

# Santa Rosa Junior College

## Program Resource Planning Process

### Biological Sciences 2017

#### 1.1a Mission

##### **Mission of Life Sciences Department:**

To provide students with an education in the biological sciences as preparation for college or university transfer, entrance into professional programs in the health sciences, or general education. Faculty strive to provide a conceptual framework from which students will develop an appreciation and understanding of the unity and diversity of the earth's life forms.

#### 1.1b Mission Alignment

Our mission matches the new mission statement of the college, developed through the strategic planning process. The Life Sciences Department prepares students for transfer as biology majors, transfer to allied health programs, and we offer GE transfer level sciences classes, both with and without a lab. We offer a developmental biology course to help students succeed in college level biology classes. We contribute to environmental stewardship by offering an ecology course that teaches the fundamental principles of ecology and "their application to problems of renewable resources, resource management, conservation, and global environmental issues".

The Life Sciences Department makes contributions that serve the college and our students and are aligned with the new Strategic Planning goals.

**A) Support Student Success** The Life Sciences Department has developed relationships with Bodega Marine Lab, Pepperwood Preserve, the Buck Institute and UCSF to provide internships for our biology majors. Experience doing research in professional research labs is the most effective way to support retention and success for biology majors.

The Department has several ways of supporting the retention and success of pre-allied health majors. The department offers a shadow anatomy course to increase the number of slots for ANAT 1 without increasing lecture or cadaver costs. Pre-allied health majors are offered the opportunity to study in the anatomy lab every Saturday, with a tutor from College Skills. The department has enlisted many students who have successfully completed rigorous science classes to mentor current students during lab time as part of our BIO 49, independent study course. The department collaborates with a local high school to offer a credit by exam option which will be given at the high school for the ANAT 140 course.

The Department conducts several outreach activities. Local high school A&P classes, as well as the Summer Health Careers Institute students, are given the opportunity to tour the anatomy lab. Several instructors go to local grade schools with 'show and tell' biology specimens to engage younger students in science.

**B) Foster Learning and Academic Excellence** The Life Sciences Department is well known for the academic rigor of our courses. Two full-time faculty members have taken

sabbaticals to study new ideas in the teaching of undergraduate biology. They have given seminars available to all members of the department to share their findings. One has posted numerous resource materials online. All Introductory Biology classes (GE), biology major classes, botany classes and the ecology class offer local field trips. Being in the biological world is the best way to engage students in the study of biology.

c) **Serve Our Diverse Communities** The Life Sciences Department prepares students to transfer to Allied Health programs such as nursing and dental hygiene. Students who successfully complete these programs can earn decent salaries. They also provide essential services to the community and thus contribute to the economic vitality of this region. Two full time faculty members have studied extensively to become fluent in Spanish since they joined SRJC. One of these faculty members has developed a Spanish language tour of the local water treatment plant. This tour helps to educate the local Latino population on environmental issues and provides outreach and engagement with the community.

D) **Improve Facilities and Technology** The Life Sciences Department plans to be actively engaged in the design and building of a new STEM facility on campus. Some of the current STEM facilities were appropriately described by Dr. Chong as 'third world'. The HVAC system in Baker Hall is a disaster and must be contributing to excessive energy consumption and cost.

E) **Establish a Strong Culture of Sustainability** The Department can best contribute to this goal by our input to the new STEM building design, and inclusion of sustainability principles as part of the curriculum of biology and ecology courses.

F) **Cultivate a Healthy Organization** The Life Sciences Department has focused on collegiality in our hiring practices for the past ten years. We rarely all agree on many topics, but have always focused on reaching consensus in an atmosphere of respect for one another. We have extensive and time consuming hiring practices that help ensure that we hire outstanding faculty. The Department has participated in several lab safety trainings, and have a designated emergency coordinator.

G) **Develop Financial Resources** Individual members of the Department have written 3 different grants that were funded. Two allowed the purchase of \$20,000 worth of equipment for biology major labs. The third grant supported student success in the Introductory Biology course. The shadow anatomy section helps to maximize apportionment funding for that heavily impacted course.

H) **Improve Institutional Effectiveness** This goal seems larger than what an individual department can contribute to. However, the Life Sciences Department has developed a regularly distributed Newsletter that ensures all members of the Department are kept informed on a variety of department and campus issues.

## 1.1c Description

We provide courses and instruction that serve three groups of students: those needing general biology or a laboratory science to transfer to a four year institution, those preparing to transfer to four year institutions as biology majors, and those intending to enter professional allied health programs. One of our former goals was to offer courses for students who wished to study the natural world for personal enrichment, and in these troubled budget times, those kinds of courses have been inactivated. The Department hopes to restore a few of these classes and/or develop new classes to serve life-long learners as the budgetary times improve. The Department offers two related courses that prepare students to be Pepperwood preserve stewards (BIO 85.1 & 85.2)

### 1.1d Hours of Office Operation and Service by Location

Life Sciences is open (faculty are here, courses are being taught) during regular teaching hours: Monday through Friday, from 7:30 AM until 5 PM, and until 8-10PM on nights when there are night courses taught (MTWThF). This is true for both SR and P campuses. The department office is in SR and is staffed by an administrative assistant for 30 hours/week and a science lab coordinator, who works 40 hours/week. The AA works flexible hours, but generally aims to be here in the middle of the day. The SLC is here for a regular work day, but is often working in labs, not in the office.

The Petaluma Life Science program offers day and evening courses. The Coordinator of Science Labs has an office in the laboratory prep area and is present during operational hours, M-F, 8:30am-4:30pm.

### 1.2 Program/Unit Context and Environmental Scan

The Life Sciences Department is currently thriving. There is great demand for our courses: the core introductory course, BIO 10, has 26 sections/semester; the 22 sections of allied health pre-requisite courses are filled to greater than 100% capacity at the start of every semester; we have added sections for biology majors to meet an increased demand. Our students are successful, at four year transfer schools and in allied health professional programs. It is important to note that many of our pre-allied health students have been accepted in a variety of schools, including Samuel Merritt University, USF, and John Hopkins. This is significant because there are limited seats available in the SRJC pre-allied health programs, but our students are well aware of this and are successfully applying to many other schools. Our faculty are known for their academic expertise and rigor, their contributions to the department and the college, their devotion to helping students succeed. The department is also well known for our successful effort to establish a collegial and highly functioning department.

A recent challenge is the institution of Transfer Model Curriculum majors. The TMC biology major was defined, recanted, and defined a second time and more recently a third time. It is clear that a biology major does not fit easily into the new mantra of completion asap. The Life Sciences Department is still in the process of deciding how and if we can introduce a TMC biology degree. The challenges we face is that the strict unit limit with these majors forces us to not include our current Introductory Biology pre-req for the biology majors courses. The omission of this pre-req would seriously jeopardize student success. In addition, while the TMC major allows students to take 5 unit chemistry courses, they have limited the biology major courses to 4 units! This

translates to only one lab / week. The department does not feel it is in the best interest of students or student success to change our majors courses from 5 to 4 unit courses. The department is working closely with the dean of Liberal Arts and Sciences and the Curriculum dean to resolve these issues. The department is committed to helping students transfer in a timely manner, to providing a degree that will ensure enrollment in impacted CSUs, AND ensuring that students are well prepared to succeed as juniors in a 4 year university. Ultimately, most of our majors transfer to UCs, and very few to the local CSU. Therefore it may not be essential that the department develop a TMC if it really does not serve students.

Another major change facing all colleges in California (and therefore this department) is meeting the recommendations of the Student Success Act. Many of these recommendations can only be implemented at the State level. I believe there are ways that the Life Sciences department can continue to improve OUR students' success without state intervention. One idea was to implement a required pre-req of appropriate math and English courses (replacing recommended pre-reqs) for the core biology and pre-allied health major courses. This was implemented at the start of Fall 2012. The department feels strongly that this is an important step in notifying students about the level of skills needed to succeed in these courses, and encouraging students to get these required courses completed early in their educational pathway. Sadly it has been the experience of Life Sciences instructors that many students with passing grades in ENGL 1A still cannot write a sentence in correct English while taking in-class essay exams. Some members of the English Department are sensitive to this challenge and are making changes in the kind of work they require in ENGL 1A. We are currently offering a section of BIO 2.1 in summer to help biology majors complete their required classes in a timely manner.

There has been a major trend in education in the biological sciences. A set of recommendations has been published by AAAS. These recommendations encourage more problem solving and analytical work in biology lab courses, and less memorization. There is also a list of core concepts that all students leaving a biology course must be familiar with. One member of the department spent a sabbatical studying these changes in biological education and has presented several workshops for the Life Sciences faculty, helping all of us to incorporate these changes into our classrooms and teaching styles. Another member of the department was on sabbatical in Fall 2013 and has also presented the results of her study to the Department.

In terms of reaching out to the community, a department member attended a few Cal-Pass meetings, but we are not yet actively engaged. We are much more engaged in outreach to local high schools, and have actively participated in the Bay Area Science Festival for the past three years. Our outreach to local K-12 schools includes having many different local high schools tour the anatomy lab, and having FT faculty bring their expertise and fun biological specimens to local grade schools to give presentations on biology.

The Department has established relationships with Bodega Marine Labs, the Buck Institute, Pepperwood Preserve and UCSF to obtain internship experiences for our biology majors.

