements** **Make full use of laboratory equipment and capabilities.** **Steward the curricula developed by retiring faculty** **Increase our capacity to cover the range of courses in our curricula.** **-------** **Full implementation of many of these enhancements will require additional permanent staff (See Goal/Initiative #10 and #11)**	counselors/advisors		
	Resurrect and enhance infrastructure for Science Modeling Labs: Curriculum development Training Science faculty, counselors/advisors	FY12 (Assumes additional permanent faculty staffing)	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Further integrate, in a scalable and sustainable way, pedagogical advances in curriculum and use of equipment: Curriculum development Equipment purchases	FY12	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Create better alignment and mutual support at all levels with math curriculum: Collaboration with Math faculty Curriculum development	FY12	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Create "Applied Physics Calculations" class for learning math in a physics context to gain entry into Math 95: Collaboration with Math faculty Curriculum development	FY12 (Assumes additional permanent faculty staffing)	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	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	FY12 (Assumes additional permanent faculty staffing)	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Create math study modules for intervention and help when students fail in the Basic Skills Diagnostic Inventory: Collaboration with Math faculty Curriculum development	FY12	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Update Electrical Fundamentals	FY12	Comprehensive initiative:

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	Curriculum: Curriculum development Equipment purchases		Physics Discipline, CD, Perkins, and/or Tech Fund.
	Develop multi-disciplinary thermodynamics course for majors: Curriculum development Equipment purchases	FY12 (Assumes additional permanent faculty staffing)	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Develop linked-course Learning Communities: Collaboration with faculty outside Physics	FY12 (Assumes additional permanent faculty staffing)	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Comprehensive enhancement of astronomy curriculum, equipment, and online resources: Curriculum development Equipment purchases	FY12 (Assumes additional permanent faculty staffing)	Comprehensive initiative: Physics Discipline, CD, Perkins, and/or Tech Fund.
	Create common laboratory packets for BI 101, 102, and 103 Survey of Biology	Begin development for BI 101, FY 12	Initiative: CD funds for non-contracted instructors, Biology
	Develop plans for stewarding the "legacies" of specialized curricula: diversity courses, plant sciences and herbarium maintenance.	FY 12 As part of Annual planning and ongoing program review	Possibly CD initiatives or Learning Community funding
	Develop plans for ensuring that at least two faculty members can teach every course Science offers.	Ongoing As part of Annual planning and ongoing program review	Faculty retreats, mentoring, professional development expenses, Faculty Inquiry Groups
Assess student learning outcomes and courses of study			
9. Implement assessment of student learning outcomes and gather student input for program	Assess online courses, including comparing student learning outcomes of online, hybrid and seat-classes. Create and implement assessment	Ongoing.	Seek funding sources; Assessment project funding when applicable

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
improvements **Outcome: High quality courses and course sequences; increased student success and retention.**	tools.		
	Work with Health Professions to assess the success of matriculated health profession students who have taken the online or hybrid options for A&P	Ongoing	A&P faculty.
	EES redesign assessment tools and plans.	W11-Sp12	Assessment project support?
	Physics assessment to improve math preparation and alignment	FY11-FY12	Assessment project support?
	Develop a Division Assessment Plan	Winter 11	May result in dedicating Division funding
	Assess learning outcomes and standardize the curricula for microbiology, A&P	Ongoing	Assessment project support?
	Increase faculty participation in Gen Ed assessment projects; incorporate Gen Ed rubrics into Division assessment plans.	Ongoing	Assessment project funds
Provide adequate technology: hardware, software, staffing to support online learning and educational resources			
10. Maintain and improve technology for student learning. Provide adequate, stable staffing for supporting technology and provide professional development for technology use. **Outcome: Improve and maintain use of appropriate technologies for learning**	Maintenance of existing computers and printers Replacement of outdated computers and printers	FY12 FY12	Tech fund initiative
	Enhance technology for instruction: Smart classrooms and ELMO document projection cameras Provide training in ways to use document cameras for teaching. Classroom clickers and software in	FY 12 FY12	Initiative: Tech Fund ATC resources and Division time and resources for trainings. Initiative: Perkins or Tech

