

# **Santa Rosa Junior College**

## **Program Resource Planning Process**

### ***Chemistry and Physics 2021***

#### **1.1a Mission**

##### **CHEMISTRY**

The mission of the Chemistry program at Santa Rosa Junior College is to provide a comprehensive program for general education, transfer, and career and technical education students, and to engage in community outreach. The program emphasizes the teaching and practice of chemistry in a manner that fosters student success, is safe and environmentally responsible, and prudently manages available resources.

##### **PHYSICS**

The Physics Program's primary mission is to provide the physics course work and the related academic training required for transfer students in science, engineering and pre-professional majors. The program's secondary mission is to foster the scientific and technological literacy of the total student population through general education and enrichment classes and activities.

#### **1.1b Mission Alignment**

##### **CHEMISTRY**

The Chemistry program's mission is in keeping with the College's mission. Specifically, we focus on preparing students for STEM transfer and CTE disciplines that require Chemistry.

In terms of Strategic Planning Goals, the Chemistry program is directly involved in the following:

1. We foster learning and academic excellence by hiring and mentoring outstanding faculty, and offering rigorous, relevant, and up-to-date curriculum.
2. We strive to serve our diverse community through our program.

3. We contribute toward a culture of sustainability by having an awareness of the impact our program may have on the environment and choosing responsible and sustainable practices and experiments.

## **PHYSICS**

The Physics program goals aligns directly with the district's central mission of education to increase the knowledge, improve the skills, and enhance the lives of our students. The program's lower division academic coursework builds the knowledge and skills of our transfer and general education students. The Physics program offers support services targeted to STEM students to improve student success and professional development. Although not a vocational program, the program also has an important role to play in our community's economic development and global competitiveness because of the pivotal role engineers and scientists play in those arenas. SRJC is the only academic institution in Sonoma County delivering the complete spectrum of lower division engineering coursework, and thus has a crucial role to play in meeting the needs of our community.

The Physics program strives to participate in the district's college initiatives. Regarding Initiative I, the faculty of the program represents the college in many community and professional organizations and work to improve K-16 articulation. Regarding Initiative V, the Physics faculty has developed SLO's for both our department's majors and all of our department's classes.

### **1.1c Description**

## **CHEMISTRY**

The Chemistry program is housed within the Department of Chemistry and Physics and provides rigorous preparation for STEM transfer and CTE students.

The program is staffed by seven full-time and over ten adjunct (part-time) instructors who have great enthusiasm for teaching. The program offers day, evening, and weekend classes at the Santa Rosa and Petaluma campuses. The program maintains high educational standards and places primary emphasis on quality undergraduate instruction.

The Chemistry program takes pride in well-maintained and equipped laboratories that include a network of over 40 computerized data acquisition stations in addition to the equipment typically found in academic laboratories. Modern instruments regularly used by students include a GC/MS, NMR, FTIR, Fast Sequential AA, gas chromatographs, microwave reaction system, and several UV-VIS spectrometers.

The program is supported by two full-time laboratory technicians (actual job titles are Coordinator, Science Labs and Science Lab Instructional Assistant) at the Santa Rosa campus and one part-time laboratory technician at the Petaluma campus who ensure that reagents, supplies and equipment are available and in good working order for all experiments.

High standards for environmental health and safety are diligently maintained.

## **PHYSICS**

The Physics program provides a standard core of lower division physics courses to prepare students to transfer to a four-year university to complete a science or engineering bachelor's degree. In addition, we also offer AS degree in Physics. We also offer courses to fulfill general education requirements and self-enrichment goals, although recent schedule reductions have all but eliminated those offerings. In addition to developing an understanding of basic concepts in physics and their applications in the world in which we live, our courses develop analytical thinking, problem solving, visualization, design, and laboratory skills.

The Physics program is very proud to host a wide range of excellent auxiliary services to enrich our students' academic and professional development. Both the Physics and Chemistry programs coordinate student participation in the Chemistry Club, Physics Club, the Women in Science and Engineering (WISE) Club, and with cooperation of the Engineering program, the Engineering Club (TEC). Our combined programs award numerous student scholarships each year.

For many years, the combined Chemistry & Physics department has been working very closely with MESA, (Math Engineering Science Achievement) to develop programs to attract and retain students with economic challenges or backgrounds that place them at a disadvantage. The partnership has been very successful in maintaining and growing a host of support activities in the face of eroding department resources. The department also supports MESA's research projects related to the chemistry and physics disciplines.

Our Program also actively serves our community by delivering planetarium shows, providing A&L presentations, staff development activities, community events, community education courses, conference presentations, and participation in professional organizations. The Chemistry & Physics Department has also participated in the Bay Area Science Festival.

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

### **CHEMISTRY**

At the Santa Rosa campus, the chemistry program typically offers classes from 7:30 am until 6:00 pm on weekdays. Two days a week, we offer night classes; for example, this semester, we offer classes from 7:30 am until 10:00 pm Monday and Thursday. We also offer classes on Saturdays from 9:00 am until 3:00 pm. At the Petaluma campus, the program offers three courses (6 sections total) of Introductory General Chemistry, General, Organic and Biological Chemistry, and Basic Chemistry Skills, Monday through Thursday. During all hours of operation on both campuses, a Coordinator of Science Labs, a Science Lab Instructional Assistant or a Science Lab Technician is on duty. An AAll staffs the Santa Rosa campus 28 hours per week.

### **PHYSICS**

The Physics classes/labs are offered Mondays through Fridays during the Spring and Fall semesters, from 9:00 am and well into the evening. We also offer summer classes including Physics 1, Physics 20 and 20L, Physics 40 and Physics 41. During all hours of operation on both campuses a Science Lab Instructional Assistant is on duty.

**PETALUMA** -- As more science and Math classes are being offered in Petaluma, the Physics program recognizes the future need to offer more Physics classes at Petaluma campus.

## **1.2 Program/Unit Context and Environmental Scan**

### **CHEMISTRY**

The chemistry program is staffed by energetic and dynamic individuals, dedicated to fulfilling our mission by providing a comprehensive program for transfer and CTE students. Although a relatively small percentage of our students go on to a bachelor's program in Chemistry, our program serves those pursuing degrees in the Life Sciences, Physical Sciences, Engineering, and pre-professional programs such as the medical, dental, and veterinary fields. Our Chemistry 60 course serves as an entry point for students who wish to enroll in the nursing and dental hygiene programs. We also have a basic skills course offering, Chem 100, which helps to prepare students for a transfer or CTE path that requires more advanced chemistry courses.

The CCC/CSU TMC (Transfer Model Curriculum) for Chemistry does not conform to the unit load for SRJC Chemistry classes (specifically Organic Chemistry, CHEM 12A/12B), so it is possible that the department will need to modify curriculum, scheduling and/or the A.S. Chemistry major itself in the future. Otherwise, there are no trends evident in any social, industrial, technological or educational context that would impact the department's program.