## 2.1a Budget Needs

**If you need additional funds, please explain.**

The Life Sciences budget must cover a great deal of items beyond those typical to most academic departments, such as live cultures, consumable supplies for labs, and equipment maintenance. Biology courses are expensive to teach, but the demand for our courses remains very high. The lab exercises performed in our courses are necessary to cover the concepts of our approved curriculum, and many of these courses prepare students for transfer into either 4-year universities or pre-allied health programs.

**4510: graphics**

Requesting increase of **\$2,350.00**

Last year we went negative on our graphics budget; we are already negative this year as of April, though we haven't yet paid our 3rd quarter copier charge.

**5690: cadavers**

Requesting increase of **\$1,000.00**

Cadaver prices went up last year, and every year they increase the mileage and service charge (from the funeral home that transports them). Cadaver dissection is an integral part of our Anat 1 program, and they are used by Anat 40 and Anat 58 as well.

**5620: field trips**

Requesting increase of **\$1,300.00**

Last year we went \$1,100 into the red; this year we expect to hold roughly the same number of field trips, with the addition of a new faculty member who is incorporating even more field trips into Bio 2.2.

**4390: general supplies**

Requesting increase of **\$2,300.00**

Consumable and live lab supplies are one of our largest annual expenses. The department utilizes various cost-saving measures to keep costs down, however due to cost increases over time (including shipping costs), it is difficult to replicate each year's purchasing so that we are able to provide the same lab experiences without an increase of funding. Furthermore, conscientious instructors have made efforts to keep lab experiences up to date, exposing students to more current experiments and techniques. The new experiments have added to the cost of supplies, but are essential to prepare students for transfer to 4-year universities. Finally, more instructors are incorporating a GMO experiment into their Bio 10 lab each semester, and there is potential to add two additional sections of this course next year.

## 2.1b Budget Requests

Rank	Location	SP	M	Amount	Brief Rationale
0001	Santa Rosa	01	01	\$2,350.00	These funds are for graphics (4510).
0002	Santa Rosa	01	01	\$1,000.00	These funds will cover the ever-increasing cost of cadavers (5690).
0003	Santa Rosa	01	01	\$1,300.00	These funds are for field trips (5620).
0004	Santa Rosa	01	01	\$2,300.00	These funds are required to cover the cost increase of our basic supplies (4390) and will ensure that we can have the required supplies for our labs.

## 2.2a Current Classified Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Administrative Assistant II	30.00	12.00	Life Sci department office management, keyboard evaluations, monitor budget, source and purchase equipment and services, update website, provide departmental orientation for new employees, prepare PAF's, enter curriculum into SIS database. NOTE: Admin also serves the E&SS department with these hours
Science Lab Coordinator; SR	40.00	11.00	coordinate purchases and preparations for 40-50 sections of labs; maintain living cultures, order and receive supplies, maintain equipment, supervise student employees, serve as SLIA for cell & micro lab preparation
Science Lab Coordinator, Pet	40.00	12.00	manage budgets, coordinate purchases and preparations for student labs; maintain living organisms, order and receive supplies, maintain equipment; work with SLIA on MICRO 60 and 5 preparations, and BIO 10 and 100 when needed. NOTE - these 40 hrs also coordinate other science courses (and their budgets) using lab facilities at the Petaluma campus: chemistry, earth/space science, physics, wastewater chemistry, animal health, viticulture, etc.
SLIA Anatomy	40.00	10.00	prepare student labs: equipment, specimens, reagents; assist in lab instruction; assign, oversee, and grade dissections; dispose of hazardous waste; order/maintain/dispose of cadavers.
SLIA Physiology	40.00	10.00	prepare student labs: equipment, specimens, reagents; assist in lab instruction; maintain and repair equipment; provide biohazard training and supervision for blood labs.
SLIA Bio Majors/Micro/Botany	40.00	9.00	prepare student labs: equipment, specimens, reagents; assist in lab instruction, grade lab reports, gather botany specimens, maintain living cultures for labs
SLIA Intro Bio	19.00	10.00	prepare student labs: equipment, specimens, reagents; assist in lab instruction; conduct review sessions; assist in grading lab exams
SLIA Biology, Pet	20.00	12.00	prepare student labs, assist in lab instruction
	0.00	0.00	

## 2.2b Current Management/Confidential Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Department Chair	20.00	11.00	manage department: budget, evaluations, program review, schedule, curriculum, hiring, department meetings and communication; Life Sciences has a SR chair (.45) and a Petaluma co-chair (.03) = .48 FTE release time. This release time decreased when

			the new chair formula was put into place, and it does not accurately reflect the time spent to do the job.
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## 2.2c Current STNC/Student Worker Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Student Lab Workers (2)	20.00	12.00	20 hours split by 2 workers. Feed animals, wash dishes, help prepare experiment solutions, help prepare BacT media, start student BacT cultures, clean fish tanks, clean labs, clean microscopes
Student Lab Assistant, Petaluma	8.00	12.00	wash glassware and slides, feed animals, prepare specimens, clean labs, maintain equipment, prepare media

## 2.2d Adequacy and Effectiveness of Staffing

The Life Sciences Department does not have adequate staffing to support our needs.

### Santa Rosa Campus

Rank #1: Our Science Lab Coordinator is currently an 11-month position. This person supports an extensive 8 week summer session, and is serving both as the SLC and the primary technician to prepare all the materials needed for the 2-3 sections of BIO 2.1 and 3-4 sections of microbiology taught each semester (a more detailed history and description of this job is provided below\*). The workload is further exacerbated by the lack of a Micro SLIA; our SLC arrives at 7:30am to prepare media for labs, and then stays two nights/week to serve the evening section of Micro 5. In order to maintain our current offerings, let alone add an evening section of Micro 60 (increasing FTES), we need to increase this position from 11 to 12 months.

Rank #2: Our Intro Bio SLIA supports all sections of Bio 10, Bio 16, Bio 25, and Bio 100, including during the summer. Bio 16 was developed and added a few years ago, yet the SLIA hours were not increased. In order to maintain, or potentially increase, our offerings of these core courses (and therefore FTES), we need to increase this position from 19 to 20 hours/week.

Rank #4: Our student workers take care of many tasks that are integral to our classes but are in no way cost effective to have SLIAs perform, such as cleaning and upkeep of lab equipment, care of living specimens, and organizing supplies. We regularly run short on hours and end up having much higher paid staff performing these menial tasks.

Rank #6: Rank #6: Microbiology is one of three "core science" courses for pre-allied health students, and yet it's the only one without a dedicated SLIA. In contrast, Anat and Physio each have their own 10 month, 40 hr/wk SLIA. This affects student safety and learning, because they don't have that additional pair of eyes and hands for help during labs that regularly use flame, potentially pathogenic microorganisms, and known mutagens for staining. It also affects the Science Lab Coordinator, who serves as the unofficial Micro SLIA (including supporting evening sections) without compensation. We are therefore requesting a new 10 month, 20 hr/week SLIA position.

Rank #7: The Life Sciences Department Chair is currently compensated with 48% release time, 3% of which is given to the Petaluma co-chair. This has proven to be insufficient for completing all the required tasks that are the purview of the chair. The current chair regularly works on evenings, weekends, and over both winter and spring break to make sure everything is

accomplished. This is no way to run a department, and it's a major impediment to recruiting faculty willing to serve as chair. The specter of "year at a time" schedule development will make this situation even more challenging. Therefore, we are requesting that our Department Chair compensation be increased from 48% to 58%.

Rank #8: One of our SLIAs (Bio Majors/Micro/Botany) has a 9 month position; all the others have 10 month positions. The department requests that this position be made comparable to the others, a 10 month position. This position serves all biology major courses, and a summer session of Bio 2.1. The increase of one month is essential in order to offer the summer section of Bio 2.1. This cannot be done without adequate instructional support for lab set-up and take-down, as well as instructional assistance during lab hours. The summer offering of Bio 2.1 has been very well received by students since its inception in 2013, and will be repeated this summer. This additional month of work has been added on (by way of a PAF) for the last 3 years, and must be made permanent.

### Petaluma Campus

Rank #3: The hire of a 50% SLIA was a wonderful result from the 2015 PRPP request. This year we are requesting an increase in hours from 20-30/week. The SLC used primarily to help with biology labs. But many other science labs have been added to the campus and this person can no longer provide enough help, especially given the expansion of biology labs with the new second FT Life Sci faculty member in Petaluma.

Rank #5: Our student workers take care of many tasks that are expensive for our classified staff to perform, such as cleaning lab equipment, caring for living specimens, and organizing supplies. Our best student workers are science students who move on with their education. An increase from eight to twelve hours per week would allow one experienced student, who is getting ready to move on, to work with and train an incoming student worker.

\* Detailed History and Description of the SLC position, in her own words:

Biological Sciences  
Science Lab Coordinator

Subject: Requesting Sci Lab Coor position go to twelve months a year.

Officially Millie Tripp retired 12/2001

I was temporarily assigned to the position as of 1/2/2002 and hired officially as 7/15/2002. Millie's job was Sci Lab Coordinator for Micro/Cell and department equipment eleven months a year. This included purchasing for her area.

Then Debra Armitage retired 3/15/2004 from her full time twelve month a year position. At that time her duties were added to mine. This added Bio 10, Bio 25, Bio 100, Bio 2.1, Bio 2.2, Bio 2.3, Anat 1, Anat 140, Anat 58, Physio 1, and Physio 58 to my area of responsibility. The labs without SLIA support then fall to me for set up of specific labs besides just chemical solutions (i.e. Bio 100, Micro 5, and Micro 60). Also with Micro 5 and 60 there are two labs that require my presence in lab for safety of the students.



