

Santa Rosa Junior College

Program Resource Planning Process

Chemistry and Physics 2022

1.1a Mission

I am personally hoping that the new department motto will be: "Teaching chemistry and physics is our passion; making the STEM field more diverse and inclusive is our 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.

Currently, the program is staffed by eight full-time and over ten associate (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 STNC 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. Prior to pandemic, One day a week, we offer night classes one day a week, and we plan to go back to doing so in the fall of 2022. For example, in the Fall 2022 semester, we are planning to offer classes from 7:30 am until 9:00 pm on Tuesdays. We also offer classes on Saturdays from 9:00 am until 3:00 pm. Eventually, we hope to start offering more night classes. We will start to offer more classes in the Petaluma campus as there now are two chemistry lab rooms. During the Fall 2022 semester, the program plans to offer two courses (9 sections total); we are planning to offer one section of Introductory General Chemistry (CHEM 42) and eight sections of General, Organic and Biological Chemistry (CHEM 60). 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.

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.

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. In fact, we are planning to offer PHYS 40 in Petaluma for dual enrollment students starting the Fall 2022 semester.

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.

We have recently been informed that the CCC/CSU TMC (Transfer Model Curriculum) for Chemistry may conform to the unit load for SRJC Chemistry classes (specifically Organic Chemistry, CHEM 12A/12B), so we are looking into the possibility that the department will offer AST chemistry degree 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 to the 2016-2017 academic year level.

CHEMISTRY

The significant cut to our 4000 and 5000 accounts has yet to be restored. Despite the demoralizing budget, we have been able to survive this academic year again, thanks to our fantastic lab coordinator (Bill Cusworth and now Milena Kalagorgevich) and also because we have only been offering in-person labs with the reduced number of students 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. And next academic year, as we will be offering all of the classes in-person at the pre-pandemic cap size, we will need to purchase more chemicals and supplies. While we have been able to make it work for this academic year (and the past five academic years), we need to emphasize that we can no longer operate at this budget. Inflation is evident in the cost of all supplies and chemicals. For example, the AirGas rental fees have gone up by 9-10%, and recently, we found out that the liquid nitrogen cost went up

from \$2.25/L to \$7.20/L, before taxes and hazmat fees. We are seeing about 10-30% increase in cost, and with the pandemic, inflation, increase in transportation costs, supply chain issues, and war, we anticipate that this will be the new normal for a while.

The chemistry program is quite frugal with our funds; we try to bid on every item we purchase, rather than only when it is required by purchasing regulations whenever we can. But, as mentioned above, we need to see our discretionary budget restored to the 2016-2017 academic year level to continue offering quality, meaningful labs and classes. We also 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 chemistry students. In addition, the lack of local industry employing chemistry and physics professionals requires us to travel to conferences for professional development and networking.

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	\$2,000.00	Annual site license required for ChemDraw Pro. Ongoing fee.
0002	ALL	02	01	\$70,000.00	restoration of chemistry budget to 2016~2017 level
0003	ALL	02	01	\$2,000.00	restoration of physics budget to 2016~2017 level
0004	ALL	02	04	\$5,000.00	Increase/restore staff travel budget for professional development activities.
0005	ALL	01	01	\$50.00	2YC3 (Two-Year College Chemistry Consortium) College Sponsorship
0006	ALL	02	02	\$6,000.00	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	11.00	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 (NOW vacant)

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	35.00	10.00	We currently have four student lab assistants in chemistry, totaling 35 hours a week

2.2d Adequacy and Effectiveness of Staffing

Currently, we have no administrative assistant for the Department of Chemistry & Physics. The District is aware of this, and 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. We have had two unsuccessful recruitings. And, given the increasing number of tasks required for this position, we are unsure of how this will work out.

CHEMISTRY

We have fantastic staff members in the chemistry program. In fact, we believe that we have the best stockroom personnels in all of the CCC's.

We currently have two fantastic staff members in the chemistry program - the amazing Milena Kalagorgevich is now our science lab coordinator (chemistry), and the magnificent Lisa Stagnoli has moved back to the Santa Rosa campus this week (Week of March 28th) as the SLIA for the Santa Rosa chemistry program. Bill Cusworth, to our dismay, has retired at the end of the 2021 calendar year.