## **PHYSICS**

The physics program is staffed by energetic and dynamic individuals, dedicated to fulfilling our mission by providing a comprehensive program for transfer and CTE students. Although a relatively small percentage of our students go on to a bachelor's program in Physics, our program serves those pursuing degrees in the Life Sciences, Physical Sciences, Engineering, and pre-professional programs such as the medical, dental, and veterinary fields. Our Physics 1 course serves as an entry point for students who have not taken physics in high school to prepare them for the rigors of problem solving. Courses such as Physics 20, 20L, 21, 21L, and 11 prepare students for programs in biology, physical therapy, and kinesiology.

### **2.1a Budget Needs**

The chemistry and physics department needs to see our discretionary budget restored. We also have a need to see a restoration of district funding for graders and faculty travel. Reader support for faculty is necessary to maintain the intensive laboratory assignments required to ensure quality education for our students. Lack of local industry employing chemistry and physics professionals requires us to travel to conferences for professional development and networking.

## **CHEMISTRY**

The significant cut to our 4000 and 5000 accounts has not been restored. Despite the demoralizing budget, we have been able to survive this academic year again, thanks to our fantastic lab coordinator (Bill Cusworth) and the fact that we have only been offering a limited number of in-person labs during this academic year. While we have not needed to use that much money on chemicals and supplies this academic year, we project that we will certainly use all of the remaining funds by the end of this academic year. While we have been able to make it work this academic year, it should be understood that we cannot operate with this budget all the time.

The chemistry program is quite frugal with our funds; we try to bid every item we purchase, rather than only when it is required by purchasing regulations whenever we can. It should also be noted that our supplies and services allotment will need to be

examined on a year-to-year basis. Our budget will need to increase periodically to keep pace with the constantly rising costs of chemicals and glassware. We will continue to rely on instructional equipment funds to replace aging equipment. Additional funds for our requested staffing increases will also be required.

## **PHYSICS**

The physics program is struggling to survive on the allocated annual budget. Despite the best effort by Greg Davis, our indispensable physics SLIA, the program is always in the red. We beg the District to augment the Physics supplies budget and award more than one equipment request per year to the program. Since the 1990's, the Physics labs have been trying to build 13 complete sets of all physics lab equipment using our modest supplies budget. Most of the physics lab equipment was purchased at a time when 8 lab stations would meet the needs of our enrollments. To accommodate all the students, we need to have 13 complete sets. The supplies budget is also needed to repair and replace broken physics equipment, much of which is over 30 years old.

## 2.1b Budget Requests

Rank	Location	SP	M	Amount	Brief Rationale
0001	ALL	04	01	\$1,700.00	Annual site license required for ChemDraw Pro. Ongoing fee.
0002	ALL	01	01	\$1,000.00	Augment Physics supplies budget
0003	ALL	02	04	\$3,000.00	Increase/restore staff travel budget for professional development activities.
0004	ALL	01	01	\$50.00	2YC3 (Two-Year College Chemistry Consortium) College Sponsorship
0005	ALL	02	02	\$4,000.00	Restore grader budget

## 2.2a Current Classified Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Coordinator Science Labs (Chemistry)	40.00	12.00	Coordinate the Chemistry laboratory operations of the department at Santa Rosa and Petaluma.
Science Lab Instructional Assistant (Chemistry)	40.00	12.00	Performs technical duties in support of the department at the Santa Rosa campus
Science Lab Instructional Assistant (Physics)	40.00	11.00	Manage day to day operational activities needed to conduct physics laboratories, replenish, repair, order parts and full experiment apparatus on an ongoing basis.
Science Lab Instructional Assistant (Chem & Phys)	25.00	11.00	Performs technical duties in support of the department at the Petaluma campus
Science Lab Instructional Assistant (Physics)	9.00	11.00	Performs technical duties in support of the Physics program at the Santa Rosa campus

## 2.2b Current Management/Confidential Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Department Chair	18.80	10.00	Supervision of the department
Program Coordinator	3.36	10.00	Physics program coordinator

## 2.2c Current STNC/Student Worker Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Student Laboratory Assistants	0.00	0.00	due to the current COVIDpandemic, we have had no student lab assistants this academic year.
	0.00	0.00	

## 2.2d Adequacy and Effectiveness of Staffing

Currently, we have no administrative assistant for the Department of Chemistry & Physics. We are excited that we are in the process of hiring one. However, this person will be an AAll for the STEM lab departments, meaning that this is a shared AAll position between the biology, chemistry & physics, and earth & space science departments. Given the increasing number of tasks required for this position, we are unsure of how this will work out.

### CHEMISTRY

We have three fantastic staff members in the chemistry program - Bill Cusworth (our indispensable, awesome lab coordinator), Milena Kalagorgevich (our AMAZING SLIA at Santa Rosa), and Lisa Stagnoli (our MAGNIFICENT SLIA at Petaluma). If it weren't for them, we would not have been able to offer any in-person labs during this academic year!

Unfortunately, to our dismay, Bill Cusworth is contemplating retiring at the end of this calendar year (Dec 2021). We need to hire a replacement coordinator science labs (chemistry). Our program would not be able to survive without this position. While we still have the AMAZING Milena, she alone cannot do everything necessary for our program. Ideally, we can start the hiring process in the fall of 2021 to have some overlap between Bill and the new lab coordinator.

The magnificent Lisa Spagnoli has been doing more than what she is expected to do. This academic year, not only has she been doing the preps for the in-person CHEM 60 labs at Petaluma, she has been moving and setting up the new science lab down at the Petaluma campus. Her position, Science Lab Instructional Assistant (Chem & Phys) at Petaluma, needs to be upgraded to a full-time SLIA position (40hrs/week, 12 months).



Additionally, we are requesting a part-time (20 hours/week, 10 month) SLIA for the Santa Rosa campus. In the Santa Rosa campus, we require additional support because of additional sections that we have and will be adding to our schedule. Although we are very close to the maximum capacity for our current building, we are looking at ways of adding even more sections of high-demand classes.

We are also requesting 4~5 workers per semester for the 2021~2022 academic year at the Santa Rosa campus. We may need one or two at the Petaluma campus for the Spring 2022 semester. We need their assistance to be able to successfully offer all of the sections we hope to offer during the 2021~2022 academic year.

## **PHYSICS**

Unfortunately, we have recently found out that Greg Davis, our indispensable physics SLIA, is considering retiring at the end of the 2021~2022 academic year. We need to hire a replacement physics SLIA. Ideally, we can start the hiring process early during the Spring 2022 semester so that there can be some overlap between Greg and the new person.

To appropriately staff the Physics program, we request that the full-time Science Lab Instructional Assistant (SLIA) position (Greg's current position) be upgraded to a full-time Coordinator of Science Labs position. The tasks of ordering and inventorying equipment, coordinating both Physics and Engineering labs, and orienting new faculty and staff on established lab procedures have fallen on the Physics SLIA. These tasks fall under the job description of Coordinator, Science Labs. With the additional lab offerings, potential expansion in Petaluma, and upcoming move (into the new Lindley Center for STEM Education), the position of the Coordinator of Science Lab is crucial.