I make all solutions for these labs. I coordinate with the SLIA's for supplies ordering. I perform inventory for all labs beyond SLIA's in lab inventories.

Then we were required to implement the Chemical Hygiene Plan (CHP) to the department. This added new duties I manage for Bio Sci; coordinating all the chemicals we use including how they are used and disposed of as well as orienting new faculty and staff on established laboratory procedures.

Next building safety was implemented and the Sci Lab Coordinators serves as manager (BSM). This involves meetings, seminars, planning and review with the EHS manager as well as development of the Bio Sci department's emergency plans.

I supervise two lab assistant student employees who support the SLIA and me.

At least twice a year I get letters from HR about maxed out vacation time accrument. With the extra hours I work I am usually carrying 23 hours of comp time on average.

I truly love my work and feel it is not practical to have it separated into two jobs. I have organized the job extremely well. For example we now have one set of chemicals in the department. The needs of the different labs are expertly known by me and as a result I developed concise procedures. Example: autoclave supports all the labs as well as the RO water system (1850 used to get water from the chem dept), dishes coordinated by area for storage and upkeep....

## 2.2e Classified, STNC, Management Staffing Requests

Rank	Location	SP	M	Current Title	Proposed Title	Type
0001	Santa Rosa	01	01	Science Lab Coordinator, 11 month	Science Lab Coordinator, 12 month	Classified
0002	Santa Rosa	01	01	SLIA, Intro Bio, 19 hours p/ week	SLIA, Intro Bio, 20 hours p/ week	Classified
0003	Petaluma	01	01	SLIA Biology	increase from 20 to 30 hrs/week	Classified
0004	Santa Rosa	01	01	Student Lab Workers	increase from 20 to 25 hrs/week	Student
0005	Petaluma	01	01	Student Lab Assistant, Petaluma	increase from 8 to 12 hrs/week	Student
0006	Santa Rosa	01	01	None (No Existing Position)	SLIA Micro (20 hrs/week; 10 months)	Classified
0007	Santa Rosa	01	01	Department Chair, Release Time	increase from 48% to 58% release time	Management
0008	Santa Rosa	01	01	SLIA Bio Majors/Micro/Botany	increase from 9 mo to 10 mo	Classified

## 2.3a Current Contract Faculty Positions

Position	Description
Life Sciences Instructor	intro bio, ecology, botany, zoology, pepperwood field courses
Life Sciences Instructor	intro bio, developmental bio, botany
Life Sciences Instructor	intro bio, physiology, anatomy, marine biology
Life Sciences Instructor	intro bio, ecology, cell biology, anatomy, physiology
Life Sciences Instructor	intro bio, physiology, anatomy
Life Sciences Instructor	intro bio, zoology, marine biology
Life Sciences Instructor	intro bio, microbiology
Life Sciences Instructor	anatomy, zoology, tropical biology, human biology
Life Sciences Instructor	cell biology, microbiology
Life Sciences Instructor	intro bio, developmental biology, marine biology
Life Sciences Instructor	anatomy, physiology
Life Sciences Instructor	intro bio, botany, ecology

## 2.3b Full-Time and Part-Time Ratios

Discipline	FTEF Reg	% Reg Load	FTEF Adj	% Adj Load	Description
Anatomy	1.7500	42.0000	2.3800	58.0000	This ratio suggests the need for more FT faculty teaching the anatomy courses (with the exception of Anat 1). This will be helped by moving one FT faculty to "anchor" Anat 58, and another to "anchor" Anat 40. However, this ratio will be harmed by the anticipated retirement of one FT faculty who teaches Anat 1.
Biology	6.1300	68.0000	2.9500	33.0000	This ratio is reduced from last year due to the hiring of 3 FT faculty members.
Botany	0.0000	0.0000	0.3300	101.0000	There are only two remaining Botany courses (we used to have 11). The faculty who end up teaching these courses (one in fall, one in spring) varies from year to year. In 2015 the numbers were 100% FT; in the subsequent two years it has been 100% adjunct. This will be affected by the anticipated retirement of one FT faculty who is a botanist.
Microbiology	0.9300	50.0000	0.9300	50.0000	This ratio has improved with the addition of a FT faculty member in Petaluma who teaches Micro 5.
Physiology	1.6000	80.0000	0.4000	20.0000	This ratio has improved with the addition of a FT faculty member who teaches Physio 1. A good portion of the hourly load in physiology is due to two FT faculty teaching overload (both of whom are over 55 and therefore within anticipated retirement range).

## 2.3c Faculty Within Retirement Range

Twelve FT faculty are listed in section 2.3a. 8 current faculty are under 50, 1 is 50+ and 3 are 55+. It is expected that 2 FT faculty will retire in the next 1-3 years. Health issues may determine the exact years of retirement.

## 2.3d Analysis of Faculty Staffing Needs and Rationale to Support Requests

The Life Sciences Department currently has twelve full-time faculty members and 21 active adjunct instructors (with 10 additional adjuncts "in the pool" but not yet assigned despite several attempts).

It can be difficult to find adjunct instructors for our various disciplines, and therefore we have historically interviewed for the adjunct pool at least once per year (with the exception of F2015-S2016 when we were hiring for two full-time positions with one person out on sabbatical). This year we have interviewed both semesters. We are usually able to add 1-3 people to the pool each time we interview. However, most candidates are only able to teach the introductory biology course, and many leave after teaching here for 1-4 semesters. We have found it particularly difficult to find adjunct instructors who can teach microbiology, cell biology, anatomy, or physiology. After interviews for our 2016 full-time Petaluma micro position we asked candidates if they would be willing to be added to the adjunct pool. Many said yes, and we now have 10 people in our adjunct pool that have not yet had an assignment. Unfortunately, after several semesters of being asked if they were available for an assignment, not a single one has panned out. So it is not enough to have people in the pool, they have to be available.

The two positions listed below describe what the Department will request after retirements expected within the next 1-3 years.

### 1) Anatomy / Physiology position, Santa Rosa campus

This position is listed here because it is expected that at least one, if not both, of the two 55+ faculty that teach anatomy and physio will retire within the next few years. The position will be needed after the retirement for many reasons. First, these courses are in extremely high demand and always overfill, feeding into other SRJC programs including nursing, dental hygiene, and kinesiology. Second, it is very difficult to staff the more advanced anatomy and physiology courses with adjunct instructors. Third, we currently we have BOTH 55+ faculty members teaching a 33-40+% overload to ensure adequate staffing of Anat 1 and Physio 1. If they were to retire at the same time, it would be like losing three faculty instead of two. Finally, no other department faculty member has shown any inclination of wanting to teach this much, contributing further to the need for positions on the Santa Rosa campus.

### 2) Botany / Intro/Developmental Bio position, Santa Rosa Campus

This position is listed in anticipation that another of the 55+ faculty members will retire within the next 3 years, and that person is our only trained botanist as well as the only FT faculty member on the Santa Rosa Campus that teaches Bio 100.

## 2.3e Faculty Staffing Requests

<b>Rank</b>	<b>Location</b>	<b>SP</b>	<b>M</b>	<b>Discipline</b>	<b>SLO Assessment Rationale</b>
0001	Santa Rosa	02	01	Life Sciences: anatomy / physiology	This person will routinely assess SLOs in any courses they are assigned: ANAT 1, ANAT 40, ANAT 58, ANAT 140, PHYSIO 1, PHYSIO 58, BIO 10
0002	Santa Rosa	02	01	Life Sciences: botany / intro/developmental bio	This person will routinely assess SLOs in any courses they are assigned: BIO 2.3, BIO 10, BIO 12, BIO 100

## 2.4b Rationale for Instructional and Non-Instructional Equipment, Technology, and Software

Existing equipment and technology are not adequate for our instructional program. Primary needs include several items that will preserve our priceless specimen collection (both taxodermic and herbarium), including a **walk-in freezer** and **museum-quality display cabinets**. Some specimen loss has already occurred, and last semester we came close to losing many more. My understanding is that both the freezer and cabinets will be included in the remodel project currently underway with RFD, but having been warned to "put everything in the PRPP," I thought it prudent to include them here as well.

Other high-priority items include **carts** with wheels that can tolerate the aggregate walkways outside Baker Hall. The SLC and SLIAs regularly hand-carry breakable items such as glassware because we don't have a cart that won't jar them. Obviously, this is a very inefficient way to transport lab supplies and equipment.

A **slide warmer** is standard equipment for a microbiology lab (used to dry slides prepared in the lab, but we don't have one in Santa Rosa).

**Rib shears** are vital for access to internal organs in cadavers. Our current pair is broken, and just barely serviceable.

The requested anatomy/physiology **models** are to replace (or supplement small numbers of) models used extensively by pre-allied health students, which wear out over time as smaller parts break and epoxy will no longer do the trick.

Several Life Sciences instructors are interested in using **iClickers**, but don't feel comfortable asking students to buy them every semester as we experiment. A department set, which could be checked out by students for use inside the classroom only (and therefore used for multiple classes every day), would allow us to develop our pedagogy around them without charging our students.

Our classroom set of **binoculars** is down to a few, very outdated pairs. These would be used primarily by Bio 2.2 students on field trips, but could also be shared with Bio 10, 12, 16, 25, 27, and 85.2.