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	A&P labs and EES labs to implement classroom assessment techniques		Fund, A&P and EES
	Implement replacement of out-of-date and limited data storage.	FY12	Perkins or Tech Fund initiative
	Complete the set of interfaces and sensors in Rm144 for PH 201 sequence and ENGR 221.	FY12	Initiative: Perkins or Tech Fund, Physics Discipline. Capital Investment
	Move Tech Fund supported staff to General Fund	FY 12	Net additional Sal/OPE Current .5 FTE plus "1039" staff converted to 1.0 FTE, Tech support
Adequate staffing and funding to support instructional excellence and/or growth			
11. Provide adequate, stable staffing for instructional programs **Outcome: Program enhancements, student success, growth in offerings, instructional excellence; net revenue in long term.**	Replace FT Science faculty as retirements occur -CH retirement for FY11 -Plant Science/Biology retirement FY12	FY 12	No new costs.
	Use online PT hiring process to increase hiring pools and fill specialized teaching needs	Ongoing	No new costs.
	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 #1 for FY12 FT EES faculty #2 for FY13 FT PH faculty #1 for FY12 FT PH faculty #2 for FY12 FT A&P faculty for FY 12 FT NRG (Renewable Option) faculty for FY12	Begin hiring processes, W-Sp, each year.	Net additional Sal/OPE

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	FT WATR faculty for FY12		
12. Provide adequate, stable staffing for instructional support.[1] **Outcome: Program enhancements, student success, support for program expansion, instructional excellence**	Convert Life Science Stockroom support to FT position. Physics Support staff to serve greater use of equipment in labs and demos and higher enrollment Convert SRC: Instructional Specialist to permanent position at .75 or more Science Division office, maintain time-sheet additional staffing NRG program office, fulltime Admin Coordinator	FY 12	Net additional Sal/OPE
Adequate EQUIPMENT funding to support instructional excellence and growth			
13. Provide capital outlay or equipment funding to replace worn or inoperative science equipment; and to purchase equipment to meet functional current standards. **Outcome: Maintenance of equipment investments, instructional excellence**	Chemistry Equipment Repair and Replacement: Repair Fourier Transform Infrared Spectrometer Replace gas chromatograph Purchase new equipment: GC/mass spectrometer and NMR	Fall 12 Fall 12 Within Bond Funding period	Chemistry Bond Equipment Request
	Purchase a replacement set of compound microscopes for SCI 103 that are failing and repair parts can no longer be purchased	Complete purchase and installation in FY12	Capital investment of $20,000
	Acquire Water Conservation Program instruments, ultrasonic water flow meters	Fall 11	Initiative: Perkins, est. $25,000

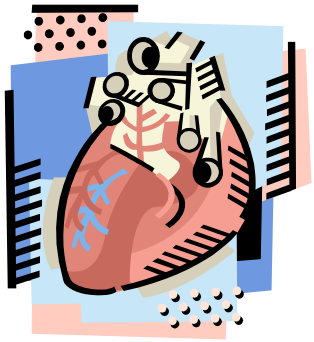
GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
Enhance revenues and fiscal sustainability			
14. Continue to implement marketing and outreach efforts for recruitment **Outcome: Increase in number of high school students beginning college science classes at Lane; increased FTE**	Continue to attend fairs and preview night; continue e-newsletter to schools. Update website; utilize Web 2.0 tools and social networking; improve marketing materials.	Ongoing Ongoing	Ongoing work team No new costs
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 extending learning with FTE collection (SRC, fieldtrips, etc.) Collaborate with external groups on weekend use of lab spaces with fees for use. Continue offering Harvest Auction Science events. Create regional practitioner trainings in NRG and related fields	Develop work team to research and recommend opportunities SAC working on this, FY 11 Ongoing, via NRG staff and faculty	Self-supporting activities No new costs Additional funding for special projects in Science FTE for college and revenue for NRG programs
16. Redesign 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 Sp 11 and FY 12	Recommendations may involve budget request

NOTES: Goal #12: 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. Actual costs would depend on the level of the new positions.