## 2.2e Classified, STNC, Management Staffing Requests

Rank	Location	SP	M	Current Title	Proposed Title	Type
0001	Santa Rosa	02	01	**retirement replacement**	Physics Science Lab Instruc Asst, 100% (11 mo)	Classified
0001	Santa Rosa	02	01	**retirement replacement**	Coordinator, Science Labs, Chemistry, 100% (12 mo)	Classified
0002	Petaluma	02	01	Science Lab Instruc Asst, (25 hrs/wk, 11 mo) - Pet	Science Lab Instruc Asst (40 hrs/wk, 12 mo) - Peta	Classified
0003	Santa Rosa	02	01	Physics Science Lab Instruc Asst, 100% (11 mo)	Coordinator, Science Labs, Physics, 100% (12 mo)	Classified
0004	Santa Rosa	02	01	None	Science Lab Instruc Asst, Chemistry, 20 hrs/wk	Classified

## 2.3a Current Contract Faculty Positions

Position	Description
Full Time Chemistry Instructor (8)	The Chemistry program currently has eight full-time instructors. This academic year, one is on a reduced load, and one is on 80% reassigned time for AFAduties. This upcoming fall (F21), seven full-time instructors will be at the Santa Rosa campus and one will be at the Petaluma camups (as a part of rotation) One will continue to be on 80% reassigned time for AFA duties, and one wilk continue to be on a reduced load.
Full Time Physics Instructor (4)	The physics program currently has four full-time instructors.

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

Discipline	FTEF Reg	% Reg Load	FTEF Adj	% Adj Load	Description
Chemistry (Fall 2020)	5.0000	53.9000	4.2700	46.1000	During the Fall 2020 semester, of the eight full-time faculty, some of us went on reduced load for various reasons. (The major reason was to provide more loads for our wonderful adjunct faculty members.) We currently employ 10 adjunct faculty members who have established load.
Chemistry (Spring 2021)	6.4000	53.9000	5.4700	46.1000	Of the eight full-time faculty members, one has no teaching load (reduced load) and two has reduced teaching load (one with reassigned time from AFA and other has reassigned time as department chair).
Physics (Fall 2020)	4.0000	83.3000	0.8000	16.7000	We now have 4 full time faculty. We currently have 2 active adjunct faculty. The reported FTEF for adjunct faculty includes all overloads for regular faculty as well.
Physics (Spring 2021)	4.2000	77.8000	1.2000	22.2000	We now have 4 full time faculty. We currently have 2 active adjunct faculty. The reported FTEF for adjunct faculty includes all overloads for regular faculty as well.

## 2.3c Faculty Within Retirement Range

We have two possible impending retirements in the next few years - one in chemistry and one in physics.

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

### CHEMISTRY

We presently have eight full-time faculty in the Chemistry program. One is on 80% reassigned time for AFA duties, and one is on reduced teaching load.

During the 2021 ~2022 academic year, seven full-time faculty instructors will be teaching at the Santa Rosa campus. We will have one full-time faculty member in Petaluma, as part of an agreement between the Chemistry Program and Petaluma Administration.

**The chemistry program would request the District to consider adding another full-time chemistry faculty position.** Maintaining an adequate number of full-time faculty is essential to the function of the Chemistry transfer program and the success of all STEM majors. Student demand for Chemistry classes has significantly risen over the past decade, and we are now offering more sections than before. To do so, our program relies heavily on the adjunct faculty members. The chemistry program currently has ten wonderful adjunct instructors, and the full-time to part-time faculty ratio is currently at 54-46 . This ratio is far smaller than 75:25 full-time/part-time ratio recommended by the American Chemical Society (in its Guidelines for Chemistry in Two-Year College Programs) and by AB 1725. For the foreseeable future, we will continue to depend on the adjunct faculty instructors as necessary. Unfortunately, attracting and keeping high-quality adjuncts (like the ones we currently have) has proven to be challenging. There is a lack of industry in the area that employs chemists, and our adjunct faculty often leave to find full-time work elsewhere. In addition, the adjunct faculty members are not required to perform college service. They cannot be expected to contribute to the other aspects of running a successful Chemistry program. To maintain continuity to fulfill department/program responsibilities and to support our program's vision and goals, we need more full-time faculty members.

### 2.3e Faculty Staffing Requests

Rank	Location	SP	M	Discipline	SLO Assessment Rationale
0000	ALL	00	00		
0001	Santa Rosa	02	01	Chemistry	Maintaining a high quality of instruction to meet the SLOs for the Chemistry program requires a level of dedication and student contact that is not expected from our adjunct instructors. This includes conducting undergraduate research, participating in clubs, curriculum assessment, grant writing, local events (i.e. DUO), and building relationships with local industry and four-year institutions, such as SSU.

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

### CHEMISTRY

Justification for items on the Instructional Equipment Request spreadsheet:

Item #2 (Oil-less Vacuum Pumps) - We are presently using water faucet aspirators to provide the lower pressure needed for our Roto-vaps. This is a costly waste of natural resources. Using oil-less vacuum pumps in the lab would have positive environment impact.

Item #4 (Centrifuge) - These centrifuges would provide each lab with a set. At present, we must transport centrifuges from lab to lab when needed, and frequently more than one lab requires their use.

Item #6 (IR) - An additional IR spectrophotometer is needed because we have expanded our lab programs in General Chemistry to use more modern instrumentation. With only one at this point, there is a bottleneck for students attempting to analyze materials.

Item #8 (NMR spectrometer) - An additional NMR spectrophotometer is needed because our 25-year-old instrument is presently non-functional due to the lack of a computer interface. IT will not replace/repair the computer that was interfaced with the instrument. With only one at this point, there is a bottleneck for students attempting to analyze materials.

Item #9 (HPLC columns) - The High-Performance Liquid Chromatography system is a brand new instrument that will expose students to a very important data collection technique that they will likely see in their future careers. The instrument is used to separate and analyze non-volatile samples such as drugs, proteins, and other biological chemicals.

Item #11 (Microwave Plasma Atomic Emissions Spectrometer) - Our 20-year-old Atomic Absorption Spectrometer is having issues. This instrument is used by our Chem 3B program several times each semester, and its use could be expanded to include Chem 3AL, given the newer technology now available.

Item #12 (Smart Boards) - Use of smart board can have many positive impacts in the classroom. For one, it will allow us instructors to accommodate many different learning styles. It will provide a better forum for students to collaborate.

Item #14 (X-ray Fluorescence Analyzer) - X-Ray Fluorescence Analyzer is also a brand new instrument that will expose students to a very important data collection technique that they will likely see in their future careers. The instrument is rapidly becoming the industry standard for elemental analysis. This will also allow us to collaborate with the anthropology department.

What is the highest priority for equipment over the next three years?

Replacing the two critical instruments (AA and NMR) that have died or on life-support.

Have you found any way(s) to share equipment with other programs/units and/or to save money repairing or repurposing equipment? If so, explain.

Our department has always had a good attitude about sharing resources across programs. Within our department, the Chemistry and Physics programs share resources and we routinely work with Biological Sciences to share not only equipment, but also staff knowledge. We have in the past and are currently hosting in our labs part of a Wine 55A/55B (Laboratory Analysis of Wines) class offered through Agriculture/Natural Resources. This involves taking on much of the preparation as if it were one of our normal chemistry lab classes. Most of our equipment is specialized, however, so sharing is unlikely

With regard to repairing equipment we have always done our best to repair any of our equipment in house prior to going to an outside repair option. We have a good track record of repairing and maintaining our equipment to ensure a long and useful life. However, we are slowly beginning to see a backlog of unrepaired equipment. Hiring an additional SLIA would improve this situation.