**Microscope cell phone adaptors** would allow the students to easily photograph slides in lab, and can also functionally "add an ocular" to monocular microscopes.

A **pump** is required to maintain water flow in a saltwater tank, and therefore is necessary to keep the animals alive! Our old one broke, and we are currently borrowing one from an adjunct faculty member. We need to replace it with one of our own.

In speaking with Mike Roth, it seems our set of **laptops for classroom use** is due to be replaced on the regular seven-year cycle, but I'm including them here just in case.

**Plant growth chambers** would allow for more sophisticated botany experiments, primarily for Bio 2.3.

The **LCD 55" monitor + cable + mounting supplies** are for the computer room at the back of the physio lab. This new set-up would allow the SLIA to project results from EKG and other experiments for student discussion and analysis.

The physio lab requires a **microcentrifuge** for the renal function lab (i.e. spinning out urine). Currently the SLIA borrows a larger one from Dan Famini in Ag, or a smaller one from the SLC. But that one is used often in preparation for cell/micro labs, so it would be nice for physio to have its own.

Students perform extensive cadaver dissections in Anat 1, but many structures (particularly blood vessels) are small and difficult to see unless one's face is right up in there. During student presentations, the **camera system** allows us to project those small structures to monitors mounted around the cadaver lab. The currently system was installed in 2003, and the single broken camera needs to be replaced with four smaller, higher quality ones (one for each cadaver table).

The **binocular compound microscopes** in the physio lab are old, and many no longer focus properly. These are only ranked as low priority because they are quite expensive, and the physio students don't use them very often compared to many of our other courses.

The final item on our ranked list comes from a brief discussion with Mike Roth about what it would take to make Baker 1890 into a useable classroom (for example, for a single section of Bio 2.1). Since it's rather small and awkwardly shaped, he suggested that rather than "full media," an **instructor computer and 80" flat monitor** or a **Solstice system with a new wireless access point** might be a good solution.

## 2.4c Instructional Equipment and Software Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	Santa Rosa	01	01	(MEAS H)large specimen freezer	1	\$10,000.00	\$5,000.00	Danielle King	1805	Shawn Brumbaugh
0002	Santa Rosa	01	01	carts with rubber/pneumatic wheels	2	\$500.00	\$1,000.00	Danielle King	1850	Peggy Rockwood
0003	Santa Rosa	01	01	MEAS H: museum-quality specimen cases (2) displays	10	\$0.00	\$0.00	Danielle King	Baker	Mike Holmes
0004	Santa Rosa	01	01	slide warmer	1	\$300.00	\$300.00	Danielle King	1885	Maria Svinth
0005	Santa Rosa	01	01	Sklar Gluck OR grade rib shears (VWR 10197-256)	1	\$550.00	\$550.00	Danielle King	1829	Caitlyn Beaton
0006	Santa Rosa	01	01	Somso comprehensive brain model (Wards 813915)	1	\$1,500.00	\$1,500.00	Danielle King	1837	Caitlyn Beaton
0007	Santa Rosa	01	01	(PURCH) Clicker2 (classroom set + instructor kit	1	\$2,570.00	\$2,570.00	Danielle King	Baker	Abigail Zoger
0008	Santa Rosa	01	01	binoculars	20	\$300.00	\$6,000.00	Danielle King	1860	Shawn Brumbaugh
0009	Santa Rosa	01	01	Somso heart model (Wards 813022)	2	\$615.00	\$1,230.00	Danielle King	1837	Caitlyn Beaton
0010	Santa Rosa	01	01	set of microscope cell phone adapters	1	\$480.00	\$480.00	Danielle King	1850	Abigail Zoger
0011	Santa Rosa	01	01	pump for saltwater tank	1	\$350.00	\$350.00	Danielle King	1860	Shawn Brumbaugh
0012	Santa Rosa	01	01	Somso auditory system model; Ward's #815106	1	\$1,950.00	\$1,950.00	Danielle King	1879	Susan Wilson
0013	Santa Rosa	01	01	laptops for classroom use with Excel data analysis	6	\$995.00	\$5,970.00	Danielle King	1850	Abigail Zoger
0014	Santa Rosa	01	01	plant growth chambers	2	\$16,000.00	\$32,000.00	Danielle King	1840	Abigail Zoger
0015	Santa Rosa	01	01	LCD 55" monitor + cable + mounting supplies	1	\$2,200.00	\$2,200.00	Danielle King	1879A	Susan Wilson
0016	Santa Rosa	01	01	Eppendorf Microcentrifuge 5424, knob version, with	1	\$4,000.00	\$4,000.00	Danielle King	1879	Lourdes Hipolito-Geusen
0017	Santa Rosa	01	01	camera system for the cadaver lab (including 4 cam	1	\$40,000.00	\$40,000.00	Danielle King	1829	Danielle King
0018	Santa Rosa	01	01	binocular compound microscopes	30	\$1,160.00	\$35,000.00	Danielle King	1879	Susan Wilson
0019	Santa Rosa	01	01	instructor computer and 80" flat monitor / Solstic	1	\$15,000.00	\$15,000.00	Danielle King	1890	Tony Graziani

## 2.4d Non-Instructional Equipment, Software, and Technology Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	Santa Rosa	04	07	computer and phone for SLIA Physio	1	\$0.00	\$0.00	Danielle King	1876	Lourdes Hipolito-Geusen
0002	Santa Rosa	04	07	front-loading, aluminum private-access mailboxes	3	\$660.00	\$1,980.00	Danielle King	1813	Ann Schott

## 2.5a Minor Facilities Requests

Rank	Location	SP	M	Time Frame	Building	Room Number	Est. Cost	Description
0001	Santa Rosa	04	07	Urgent	Baker	All	\$0.00	HVAC upgrade desperately needed for all areas of Baker Hall; refer to Analysis of Existing Facilities for details of impact on curriculum
0002	Santa Rosa	04	07	Urgent	Baker	1850	\$0.00	Reconfiguration of 1850 for increased safety, efficiency, and student access, including adding external doors to the four offices (1840A, 1849A, 1860A, 1869A)
0003	Santa Rosa	01	01	Urgent	Baker	1805, 1849, 1869, 1860, 1860A, 1840	\$0.00	Reconfiguration of 1805 as a maker space, including removal of the interior wall and installation of a large specimen freezer and museum-quality specimen cases for both our displayed and non-displayed collection
0004	Santa Rosa	01	01	2-3 Yr	Baker	external	\$0.00	Fenced experimental garden (off 1805 or on lawn outside the C wing)
0005	Santa Rosa	04	07	Urgent	Baker	1876/1879A	\$0.00	Reconfigure Physio Computer Lab/Office for SLIA
0006	Santa Rosa	04	07	Urgent	Baker	1885A	\$0.00	Reposition the sink on the west side of 1885A to fix ergonomics issue
0007	Santa Rosa	01	01	Urgent	Baker	1885	\$0.00	Add locks so that students can be restricted from entering 1882 and the prep area (1885A)
0008	Santa Rosa	04	07	Urgent	Baker	1849	\$0.00	Fix torn up floor and wall (leftover from installation of AV)
0009	Santa Rosa	01	01	1 Year	Baker	1872	\$0.00	Repurpose 1872 to a Student Lounge
0010	Santa Rosa	04	07	1 Year	Baker	1829	\$0.00	Add light switch near the door that opens into 1837
0011	Santa Rosa	01	01	1 Year	Baker	external	\$0.00	Install dermestid beetle box
0012	Santa Rosa	04	07	2-3 Yr	Baker	1850	\$0.00	Fix pocket doors into 1850 from all 4 offices



## 2.5b Analysis of Existing Facilities

From the Spring 2016 PRPP:

"Baker Hall needs to be completely replaced. The building is very old and completely outdated. The Life Sciences Department is planning on being part of the new STEM building. This new science building will shortly be in the planning stages, and Life Sciences faculty are committed to being part of this process, and ensuring that the new building meets student, faculty and sustainability needs."

Although we were promised that we would be included, obviously, we are no longer part of the new BSR building. This, despite the fact that Life Sciences is at the core of the sciences here at SRJC; students in our two majors (Biology and Pre-Allied Health) fill the Chemistry and Physics courses in much greater numbers than do students from their respective majors.

We are currently working with Mark Ranyak from RFD to plan renovations to Baker Hall, but no amount of remodeling will bring us up to 21st century standards. We are hopeful that at the very least we can be a part of an annex of faculty and staff offices, to make steps toward the ultimate goal of a unified STEM cluster. Furthermore, we eagerly anticipate Phase 2 of the STEM Complex, when our department and E&SS will finally join our STEM colleagues in a new complex.