With Bill's retirement and Lisa moving back up to the Santa Rosa campus, there is now a vacancy in the SLIA position at the Petaluma campus. THIS POSITION NEEDS TO BE FILLED IMMEDIATELY; the Petaluma chemistry program would not survive without a SLIA. And with addition of more sections, including offering one section of PHYS 40 for dual enrollment students in Petaluma, the Science Lab Instructional Assistant - Petaluma position needs be upgraded to a full-time SLIA position (40hrs/week, 11-12 months).

In addition, we are also requesting 5-6 student workers per semester (total of 50hrs per semester) for the 2022-2023 academic year at the Santa Rosa campus. We may need one or two at the Petaluma campus for the 2022-2023 academic year as well. We need their assistance to be able to successfully offer all of the sections we hope to offer during the 2022-2023 academic year.

PHYSICS

We request that the full-time Science Lab Instructional Assistant (SLIA) 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	Petaluma	02	01	Science Lab Instruc Asst, (25 hrs/wk, 11 mo) - Pet	Science Lab Instruc Asst (40 hrs/wk, 12 mo) - Peta	Classified
0002	Santa Rosa	02	01	Student lab workers		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)	There are eight contract faculty members in our program. This number, however, is somewhat misleading. Our effective FT number is about 6.3 as one member of our program is on Early Retirement Reduced Load (50%), another has significant release time for AFA duties (80%), and a third member has department chair release time (40.33%).
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 (2021~2022 academic year)	7.0700	53.8000	4.2700	46.1800	Of the eight full-time faculty members, three have reduced teaching loads for a variety of reasons.
Physics (2021~2022 academic year)	4.0000	84.0000	5.4700	16.0000	The physics program has four FT faculty members and three associate faculty members.

2.3c Faculty Within Retirement Range

We have two possible impending retirements in the next few years - one in chemistry and one in physics. Another faculty member in chemistry is considering retiring within 5 years.

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

PHYSICS

In the Physics program, we presently have three full-time faculty members.

The physics program requests the District to consider adding another full-time physics faculty position. Maintaining an adequate number of full-time faculty is essential to the function of the physics transfer program and the success of all STEM majors. Starting this upcoming Fall semester, we plan to offer one section of PHYS 40 every semester in Petaluma for dual-enrollment students. However, with the possibility that one of our FT physics instructors will be retiring soon, there would be a staffing issue. We would need to rely on the associate faculty instructors to offer all necessary classes, but unfortunately, attracting and keeping high-quality associate instructors has proven challenging. There is a lack of industry in the area that employs physicists, and there are also no schools nearby that offer graduate programs in physics. Additionally, the associate faculty members are not required to perform college service, and they cannot be expected to contribute to the other aspects of running a successful physics program. To maintain continuity to fulfill department/program responsibilities and support our program's vision and goals, we need to keep the current number of full-time faculty physics instructors.

Text of Fall 2022 Faculty Staffing Request

Criteria #1: Program Need

The Chemistry and Physics Department appreciates and embraces the rewards of a diverse and inclusive learning/working environment. We are deeply committed to excellence in education and thus to providing a safe, welcoming, and collegial environment conducive to collaborative working and learning. We strive to prepare our students for pursuing successful STEM careers. In that effort, we utilize modern equipment in the physics lab and provide the students with a variety of experiments where they apply concepts to real world problems and learn and develop relevant analytical skills.

One of our primary missions is to support our current STEM students and increase the number of underrepresented STEM students. To assist this goal, we

need to hire a replacement for a physics faculty member that suddenly retired before the beginning of the Fall 2022 semester. Ideally, the new hire would expand the groups of students that our faculty can be role models for and help us reach a wider range of students.

We need to hire a replacement to operate under optimal strength. Currently, there are 3 contract physics faculty members, which is not enough to cover the schedule demands. Because of the sudden retirement, each contract faculty member took on additional load this semester. From the total load of 4.34 FTEF, 0.40 FTE is taught by associate faculty, and the rest is split among the three contract faculty members. We are committed to making it work, but this arrangement is not sustainable. The total load for SPRING 2023 is 4.94 FTE, with several sections unstaffed.

Criteria #2: Student & Staffing Need

Maintaining an adequate number of full-time faculty is essential to the success of all STEM majors. While there has been a small decline in the FTES/FTEF ratio over the past few years, the ratio is comparable to the STEM Cluster average for both Spring 2021 and Fall 2021. However, that was before the unexpected reduction of Physics FTF from four to three just before the Fall 2022 semester. In addition, at the end of Fall 2021 a long time, reliable, associate faculty member retired.