We also have a good track record of repurposing equipment. If there is any useful life in something that we have the opportunity to replace, we will seek to place the item within our cluster, the District, or when possible to donate the equipment to local public high schools.

## **PHYSICS**

An essential component of physics instruction is the ability for students to conduct laboratory experiments. This requires a significant investment in dedicated instructional equipment for our physics lab. Equipment breaks and becomes obsolete and we strive to use our meager supplies budget to maintain or replace as much as we can. Allocation of instructional equipment money each year is also essential to replace equipment that is 30 or more years old. Items on the list (Items #1, #3, #5, #7, #10, and #13) are necessary for these reasons.

## **2.4c Instructional Equipment Requests**



Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	Santa Rosa	01	01	Veriner Lab Quest	16	\$339.00	\$5,424.00	Masanori Iimura	Lark	Greg Davis
0002	Santa Rosa	01	01	Oil-less Vacuum Pump for RotoVaps	1	\$2,126.00	\$2,126.00	Masanori Iimura	Bech Hall	Bill Cusworth
0003	Santa Rosa	01	01	Green Lasers	14	\$219.00	\$3,066.00	Masanori Iimura	Lark	Greg Davis
0004	Santa Rosa	01	01	Centrifuge	3	\$934.00	\$2,801.00	Masanori Iimura	Bech Hall	Bill Cusworth
0005	Santa Rosa	01	01	Oscilloscope 2 channels, Grey Oscilloscops	15	\$364.38	\$7,035.00	Masanori Iimura	Lark	Greg Davis
0006	ALL	01	01	IR Spectrometer	1	\$20,000.00	\$20,000.00	Masanori Iimura	Bech Hall	Bill Cusworth
0007	Santa Rosa	01	01	Cameras	15	\$469.00	\$7,035.00	Masanori Iimura	Lark	Greg Davis
0008	Santa Rosa	01	01	NMR Spectrometer; benchtop; 60MHz, multi-nuclei	1	\$70,000.00	\$70,000.00	Masanori Iimura	Bech Hall	Bill Cusworth
0009	Santa Rosa	01	01	High-Performance Liquid Chromatography Columns	3	\$1,000.00	\$3,000.00	Masanori Iimura	Bech Hall	Bill Cusworth
0010	Santa Rosa	01	01	Atomic Force Microscope Education Kit with attachm	1	\$14,414.12	\$14,414.12	Masanori Iimura	Lark	Greg Davis
0011	Santa Rosa	01	01	Microwave Plasma Atomic Emission Spectrometer	1	\$56,000.00	\$56,000.00	Masanori Iimura	Bech Hall	Bill Cusworth
0012	Santa Rosa	01	01	Smart Boards	3	\$2,500.00	\$7,500.00	Masanori Iimura	Bech/Lark/Petaluma	Masanori Iimura
0013	Santa Rosa	01	01	Elmo CVR32/24 (Clicker Base + 50 extra clickers)	1	\$2,833.00	\$2,833.00	Masanori Iimura	Lark	Greg Davis
0014	Santa Rosa	01	01	X-Ray Fluorescence Analyzer	1	\$32,000.00	\$32,000.00	Masanori Iimura	Bech Hall	Bill Cusworth
0015	Santa Rosa	01	01	Thomson Tube S	1	\$1,230.00	\$1,230.00	Masanori Iimura	Lark	Greg Davis

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0016	Santa Rosa	01	01	Force of magnetic field apparatus	13	\$299.00	\$3,887.00	Masanori Iimura	Lark	Greg Davis
0017	Santa Rosa	01	01	Scanning Electron Microscope (SEM)	1	\$75,000.00	\$75,000.00	Jan Kmekto	Lark	Jan Kmetko

## 2.4d Non-Instructional Equipment and Technology Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
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## 2.4f Instructional/Non-Instructional Software Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	ALL	01	01	Annual License for ChemDraw Pro Software (on-going)	1	\$1,700.00	\$1,700.00	Mas Iimura	Bech Hall	Bill Cusworth

## 2.5a Minor Facilities Requests

Rank	Location	SP	M	Time Frame	Building	Room Number	Est. Cost	Description
0001	Santa Rosa	04	07	Urgent	Bech Hall	1948, 1960, 1980	\$500.00	Replace chalkboards with whiteboards

## 2.5b Analysis of Existing Facilities

### CHEMISTRY

The Chemistry program on the Santa Rosa Campus is located in Bech Hall, a sixteen-sided, 12,000 square-foot building that is now over fifty years old. The facility is definitely showing its age and is at its maximum carrying capacity. However, the staff maintains it with great pride. The facility includes:

- Two 88-person lecture halls and one 28-person seminar room equipped with computer/video projection systems and network connections. The three lecture halls also have tables designed for use by students with disabilities and assistive audio systems for students with hearing impairment. The chairs in all three rooms are beginning to fail; all three rooms have at least one non-functioning chair.
- Two 28-person general chemistry labs with a shared analytical balance room. Each general chemistry lab is equipped with 14 computer workstations and four fume hoods. The balance room houses 13+ electronic analytical balances for student use.
- One 26-person organic chemistry with an adjacent instrument room. The lab is equipped similarly to the general chemistry labs, and the instrument room houses most of the large instruments in the department. The stools for this laboratory are stored in stacks in the front of the room. A separate storage space or solution is needed to clear this space.
- A portable laboratory station for use by students with disabilities is available for students who need accommodation in the laboratory. However, the unit is too big, and a disabled student has no easy access to fume hoods in the laboratories.
- A stockroom with storage space for laboratory equipment and chemicals, and limited space for preparing and staging materials for laboratory experiments, which are kept on carts and moved into to the laboratory just before each lab period. The stockroom has very limited (approx. 90 sq. ft) office space for two full-time stockroom employees and a number of part-time student workers.
- Seven offices for full-time faculty members. We do not have adequate spaces for all of our adjunct instructors.
- A new space is needed for students to be able to work and study together. Currently, students are confined to the hallways and entryway of the building when not in class.
- A departmental office with space for our administrative assistant, mailboxes, a conference table for meetings, office supplies storage and most of our office equipment. A separate conference/break room for meetings would allow for more flexibility in the use of this space. Perhaps this space could serve as a combined conference room/student work area.
- An equipment room behind the instrument room which is currently used for storage and for administering exams.
- Six storage closets, two used for lab stool storage, two for equipment, and two for utilities/custodial supplies.
- One toilet for staff use. (\*\*Due to the COVID pandemic, we have been allowing students to use it as well.)

- There are no student restrooms in the building. Student restrooms are needed.
- The building has no air conditioning outside of the lecture halls. During hot weather, students lab goggles fog up and students tend to remove them, creating an ongoing laboratory safety issue.

The Department is anticipating the future construction of a new science building which will alleviate the space constraints felt in the stockroom, adjunct faculty office, department office/conference room, student study areas and laboratories, as well as provided needed upgrades to restroom availability, HVAC, and natural light availability. Nonetheless, given that a new building is still in the distant future, there are a number of improvements that can be made now to the current facility that will improve it in a worthwhile way.