In the meantime, we were asked to describe the most critical needs for Baker Hall, and we submitted the following document to our STEM Dean, as well as the Interim Senior Director of Facilities Planning & Operations:

### **Baker Hall Critical Needs Prioritization List**

These are our highest priority requests, ranked according to need:

- 1. New roof and high-efficiency HVAC system, including a stand-alone HVAC system for the cadaver lab (1829) and prosection room (1835)**

*Justification: This is simply part of the total cost of ownership of an aging building.*

*Specific issues include: roof leaks; lack of insulation; extreme temperature fluctuations; chemical odors emitting from cadavers that affect those in adjacent offices, the hallway, and the food prep room; and rat damage, urine, and droppings. This is a health and safety issue, and well as a sustainability issue because the building is so energy inefficient.*

- 2. Reconfiguration of 1850, including adding external doors to the four offices (1840A, 1849A, 1860A, 1869A)**

*Justification: This is a large space that is currently underutilized because of the awkward layout. It is also the primary location for chemical storage, which must be separated from the rest of the room to allow us to have space for administering DRD exams and other student use (health and safety issue). As it stands, the exterior doors to 1850 are always locked due to the chemical storage. This results in students not having access to faculty offices. Our original idea was to build a wall on the south side to allow student access to 1840A and 1860A (as was already done for the north side). However, Paul*

*suspected there may be issues with the location of the electrical panel and fume hood. Our alternative idea is to add external doors to all four offices.*

**3. Reconfiguration of 1805 as a maker space, including removal of the interior wall and installation of a large specimen freezer and museum-quality specimen cases for both our displayed and non-displayed collection**

*Justification: We need space for long-term projects and demonstration-based learning. We are also losing taxonomic and botanical specimens, some of which are priceless, due to insect infestation. We sometimes borrow space in Ag's walk-in freezer, but in order to rotate our large collection through, we need one of our own. Proper storage in museum-quality cabinets would also significantly reduce specimen loss due to insect infestation.*

**4. Fenced experimental garden (off 1805 or on lawn outside the C wing)**

*Justification: It is normal for plants grown in greenhouse facilities to move between indoor and outdoor space as part of their developmental process or for experimental reasons. We have outfitted Baker 1805 with grow lights in order to mimic the indoor growing space of a greenhouse, but lack any outdoor space. Fencing in some of the outdoor areas would be an inexpensive way to mimic the growing conditions normally provided in biology departments.*

The items below did not make the "Top 4," but are also needed:

**5. Reconfigure Physio Computer Lab/Office for SLIA**

*Justification: To gain additional faculty office space and ensure that our Physio SLIA has a private office, we want to restore 1876 to an office. This will only require hanging a door between 1876 and 1879A and keying it to the same lock as the exterior office door. Status: This project is already in progress, with an estimated completion date at the end of April.*

**6. Reposition the sink on the west side of 1885A**

*Justification: The depth of the sink is good for washing large glassware, but there is a large (6") expanse of counter to reach over, resulting in terrible ergonomics and a consistently aching back for the staff.*

**7. Install internal lock on 1885A, and between 1885 and 1882**

*Justification: We currently can't host open lab for Bio 2.1 or Micro because of potential student access to the chemicals in the prep room and an adjacent faculty office.*

**8. Fix torn up floor and wall (leftover from installation of AV)**

*Justification: This room was left a mess after an apparently incomplete AV installation. This is not only unsightly, but a significant tripping hazard for the instructor trying to work at the chalkboard.*

**9. Repurpose 1872 to a Student Lounge**

*Justification: We have a distinct lack of interaction space for faculty, staff, and students. 1872 is a cramped, underscheduled classroom that could be much more efficiently used as a shared space/study lounge. Faculty and tutors could host drop-in office hours and review sessions. With the addition of a couch, small refrigerator, and microwave, students would also have a warm indoor space to grab lunch or a snack between classes.*

**10. Add light switch near the door that opens into 1837**

*Justification: There is currently only one light switch in the cadaver lab, and it cannot be accessed from the doors into either the Anat 1 or Anat 58 anatomy lab. Students have to walk across a dark room, with a potentially slippery floor, to reach the only light switch (which is on the wall backing the hallway).*

**11. Install dermestid beetle box**

*Justification: This is required for preparation of vertebrate skeleton specimens, but must be located at a far, safe distance from existing specimens because just one escaped beetle can ravage a collection.*

**12. Fix pocket doors into 1850 from all four offices**

*Justification: None of these doors will open or close easily; there is nothing to grip to open them. Faculty and staff must use their keys as a lever, which ends up bending all their keys.*

### 3.1 Develop Financial Resources

In 2013-2014 Life Sciences Department members applied for and were awarded two grants:

New Initiatives for Innovation  
Improvement of Fluency in Biology Courses  
grant from VPAA  
Scott Lorbeer (SLIA) and Kirtsen Swinstrom (faculty)  
BIO 10 students  
\$2000

Vision and Change in Biology Education  
SRJC Foundation  
Nick Anast, faculty  
Biology Major Students  
\$10,000

A Life Sciences faculty member received a grant from Women in Philanthropy and \$5000 was awarded to a student to complete an invaluable summer internship program in Summer 2015.

### 3.2 Serve our Diverse Communities

The recruiting of diverse candidates is primarily a function of HR. We confer with HR & DCO and support advertising in a diverse array of places, including traditional professional sites and Craig's list, for all of our positions: FT, adjunct, staff.

One way that the Life Sciences department promotes sensitivity to diversity is that two FT faculty members have become fluent in Spanish since being hired. One of these faculty

members has developed a Spanish language tour of the Santa Rosa waste water treatment facility. Promoting an understanding and appreciation of this facility is one way to facilitate environmental literacy among Santa Rosa citizens. Support of education about the environment is a major goal of our introductory biology course and our ecology course.

The Pre-Allied Health program in the department serves our diverse community in several ways. We offer pre-requisite courses at four levels: ANAT 140 for medical assisting, ANAT 40 for the paramedic program, ANAT 58 & PHYSIO 58 for LVN and Rad tech programs, and ANAT 1, PHYSIO 1, and MICRO 5 for the dental hygiene and nursing programs. Students in all of the Life Sciences classes are a very culturally diverse group, including many ESL students, veterans, and re-entry students. These course prepare students for entry into allied health programs. If students get into these programs and successfully complete them, they are ready for numerous and well paying jobs in Sonoma County.

### 3.3 Cultivate a Healthy Organization

The Life Sciences Department is known for the high level of collegiality among its members. We rarely all agree on any topic but there is always collegial respect and support. Many students have commented on how wonderful it is to take classes when the faculty all clearly like, respect and support one another.

We support classified staff requests to attend professional development activities; we support staff who wish to take on new tasks by giving training, mentoring. Several of our faculty have offered professional training activities.

It is not a "robust program" but stretch breaks are now incorporated into many classes. There is a culture of bringing one's own lunch to work, and the staff refrigerature is full of phenomenally healthy choices for lunch. One botanist produces an abundance of seedlings as part of her class and many of us take extras home for our gardens.

Our labs were recently evaluated to ensure that we meet safety standards. Quite a bit of relocation of materials were stored on the tops of cabinets, with no earthquake restraints. Most of these materials have been moved and earthquake restraints have been placed in relevant labs.

### 3.4 Safety and Emergency Preparedness

The Science Lab Coordinator, Scot Lorbeer, is the safety leader in Petaluma, E wing. The Science Lab Coordinator, Beth Johnstone, is the department safety leader in Santa Rosa, Baker Hall. The safety leaders attend safety committee meetings. Any critical information is reported at department meetings. Several years ago there was a safety training at a PDA day, and almost all Life Science faculty and staff attended.

### 3.5 Establish a Culture of Sustainability

I reviewed the website called Sustainable SRJC, and thought about the implications for Life Sciences. The most significant challenge, in my opinion, is that the heating and cooling mechanisms for Baker Hall need a drastic update. Faculty are routinely exposed to freezing office spaces, while lecturing in 1809 is like being in a sauna. The small 'prosection' room that is part of the anatomy lab (recently remodeled) is often 80 degrees and staff place hot tea kettles under the room thermostat to turn off the heat. These high temperatures are very bad for the anatomical specimens stored in that room and are very energy inefficient. The 'fixes' supplied by the college included baffles made out of cardboard! I doubt that in these reduced budget times anything will be done about these problems, but the HVAC system at Baker is NOT contributing to sustainability.

A second, more minor change, would be better upkeep of the trilogy recycle containers. These are wonderful, and placed in many convenient locations! Custodial services should ensure that the outsides are kept clean - filthy dirty recycle containers do not inspire one to walk the few extra steps. They also need repairs to the locks. I work at the college every Saturday and several times a semester report thieves cleaning out our recycle containers. It would also be helpful (but probably too labor intensive) to have a fourth container for organic wastes. Because Baker Hall is infested with rats at not infrequent intervals, organic wastes would have to be collected every day.

I wrote the above three years ago. I wish I could report that the very minor improvement of proper maintenance of the recycling containers had been addressed. It has not and if anything, things are worse.

Two faculty members who live near to the college commute by bicycle. They are personally contributing to sustainability and are excellent role models for students.

The Life Sciences faculty is strongly committed to serving on any relevant committee that will provide input to the design of the new STEM building, and oversight during construction, to ensure that sustainable principles are used for the design and construction of this building.

#### 4.1a Course Student Learning Outcomes Assessment

All of the Department's 21 active and regularly scheduled courses have had at least one SLO assessed. Half of the courses have had all SLOs assessed. All of the completed assessments have been entered into the Sharepoint web site. The department will complete assessments for all SLOs in all courses by the end of Fall 2014.

One outcome was a plan to change the way microscope use is taught, which should improve student learning of this vitally important skill. Many of the assessments suggested that current course material was appropriate and covered in a way that 70 to 90% of students were able to successfully answer assessment questions. Therefore very few changes have been made in courses due to currently completed assessments.

The department devoted a PDA workshop to ensuring the SLOs for sequenced courses in both majors were well aligned. Many SLOs were re-written in light of the department experience actually conducting assessments. The SLOs for BIO 10 do align with the SLOs for both major programs (biology and pre-allied health), for which it serves as a pre-requisite.