We need an FTF replacement so we can meet the department's and the students' needs. Physics is a fundamental science, and completion of a number of physics courses is required for transfer for all STEM majors. The above mentioned 4.94 FTE load can't be covered by three contract faculty members. Although we have actively searched for and recently recruited several new associate faculty members, their availability is very limited. Recruiting new high-quality associate faculty has proven to be a challenge due to a lack of industry in the area that employs physicists.

In addition, the associate faculty members are not required to perform college service, and we cannot expect them to contribute to the other aspects of running a successful Physics program such as mentoring, outreach, and club advising. To maintain continuity to fulfill department/program responsibilities and to support our program's vision and goals, we need a fourth full-time physics faculty member.

Criteria #3: Student Equity Need

Providing an inclusive, safe learning atmosphere is and will always be one of the primary goals for the members of the department. We believe we've been making small but significant improvements. For example, there has been an increase in Latinx students in the Physics program. While this is encouraging, we could and need to do much better.

For the new FTF position, we want to find a qualified candidate who shares our passion for equity in STEM. Ideally, the new FT hire will be someone who can expand the diversity of

underrepresented STEM students for which SRJC physics faculty can be a role model and who will work with current faculty to continue to improve the learning experience for all students studying physics at SRJC.

Furthermore, if the position is approved, it will allow the Physics program to offer physics courses in Petaluma, expanding the range of students we are able to reach.

Criteria #4: Societal Priorities

Science and technology have direct impacts on almost every aspect of our daily lives, and according to an AAAS report titled “STEM and the American Workforce,” it was reported that STEM supports two-thirds of US jobs, 69% of the U.S. GDP and \$2.3 trillion in annual federal tax revenue. And according to the U.S. Bureau of Labor Statistics (BLS), occupations in the STEM field are expected to grow 8.0 percent by 2029, compared with 3.7 percent for all occupations. However, some believe that there might not be enough in the field to fill these jobs.

As mentioned in the previous sections, a new FT position would help us to offer a more inclusive learning environment and to find ways to increase diversity in STEM. In this ever-changing world, it is important for the members of the STEM community to represent the diversity of the society that we live in. Having a wide range of experiences and perspectives benefits everyone.

2.3e Faculty Staffing Requests

Rank	Location	SP	M	Discipline	SLO Assessment Rationale
0001	Santa Rosa	02	01	Physics	Maintaining a high quality of instruction to meet the SLOs for the physics 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/PHYSICS

Justification for items on the Instructional Equipment Request spreadsheet:

Item #1 Vibration Isolation Table: \$5k. The table will provide vibration isolation for our Atomic Force Microscope (purchased with 2021~2022 IELM - thank you!).

Item #2 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 other courses such as Chem 3AL, given the newer technology now available.

Item #3 - SmartBoard in PC 103. REMOVED DUE TO ITG FUNDING.

Item #4 - The EDX system in an SEM provides information about the elemental and chemical composition of a sample, pixel-by-pixel. The add-on will be used in collaboration among the Physics, Chemistry and Material Science faculty for the sample characterization, with 20nm-resolution. Many STEM students join the workforce in local industries that utilize analytic instruments, including the SEM equipment with EDX. The expanded system at SRJC will provide training to the students, improving their qualifications and preparedness for the local industries. At SRJC, students will learn how to interpret the fluorescence peaks for the sample identification, and specifically how the analysis relates to identifying contaminants and second-phase transitions in fracture analysis.

Item #5 Analytical Balances in PC 103. Having extra analytical balances will allow Petaluma chemistry students to have better lab exposure.

Item #6 (X-ray Fluorescence Analyzer) -A desktop X-Ray Fluorescence Analyzer 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 rapidly becoming the industry standard for elemental analysis, and it will be used in various courses, including CHEM 100.

Item 7 (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 #8 - Low voltage Direct Current power supplies are used for half of the laboratory experiments in PHYS 42 and PHYS 20B. We need to replace several of the old ones that are not functioning properly.

Item #9 - Several physics labs involve measurements of inductance (L), capacitance (C), and resistance (R). We currently own only one LCR meter that is old and is showing signs of wear. It would be helpful to have several LCR meters for students to share during one lab period.

Item #10 - The High Voltage Power Supply serves to heat up the cathode in the Thompson's Cathode Ray Tube, which is used for several classic physics laboratory experiments. The lab equipment is essential for student learning. We have 3 of these supplies that are malfunctioning and need to replace them.

