Unit Planning: Instruction
For 2010-2011 (FY11)
Science Division

Executive Summary

- The Science Division added 34 transfer sections and 9 CT sections in FY09 to accommodate enrollment growth.
- Science is operating at full capacity to meet student needs; transfer course fill rates were 96.7% in FY09 and 92.8% overall for the Division.
- The Science Division produced1066 FTE in FY09 (excluding College Now).
- The Science Division overall gained 17.6% in FTE over FY08 (excluding College Now).
- 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.

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 09-10 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 is in its second year with strong enrollment. 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. 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 14.9% from the previous year, reversing any declines reported for FY08. NRG/WATR FTE increased dramatically, contributing to the 17.6% gain for FTE earned directly by Science courses. Overall, including College Now, the Division earned 1199.3 FTE, for a 14.7% gain over FY08.

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 39% of the Science FTE from satellite campuses derives from distance learning (telecourses and online courses) offered by Science Division faculty. College Now courses are supported by Science faculty liaisons. College Now sections increased from 54 in FY08 to 61 in FY09.

Enrollment management: effects of enrollment surge

The FY09 enrollment surge reversed the loss of FTE in Biology in FY08. Biology suffered the deepest cuts in sections due to budgetary limits in FY08. The FTE gains in Biology were nearly triple the loss of FTE (5.5%) in FY08. All disciplines in Science experienced double-digit increases in FTE from FY08 to FY09. The total Science increase for transfer areas was 14.9%. When NRG/WATR programs and Coop courses are included, the increase was 17.6%. FTE in NRG/WATR increased 67% and accounts for the higher overall number.

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.

	Sections							FTE						
DISCIPLINES	03-04	04-05	05-06	06-07	07-08	08-09	%Chg 08 to 09	03-04	04-05	05-06	06-07	07-08	08-09	%Chg 08 to 09
A&P	50	52	53	51	51	55	7.8%	166.2	161.3	160.4	156.1	162.2	187.3	15.5%
Biology	108	109	105	109	99	110	11.1%	320.4	310.9	305.5	319.1	303.9	345.1	13.6%
Chemistry	65	77	76	68	78	77	-1.3%	184.6	168.8	168.0	166.0	166.3	183.2	10.1%
Engineering	4	5	5	6	6	6	0%	7.4	8.1	9.0	12.0	11.6	15.5	33.4%
EES	40	39	36	33	32	39	21.9%	127.1	122.1	84.7	102.0	105.3	127.1	20.7%
Physics	35	35	33	35[2]	34	37	8.8%	92.5	78.5	70.0	87.8	89.1	105.1	18.0%
TOTAL SCIENCE TRANSFER	**302**	**317**	**308**	**302**	**300**	**324**	**8.0%**	**898.2**	**849.7**	**797.6**	**843.0**	**838.4**	**963.3**	**14.9%**
NRG Mgt[1]	22	22	22	23	23	32	39.1%	32.0	34.1	39.2	37.6	48.1	80.2	67.0%
Co-op	17	18	19	17	20	16	-20.0%	18.2	18.5	16.7	12.8	20.1	22.6	12.3%
TOTAL SCIENCE DIVISION	**341**	**357**	**349**	**342[2]**	**343**	**372**	**8.5%**	**948.4**	**902.3**	**853.5**	**893.3[2]**	**906.6**	**1066.1**	**17.6%**
College Now	n/a	15	18	30	54	61	13.0%	38.0	48.4	61.2	68.4	139.4	133.1	-4.5%
TOTAL SCIENCE W/COLLEGE NOW[3] (corrected)	**341**	**372**	**367**	**372**	**397**	**433**	**9.1%**	**986.4**	**950.6**	**914.7**	**961.7[2]**	**1045.9**	**1199.3**	**14.7%**
Science total from Classbuilder	376	418	406	441	499	561	12.4%	986.4	950.6	914.7	959.8	1045.9	1199.3	14.7%
CottGr-Florence[4]	13	15	16	20	25	24	-4.0%	9.8	13.5	12.0	14.6	17.9	19.4	8.4%
TOTAL LCC SCIENCE-GENERATED FTE	**352**	**385**	**382**	**392**	**421**	**457**	**8.6%**	**996.2**	**964.1**	**926.7**	**976.3**	**1063.8**	**1218.7**	**14.6%**