PLAN: The department has divided the 21 active courses into 5 per semester for assessment, which means that every course will have one SLO assessed every two years, and all courses will have all SLOs assessed in a six year cycle.

	SLO ##'s	1	2	3	4	5	6	comments
1 ANAT 1	3	mh, S13	sw, S11	dk, S13	sw, f13			to do Fall 14
2 ANAT 140	2	bn, F13	bn, F13					
3 ANAT 40	2	dk, S11	dk, F12					no SLOs
4 ANAT 58	2	yg, S14	mc, F12					
5 BIO 10	5	tg, rf, S11	az, F12	az, F12	az, F12	az, F12		
6 BIO 100	3	ks, S11	rf, F11	rf, F10				
7 BIO 12	4	sb, F13	jp, S14	jp, S14	jp, S14			
8 BIO 13	6	dk, S12		dk, S13				COR to be revised
9 BIO 2.1	4	tg, S11	cs, F10	tg, S12				
10 BIO 2.2	5		sb, S12					
11 BIO 2.3	5	rf, F10	az, S11	az, F12	az, F13	rf, S11		
12 BIO 25	5	ks, S13	jw, F13	jw, F13	jw, F13			
13 BIO 26	6							revise to BIO 27
14 BIO 49	1	sw, F12						
15 BIO 85.2	5	jw, S14	jw, S14	jw, S14	sb, S11			
16 BOTANY 10	5		sb, F11					
17 BOTANY 60	3	sb, S11	jp, S14	jp, S14				
18 BOTANY 64	3							taught summer 14
19 MICRO 5	6	ko, S14	cs, F12	rc, S14	cs, X12; rc S14	rc, S14	rc, S 14	
20 MICRO 60	5	ms, S14	ms, S14	nk, F12	ms, S14	nk, F12		
21 PHYSIO 1	2	sw, F13	sw, F13	na, S14				
22 PHYSIO 58	2	xx, F11	mh, F12					

#### 4.1b Program Student Learning Outcomes Assessment

Program Outcomes have been written and are posted on the web for the two department majors: biology and pre-allied health. The program assessment for both the biology and pre-allied health majors were added to the Sharepoint website in March, 2014. The department completed these program assessments using the cumulative assessment approach.

It is important to note that the high pass rate of SRJC students on nursing and dental hygiene board exams reflects very well on the preparation given these students in the department's anatomy, physiology & microbiology courses (the pre-allied health major). Anecdotal information (communication from former students as they complete 4 year degrees or allied health programs in other schools) supports the success of both our biology major and pre-allied health major programs.

#### 4.1c Student Learning Outcomes Reporting

Type	Name	Student Assessment Implemented	Assessment Results Analyzed	Change Implemented
Course	ANAT 1	Fall 2013	Fall 2013	Fall 2013
Course	ANAT 40	Fall 2012	Fall 2012	Fall 2012
Course	ANAT 58	Fall 2012	Fall 2012	Fall 2012
Course	ANAT 140	Fall 2013	Fall 2013	Fall 2013
Course	BIO 10	Fall 2012	Fall 2012	Fall 2012
Course	BIO 12	Fall 2013	Fall 2013	Fall 2013
Course	BIO 13	Spring 2013	Fall 2012	Spring 2013
Course	BIO 2.1	Spring 2013	Spring 2013	Fall 2013
Course	BIO 2.2	Spring 2013	Spring 2013	Fall 2013
Course	BIO 2.3	Fall 2013	Fall 2013	Fall 2013
Course	BIO 25	Fall 2013	Fall 2013	Fall 2013
Course	BIO 26	Spring 2010	Spring 2010	Spring 2011
Course	BIO 49	Fall 2012	Fall 2012	Fall 2012
Course	BIO 85.2	Spring 2011	Fall 2011	Spring 2012
Course	BIO 100	Fall 2012	Fall 2012	Fall 2012
Course	BOTANY 10	Fall 2011	Fall 2011	Spring 2012
Course	BOTANY 60	Spring 2011	Spring 2011	Spring 2012
Course	MICRO 5	Fall 2012	Fall 2012	Fall 2012
Course	MICRO 60	Spring 2014	Spring 2014	Spring 2014
Course	PHYSIO 1	Spring 2014	Spring 2014	Spring 2014
Course	PHYSIO 58	Spring 2012	Spring 2012	Fall 2012
Certificate/Major	BIOLOGY MAJOR	Spring 2014	Fall 2014	Fall 2014
Certificate/Major	PreAllied Health Major	Spring 2014	Fall 2014	Fall 2014

#### 4.2a Key Courses or Services that address Institutional Outcomes

Course/Service	1a	1b	1c	2a	2b	2c	2d	3a	3b	4a	4b	5	6a	6b	6c	7
Bio 10	X	X	X	X	X	X	X	X	X	X	X			X		X
Bio 110	X	X	X	X	X			X		X	X			X		X
Bio 12			X	X	X	X	X	X	X	X	X			X		X
BIO major	X	X	X	X	X		X	X	X	X	X	X		X		X
Pre-Allied health major	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X

#### 4.2b Narrative (Optional)

The courses in our program are very rigorous. Students must apply and therefore practice foundational skills, time management, and critical thinking in almost all Life Sciences courses. In some courses oral reports are required (communication). In many of our majors courses there are many international students and significant interaction with peers is a routine part of all laboratory courses. Introductory biology and ecology courses provide in depth instruction in the basis for environmental responsibility. Many students who succeed in the allied health pre-reqs state that the most valuable thing they learn is new depths of personal capability – they can succeed beyond anything they thought possible in a very challenging course. It gives them the confidence to pursue their career goals in allied health occupations.

#### 5.0 Performance Measures

The most important performance measure for the two Life Sciences Department majors, Biology and Pre-Allied Health, would be the number of students who transfer to four year schools or are admitted to allied health programs. Unfortunately, the JC does not collect these kind of data. If these data were available, as well as data on successful completion of bachelor degrees in biology or successful passing of NCLEX and dental hygiene board exams, our performance measures would be outstanding. To partially compensate for the lack of relevant performance measures for our programs, the department has begun the practice of surveying all biology students each semester to ascertain if they have been accepted into a 4 year program. In 2014 7 students received an AS degree in biology but over 40 students transferred to 4 year universities as biology majors.

The data that are collected by the JC includes the number of majors granted in our two programs. The number of **biology majors** for the last 4 years are 5, 3, 9, 7. These numbers are very small, most likely because an AS in biology serves no academic purpose other than noting achievement and completion. Almost no students apply for this degree, they want the BA / BS in biology. Furthermore, most transfer before completing all of the AS requirements. The department has modified this major, eliminating the BIO 55 requirement and the elective requirement. We hope that this change, and a stronger emphasis to students on the value of actually completing this degree, will increase these numbers.

The number of **pre-allied health majors** for the past 4 years are: 58, 56, 60, 72. These numbers are very impressive for several reasons. First, most students in this major are taking pre-requisite courses for nursing or dental hygiene, and they usually get their AA degree in these disciplines. These numbers may mean that students are increasingly aware of some value to the AA degree even in the pre-requisite discipline.

It is of great interest to review the data supplied for AS degrees awarded in 2013/2014. If we add the degrees awarded in both of our majors, - biology and the physiology / pre-allied health major, as well as all other degrees for which Life Sciences courses are essential pre-requisites: EMT, medical assisting, vocational nursing, radiologic technology, nursing, dental hygiene, 258 AS degrees were awarded related to Life Sciences, which equals 36% of all AS degrees awarded.. If one adds in degrees awarded in Natural Sciences the number rises to 71%. The department teaches courses that students value, need, and that lead to degree completion.

It is also important to notice the following about degrees awarded at SRJC. There are only four majors that grant more than 100 AA/AS degrees: Humanities, Social & Behavioral Sciences, Natural Sciences, and Nursing. Life Sciences contributes to the latter two degrees, and only Nursing is a specific degree, a degree in a defined discipline, a degree that leads to a job. These numbers are further testimonials to the major contributions Life Sciences makes to degree completion at SRJC. Another performance measure would be the number of students who successfully complete their science GE requirement in our introductory biology course. These data are not available as this course includes students heading for the Biology or Pre- Allied Health degrees, as well as GE students.

## 5.1 Effective Class Schedule: Course Offerings, Times, Locations, and Delivery Modes (annual)



We are constrained by the lab component of most of our classes. We do use Fridays for some sections; there are evening sections for all the high demand A, M & P classes. There are currently no regularly scheduled weekend classes except the shadow anatomy section that meets on Saturdays. The Department offered a section of introductory biology as part of the weekend college in spring 2015 on a Friday/Saturday schedule. It is noteworthy that while the class filled, there were no weekend college students enrolled.

We offer our full range of classes in SR. General biology, marine biology, basic skills biology and microbiology are all offered in Petaluma. The opportunity to offer microbiology in Petaluma has made it possible to offer almost enough microbiology courses. The department teaches both micro and cell in the same lab in Santa Rosa, and the labs are filled to capacity. A&P classes will remain solely in SR due to cost of lab construction and outfitting. One deficit in the schedule is that there are no night sections of MICRO 5, only of MICRO 60. The department added an evening section of MICRO 5 and we are still waiting for an augmentation of our supplies budget.

The department believes strongly that lab courses must be taught in a lab, not online. The demand for lecture only biology courses has not merited the development of an online version of any of these offerings. Note that many nursing and graduate programs will only accept face-to-face lab courses.