On the Petaluma campus, there is one Chemistry laboratory in Kathleen Doyle Hall. It has lab space for 27 students per section. Starting this fall, we will also be using the newly constructed lab. We are planning to offer 8~9 sections of chemistry courses in Petaluma this Fall. This is possible with two chemistry lab spaces, but as mentioned in the previous section, to do so, we need the current SLIA position in Petaluma to be upgraded to a full-time SLIA position (40hr/wk, 12 mo). There is an adjacent stockroom, which has some access issues. There is only a single fume hood in the Chemistry laboratory. More advanced Chemistry classes require one fume hood for every three students. The Chemistry lecture classes in Petaluma are taught in whichever classrooms are available, usually in Doyle Hall.

## **PHYSICS**

The faculty members of the Physics program are in the Analy Village, and the classes are taught in Lark Hall. The physics program will be sharing the space with the Earth and Space Science Department and the Biological Science Department.

The Physics program is impacted and could make use of a second laboratory space. While there will be two lecture rooms in Lark Hall, the rooms will be shared amongst the three departments. Presumably, this will still make it difficult to schedule simultaneous or overlapping sections of any Physics classes. This limits options for students and makes it difficult to provide adequate lab support.

The Physics program is interested in offering classes at the Petaluma campus. We will need to start working with the two Deans.

### **3.1 Develop Financial Resources**

The Chemistry and Physics Department is always interested in grants that will help us update and add to the instrumentation and equipment we use in our laboratory curriculum. This would benefit both the students and the College. We are also seeking funding and assistance for expanding our program in Petaluma.

### **3.2 Serve our Diverse Communities**

Diversity and inclusion are essential in the field of science, and the Department is proud to foster both. The Department continues to support a diverse workforce. The Department follows all procedures and guidelines set forth by Human Resources in the hiring of faculty and staff.

### **3.3 Cultivate a Healthy Organization**

The members of the Department of Chemistry and Physics (contract faculty members, classified staff, and adjunct faculty members) are a cohesive entity who works well together. We share a common goal, and we treat and support each other with respect, both professionally and personally.

The Department of Chemistry and Physics fully embraces the professional development of all members of the department including classified staff. One thing that we would like to do is to develop more discipline specific workshops for FLEX and on PDA Day.

### **3.4 Safety and Emergency Preparedness**

The Chemistry safety leaders are Bill Cusworth, Milena Kalagorgevich, and Megan Williams (Bech Hall), and the Physics safety leader is Greg Davis (Shuhaw).

### **3.5 Establish a Culture of Sustainability**

Whenever possible, we try to convey the concepts of sustainability in our classes. For example, Green Chemistry concepts are introduced and discussed in courses such as CHEM 42, CHEM

12A, and CHEM 12B. The most significant potential for a direct environmental impact of the Department of Chemistry and Physics arises from its Chemistry laboratory instruction program. To that effect, the Chemistry program is deeply committed to teaching labs that are safe and achieve the desired learning outcomes while minimizing the use of toxic, dangerous, rare, and/or expensive chemicals. Whenever possible, any environmentally risky experiments are performed on a microscale, which uses less than a 1/100 of the resources used by more traditional experiments. Even the more benign experiments are conducted on the smallest scale that is practical, in order to preserve natural resources and minimize cost.

As a department, we continue to make significant improvements in the area of reducing the amount of paper we use. We proactively work with textbook publishers to minimize the number of textbook desk copies sent to the individual instructors. A majority of the instructors assign online homework instead of collecting paper copies; all student handouts (syllabus, reading assignments) are shared with students electronically. The only mass printing is done for exams and, currently, about 50% of those are copied double-sided. Bech Hall has student and staff recycling bins for paper, glass, and plastic. We also have two green (compost) bins - one in the main office and one in the hallway. Used batteries are disposed of properly.

## 4.1a Course Student Learning Outcomes Assessment

### CHEMISTRY

The Chemistry Program is in year 3 of its current assessment cycle (started in Fall 2016). We are a little behind on the assessment but have discussed the need to be on top of the assessment. The faculty members of the chemistry program continue to discuss these assessments and use them to improve our teaching and curriculum.

#### Summary of Chemistry Program SLO Assessments for Current Cycle

	SLOs assessed since Fall 2016	Total SLOs	Done Until Fall 2022
Chem 1A		3	NO
Chem 1B		4	NO
Chem 12A	1, 2	5	NO
Chem 12B		2	NO
Chem 42		4	NO
Chem 60		4	NO
Chem 8		4	NO
Chem 100		3	NO

### PHYSICS

The second six-year cycle of SLO assessment for the Physics program will begin in Fall 2019.

The Physics faculty continue to discuss these assessments and use them to improve our teaching and curriculum.

#### Summary of Physics Program SLO assessments (Beginning Fall 2019 \*\*)

	SLOs assessed since Fall 2018	Total SLOs	Done Until Fall 2025
PHYS 1		4	NO
PHYS 11		2	NO
PHYS 20		2	NO
PHYS 20L		2	NO
PHYS 21		2	NO
PHYS 21L		2	NO
PHYS 40	3	4	NO
PHYS 41		4	NO
PHYS 42	1	4	NO
PHYS 43		3	NO

### 4.1b Program Student Learning Outcomes Assessment

#### Program-level Student Learning Outcomes - Chemistry Major (Assessed Fall 2014)

A successful Chemistry major matriculating from the SRJC Chemistry Department will be able to:

1. relate observable phenomena to molecular events according to prevailing chemical theories.
2. identify, synthesize, and predict and explain the structure of a variety of compounds, both inorganic and organic.
3. accurately and safely obtain and analyze data from experimental sources, including traditional laboratory methods, computer-interfaced data collection devices, and advanced analytical instrumentation.
4. use critical thinking skills to analyze “real-world” applications of chemical knowledge and theories.
5. communicate effectively the results of laboratory experiments, including error analysis.



These program outcomes will be assessed through the assessment of Chem 12B, the program's capstone course. The goal is to do this during the 2019~2020 academic year.

**Program-level Student Learning Outcomes -Physics and Physics-T Major (Assessed Spring 2015)**

1. Apply physical principles from the basic subfields of physics (classical mechanics, electricity and magnetism, quantum mechanics, statistical mechanics, and thermodynamics), as well as areas from application (e.g. solid state physics, optics, etc.) in advanced courses;
2. apply physical principles to novel situations through critical thinking, problem solving, mathematical modeling, and laboratory experimentation.
3. design and assemble experimental apparatuses, conduct and analyze measurements of physical phenomena, assess experimental uncertainty, and make meaningful comparisons between experiment and theory; and
4. communicate ideas and processes of physics clearly and precisely, both orally and in writing.