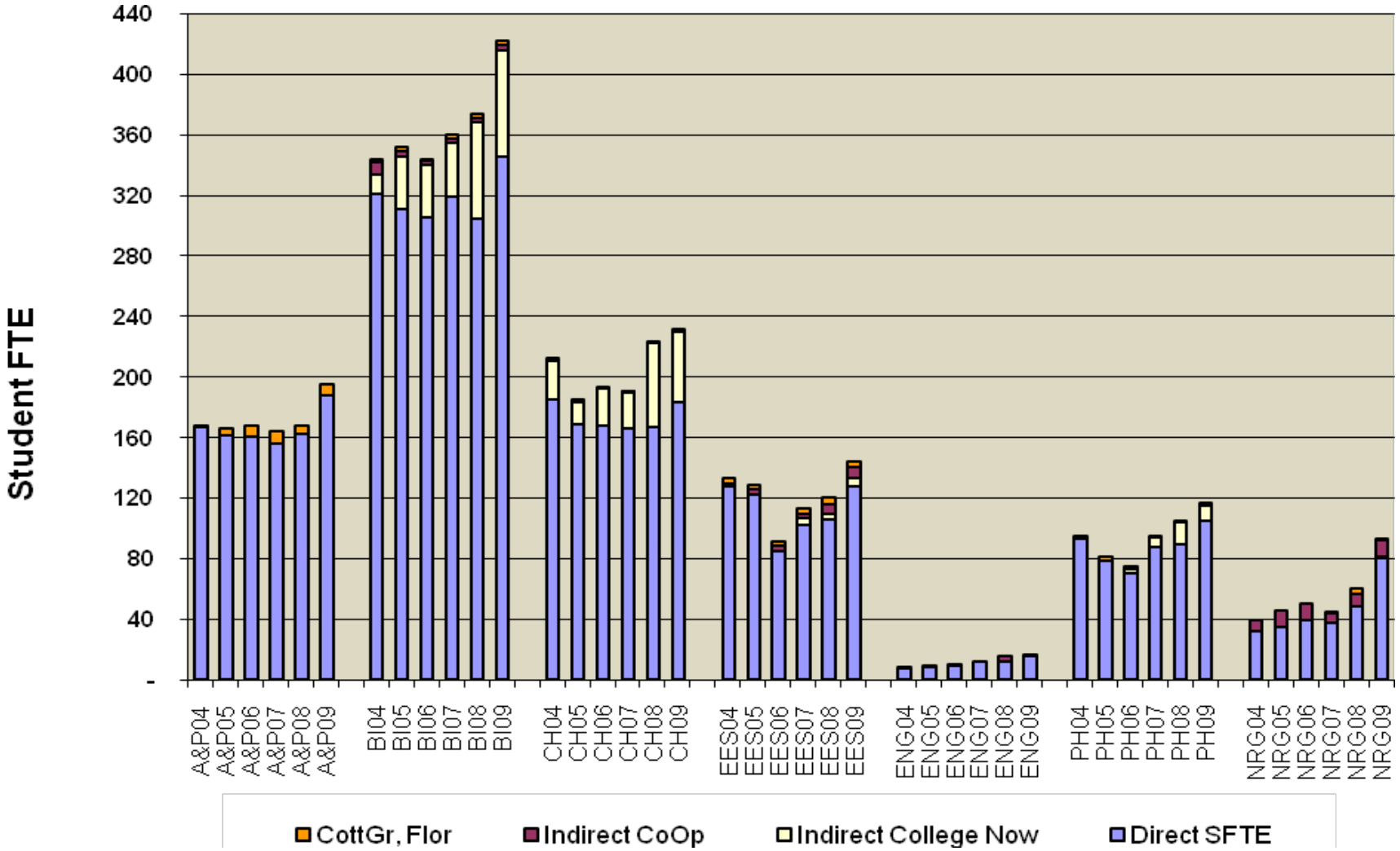
[1]NRG includes courses with the NRG, DRF, SUST, and WATR prefixes and a variety of X-prefixes for various workshops conducted by the NRG faculty. All FTE from NRG is accounted; in the section counts for NRG we have only included regular AAS classes. NRG Management receives tuition from its courses.

[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.

[4]These classes are included to provide a full picture of Science FTE at Lane; approximately 39% 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 Six Year Enrollment History



Student FTE/Faculty FTE ratio

The Student FTE/Faculty FTE ratios are approximations only and should be interpreted with caution. Enrollment increases are reflected in the higher Student FTE/Faculty FTE ratio for FY09. 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	FY08 (calculated 10/31/07)	FY09 (calculated 10/31/08)	FY08	FY09
Science (excluding Energy Management[5])	852.8	992.9	29.2	29.1	29.2	34.1
Energy Management	53.8	73.3	2.8	3.8	19.0	19.5
Science Total (including Energy Management)	**906.6**	**1066.1**	**32.0**	**32.9**	**28.3**	**32.4**

Course Completion and Success Percentages, FY09

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. Completion and success rates increased slightly in FY09 from FY08.

Table 3. Completion and Success Rates by Prefix Groupings, FY09

Prefix groupings	End Wk2 Total	Finish	Complete Rate	ABCP	Success Rate
AP	1261	1182	93.7%	1086	86.1%
BI/Z/BOT	2396	2230	93.1%	2013	84.0%
CH	1173	1077	91.8%	946	80.6%
ENGR	177	166	93.8%	159	89.8%
ENVS/G/GS	957	870	90.9%	793	82.9%
ASTR/PH	708	664	93.8%	604	85.3%
NRG/WATR	666	625	93.8%	615	92.3%
Total Science incl. Coop	7338	6814	92.9%	6216	84.7%
College totals	86,801	79,732	91.9%	71,890	82.8%

Completion and Success for online classes

In FY09 Science offered 17 sections of 9 distance learning courses (not counting hybrid courses) including 7 sections of three telecourses and 10 sections of six fully online courses. We also offered two sections of a hybrid class.

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 88.9%; success rates averaged 80.7%. Both figures are slightly lower than the averages for all classes.

As part of its FY09 initiatives, the Biology discipline converted BI101J, Unseen Life on Earth, into an online course. We also converted a BI102G, Genetics and Society, to an online format. These additions provide students with an online three-course sequence in biology which includes two options for BI102. Total 2nd week enrollment for the courses last year was 172, with 90.7% completion and 82.6% success.