There is a tremendous demand for anatomy, physiology, microbiology classes. Given the constraints of lab size and supplies costs we will not attempt to offer more sections of these courses, even though they would fill. Our goal is therefore to maintain our current offerings of 6 sections / semester (plus one of each in summer) of the anatomy, physiology, and microbiology courses required for nursing and dental hygiene. This number of sections does not meet student need, 20 students were turned away from ANAT 1 in Spring 2015. However, additional offerings would not significantly help students as there will be no expansion of the SRJC allied health programs. Further, the department schedules a shadow anatomy section every semester that allows an additional 30 students to enroll at minimal cost to the college.

The best solution to meeting student demand for pre-allied health courses would be a change in priority registration policies. Every semester students enroll in the anatomy, physiology, microbiology courses who are significantly under-prepared. There are also many students who repeat these classes two and three times. Higher priority for students who have seen a counselor and completed their English, math and LIR requirements, as well as a lifting of the constraints placed on students with BAs who need to "re-train" would allow even higher completion rates in these classes. It appears that these 'reforms' are close to becoming a reality due to changes in progress at the State level. Our collaboration with the HOPE center and the college skills 770 course with on-site tutors in the anatomy and physiology labs has been a very successful effort to better serve students receive help during open lab study times.

A review of the **Student Headcount data** shows that numbers have declined slightly in the past 2 years, 5-12%. This is a trend seen across all disciplines and I do not believe reflects specifically on the Life Sciences programs or course offerings.

i

## 5.2a Enrollment Efficiency

On the Santa Rosa campus, in all disciplines except botany, in fall and spring, for the past three academic years and the Fall 2014 semester, the department has exceeded 95% and most

sections are greater than 100% efficiency. When one includes data from the Petaluma campus, and summer enrollments there are lower efficiencies, 75-108%.

On average, these numbers exceed excellent!

The department's efficiency numbers are outstanding. We achieve these results by over-enrolling almost every class. We know that not every student can complete these classes. Our goal is to end the semester with 85% enrollment.

The numbers also indicate that much of our program is impacted, especially the Pre-Allied Health major which prepares students for entry into allied health programs. The department has met the need for more of these courses in several ways: teaching almost all sections as double lecture sections, and offering a "shadow" anatomy class. The department cannot offer more sections due to building, staff, instructor and supply constraints. We also do not think we need to offer more sections. There are better ways to meet student needs. One is to realize that the nursing demand is not unlimited. Students graduating from the JC RN program recently have had difficulty finding jobs in Sonoma County. We do not do students a favor by teaching ever expanding numbers of courses without analyzing the job market saturation. The most important thing we could do is a better job of counseling. If only students really prepared for A&P courses enrolled in them, we would have a seat for every student that wanted to take our pre-req science classes. A change in priority registration policies and required counseling would be the best ways to address this problem. The department has invited the counseling department to address all pre-allied health classes next fall.

## 5.2b Average Class Size

Class size for most of our courses is dictated by lab size which is 24 (28 for physiology). Any numbers above 24 reflect overfilling of classes by dedicated instructors. Scanning the numbers shows that in most cases we are at 24 or above. The numbers for biology in Petaluma are lower and this matches an overall lower demand for classes on the Petaluma campus, rather than any problem specific to Life Sciences.

## 5.3 Instructional Productivity

The stated goal of the college is 18.7. A general overview indicates that the majority of the FTES/FTEF values for Life Science classes are well above this goal in fall and spring semesters at both campuses. There is a consistent pattern of this value being below 18.5 in summer sessions. For the most part summer sessions are taught as single sections, not the usual double sections that can be offered in the fall and spring semesters, and this lowers our numbers.

The botany values are consistently slightly below 18.7, this is because the botany class is always taught as single sections. Microbiology values are low in Fall 2013, in part because the MICRO 5 section was a single section. In addition, two sections of BIO 10 were cancelled on the Petaluma campus, leaving 2 single sections, and the FTES/FTEF was 14.82. An explanation for the reduced demand for BIO 10 in Petaluma is not clear. The department reduced the number of sections offered in Spring 14 and will reduce the number for Fall 14 and Spring 2015 as well.

This productivity on both campuses is maintained by optimizing course offerings and schedule times to meet student needs, and teaching double sections of our introductory biology courses and most of the A, P, and M courses, whenever possible.

## 5.4 Curriculum Currency

Since the last PRPP, the department has inactivated any course that does not meet our core mission as a response to the budget crisis. Two years ago we offered 38 courses, last year 30, and currently we have inactivated more and offer 25. All of these courses have current CORs and we have initiated a regular cycle of 5 year review for all of these courses. Five course outlines were submitted to CRC in Fall 2015 for updates to the CORs.

## 5.5 Successful Program Completion

The number of AS degrees awarded in biology for the last 3 years are: 3, 9, 7. These very low numbers are not surprising or in any way discouraging. Completion of an AS degree in biology is not useful for almost any of our students.

Most students with a serious enough interest in biology to take any or all of our biology majors series (BIO 2.1, 2.2, 2.3) are planning to transfer to a 4 year university and earn a BA/BS in biology. These students know that a BS in biology is the bare minimum to do any kind of professional work in this discipline. An AS degree in biology does not provide entry into any job or career with which I am familiar. Furthermore, they are so focused on transfer that they do not always complete all lower division courses here, but fit in as much as they can before transfer. Thus they may not complete all requirements for an AS degree. The department collects information from students every spring semester about whether they are transferring to a 4 year school. In spring 2012 fifty biology major students were transferring to a 4 year school. This is an excellent number, suggesting that our biology major is very successful in terms of completion.

The number of AS degrees in our physiology / pre-allied health major are relatively high in the same last three years: 65, 72, 83. This is especially impressive since the majority of these students go on to earn an AS degree in dental hygiene or nursing. These numbers may indicate that students have become more aware of the value in getting a degree at each academic landmark, they may also reflect the increasing number of students who do not get into the JC programs and continue their education elsewhere, but want a record of their achievement here.

As a department we try to make sure that we minimize the barriers to successful completion of our majors courses. We coordinate scheduling of the Biology Major's courses with Chemistry and Physics departments. We ensure that courses are offered frequently enough for students to complete other programs (Botany 10 for viticulture students, Biology 12 for environmental studies students). Shadow Anatomy sections are offered to ensure that as many students as possible have the chance to take Anatomy 1 in preparation for the nursing program. We also have prepared rotation plans that show students how to complete our majors in a two year time frame.

## 5.6 Student Success

Student success data were supplied for retention, course completion and grade point average.

### **Retention**

Retention rates for the college ranged from 74.5 to 84.9%. District-wide retention is higher in summer session than either regular semester. Retention rates for ALL Life Sciences disciplines on both campuses ranged from 75.1 to 87.8%. Thus our retention rate equals or exceeds that of the district. These are especially noteworthy retention rates since many of these courses are notoriously difficult for students. Looking at retention rates in individual disciplines there is a consistent pattern of higher retention in the summer. One hypothesis is that summer classes enroll more students with completed BA degrees and more committed students. It is also true that summer provides more total immersion course work, which favors higher success rates. There are a few numbers below 70% - for 2/6 last times a botany section was offered; and the last 2 semesters of anatomy. Anatomy includes ANAT 140 which enrolls many extremely underprepared students and therefore has a high attrition rate. The department is initiating a discussion about pre-reqs for this course.

### **Successful Course Completion**

The range for the college is 69.9 - 82.5%. The Life Sciences data for all disciplines/ both campuses falls from 68.7 to 82.8%, excellent agreement with college data. In general the biology data for Petaluma are a little lower than for SR. It is very difficult to draw any conclusions since the courses taught as BIO courses in SR include all of the Biology majors courses, which are not offered in Petaluma.

Completion rates for the anatomy and physiology courses in fall and spring are generally 65-68%, reflecting both the difficulty of these classes and the significant number of underprepared students. Completion rates are much higher for microbiology courses and my hypothesis is that most of these students have already completed anatomy and physiology, and are not the underprepared students!

The data are very low for the one physiology course taught in Petaluma (45.5 and 42.9 in two different semesters). This course has been inactivated and will no longer be taught in Life Sciences. The content (exercise physiology) is now part of a new KAD course.

### **GPA**

The district data range from 2.713 - 3.049; Life Sciences overall data range from 2.43 - 2.78. Life Sciences data matches the overall values seen in the STEM cluster - slightly lower than the district average. This is not surprising, since Life Sciences classes are very demanding science classes.

There are some appropriate general comments one could make about the student success data. It is striking to note the retention and successful completion data for summer courses - the numbers are better than for fall and spring semesters. This suggests that students taking science classes greatly benefit from classes that are offered 4 days a week vs the usual two days per week. Within the regular semester there are two anatomy instructors who teach double sections, half the class meets for lab on the same day as lecture, half on alternate days (ie 4 days of class/week). Both instructors note every semester close to a 10% point difference in grade distribution - more time spent on task in the classroom translates directly to better grades!

The department feels that reasons for any low retention and successful completion rates include the following:

- \* students who do not yet know their academic goals and/or are not ready for academic courses
- \* poor study, time management, reading and writing skills
- \* outside school demands of family and work responsibilities
- \* lack of financial support
- \* increasingly poor preparation in English and critical thinking skills in our student population, even in students who managed to earn a passing grade in ENGL 1A!!!!!!