Discipline and Operations Summaries

Discipline and operations summaries were drafted by 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



Accomplishments and strengths: In FY10 the Anatomy and Physiology discipline acquired Carl Perkins funds to improve out-of-class access to study materials for students. The Perkins funds allowed purchase of 30 locking skull cases. These secure carrying cases improve student access for our current and new hybrid courses.

The goals that we have for the current year (FY11) are focused on assessment in our courses. We are engaged in

1) assessing learning outcomes for the anatomy and physiology courses. Currently, we are attempting to standardize key summative exam questions that assess our desired learning outcomes,
2) standardizing learning outcomes for microbiology, and
3) evaluating the learning outcomes and updating the curriculum content for the online "Unseen Life on Earth" course.

Challenges and limitations: Part of our discipline's strength is our culture of mentoring our part time faculty to insure the quality of student learning experiences and our support for new faculty in being successful. As we expand, it has become a challenge for the full time faculty to provide the support and oversight needed to mentor our part time faculty. To meet enrollment demands, we increased from 55 sections of A&P/microbiology in FY09 to 67 sections of A&P/microbiology in FY10, an increase of 21%. A&P FTE increased 12.6% in FY10. We offered one less section of BI 112/Biobonds in FY10 (21 sections). Counting A&P and Biobonds sections, only 20% were taught by full-time instructors last year. Only one Biobonds section was taught by a full-time faculty, in the wake of the retirement of one of the biology faculty. We have addressed this issue by developing a 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. At the end of FY10, the Division hired a full-time Cell Biology faculty to take over Biobonds biology coordination and teach the highly valued prerequisite to the A&P sequence.

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 6 years the fill rate (capacity rate) for BI 112 sections has averaged over 97%. In the same time span, we have effectively managed our offering of BI 231, the first of the sequence, so that it has had an average fill rate of 100.5%, with a maximum of 107.5% in FY09. This means that many A&P sections are overfilled, which places added stress on faculty, students, and class materials. 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.

Needs and goals: In FY12, we will continue to assess success, completion and learning outcomes in our seat classes, the online and hybrid classes. 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.

Biology

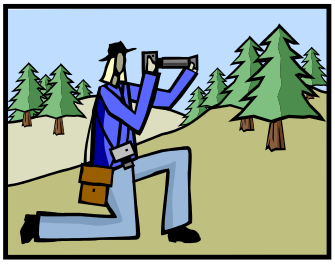
Accomplishments and strengths: Biology (excluding A&P) courses represented 31.7% of the Division's student FTE in FY10 (36.1% of the transfer courses' FTE). Biology courses generated 370.6 FTE, an increase of 7.4% from the previous year. For FY10, capacity rate for Biology overall was 96.6%, reflecting the college's overall enrollment surge.

As widely cited, the majority of college students take their only science courses at community colleges, and the majority at Lane take at least one term of Biology. Biology continues to provide a wide range of 100-level Biology courses to meet this general education AAOT and direct transfer need. Biology is the largest cohort of science majors that feeds other disciplines. Due to space limitations, we reached our maximum number of Biology Majors during FY10. We also maxed the number of on-site biology courses. Additional sections in FY10 were in online/hybrid offerings, including 3 added sections of online instruction and the conversion of a former telecourse to online instruction.

Program assessment is a top priority. As we add courses on-line we gather data on student retention and success. We want to provide an authentic lab experience (both to maintain our legal obligations to state credit definitions and the larger goal of increasing scientific literacy). Excluding the A&P classes, we offer 2 sections in a hybrid format and 10 sections fully on-line. This provides us with a rich data set both longitudinally and across a variety of topics and teaching styles. Two contracted faculty are actively exploring cyberlearning opportunities in biology: one is assisting in the submission of a grant to the Gates Foundation to assess "proven" online simulations and another is a faculty advisor to an NSF grant (C3 – Cyberlearning at Community Colleges).

Full time staffing shortages mean that the vast majority of our 100-level courses are taught by non-contracted instructors. We are fortunate to have a very energetic group. They started a Faculty Interest Group (FIG) this term to assess BI 101 labs for coordination, improvement, and updates. FIG participants will seek curriculum development funds to continue this work as it is outside the normal single-class/single-instructor model of teaching. It would normally fall to contracted faculty to maintain a program in such a matter, but due to staffing shortages the overwhelming majority of General Survey instructors are non-contracted instructors. Biology Majors instructors will assess the success and retention rates of the new "trailer" section of the Biology majors sequence (that starts Winter term and finishes the following Fall term). Overall, 60% of Biology sections are taught by non-contracted instructors; in the General Survey sections, this rate rises to 69%.