Capacity Analysis (fill rate of class sections):

In line with the overall enrollment increases, all areas showed gains in fill rates for FY09. Science added sections conservatively. As a result nearly 50% of transfer classes exceeded capacity, with some as high as 127%.

Table 4 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 capacity percentages are calculated using a somewhat different set of sections than the entire Science program. Overall the transfer program increased in fill rates from 92.6% in FY08 to 96.7% in FY09. EMPT fill rates in FY09 for transfer courses (based on student enrollment) indicated rates of 96.3% for Fall, 92.8% for Winter, and 94.0% for Spring. In Fall09 for FY10, the EMPT fill rate for transfer courses was 100.3%.

Table 4. Capacity rates[1] for Science, FY05 – FY09

	Sections (using actual in-house counts)						**Capacity %** (from Classbuilder data)[1]					
	04-05	05-06	06-07	07-08	08-09	%Chg 08 to 09	04-05	05-06	06-07	07-08	08-09	%Chg 08 to 09
SCIENCE TRANSFER	317	308	302	300	324	8.0%	92.1%	85.6%	83.3%	92.6%	96.7%	4.3%
NRG/WATR[2]	22	22	23	23	32	39.1%	60.8%	62.0%	60.2%	72.0%	75.7%	5.2%
TOTAL SCIENCE DIVISION Incl. NRG (w/o Co-op)	337	329	325[2]	323	356	10.2%	89.9%	83.2%	81.4%	90.2%	92.8%	2.9%

[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] Excluded from NRG/WATR 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.

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. The high Fall 2009 fill rate reflects on increase in credit programs' FTE for the college. The majority of science classes were overfilled. 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. However, sections were not added because of limits on space, lab support, and faculty to teach the courses. The Division is beyond capacity in many areas.

Table 5. EMPT fill rates, end of Fall terms.

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

Revenues/FTE and Costs/FTE

The financial information in Classbuilder 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 does 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.

The data presented here are lifted directly from IRAP Classbuilder data. The full analysis with cost sources tied to course prefixes (subjects) is available in Classbuilder; and for Science staff and faculty, on the Science server.

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

REVENUE/FTE 2008-09 Subj Subject Description	Total Student Credits	Total Student FTE	Credit Tuition (allocated by credits) ($)	Non-Credit Tuition (allocated by SFTE) ($)	State Support (allocated by student FTE) ($)	Mandatory and other Student Fees ($)	Other Sources ($)	Grant Revenue ($)	Total Revenue ($)	Total Revenue per FTE ($)
ASTR Astronomy	747	20.8	58,832		49,371				108,203	5,200
BI Biology	16126	588.5	1,270,054		1,396,101	11,082			2,677,237	4,550
BOT Botany	96	3.1	7,561		7,378				14,939	4,804
Z Zoology	260	8.4	20,477		19,952				40,430	4,807
CH Chemistry	5979	227.3	470,895		539,190	9,932		19,080	1,039,098	4,572
ENGR Engineering	653	19.0	51,429		45,006	288			96,723	5,099
ENVS Environmental Science	836	32.9	65,842		78,007				143,848	4,375
G Geology	2171	71.4	170,984		169,275	1,904			342,163	4,796
GS General Science	1369	47.6	107,820		112,906				220,726	4,638
PH Physics	2519	88.5	198,392		209,987	520			408,899	4,620
Transfer total	30756	1107.5	2,422,286	0	2,627,173	23,726	0	19,080	5,092,266	4,598
NRG Energy Management	1695	55.0	133,495		130,533	154,051	188,374		606,453	11,022
SUST	270	8.3	21,265		19,644				40,909	4,941
WATR	371	10.4	29,219		24,555	20,626		4,603	79,003	7,633
XCST Construction		0.8	-	420	1,874				2,294	2,904
XHE Health		2.4	-	1,297	5,789				7,086	2,904
XNRG Energy Mngmt		14.3	-	7,580	33,831	39,927	48,823		130,161	9,128
XRH Refriger/Heating		0.8	-	399	1,779				2,178	2,904
CT total	2336	92.0	183,979	9,696	218,005	214,604	237,197	4,603	868,084	9,436
SCIENCE TOTAL	33,092	1,199.3	2,606,266	9,696	2,845,179	244,038	31,921	23,684	5,760,783	4,804
LANE TOTAL	340,745	12,823.0	26,836,418	842,719	30,423,284	3,133,665	944,588	3,126,795	66,226,743	5,164

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. It's not clear to me why this is so.
[2]XCST and XHE are consistently attributed to Science. These continuing ed activities may 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 lab support staff for science has not increased to meet the growth in number of sections being offered each term. Likewise, permanent staffing in the Science Resource Center remains limited to one staff member. 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 FY10 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.

For FY010, having a set budget for Part-time faculty is very useful for our planning throughout the year. The EMPT remains a valuable planning tool for enrollment.

Support needed to sustain excellence and to grow

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 FY09, and anticipates additional retirement announcements in FY10 and 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.
- 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.

In other words, 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.

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
5. ongoing "04" personnel funding for online TAs for emerging large-enrollment online classes

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 themes for the Science Division's plans for FY11 are
(1) optimizing sustainable access for students and options for quality learning; and
(2) optimizing the curricula and resources we already have (continuing from FY10).