The department feels it can make a contribution to retention and successful completion. Interventions currently in place to help students succeed include:

- \* developmental course to help students with bio 10 (bio 100)
- \* an educational campaign to alert students to preparation needed for Anat 1 and Physio and MICRO 5 (web site info & memos to counselors) 1
- \* the use of CSKLS tutors and student tutors in labs

## 5.7 Student Access

The most striking data in this section is the increased % of Hispanic students in all of our disciplines. In anatomy the change is 19.5% for 2012/13 to 34.8% for 2013/14. In biology it is 16.4% to 28.8%; in microbiology it is 11.7% to 25.8%; in physiology it is 12.9% to 25.3%. There was even an increase in botany: 8.3% to 17.4%. I think that a major part of this change is that many more students are willing to list their ethnicity, as the numbers for "declined to state" has dropped dramatically.

There are significantly more females than males in all of the Pre-Allied Health courses, 75:25%, but this is expected. There have always been fewer males in nursing and dental hygiene professions, this is reflected in the gender data for our allied health pre-reqs. Having 25% males is actually a good number!

There are several outreach efforts to bring in students for the pre-allied health programs and therefore our pre-requisites. Our department outreach for this program is primarily allowing several high school classes to visit the anatomy lab every semester.

The Life Sciences department offers two courses at the 100 level to serve students who might have English and socioeconomic challenges: ANAT 140 and BIO 100.

## 5.8 Curriculum Offered Within Reasonable Time Frame

All of the department's core courses are taught every semester, high demand courses are taught in multiple sections and differing day/time slots, when possible. Starting in Fall 2014 we offered all pre-allied health courses with at least one section at night. A few courses with lower demand (BIO 26, BOTANY 10 & 60) are taught in alternate semesters. BIO 13 is alternated each semester between the SR and Pet campuses.

## 5.9a Curriculum Responsiveness

Most of our curriculum is standard, and the same courses have been needed, required, taught for the past 50 years.

Our curriculum is current and in compliance with UC/CSU requirements. Our curriculum provides the essential pre-requisites for all of the allied health programs. BIO 10 is required for many GE students. To a minor extent we also support viticulture and environmental students.

We added a new course, which will be offered for the first time in Fall 2016, BIO 16 - Introductory Biology through Current Issues. This course is designed for non-biology majors and will emphasize the core concepts of biology linked to current issues. It should be a more

engaging course for non-majors, and one that will better prepare them to be better informed citizens with respect to science, the environment and sustainability.

### 5.9b Alignment with High Schools (Tech-Prep ONLY)

NA

### 5.10 Alignment with Transfer Institutions (Transfer Majors ONLY)

Yes. Our biology majors curriculum is aligned with most CSU and UC major programs. The core topics taught in the first two years of a 4 year biology major include: cell biology, botany, ecology, zoology, evolution. These topics can be arranged in different ways in different transfer institutions. Some pair botany with ecology and zoology with evolution (as we do at SRJC) and some teach organismal biology (botany with zoology) and ecology with evolution. It is therefore imperative that biology majors at SRJC take all three of our biology major classes (BIO 2.1, 2.2 and 2.3) before transferring.

### 5.11a Labor Market Demand (Occupational Programs ONLY)

NA

### 5.11b Academic Standards

The grade distribution is reasonably aligned. If one examines more detailed data than in the summaries, the ANAT 1 sections that meet 4x / week have consistently higher GPA than the sections that meet 2x / week. Similarly the summer sections often have a higher GPA. The conclusion is simple and obvious - if students spend more time / week in class they perform better, even if the hours are longer. However, it is important to note that the vast majority of students failing the A, P & M courses drop either with or without a W grade.

Faculty for each of the courses with multiple sections meet once a year to discuss the course. FT faculty are in agreement about holding to high academic standards, while simultaneously doing everything possible to help students succeed. We hold monthly department meetings and this issue is discussed at regular intervals. The department has put a lot of weight on this issue in decisions about hiring, evaluating and retaining adjunct faculty.

## 6.1 Progress and Accomplishments Since Last Program/Unit Review

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
0001	Santa Rosa	02	01	build new science / STEM building. all current STEM buildings are very old, with multiple problems: poor energy efficiency, rats, are built to sprawl vs conserving space, 4 buildings vs. one	participate in STEM cluster planning meetings	4 years	This goal is no longer relevant, as our department has been excluded from the new building.
0002	Santa Rosa	02	01	enhance our current internship program for biology majors	research additional opportunities; improve application process, develop short course to prep students for internships, poster sessions	2 years	Done: we placed students into internships and awarded scholarships/stipends to help support students with financial need; we expanded opportunities by developing a relationship with Safari West (and placed 3 students); Pepperwood interns participated in the MESA poster session; we are developing opportunities for interns to present posters at the Western Wildlife Society Meeting as well as research presentations at the Buck Institute for Research on Aging lab meetings
0003	Santa Rosa	05	03	develop department work back-up plan	more easily cover emergency absences, have more than one person capable for most tasks	2 years	Done: completed two round of adjunct faculty hiring, and the department chair developed a master faculty list with all subdisciplines listed and asked adjunct instructors to self-identify which courses they're qualified to sub for
0004	Santa Rosa	03	05	prepare loaner boxes for K12 outreach	encourage K12 students to enter STEM disciplines	2 years	The Bio Club has created interactive materials on biomechanics that the students use at school demos, has formed a mentorship program at Rancho Cotati High School, and attends the CalSERVES after school program to do interactive teaching; we host high school anatomy lab visits

## 6.2a Program/Unit Conclusions

Location	Program/Unit Conclusions
ALL	<p>1) Both Life Sciences programs, the Biology major and Pre-allied health major, have been kept current, providing excellent preparation for transfer and success in nursing and dental hygiene programs respectively. Life sciences courses that serve these majors and GE students are in great demand; most fill within 24 hours.</p> <p>2) The department is making changes in accordance with AAAS recommendations, primarily in Bio 10, to focus on core concepts and active learning. Our new course, Bio 16, should serve non-biology major students more effectively than Bio 10. It was offered for the first time in Fall 2016, and we are currently working on nurturing enrollment. The coming fall will offer an opportunity for a new faculty member to teach this course, and continue to develop the labs in particular.</p> <p>3) Department data supports offering sections with more class meetings/week (4 vs. 2) as a valuable way to increase student retention and success in rigorous courses such as Anat 1.</p> <p>4) The biggest barriers to completion and success in Life Sciences courses are poor English and/or study skills and the life challenges common to community college students. Adding English pre-reqs to our courses has been one contribution to finding solutions, and faculty work continuously to mentor and support individual students who are struggling.</p> <p>5) A vital way to enhance success is to provide internship experiences for biology majors. The department continues to develop our internship program, and to expand these opportunities for traditionally underserved students.</p> <p>6) Open access is a fundamental value of community colleges, and lack of access is a major barrier to student success and course/degree completion. The department understands the importance of K-12 outreach, and has worked at this through three avenues: 1) hosting anatomy/cadaver lab tours for high school anatomy classes, 2) various outreach/mentorship projects by the Biology Club, and 3) Anatomy faculty and SLIA participation at the Santa Rosa Middle School Career Day.</p> <p>7) Biology is a high-unit major, and students can find it difficult to make it through all required courses in two years. We ask that our STEM Dean help coordinate the scheduling of Chemistry and Physics courses with the Bio majors course schedules to maximize enrollments and ensure that students can complete their requirements in a timely manner.</p>

## 6.2b PRPP Editor Feedback - Optional

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### 6.3a Annual Unit Plan

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
0001	Santa Rosa	04	01	Remodel Baker Hall with the understanding that we will be included in the 2nd phase of the STEM cluster building	Replace roof and HVAC systems; make shared spaces more integrated and effective for students, faculty, and staff	2 years	Funding for both ongoing maintenance (roof & HVAC) and from Facilities and/or Measure H (remodel); further meetings with lab planner, architect, etc.
0002	ALL	02	01	STEM visioning and integration across disciplines and campuses	stay active in the planning process for the 2nd phase of the STEM cluster building; better communication and coordination of program development between the STEM departments and Petaluma	ongoing	Funding for 2nd phase of STEM cluster building, inclusive planning meetings involving STEM departments and Petaluma faculty, staff, and administrators
0003	Santa Rosa	01	00	support student success and facilitate peer support/networking by creating comfortable spaces for students to study and gather informally	convert 1872 to a student lounge; replace some lawn by C wing with tables and benches	1 year	permission to convert classroom, funding or donations for furniture
0004	Santa Rosa	01	01	coordinate STEM schedule development	work with our dean to better coordinate scheduling of math, chem, bio, and physics courses	2 years	STEM cluster meetings with our deans to coordinate with (or in advance of) release of Proof 1
0005	Santa Rosa	01	00	develop short course to better prepare students for internships, graduate school, and eventual employment	develop curriculum for a critical thinking course with accompanying 1-unit discussion section (mentorship piece)	2 years	already submitted grant; investigate team-teaching with Philosophy or English
0006	Santa Rosa	03	05	continue K-12 outreach	encourage K-12 students to enter STEM disciplines	ongoing	continue what we're already doing, especially supporting the Bio Club (see Section 6.1)
0007	Santa Rosa	01	01	enhance our student employment opportunities for biology majors	improve application process to encourage a more diverse pool of student applicants	1 year	faculty referral of promising students to our new online application for department student workers