Staff continues to **maintain Lane's biological assets**, including the native landscape, the wet lab, the greenhouse, and the perimeter trails and ecosystems. Biology courses use these areas for hands-on learning in ecology, field biology, and sustainability. This year we recorded a female turkey and her chicks spending time foraging for food and taking cover in the meadows around the Science/Math building. Song bird diversity continues to increase as native plants grow. Courses utilize the perimeter ecosystems, ranging from oak savannah and young Douglas fir forests on the south side of the campus to wetlands to the north.



Lane historically offered **international biology classes** and we continue to develop current opportunities. The Costa Rica field course serves as a template for planning future courses to Baja and Alaska (granted, the last one is not international, but we hear you can see Russia from there).

We replaced aging computers and projectors in most of the biology classrooms in FY10. The importance of modern **technology** in the sciences grows each year. We intend to regularly replace equipment to provide the most current experiences in biology labs for students (as budget allows).

Our **facilities serve a number of community groups** for meetings and workshops. This year's Science Advisory Committee (SAC) is exploring additional opportunities and will establish procedures for room use agreements and use fees. Moreover, hosting community groups, school groups, and other external groups in our facilties establishes valuable community relationships and establishes the Science Division as a key resource for science education.

Challenges and limitations, Needs and goals: The Life Science Stockroom improved its efficiency greatly with the **addition of hours for the instructional specialist in FY11**. The tenuous nature of these hours looms large for FY12 and beyond. We request a more formal solution be found. Without this crucial support we will be forced to reduce the number of sections during this period of increased student demand.

Recent contracts allowed overloads which bridged **staffing demands** (barely!) for FY10 and FY11. We lost one non-contracted instructor to a contracted position at Linn-Benton Community College this year. (Good for Charlene! Tough for us!) To meet the continuous challenge of staffing we are actively creating part-time hiring pools, including a hiring for a Plant Science instructor. This pool replaces the partial retirement of Gail Baker. Gail holds an important faculty position in two ways: she is an integral part of the Biology Majors' sequence and continues the very long legacy of Plant Science at Lane. We anticipate her future retirement and will be requesting a replacement to maintain the Plant Science program, which includes an herbarium (a superb regional asset and one of only 16 community college herbaria nationally). Gail maintains important ties to our community through her work with the Mt. Pisgah Arboretum and the Native Plant Society of Oregon and the University of Oregon (Dr. Bitty Roy's research lab). The Division places a high priority on maintaining these significant ties.

One biology classroom uses aging microscopes that were not replaced during the Bond capital investment in 1999. Replacement parts are no longer available resulting in an ever-**decreasing set** of microscopes for laboratories. We request a **capital investment** of approximate $20,000 to purchase new microscopes, bringing this lab up to the same standards as the other biology lab rooms.

The investment in staff to **maintain our current capital investments** cannot be underestimated. We manage with student workers in our wet lab and greenhouse spaces. These positions continue to fill an urgent need. Any cuts to these hours threaten to decrease the value of our facilities and equipment.

Chemistry

Accomplishments and strengths: This year saw further implementation and integration of Green Chemistry in the General Chemistry curriculum, including development of some additional laboratory activities. A freshly edited lab packet was used Fall 2009, and a revised CH 222 lab packet was used Winter 2010. Experiments that are appropriate for College Now, for high school chemistry, or for other programs have been and will continue to 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 2009 in an effort to increase student awareness of chemistry and to attract more students to our courses. We offered our CH150 Preparatory Chemistry for the first time (2 sections) and continued to refine the CHPS Chemistry Problem Solving classes. We strategically expanded the numbers of sections of existing courses. We planned for the loss of a long time full-time discipline member, and the one quarter absence of another full-time member (sabbatical).