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

- Introduce Unit Plan components and timelines at Fall Division In-service
- Review of 09-10 plan and funded initiatives; Initial brainstorming of new activities, deadline setting, at Division meeting, Oct. 2
- Three Unit Plan Open Houses held between Oct. 21 - 28
- Equipment request planning, at Division meeting, Oct. 30
- Section III table and Discipline summaries, due Nov. 2; extended to Nov. 10
- Review of Section III table and technology needs, at Division meeting, Nov. 6
- Compilation of data elements, Section III table and discipline summaries

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. 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 goals for the Division, with short term expenses that will result in improved quality and net revenues in the long term.

Initiatives and activities are grouped under the following overarching goals for the Science Division:

- **Optimize sustainable access for students and options for quality learning**
- **Enhance and develop new curricula for quality learning**
- **Assess student learning outcomes and courses of study**
- **Provide adequate technology: hardware, software, staffing**
- **Provide adequate staffing and funding to support instructional excellence or growth**
- **Provide adequate EQUIPMENT funding to support instructional excellence and growth**
- **Enhance revenues**

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 Plan additions for FY11	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.	Incorporate into TRIO STEM proposal, Fall 09 Continue work on this FY10 to FY11	Initiative: ancillary work to support summer meetings, multi-disciplinary team
Enhance and develop new curricula for quality learning			

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
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 Get SAC and/or Division approval Get Curriculum and Sustainability &Learning committee approvals	W10 Sp10 F10	Enrollment enhancement; no new costs.
	Develop a field ecology course with diversity emphasis that includes travel to national and international ecologically significant sites; possibly as interdisciplinary learning community with Spanish immersion and/or international student enrollment	Offer Sp11 and/or Summer 11, possibly as a Spring Break course, or intensive 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 sustainable chemistry course: Identify chemistry content areas needing support; Write learning outcomes; Develop course materials; schedule for F10	W10 – Summer 10 Teach in F10	Initiative: CD, Chemistry Discipline
	Develop Natural Disaster emphasis G 102 course, to articulate with UO G 102, Environmental Geology and Landscape Development	Develop in FY11, teach in W12	Initiative: CD, EES Discipline
4. Increase online learning options for students. **Outcome: More options for students to succeed; high quality online offerings; enrollment increases.**	Provide TA support for increased enrollments in online courses, where appropriate. Increase online and hybrid options for AP courses. Add new online courses, including	BI101l, Swank Online AP sequence developed and offered 09-10. Summer 10, for F10	TA support for large enrollment classes Initiative: CD, BI Discipline

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	BI 101K Introduction to Genetics		
	Develop online chemistry preparatory course: Convert existing course materials to online format; add to class schedule	Sp10 Teach F10	Initiative: CD, Chemistry Discipline
	Develop online CH112 course: Convert existing course materials to online format; add to class schedule	F10 Teach W11	Initiative: CD, Chemistry Discipline
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**	Work with Health Professions to develop online or hybrid options for A&P as appropriate Purchase new materials for student learning in online and hybrid courses.	Ongoing F10	Initiative: Perkins, AP Discipline
	Pursue development of a first year "science for health professions" experience.	Implementation Summer 10	Initiative: CD, A&P discipline Or Title III initiative
	Develop support for pre-pharm/pre-med majors, including articulation with OHSU	Develop a special topics or seminar class Develop marketing for pre-med, pre-pharm	Initiative: CD, A&P discipline; collaborate with new Academic Advisor for Science
6. Physics Discipline enhancements to curriculum.	Resurrect Principles of Technology and link to Advanced Technology	FY11	Comprehensive initiative proposals will be

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
OUTCOME: Comprehensive improvements to curriculum to increase student success; net revenue to college in long term **Full implementation of many of these enhancements will require additional permanent staff (See Goal/Initiative #10 and #11)**	programs: Curriculum development Collaboration with AT faculty and counselors/advisors		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	FY11	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	FY11	Short term expense Net revenue to college in long term
	Create better alignment and mutual support at all levels with math curriculum: Collaboration with Math faculty Curriculum development	FY11	Short term expense Net revenue to college in long term
	Create "Applied Physics Calculations" class for learning math in a physics context to gain entry into Math 95: Collaboration with Math faculty Curriculum development	FY11	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	FY11	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	FY11	Short term expense Net revenue to college in long term

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	Inventory: Collaboration with Math faculty Curriculum development		
	Comprehensive enhancement of astronomy curriculum, equipment, and online resources: Curriculum development Equipment purchases	FY11	Short term expense Net revenue to college in long term
	Develop multi-disciplinary thermodynamics course for majors: Curriculum development Equipment purchases	FY11	Short term expense Net revenue to college in long term
	Develop linked-course Learning Communities: Collaboration with faculty outside Physics	FY11	Short term expense Net revenue to college in long term
	Update Electrical Fundamentals Curriculum: Curriculum development Equipment purchases	FY11	Short term expense Net revenue to college in long term
	Leverage equipment building opportunity with UCORE interns: Collaboration with physical science faculty Curriculum development Materials and supplies	FY11	Short term expense Net revenue to college in long term
7. Additional curricular activities **Outcome: Improved student success and more options for completing AAOT and other program requirements**	Curriculum development for "Universal Access" in Biology, including access to field trip learning activities	FY11	Initiative: CD, Biology Discipline
	Explore adding topical course offerings in Earth and Environmental Sciences to attract a wider variety of students into science: Meteorology, Fossil Record	Explore demand, FY10 Initiative for FY11	Long term increase in Student FTE, increased revenues