## **4.1c Student Learning Outcomes Reporting**

Type	Name	Student Assessment Implemented	Assessment Results Analyzed	Change Implemented
Course	Chem 100	Fall 2010	Spring 2011	N/A
Course	Chem 12A	Fall 2010	Spring 2011	N/A
Course	Chem 1A	Fall 2010	Spring 2011	N/A
Course	Chem 1B	Fall 2010	Spring 2011	N/A
Course	Chem 42	Fall 2010	Spring 2011	N/A
Course	Chem 4A	Fall 2010	Spring 2011	N/A
Course	Chem 60	Fall 2010	Spring 2011	N/A
Course	Chem 8	Fall 2010	Spring 2011	N/A
Course	Chem 100	Fall 2011	Spring 2012	N/A
Course	Chem 12A	Fall 2011	Spring 2012	N/A
Course	Chem 12A	Spring 2011	Summer 2011	N/A
Course	Chem 12B	Fall 2011	Spring 2012	N/A
Course	Chem 12B	Spring 2011	Summer 2011	N/A
Course	Chem 1A	Spring 2011	Summer 2011	N/A
Course	Chem 1A	Fall 2011	Spring 2012	N/A
Course	Chem 1B	Fall 2011	Spring 2012	N/A
Course	Chem 1B	Spring 2011	Summer 2011	N/A
Course	Chem 42	Spring 2011	Summer 2011	N/A
Course	Chem 42	Fall 2011	Spring 2012	Spring 2011
Course	Chem 4A	Fall 2011	Spring 2012	Spring 2011
Course	Chem 4B	Spring 2011	Summer 2011	N/A
Course	Chem 60	Spring 2011	Summer 2011	N/A
Course	Chem 60	Fall 2011	Spring 2012	N/A
Course	Chem 8	Spring 2011	Summer 2011	N/A
Course	Chem 8	Fall 2011	Spring 2012	Spring 2011
Course	Chem 100	Spring 2012	Summer 2012	N/A
Course	Chem 1A	Spring 2012	Summer 2012	N/A

Type	Name	Student Assessment Implemented	Assessment Results Analyzed	Change Implemented
Course	Chem 1B	Spring 2012	Summer 2012	N/A
Course	Chem 42	Spring 2012	Summer 2012	N/A
Course	Chem 4A	Fall 2012	Spring 2013	N/A
Course	Chem 4B	Spring 2012	Summer 2012	N/A
Course	Chem 60	Spring 2012	Summer 2012	N/A
Course	Chem 8	Spring 2012	Summer 2012	N/A
Course	Chem 4B	Spring 2013	N/A	N/A
Course	Chem 8	Spring 2013	N/A	N/A
Course	Phys 1 Physics Problem Solving	Spring 2014	Spring 2014	N/A
Course	Phys 11 Descriptive Physics	Fall 2014	Fall 2014	N/A
Course	Phys 20 General Physics Part I	Spring 2014	Spring 2014	N/A
Course	Phys 20L	Spring 2014	Spring 2014	N/A
Course	Phys 21 General Physics Part 2	Spring 2014	Spring 2014	N/A
Course	Phys 21L	Summer 2013	Summer 2013	N/A
Course	Phys 40	Fall 2013	Fall 2013	N/A
Course	Phys 41 Waves, Optics, Thermo	Spring 2014	Spring 2014	N/A
Course	Phys 42 Electricity and Magnet	Spring 2014	Spring 2014	N/A
Course	Phys 43 Modern Physics	Fall 2014	Fall 2014	N/A

## 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
Chem 12A/B	X	X	X					X		X	X	X				X
Chem 1A/B	X	X	X					X		X	X	X				X
Chem 42	X	X	X	X			X	X		X	X	X	X			X
Phys 1	X			X	X		X	X		X	X					
Phys 10/10L or Phys 11	X		X					X	X		X	X				X
Phys 20, 20L, 21, 21L	X	X			X					X						
Phys 40, 41, 42,43	X	X			X					X						

## 4.2b Narrative (Optional)

## 5.0 Performance Measures

not applicable

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

### CHEMISTRY

The Chemistry program is offering a schedule that is as balanced and convenient as possible, given the constraints of the facility and staffing. On the Santa Rosa Campus, Bech Hall has three laboratories, which limits the number of lab sections that we can schedule. On the Petaluma Campus, the Chemistry Program is limited by the fact that the current laboratory facility is only suitable for two of our courses (Chem 60 and 42).

Back in 2009, the Chemistry department created a rotation plan to ensure that students will be able to get through our program in a timely manner. For example, our summer offerings are designed to enable students who need all five semesters of our program to finish the program in two years. We also offer an evening sequence for the first three semesters as well as for Chem 60. We are now offering a Saturday section of Chem 42 as well. Lately, the problem has been that all sections of our core program courses have been filling up soon after registration opens. It appears that we could add more sections of Chem 42, Chem 1A, and Chem 60 each semester and they would fill and only be limited by lack of space and/or staffing.

## PHYSICS

The Physics program offers the standard slate of physics courses to meet the basic needs of SRJC's students. These courses are offered on the Santa Rosa campus and almost exclusively during the day to full-time students.

Bio-engineering and biomedical engineering are areas of increasing demand from students and industry. There are ideas to develop a nano-technology materials/physics course and a new intro to Physics. In the past, chronic understaffing (faculty and technical support staff) made growing our program and responding to curricular changes increasingly difficult. With the current increase of lab support and close cooperation with the Chemistry program, we are hoping to be able to start developing new courses.

The Physics program is in contact with Petaluma campus for offering non-lab Physics course, PHYS1, or hybrid courses for PHYS11, PHYS20 and PHYS21 (with labs at the Santa Rosa campus).

Due to the nature of physics courses, challenging material requiring one on one interaction between the instructor and the student, we are currently not offering any online courses. Phys 11 (GE, conceptual physics) has been targeted as a possible online (or hybrid) course.

## Student Headcount

Semester	Headcount
X15	110
F15	452
S16	487
X16	79
F16	435
S17	521
X17	74
F17	341
S18	371
X18	87
F18	374

## 5.2a Enrollment Efficiency

### CHEMISTRY

The Chemistry program's average enrollment efficiency is well over 100%, exceeding the district goal of 95%. Chem 60, Chem 42, Chem 1A, Chem 1B, Chem 12A and Chem 100 sections are traditionally filled to the maximum (or beyond) by the first census; this helps maintain the average efficiency at close to 100%. STEM courses continue to be in high demand, even as the enrollment in other courses is declining. The only way to alleviate the efficiencies that are >100% is to offer more sections, which could prove difficult due to the limited number of faculty and limited lab facilities.

Enrollment Efficiency for the Chemistry Program (All locations)

	<b>F2017</b>	<b>S2018</b>	<b>X2018</b>	<b>F2018</b>
Chemistry	103.1%	98.4%	110.4%	103.3%

### PHYSICS

The Physics program is at or slightly below the capacity in many of the sections. To accommodate the demands of the students, we have been offering more sections over the past few years. In the past, physics faculty members were going well beyond the class limits to accommodate students that need the classes for their transfer major, to the detriment of instructional quality and also causing a substantial increase in uncompensated workload.

ALL Locations Enrollment Efficiency

Disc	X2015	F2015	S2016	X2016	F2016	S2017	X2017	F2017	S2018	X2018	F2018
Physics	97.4%	86.2%	89.5%	100.0%	82.8%	89.4%	98.8%	84.1%	90.8%	108.8%	8

## 5.2b Average Class Size

### CHEMISTRY

The average class size for courses in the Chemistry Program has been relatively consistent over the last five years. This trend will very likely (hopefully) continue in the coming years. As mentioned in Section 5.1, the program is bound to the confines of the building and available laboratory space to meet safety requirements. Our laboratory facilities limit us to a maximum of between 20 and 28 students per section, depending on the room and the course.