Chemistry enrollment growth is limited by access to the two chemistry labs in Science. Despite limitations, we added 3 sections of General Chemistry in FY10. In addition, the 2 CH 150 sections were new classes. The Chemistry faculty would like to develop these as online sections, but have been unsuccessful in two rounds of initiative requests. Moving these sections to online would permit greater access for students and also free up much needed classroom space in Science. In FY11, we are teaching the CHPS Chemistry Problem Solving classes in the equipment room for Chemistry. This is a poor learning environment for these discussion and problem solving small-enrollment classes.

Challenges and Limits: Time is a major limiting factor, as is space for both lecture and lab. Along with other Science disciplines, the chemistry discipline used the Responsibility Matrix for scheduling (this included multiple schedule rewrites based on changing staffing and college needs), Banner expense data for managing costs, and the part-time seniority database for staffing recommendations. We also devoted time to Unit Planning (once again with no observable outcome), and mentoring part-time faculty. Increased enrollment pushed our discipline to its limit. We started Summer 2010 with classes unstaffed for both Summer and Fall. Last minute approvals for a one year temporary full-time replacement for a retired full-time staff member, and a full-time one quarter sabbatical leave replacement hire were in place, but hires had not been completed. We planned for and piloted the College's new hiring

process for these and part time hires. We found the processes unnecessarily time consuming and unwieldy. 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 continues to propose expanding online courses as a means of meeting student demand and containing instructional costs (see chemistry curriculum development initiative). We have continued standardization of the General Chemistry curriculum and free enrollment across lab sections. This is acting to ensure that students can move seamlessly through the three-term sequence. While it involves a certain amount of instructor overhead, the improved student experience seems to be worth the investment.

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 materials costs and under-prepared students. 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

1) Chemistry Curriculum Development Initiative: a) Online Preparatory class for general chemistry; b) Online Biobonds (CH112) and/or chem prep course (CH150); c) Sustainable Chemistry class

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

3) Full-time permanent chemistry faculty position

Earth and Environmental Sciences

Accomplishments and Strengths: The eight faculty members who teach within the Earth and Environmental Sciences discipline (EES) are all devoted, collegial, skilled, and well-trained teachers. Although all of our faculty members teach part time, we also have all taught at LCC for several years, providing a stable and consistent learning environment for students with experienced faculty. This group works well together. All of our courses can be taken to satisfy general science requirements for the AAOT degree. The number of sections we offered in FY10 increased 12.8% (from 39 to 44) from the previous year and FTE increased by 20.2%. We continue to offer trailer sections of G 101, G 102, ENVS 181, and ENVS 183 and have added a second section of ENVS 184. Capacity in EES classes was extremely high in FY10, with half the courses having over 100% fill rates. The majors' sequence is continuing to be strong, with capacity increasing from a low of 44.7% in FY06 to 100% in FY08, 93.1% in FY09 and 100% in FY10. All of our courses except for ENVS 184 and the General Science telecourses will have been taught by at least two of the present part-time faculty

members. This allows program stability for the long term. In FY11 we are planning offering additional distance learning sections of GS 142 to help meet student demand.

EES faculty members are all trained in Sustainability Infusion and four of us have given training sessions to others. We obtained approval for ENVS 181 as a sustainability-focused class and plan to submit the remaining ENVS courses for sustainability focused status. This year we will apply for curriculum approval for a new Geological Hazards class that will be offered as an on-line course; the course was developed by a faculty team in EES supported by curriculum development funds awarded through Unit Planning.

Challenges and Needs: EES needs at least one full-time faculty member. This is a strong and growing program. We lost our full-time faculty member when Sarah Ulerick became Interim Dean of Science 4 years ago. Now that she is permanent dean and will not be coming back as an EES faculty member we need to fill this empty position. In FY10 and now in FY11, EES has had the largest proportion of part-time faculty who teach overload courses within Science. Although several of our faculty members are interested in developing new courses, we have held the increase down to one planned new courses, Geological Hazards. For the sake of sustaining the program in the long term, we should continue to encourage our faculty to teach other EES courses, particularly ENVS 182 and ENVS 184, which both have strong atmospheric components.

In conjunction with biology we see the opportunity to develop a program in Watershed Science. We need funds for researching and designing this program and will eventually need a full-time faculty member in this area. The program is conceived as an AAS career technical program with many courses that also meet AAOT eligibility. In this way, students can progress in a "dual track" leading to employment and/or continued academic progress.