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	Incorporate more GIS lab activities into EES courses	FY11	Initiative: CD, EES
	Develop three Resource Conservation Management courses	Complete by end of W10	Initiative: CD & Perkins, NRG (RCM option)
Outcome: Steward the curricula developed by retiring faculty	Develop plans for stewarding the "legacies" of specialized curricula, especially courses that meet the college Diversity requirement.	Sp10 thru W11 As part of Annual planning and ongoing program review	Possibly CD initiatives or Learning Community funding
Outcome: Increase our capacity to cover the range of courses in our curricula.	Develop plans for ensuring that at least two faculty members can teach every course Science offers.	Sp10 thru W11 As part of Annual planning and ongoing program review	Faculty retreats, mentoring, professional development expenses
Assess student learning outcomes and courses of study			
8. Implement assessment of student learning outcomes and gather student input for program improvements	Assess online courses, including comparing student learning outcomes of online, hybrid and seat-classes. Create and implement assessment tools.	Begin W10, and ongoing: BI 102G Genetics and Society, and AP sequences.	Seek funding sources; work with Assessment team
Outcome: High quality courses and course sequences; increased student success and retention.	EES redesign assessment tools and plans.	W10-Sp11	Assessment project support?
	Physics assessment to improve math preparation and alignment	FY10-FY11	Assessment project support?
	Develop a Division Assessment Plan	W10 – F10	May result in dedicating Division funding
	Increase faculty participation in Gen Ed assessment projects; incorporate Gen Ed rubrics into Division assessment plans.	W10 and ongoing	Assessment project funds?
Provide adequate technology: hardware, software, staffing			
9. Maintain and improve	Maintenance of existing computers	FY11	Tech fund initiative

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
technology for student learning. Provide adequate, stable staffing for supporting technology and provide professional development for technology use. **Outcome: Increase use of appropriate technologies for learning**	and printers Replacement of outdated computers and printers	 FY11	
	Enhance technology for instruction: Smart classrooms and additional Starboards. Provide training in ways to use Starboards for teaching.	FY 11	ATC resources and Division time and resources for trainings.
	Implement replacement of out-of-date interfaces and sensors for Physics instruction in Rm119; and complete the set of interfaces and sensors in Rm144. Purchase, Train faculty, Organize storage	FY11	Perkins or Tech Fund initiative
	Move Tech Fund supported staff to General Fund	W10 Budget request to ASA Sp10 Budget approval Sp10-Su10 Hiring processes, if necessary	Net additional Sal/OPE Current .5 FTE plus "1039" staff converted to 1.0 FTE, Tech support
Provide adequate staffing and funding to support instructional excellence or growth			
10. Provide adequate, stable staffing for instructional programs **Outcome: Program enhancements, student success, growth in offerings, instructional excellence; net revenue in long term.**	Replace FT Biology Faculty vacancy created by retirement: Cell Biology and Biobonds emphasis Replace FT Science faculty as retirements occur (anticipated CH retirement for FY11)	Post Winter 10, Hire by F10 for FY 11	No new costs. No new costs.
	Develop online PT hiring process to increase hiring pools	Sp10 for FY11	No new costs.
	Hire additional PT faculty in the short term for high demand areas.	Two PT EES faculty, F10 Other areas, as needed.	Enrollment enhancement if needed.

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
	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 FY11 FT EES faculty #2 for FY12 FT PH faculty #1 for FY11 FT PH faculty #2 for FY12 FT A&P faculty for FY 11 FT NRG (Renewable Option) faculty for FY11 FT WATR faculty for FY11	Begin hiring processes, W-Sp, each year.	Net additional Sal/OPE
11. Provide adequate, stable staffing for instructional support.[1] **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 Science Division office, fulltime Admin. Assistant NRG program office, fulltime Admin Coordinator	Hiring process, Sp10	Net additional Sal/OPE
Provide adequate EQUIPMENT funding to support instructional excellence and growth			
12. Provide capital outlay or equipment funding to replace worn or inoperative science equipment; and to purchase equipment to meet functional	Chemistry Equipment Repair and Replacement: Repair Fourier Transform Infrared Spectrometer Replace gas chromatograph	Fall 2011	Chemistry Bond Equipment Request

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
current standards. **Outcome: Maintenance of equipment investments, instructional excellence**	Purchase new equipment: GC/mass spectrometer and NMR	Fall 2011 Within Bond Funding period	
	Acquire Water Conservation Program instruments, ultrasonic water flow meters	Fall 2010	Bond Equipment Request, Est. $22,500
Enhance revenues			
13. 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. Improve marketing materials.	Mostly in Sp10, Sp11 W10-Summer 10	Ongoing work team No new costs
14. 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.) Continue offering Harvest Auction Science events	Develop work team to research and recommend opportunities	Self-supporting activities No new costs
15. 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
16. Encourage and implement	Reduce use of paper thru duplex	Ongoing.	No new funds.

GOAL/INITIATIVE	ACTIVITIES	TIMELINE	BUDGET IMPACT
sustainability behaviors (green purchasing, life cycle costing, expanded native landscaping, etc.) **Outcome: Fiscal and operational sustainability**	printing and increased e-communication Implement building systems efficiencies		Facilities Management support needed. Groundskeeping and Biology cooperative project.