## Average Class Size

	F2017	S2018	F2018
Chemistry	24.1	23.3	24.3

## PHYSICS

\*\* It is important to note that average class size as calculated by the system may not be an accurate measure of the Physics program's enrollment efficiency. For example, Phys 41 and 42 have two lectures and three labs each. To allow all possible combinations of lab/lecture, we end up with 6 sections for each course, although more than half are unloaded. Average class size records 6 sections at 12 students even if each lecture has 36 and each lab has 24.

As an example, the system reported the average class size for Fall 2018 is 20.6. This number needs to be adjusted according to the following reported enrollment numbers at census day:

Course	Number of LECTURE sections	Total Enrollment
PHYS 1	2	52
PHYS 11	2	33
PHYS 20	2	62
PHYS 21	1	21
PHYS 40	2	90
PHYS 41	2	65
PHYS 42	2	55
PHYS 43	1	17

Using these values, the average class size for Fall of 2018 has to be corrected from the reported value of 20.6 to 28.2! The same level of correction applies to all the Fall and Spring semesters.

Lecture classes in physics have appropriate enrollment limits of about 30 to 40. Physics lab classes have appropriate limits of 24. We have been allowing students over the class limit for some of the Physics lectures and labs. ALL Locations Average

Class Size (data are flawed. See the explanation above).

	F2017	S2018	F2018
Physics	19.9	21.5	20.6



Overall, the average class sizes have been steady over the past three years; most of our physics classes are near or slightly below the capacity.

### 5.3 Instructional Productivity

#### CHEMISTRY

#### CHEMISTRY

The Chemistry Program for a while (up to about five years ago), has averaged well above the college-wide productivity goal of 18.7. Unfortunately, we are noticing a decrease in FTES/FTEF productivity; our productivity value has decreased from 19.76 in Fall 2013 to 17.31 in Fall of 2018. One possible cause of this is the change in enrollment. Just like other programs on campus, our program is not immune to the declining college enrollment.

We do need to work to tighten things up to avoid running low-enrolled classes, even if those are terminal classes. We need to monitor and have a strong and better sense of the course enrollment patterns to develop a schedule that works each semester.

#### Instructional Productivity

	F2017	S2018	F2018
FTES/FTEF	17.304	17.13	17.31

#### PHYSICS

The FTES/FTEF productivity value for the physics program is also decreasing. While low-enrollment may not be avoidable in some courses, we will work to explore alternative scheduling which will not compromise the instructional quality and infringe on the workload of the faculty members. One difficulty is that the lab enrollment numbers are limited by facilities and equipment.

#### ALL Locations FTES/FTEF Productivity

	F2017	S2018	F2018
FTES/FTEF	14.44	15.32	13.36

## 5.4 Curriculum Currency

### Is the curriculum current?

Yes. All of the Chemistry and Physics course outlines are current and have SLOs.

### How does the program encourage students to complete certificates, licenses, or majors?

The Department of Chemistry and Physics provides prerequisite courses for numerous Associate degrees.

The Chemistry major has been approved since 2008 and the Physics major since 2009.

## 5.5 Successful Program Completion

### CHEMISTRY

The Chemistry program has set up a rotation plan designed to help students complete our program in a timely manner. For a chemistry major, life science, or pre-med student, there is a five-semester sequence that needs to be completed: Chem 42-Chem 1A or 4A-Chem 1B or 4B-Chem 12A-Chem 12B. Students who pass the placement (diagnostic) test can skip Chem 42 and complete the program in 4 semesters, but the majority of our students begin the sequence at Chem 42. For this reason, we have scheduled our summer session to accommodate the extra semester. We offer Chem 42, Chem 1A, and Chem 1B in the summer so that a student can still complete Chem 12B at the end of the fourth (non-summer) term. We also offer an evening sequence for Chem 42-Chem 1A-Chem 1B for those students who work during the day. We also offer Chem 60 in the evening 3 out of every 4 semesters.

The Chemistry program has awarded a total of 63 associate degrees since the degree was approved in 2008. Over the last three years, 31 associate's degrees were awarded (twelve in 2015~2016, seven in 2016~2017, and twelve in 2017~2018). These figures are not entirely surprising (nor discouraging) since our department's main function is to serve students in a wide variety of STEM and health-related majors. Approximately 50 students complete Chem 12B each Spring, and this number better represents the number of students that complete our program. Also, the number of students who complete Chem 1A or Chem 1B as their final chemistry course requirement for engineering, physics, or other science majors have technically completed the short version of our program. Having said that, we would, of course, like to increase the number of students who major in Chemistry.

### PHYSICS

The Physics program's core mission is to prepare students for transfer in physics as well as all the disciplines within engineering and science.

The program also offers an AS major in Physics.

## 5.6 Student Success

It appears that, within statistical boundaries, the retention and course completion data for the chemistry department closely matches the District averages. The average GPA of our students tends to be slightly lower than the District average. But this is as expected as the number of rigorous science and math courses that our students have to take tend to have that effect on their cumulative GPA.

Semester	F2015	S2016	X2016	F2016	S2017	X2017	F2017	S2018	X2018	F2018
<b>Reten</b>	79.9%	79.2%	93.0%	83.2%	82.7%	89.7%	83.6%	77.6%		77.8%
<b>Comp</b>	74.4%	74.0%	89.4%	77.7%	77.5%	87.7%	76.8%	72.7%		71.6%
<b>GPA</b>	2.59	2.64	2.97	2.76	2.77	3.27	2.73	2.67		2.68

## PHYSICS

Students retention (Rten), course completion (Comp) and grade point average (GPA) are tabulated below:

Semester	F2015	S2016	X2016	F2016	S2017	X2017	F2017	S2018	X2018	F2018
<b>Reten</b>	83.8%	84.2%	97.5%	80.0%	83.4%	85.9%	81.8%	87.3%		80.3%
<b>Comp</b>	81.2%	81.3%	94.9%	78.4%	81.0%	85.9%	79.9%	83.2%		77.8%
<b>GPA</b>	2.94	2.97	3.32	3.02	2.97	3.11	2.86	3.02		2.99

Retention and course completion statistics in Physics classes over the 4 years of data fluctuate above 80% without any significant trend. This level of retention is quite high for the challenging subjects in our program, significantly higher than at other institutions. We feel this is accomplished primarily by the excellent quality of students we enjoy at SRJC because of our reputation and our scholarships, the excellent preparation our students receive in all their STEM preparatory classes, and the esprit de corps developed in our program both in classes and extra-curricular activities.

The percentage of successful course completion also remains steady fluctuation around 80%. Grade point averages for the Physics classes have remained stable in the 2.8-3.0 range.

## 5.7 Student Access

### CHEMISTRY

#### T/CHEMISTRY

The Chemistry Department continues to maintain a diverse student population in keeping with the District percentages through its relationship with MESA and participation in community outreach programs.