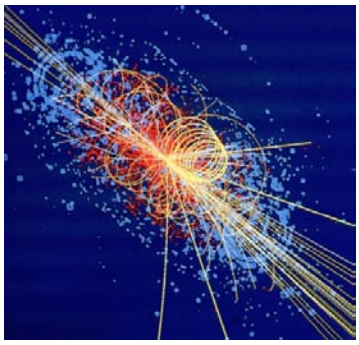
In time Earth and Environmental Sciences discipline will need two full-time faculty members. The numbers of students majoring in Geology and Environmental Science exceeds the numbers for Physics and Chemistry. However, Physics has two full-time faculty members and Chemistry has four. The number of courses (44) we taught in FY10 exceeded the number taught in Physics. For now, one of the part-time instructors takes on the role of discipline coordinator. Unfortunately, the number of paid hours is insufficient for this role. This also limits our group's ability to take on new challenges and continue to update and innovate our curricula as much as we think would be valuable to students.

Our Environmental Science faculty needs curriculum development funds to develop new laboratory exercises to support the Sustainability Coordinator AAS objectives required of our courses. We plan to seek Perkins funding in support of the AAS degree. In cooperation with Biology, Chemistry and other Science faculty, we plan to continue working on a transfer Science Sustainability course of study. We would like to improve our assessment methods within EES courses and need to research best practices in earth and environmental science education at other colleges.

Physics

Accomplishments and strengths: Our current 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 continue not being offered (last offered in FY06). Enrollment remained strong following the double-digit increase in FY09; however total FTE decreased slightly by 2.7%. In addition, Fall registrations for physics courses increased in FY11. Generally, individual courses have maintained or increased their enrollments, validating changes in curriculum and offerings from years past. In FY09, Physics added two sections of PH 102 to accommodate the increased enrollment in the Energy Management program. Despite promises on increased support for this increase, none was provided. Additional sections have been added in FY11, with some support from Energy Management for urgently needed curriculum revisions.



In April 2009, the physics discipline initiated a workload review process to examine various aspects of physics faculty workloads including the TLCs awarded for lecture/lab format classes, the large number of courses that full-time faculty are responsible for and the lab support available to the discipline. This process continued into FY11.

Adjunct faculty members, drawn increasingly from newly graduated or graduate student ranks, continued to inspire students by their closeness to physics research and by 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. This standard exists for good reason, and it is apparent that the considerable progress in the discipline as a whole comes from the leadership of the contracted faculty. Numerous other advances are not possible without two more contracted faculty positions. Two more Physics positions would provide the number of permanent faculty positions comparable with Chemistry.

Permanent physics faculty members initiated two Faculty Inquiry Groups (FIGs). Paul Bunson organized a joint physics and calculus discussion group exploring commonalities and differences in language, goals, methods and problem solving. Dennis Gilbert organized a FIG involving General Physics and related areas of mutual interest among physics education researchers at UO and OSU. Dennis Gilbert continued to serve as an advisor and Lane liaison to the NSF –funded UCORE program at UO. The program's goal is to catalyze interest in physical sciences by providing paid summer research opportunities for community college students across the state. This year five Lane students were chosen to participate in the program. Two faculty members attended the American Association of Physics Teachers (AAPT) summer meeting. Paul Bunson was awarded a grant to attend. (The grant was sponsored by Oregon Department of Community Colleges and Workforce Development, the Oregon section of AAPT and Vernier Software.) Several faculty members also regularly attend and contribute to the ORAAPT who meet twice per year. Dennis Gilbert and Paul Bunson are involved in an Oregon State University grant examining and integrating the introductory physics curricula between community colleges and OSU where most of our engineering majors attend. PH211 at Lane is one of the courses involved in their initial study.

On campus, the faculty have been involved in numerous committees and ventures on campus including Faculty Council (Dennis Gilbert, co-chair), Learning Council (Gilbert as Faculty Council co-chair), College Now (Bunson), Faculty Connections Coordinator (Gilbert), Faculty Connections Steering Committee (Gilbert and Swanson), Faculty Connections fall program panelist (Bunson), Assessment (Bunson), and physics x (Gilbert). Physics faculty

members have continued to do some curriculum development for all courses, though primarily in courses taught by the permanent faculty.