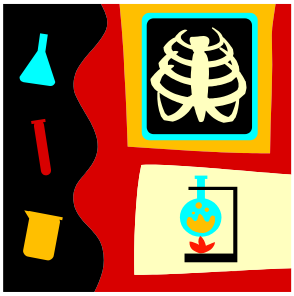
NOTES:

[1]Goal #11: 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: The 08-09 accomplishments of the Anatomy and Physiology discipline include continued 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 to both improve classroom learning and enhance students' access to materials outside of class. The Perkins funds will purchase (1) needed laboratory equipment (DNA kits), (2) anatomical models (bones and skulls) for use in the Science Resource Center for our current and new hybrid courses and (3) microscopes for classroom use. Other goals of the current year are to fine tune the learning outcomes for our anatomy and physiology classes, continue program assessment of current and new courses, and begin working on standardized learning outcomes for microbiology. A&P faculty members also developed and are now offering hybrid and online courses in our discipline. We are developing assessment tools and advising handouts for the students for these courses as well. In addition, we continue to work closely with the Health Professions Division which included ongoing dialog with program coordinators and serving on hiring committees. Toward these ends, Stan Swank applied for and received a sabbatical leave for Fall 2008 to study online learning in sciences. Brian Nichols applied and received a sabbatical leave for Fall 2009 to continue studies in the Nursing program.

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 support 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. Last year we offered 55 sections of A&P/microbiology and 22 sections of BI 112/Biobonds, an increase of 15.5 % FTE in A&P/Microbiology and an increase of 18.2% FTE in Biobonds. Of our A&P classes in 08-09, 58% were taught by part time instructors and of our BI 112 classes, 86%! We have addressed this issue by the development of 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 and curricular consistency in this critical course sequence remains a challenge.

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%. 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: 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). 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 32.4% of the Division's student FTE in FY09; Biology courses generated 345 FTE, an increase of 13.6% 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. Biology is the largest cohort of science majors that feeds other disciplines. For FY09, capacity rate for Biology overall was 99.3%, reflecting the college's overall enrollment surge.

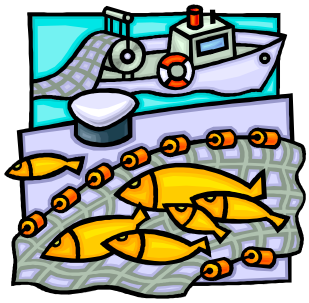
The Biology faculty is engaged in continual course improvements and developing new curricula. Faculty developed and taught a course in General biology with an emphasis in sustainability. The course was approved as a sustainability centered course by the Sustainability and Learning committee and was incorporated into the AAS Sustainability Coordinator degree curriculum. Faculty members are continually updating their 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 Science Division has four invaluable resources: the wet lab, the greenhouse, native landscape, and nature tails/LCC wetlands which are used 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 wet 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 greenhouse, native landscape, and nature trails/LCC wetlands are used in a number of Botany and ecology courses including wildflowers and many of our survey courses and general science courses. Presently we are collaborating with U of O students and faculty on access and educational programs utilizing the LCC wetlands.

Challenges and limitations: Each term (F, W, Sp) Biology offers 34-36 sections on a large diversity of topics. There are 12-16 different subjects taught. Offering such a wide range of courses presents challenges for lab preparation, materials management, scheduling and staffing. Each four-credit lab course meets six hours per week and requires materials, set-up and clean 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 taught by different instructors.

To meet the demands of these course with their accompanied set ups and to coordinate the demands from different instructors, it is imperative to have a **full-time instructional specialist for lab prep and support**!

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.



The Division supports additional part time hours for maintaining the aquaria in the Wet lab, a valuable resource for marine biology and other science courses. Maintaining the Wet lab 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.

To meet the demands of the wet lab, it is also imperative to have a **"04" wet lab worker.**

Urgent needs: A **full-time Instructional Specialist** is needed In order to coordinate the varying demands of the life sciences courses. This person would provide 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, this full-time position 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. The knowledge of this person would increase every year and therefore fewer resources would be needed for training new personnel and fewer

turnovers of workers would occur. This individual worker would be fully trained in all aspects of the stock room.

A **"04" Wet Lab Worker** is also needed 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. A permanent full-time position would help mainstream needed funding.

Technology Needs
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, on-line courses) would attract additional students. One of our marine biology instructors is proposing to film marine biology field trips for access on-line, potentially creating an on-line marine bio course. The field course to Costa Rica has been successfully taught in 2006 and 2008, and is scheduled for Summer 2010. 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 is being considered.

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

Chemistry

Accomplishments and strengths: Chemistry has gone green! Meyer grant funds supported the discipline's yearlong project of developing sustainable (green) laboratory modules. The grant had a curriculum development component and a dissemination component. Current labs were assessed and revised, and new green labs were developed and tested for introductory and general chemistry at both the college and high school level. A revised CH 221 lab packet was used fall term, 2009. 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 2008 in an effort to increase student awareness of chemistry and to attract more students to our courses and had the largest attendance to date at the Annual Mole Day pizza celebration. Nine They Might Be Giants CDs were raffled to students and staff correctly answering a question about the periodic table. New courses offered were CH150 Preparatory Chemistry and CHPS Chemistry Problem Solving continued.