Ethnicity	2015-16	2016-17	2017-18	2018-19(F18)
White	52.8%	44.8%	45.5%	43.1%
Asian	5.3%	5.2%	6.0%	6.8%
Black	2.4%	2.1%	1.8%	1.9%
Hispanic	30.6%	34.8%	32.4%	35.8%
Native American	0.6%	0.8%	0.4%	0.4%
Pacific Islander	0.1%	0.5%	0.1%	0.1%
Filipino	1.5%	1.3%	1.4%	1.4%
Other Non White	6.2%	5.6%	6.9%	5.1%
Decline to State	0.4%	4.9%	5.6%	5.4%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Gender	2015-16	2016-17	2017-18	2018-19 (**F18)
Male	41.8%	42.7%	40.3%	39.0%
Female	57.6%	56.0%	58.0%	59.0%
Unknown	0.5%	2.1%	1.6%	2.80%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

### PHYSICS

Data listed below indicates a steady increase in the percentage of Hispanic students in Physics and a slight increase in the age range of 21 to 25.

Ethnicity	2015-16	2016-17	2017-18	2018-19(F18)
White	56.0%	49.8%	45.3%	44.3%
Asian	8.7%	7.3%	10.0%	11.1%
Black	1.6%	0.4%	2.5%	1.6%
Hispanic	24.8%	29.6%	29.3%	27.9%
Native American	0.1%	0.0%	0.0%	0.1%
Pacific Islander	0.1%	0.1%	0.0%	0.0%
Filipino	1.1%	2.2%	1.6%	1.0%

Other Non White	6.9%	7.2%	7.0%	8.1%
Decline to State	0.8%	3.4%	4.4%	5.9%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Gender	2015-16	2016-17	2017-18	2018-19 (**F18)
Male	64.5%	64.8%	70.8%	59.4%
Female	34.6%	33.0%	26.7%	37.5%
Unknown	1.0%	2.1%	2.5%	3.1%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Age Range	2015-16	%	2016-17	%	2017-18	%	2018-19	%
0 thru 18	84	9.0%	98	11.0%	70	10.2%	71	9.7%
19 and 20	346	37.2%	299	33.5%	258	37.4%	245	33.5%
21 thru 25	326	35.1%	352	39.4%	248	36.0%	280	38.3%
26 thru 30	112	12.1%	88	9.9%	66	9.6%	81	11.1%
31 thru 35	31	3.3%	32	3.6	24	3.5%	28	3.8%
36 thru 40	16	1.7%	13	1.5%	16	2.3%	19	2.6%
41 thru 45	8	0.9%	5	0.6%	2	0.3%	5	0.7%
46 thru 50	1	0.1%	3	0.3%	0	0.0%	1	0.1%
51 thru 60	2	0.2%	1	0.1%	4	0.4%	1	0.1%
61 plus	3	0.3%	2	0.2	1	0.1%	0	0.0%
<b>ALL Ages</b>	<b>929</b>	<b>100.00</b> %	<b>893</b>	<b>100.00</b> %	<b>689</b>	<b>100.00</b> %	<b>731</b>	<b>100.00</b> %

## 5.8 Curriculum Offered Within Reasonable Time Frame

### CHEMISTRY

Our general chemistry sequence (1A - 1B) is offered in Fall-Spring, Spring-Fall, Summer-Fall and Spring-Summer patterns. The organic chemistry sequence is offered each year in a Fall-Spring pattern. Chem 60 and Chem 42 are offered every semester.

### PHYSICS

The Physics program currently offers all courses each semester and several courses during summer session.

## **5.9a Curriculum Responsiveness**

Chemistry has one General Ed. course, Chemistry 42. It is a one semester general chemistry course with a laboratory. It is taught in compliance with the CSU/UC requirements. It is also a pre-requisite for those students who are not prepared for Chem 1A, and therefore serves science and engineering programs and majors. Physics offers a conceptual physics course for general education.

Chemistry and Physics Department serve mostly as support programs for almost all STEM majors. We serve over 700 students each semester. The majority of our students transfer as STEM majors to four-year universities, and the remainder go on to certificates and degree programs in the allied health fields.

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

not applicable

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

The Chemistry and Physics majors at SRJC match the lower-division requirements at Sonoma State University, UC Davis and UC Berkeley (the three most common transfer institutions for chemistry majors), as well as virtually all other CSU and UC campuses.

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

not applicable

## **5.11b Academic Standards**

The department monitors and discusses academic standards on a regular basis, through the evaluation process and curriculum updates. Student Learning Outcome

assessments are performed and discussed, and the results are used to maintain our high academic standards.

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

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
0000	ALL	01	00				
0001	ALL	01	01	Ensure proper levels of faculty and classified staffing.	Hire two additional full-time faculty members in Chemistry.	2019~2020	Hired Dr. Jesse Tamayo. Definitely could use another full-time chemistry faculty.
0002	Petaluma	01	01	Expand Chemistry and Physics programs in Petaluma	Offer Physics 1 in Petaluma. Eventually expand to other courses.	2016-2017	We have not been able to accomplish this. Need to have a better plan and communication with the Petaluma Dean. Financial support for lab equipment and additional classified staffing needed.
0003	ALL	08	06	more open and honest communications with two campuses and the two Deans	Work together to find solutions	next 3 years	I think we are working to accomplish this. We have a good relationship with the STEM Dean. We appreciate his leadership skill and trust him.
0004	ALL	03	05	More outreach	Encourage students (especially underrepresented group) to go into STEM field	ongoing	Actively participating in outreach programs. Have been participating in Lunafest (Petaluma) and Day Under the Oaks. Supported student clubs at North Bay Science Fair. One of us has been doing demos at Cali Calmecac, a Spanish immersion school in Windsor CA.
0005	ALL	01	01	complete SLOassessment	Course improvement	next three years	Both Chemistry and Physics program are working to assess SLO's. Both programs meet and discuss about course improvements frequently.



**6.2b PRPP Editor Feedback - Optional**

## 6.3a Annual Unit Plan

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
0000	ALL	01	00				
0001	ALL	03	05	Support BIPOC and other minority STEM students	Encourage students (especially underserved/underrepresented group) to go into STEM field	ongoing	financial support for equipment and materials. FLEX/PGI?
0001	ALL	01	01	Find ways to deal efficiently/effectively with the potential bottlenecks resulting from this COVID-19 pandemic	assist with student completion	next two years	financial support to offer more classes/labs
0001	ALL	03	04	Continue having honest (and perhaps uncomfortable) conversation about race at workplace and in class	Working together to find solutions toward a better workplace/society	ongoing	support and trust.
0001	ALL	01	07	hire retirement replacements	need to hire retirement replacement for a lab coordinator (CHEM) and a SLIA (physics)	2021~2022	
0002	ALL	08	06	more open and honest communications with two campuses and the two Deans	Work together to find solutions	ongoing	Support, trust, and transparency
0003	Petaluma	01	01	Offer more Physics courses in Petaluma.	Expand Chemistry and Physics programs in Petaluma	2022~	Financial support for lab equipment and additional classified staffing needed.
0004	ALL	01	01	Ensure proper levels of faculty and classified staffing.	Hire an additional full-time faculty members in Chemistry.	2021~	Financial support for hiring faculty members.
0005	ALL	01	01	complete SLO assessments	Course improvement	next three years	