Challenges and Limitations: In general, we are in a situation where our curriculum is not yet fully replicable, sustainable, or fully up-to-date. Despite some improvement, much of our equipment is old, incomplete, or 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.

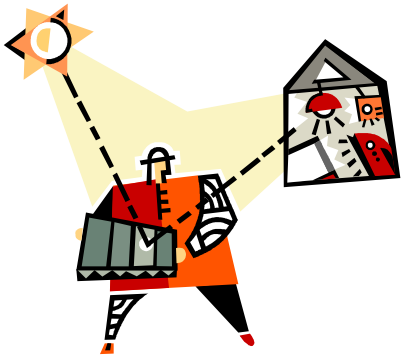
Our most urgent need for a sustainable high quality physics learning environment is to have two more full-time positions, which is outlined in another section. Other urgent needs are also described in our initiative proposals.

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.

Urgent Physics Discipline Needs: Our most urgent need for a sustainable high quality physics learning environment is to have two more full time positions, which is outlined in Section III. Other urgent needs are also described in our initiative proposals.

Energy Management Program

The Energy Management, Renewable Energy Program, and the Northwest Energy Education Institute continually have a positive impact on Division/College FTE generation. Except for college infrastructure (space/heat/IT network/administrative support and supervision, accreditation, etc.) the programs are supported largely by acquiring grants, generating revenue by conducting professional development opportunities to the national energy management industry, and by tuition reimbursement and fees for courses. In Fall 09 the program introduced the Resource Conservation Management option which prepares students to manage waste streams in the built environment. The Water Conservation Technician Program enrollment experienced strong first-year student enrollments for FY09, although the first cohort (from FY08) had a higher than expected attrition rate in moving on to second year courses. Early data from FY11 shows significant gains in retention Also, in Fall 09 the Energy Management program more than doubled its enrollment (using 07-08 as a base year, gain of 224% in FTE) which again increased its contribution to the division/college FTE generation.



The program submitted two National Science Foundation (NSF) ATE grant pre-proposals in April 08 which received "encouraged to submit full proposals" comments by all evaluators. Both proposals were designed to significantly increase program FTE using distance learning delivery platforms. The college was notified in August 2009 that the Energy Program was

awarded one of the two proposals. The Leading Alternatives in National Energy Solutions (LANES) award is for $810K over a three year period ending July 2012. The grant will provide funding to support an online version of the entire energy program.

Additional FTE is generated by the program through professional development opportunities offered to the national energy industry and regional public. An example is The Building Operators Certification (BOC) which the Energy Program helped to create. Another example is the National Sustainable Building Advisors Program (NaSBAP) which was launched fall 08. The BOC and the NaSBAP are Lane non-credit programs that offer national certifications.

Strategic Investments funds helped to create Energy Management Program hybrid courses which have been implemented beginning Fall 2010. The MentorLinks project has concluded with a healthy program at West Virginia University at Parkersburg. The program operates independently of the Lane Community College Energy Program, which is the objective of MentorLinks. Experience from these two initiatives has provided the Energy Program with a new revenue source which is to assist other community colleges to develop programs that are similar to the Lane program. To date the Energy Program has helped three institutions, which are Salt Lake City Community College (funded by Rocky Mountain Power), St. Claire Community College and Lakelane Community College (both funded by Siemens Building Technologies). This builds the Energy Program's track record of successfully assisting other community colleges to develop related programs with a consistent curriculum.

The Energy Program has implemented the first year of NFS LANES grant planning by creating partnerships with five community colleges that are interested in pursuing energy efficiency program development. The five college partners are Northeast Technical Community College in Wisconsin, West Virginia University at Parkersburg in West Virginia, American River College in California, The Bronx Community College in New York, and Delaware Technical Community College in Delaware. Most are accessing our course content and building programs by consulting with Energy Program staff. Delaware on the other hand is taking the entire course work online. Consequently, the program staff is in the process of creating second-year online courses.