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 in FY 08 gave 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

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

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

3) Full-time chemistry faculty position

Earth and Environmental Sciences

Accomplishments and Strengths: The discipline of Earth and Environmental Sciences is fortunate to have such a committed, talented, experienced, and well-trained faculty, all eight of whom teach part time. Anecdotal evidence suggests that students going on to be environmental science or geology majors who take Lane's courses are better prepared than students taking beginning level courses at the University of Oregon in these fields. Our courses also support non-science majors taking their science core courses. The number of sections we offered in FY09 was up 21.9% from the previous year and will increase more in FY10. We added trailer sections of G 101, G 102, ENVS 181, and ENVS 183. The majors' sequence has shown solid growth, with capacity increasing from a low of 44.7% in FY06 to 100% in FY08 and 93.1% in FY09. As we gain more experience teaching new courses developed in recent years, more faculty members are taking on the new courses, providing a measure of program sustainability. By Winter 2010 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. In FY10 we will offer an additional distance learning section, GS 142, in the spring.

EES faculty are campus leaders for infusing sustainability concepts into curricula. Our environmental science courses are part of the new Sustainability Coordinator AAS degree program. All of our faculty members have taken the Sustainability Infusion Training and four of us have given training sessions to others. In 2008-09 we experimented with pre and post-tests to assess student learning, but feel that we need to refine our student assessment to make it more meaningful. We will continue with assessment projects for FY10 and FY11.

Challenges and Needs: In FY10 our entirely part-time faculty has reached its maximum capacity with three of us teaching seven courses each from Fall 2009 to Spring 2010. The remaining faculty members have other obligations that kept them from teaching more courses. We will need to hire two additional part-time faculty members for next year or get a full-time faculty member if we are to teach the same number of courses in FY11. Although several of our faculty members are interested in developing new courses, we feel that with our limited resources we need to hold the variety of our courses steady. 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. Someone with climatology background would be desirable as a new hire.

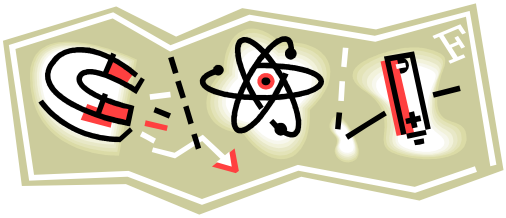
In the long run, Earth and Environmental Sciences discipline needs two full-time faculty members. The numbers of students majoring in Environmental Science and Geology exceeds the numbers for Physics and Chemistry. However, Physics has two full-time faculty members and Chemistry has four. Without a full-time faculty member, one of the part-time instructors is 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.

In the area of curriculum development, our Environmental Science faculty needs funds to develop new laboratory exercises to support the Sustainability Coordinator AAS objectives that the program requires our courses to achieve. We plan to seek Perkins funding in support of the AAS degree. We are also still interested in establishing a transfer Science Sustainability course of study in cooperation with Biology, Chemistry and other Science faculty. We started this process last year but need to do more work before the Science Division will approve it. We need to submit applications for ENVS courses to be established as Sustainability Focused courses. With the additional course load for our faculty in EES this year, we have been unable this year to pursue curriculum development of more GIS lab activities in Geology and Environmental Science courses. However, in FY11, we will have more opportunity to enhance our GIS training. We would like to improve our assessment methods 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 were not offered in FY08 and FY09. The fall section of in-class ASTR 107 was restored after being cut by the general mandate to cut sections the previous year. We introduced a trailer section of PH 201 in the evening to increase PH 201,2,3 enrollment, but did not carry it on into PH 202. Overall in FY09, physics courses increased 18.5% in registrations, 17.4% in student credit hours, and 18% in student FTE, whereas there was a lower 8.8% increase in the number of sections (one section). In FY08, we maintained and increased FY07's increases in enrollment of 24%, in student credit hours of 28.9%, in student FTE of 26.2%. This year, then, we maintained that steady double-digit increase.



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 in FY08. In FY09, this student FTE dropped by 2.9%. Since FTE in PH 211 started 1.4% higher, the decline occurred when new adjuncts taught classes; FTE in PH 213, for example, was down by 9.7 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 strong enrollments in the PH 211,2,3 sequence led to a strong 33.5% increase in the Electrical Fundamentals class, for which the Physics discipline is responsible.

A large FY07 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 validated 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. In FY09, astronomy classes had an 18.9% increase in FTE, while increasing the number of sections by only 14.3%, which further validates the wisdom of the discipline.

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 in the past 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, our experiment with the trailer section did not perform sufficiently well to continue, and as a further result we cut one PH 203 section, so that the number of PH 201,2,3 sections remained a constant. Yet, overall in PH 201,2,3 student FTE increased by 21.6%, an indication of PB's efforts to improve the sequence and the wisdom of getting more students at the front end of the sequence, though there was not enough to justify a full trailer sequence this year.

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. 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 permanent faculty, and numerous other advances are not possible without two more faculty positions, so that Physics is comparable with Chemistry in faculty staffing.

Other accomplishments last year included small gains in curriculum development. With the help of Learn & Earn students, we continued using Math skills assessment instruments and continued conversations with Math faculty members, but nothing came of it due to lack of time by both Physics and Math colleagues. There was movement toward physics requirements in the physical therapy assistant program. The UCORE internship program, of which DG is Lane liaison and was appointed to its advisory board in FY09, had another successful year. PB has continued good contacts with high schools as College Now representative. Both PB and DG attended the major physics education conference over the summer, and DG also attended in the winter. He maintained the physics x "class" for another year. PB served on the college-wide Assessment team and DG served a year of his term as Faculty Council Co-Chair.

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.

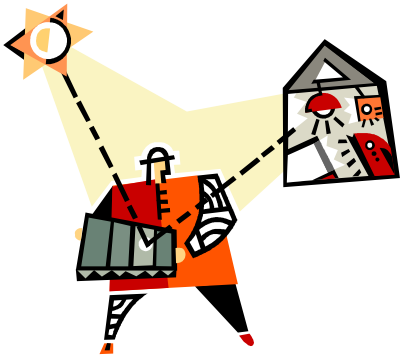
In general, we are in a situation where our curriculum is not yet fully replicable, sustainable, or fully up-to-date. Despite some improvement, much of our equipment is old, incomplete, or disorganized, and/or not fully integrated into the curriculum. In terms of staffing, there are insufficient permanent positions and insufficient classified support if we were to fully integrate equipment into the curriculum. In FY09, modest curriculum development and tech fee awards were made, and put to good use.

The permanent physics faculty works extra hard as a result of understaffing, which continues to be exacerbated as the physics offerings expand. This was made more problematic when the administration modified workload schedules set in the division by the interim dean. As a result, the matter is referred to a workload hearing in FY10.

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: 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 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, 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. Fall 09, the program introduced the Resource Conservation Management option which prepares students to manage waste streams

in the built environment. The Water Program enrollment is at capacity for the second straight year which demonstrates that our forward thinking staff and advisory committee are on target in terms of growth in the building resource conservation sector. Also, in Fall 09 the Energy Management program tripled its enrollment (using 07-08 as a base year) which again increased its contribution to the division/college FTE generation.

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. 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 National Sustainable Building Advisors Program (NaSBAP) which was launched fall 08. The NaSBAP is a Lane non-credit course that offers a national certification.

Work on the Strategic Investment Funds online course development is continuing in FY10. Most first year classes are in a stage of hybrid development and are being used in first year classes. It is expected that the program will begin offering online courses winter term 2010 starting with Introduction to Energy Management, Solar PV Fundamentals, and Water Conservation: Residential. Strategic Investment Funds are also being used to build an outdoor solar installation lab on campus.

Through the American Association of Community Colleges MentorLinks project, (NSF funded), The Energy Program director has been working with the West Virginia University –Parkersburg to develop a residential energy conservation program. The director met with the Parkersburg senior administration and found that through LCC Energy Program assistance, they have acquired $500K in state grants for residential weatherization and solar installation training. The MentorLinks project has proven to be beneficial to both the energy program and the West Virginia University program.

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, resource conservation, 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. Furthermore, because of the growth of the programs - 30 1st year and 25 2nd year energy management students fall 2007 increased to 90 1st year and 45 2nd year energy management and 30 1st year and 25 2nd 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 Energy Management 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 FY09 the Science Resource Center (SRC) supported student success and retention, serving 1,062 documented students (and possibly many others who were not registered), for 12,744 hours of tutoring, and generating 25 FTE through tutoring services during the year. Over 2600 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 30 new computers that are completely matched and 3 new printers enhanced technical infrastructure for student learning, and decreased back-up time.

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. 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.

The SRC coordinator works collaboratively with the Math Resource Center staff to meet student needs for study space and testing services. This year (Fall 2009) the SRC has begun to share space with the Math Resource Center. We are sharing room 171 as a quiet study room. It is already being well used by students with more than 20 at a time working in the room. The room offers access to both science and math tutor areas at the same time. Both Centers are also sharing room 165 as a testing room. This is especially useful on Saturdays, when the Distance Learning students often have had to wait for testing. The SRC is often filled to capacity, with all computers filled and nowhere to sit. We have repurposed room 193D as an Anatomy and Physiology model study room. We have stationed computers, tutors and human anatomy models in there and are continuing to remodel the room with shelves and new furniture.

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 Tutor Central, Liz Coleman we are hiring some Instructional Specialist level tutors and these tutors have allowed the single staff member to take mandated breaks and attend some division functions. These 04 workers take a long time to learn their jobs and a more stable position, funded through Science, would give more dependable service to Science and our student population.

Goals for FY10 and continuing for FY11 include continuing to examine and adjust 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, staff coordination, and leadership for student retention and success. In addition, as we have devised new testing procedures; we are testing them this year with both students and instructors both inside Lane and for other SRC users from outside our college. We will continue monitoring how the changes are working. The Social Science testing center has taken over a small percentage of the distance learning testing for Science courses and we are communicating with Toni Timmers on how this is affecting her testing center. Moodle Testing however is a small part of our testing load. 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.

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 initiated in FY08 continues 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. We hope to place more computers for student use in the A&P model study room and add to our bank of Moodle testing computers.

College Now

Lane's Science faculty from Biology, Chemistry, EES and Physics works with high school faculty to offer sections for college credit. While the number of sections increased from 54 in FY08 to 61 in FY09, the College Now FTE gains in FY08 have leveled off. FY09 FTE was slightly less than in FY08 (133 compared to 139). Science courses account for 15.5% of Lane's College Now FTE.

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.