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. The ability to participate on a national level has propelled the Energy Program to national prominence as a leader in energy education, a fact that has been recognized frequently by the College President and the New York Times.

Critical Needs for FY10: The Energy Program has an opportunity to significantly grow into the extremely active energy efficiency, renewable energy, resource conservation, and water conservation industries. The program has three full-time faculty members who are supported by revenue generated by the energy program's professional development and grant writing activities. Because of the growth of the programs - 30 first-year and 25 second-year energy management students fall 2007 increased to 90 first-year and 45 second-year energy management and 30 first-year and 25 second-year water conservation students fall 2009) the program is now lacking in adequate industry related monitoring equipment. Therefore, the critical needs are:

- Fulltime Renewable Energy faculty
- Fulltime Water Conservation faculty
- Fulltime Administrative Support
- Classroom and lab facilities for new courses
- Continued support for distance learning development
- Sufficient equipment to support program courses.

Science Resource Center

Accomplishments and strengths: During FY10 the Science Resource Center (SRC) supported student success and retention, serving 1,233 documented students (and possibly many others who were not registered), for 14,604 hours of tutoring, and generating 28.6 FTE through tutoring services during the year. Over 2400 exams were administered to students over the year. The SRC also continued to provide students with a wide variety of discipline specific media, specimens, models, tools, and other equipment. Installation of new furniture and shelf space in the new Anatomy and Physiology Model room has helped increase room usage and is a much more organized and useful space for students. The room usage in the SRC is very high. Head counts done hourly show that we often run over 100 people in the facility at a time, and average about 50 people an hour. Because of this high usage, we are now sharing space with the Math Resource Center (MRC). We share room 171 as a Quiet Study space and room 165 as a Testing space. This allows us to serve many more students and now we can give more tests than we have been able to in the past. Student support seems strong and Saturday sessions are well attended. We are allowing Math students to print their assignments in the SRC, so our computers are for both Math and Science students. This makes the MRC and SRC complementary experiences for students. These changes were initiated by the SRC task force, under the leadership of Star Glass, the SRC Coordinator.

The SRC staff has changed the type of tutors we are hiring. In the past we have hired student tutors for peer to peer tutoring. These tutors cannot assist in the other functions of the Center, such as testing. Also their attendance is not dependable and the quality of instruction is not consistent enough for many of our students. Through Tutoring Services and Liz Coleman, we are hiring some Instructional Specialist level tutors. These 04 workers take a long time to learn their jobs, and a more stable position gives more dependable service to Science and our student population. Our tutor's ability to explain the more complex academic topics is invaluable to our students, and their reliable attendance helps keep the Center running well.

Challenges and goals: 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.

In response to the increase in testing in the SRC (due to the enrollment surge), an Instructional Assistant has been hired at .49 FTE (timesheet position) to assist in testing, room and tutor oversight, and to free up the coordinator to do assigned meetings and tasks in the Science Division. Most of testing in the SRC is make up testing and is only done in the SRC. These tests can include extensive directions from instructors, practical exams, and tests from other colleges. This in-house testing is time consuming and one of the primary tasks of the SRC. Funds for this position were provided from the ASA funds to meet the enrollment surge. The Instructional Assistant is temporary and needs to be expanded to .73 or 1.0 FTE as, even with our current help, we are still pressed to meet the needs of students in the SRC.

The SRC coordinator will continue to assess usage of the SRC resources and needs for additional resources and staff.

College Now

Lane's Science faculty from Biology, Chemistry, EES and Physics works with high school faculty to offer sections for college credit. Science FTE accounted for 14.6% of the total College Now FTE Lane earned in FY10. College Now sections and enrollment decreased in FY10 from 61 sections in FY09 to 55 classes. Crow and Harrisburg High Schools did not offer College Now Science courses; Elmira High School joined the program. FY10 FTE was slightly less than in FY09 (125 compared to 133).

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. Along with the Division Dean, the faculty contacts meet twice yearly with College Now faculty; in addition, individual faculty make high school visits when feasible to maintain strong relationships with our College Now colleagues. Challenges for FY11 and FY12 will be the State's request for more provisional certifications of College Now faculty and increased requirements for documenting learning objectives in the alignment of curricula.