Item #11 - The 500-V Direct Current power supply provides a range of voltages for a number of laboratory experiments in PHYS 42 and PHYS 20B. We need to replace several that are not functioning properly. The equipment has direct impact on student learning.

Item #12 - Hotplate/Magnetic Stirrer - Hot plates/magnetic stirrer are often used in the laboratory to carry out chemical reaction, to heat samples, and to stir the reaction mixture. We need to replace 30 of them.

Item #13 - Polarimeter - Stereochemistry is an important topic in organic chemistry, and it deals with the study of three-dimensional structure of molecules. It is of critical importance as, for example, the shape of a drug molecule is an important factor in how it interacts with receptors and other biological molecules in the body. Polarimeter is a necessary instrument to teach students about stereochemistry.

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

In the physics program, we need the vibration isolation table (#1) to be able to fully use the recently purchased instruments. For the chemistry program, replacing the AA (which is on life-support) with Microwave Plasma Atomic Emissions Spectrometer (#2) is the highest priority.

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. While most of our equipment is specialized (and thus sharing is unlikely), we would be happy to share our equipments with other programs if they can find uses for them.

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.

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	Vibration Isolation Table	1	\$5,000.00	\$5,000.00	Masanori Iimura	Lindley Center/Lark	Saska Gjorgjievska
0002	Santa Rosa	01	01	Microwave Plasma Atomic Emission Spectrometer	1	\$56,000.00	\$56,000.00	Masanori Iimura	Bech Hall	Milena Kalagorgevich
0004	Santa Rosa	01	01	Energy Dispersive X-ray detection system for elemental analysis (add-on for the JEOLSEM)	1	\$50,000.00	\$50,000.00	Masanori Iimura	Lark	Jan Kmetko
0005	Petaluma	01	01	analytical balances	3	\$2,800.00	\$6,400.00	Masanori Iimura	PC103	Masanori Iimura
0006	Santa Rosa	01	01	X-Ray Fluorescence Analyzer desktop	1	\$32,000.00	\$70,000.00	Masanori Iimura	Bech Hall	Milena Kalagorgevich
0007	Santa Rosa	01	01	High-Performance Liquid Chromatography Columns	3	\$1,000.00	\$3,000.00	Masanori Iimura	Bech Hall	Milena Kalagorgevich
0008	Santa Rosa	01	01	DC Power Supplies	4	\$198.00	\$792.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0009	Santa Rosa	01	01	LCR Meters	4	\$253.00	\$1,012.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0010	Santa Rosa	01	01	HV Power Supplies	3	\$903.00	\$2,709.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0011	Santa Rosa	01	01	500-Volts DC Power Supplies	3	\$880.00	\$2,640.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0012	Santa Rosa	01	01	Hotplate/magnetic stirrer (PC-420D)	30	\$900.00	\$27,000.00	Masanori Iimura	Bech Hall	Masanori Iimura
0013	Santa Rosa	01	01	Polarimeter	1	\$30,000.00	\$30,000.00	Masanori Iimura	Bech Hall	Masanori Iimura
0014	Santa Rosa	01	01	Rotary Evaporatory and Vacuum Pump	1	\$6,500.00	\$6,500.00	Masanori Iimura	Bech Hall	Milena Kalagorgevich

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 Imura	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. There are no student restrooms in the building. Student restrooms are needed.

- The building has no air conditioning outside of the lecture halls, and because of noise from the construction of the Lindley center, we cannot open the building doors. 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, 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 now are two Chemistry laboratory classrooms, and we can start to offer 8~9 sections of chemistry courses in Petaluma. However, 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 old 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.

In addition to PHYS 11, we will start to offer PHYS 40 for dual-enrollment students in Petaluma starting this fall.

3.1 Academic Quality

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 Student Success and Support

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 Responsiveness to Our Community

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 Campus Climate and Culture

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

4.1a Course Student Learning Outcomes Assessment

CHEMISTRY

The Chemistry Program is in year 6 of its current assessment cycle (started in Fall 2016). We are a little behind on the assessment (only completed 19 of the 40 available SLO's) 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

	Available SLO's	SLOs assessed since Fall 2016	Done Until Fall 2022
Chem 3A/3AL	6	4	NO
Chem 3B	5	3	NO
Chem 12A	5	5	YES
Chem 12B	2	2	YES
Chem 42	4	4	NO
Chem 60	4	3	NO
Chem 8	4	0	NO
Chem 100	3	1	NO

PHYSICS

The physics program is in Year 3 of its current assessment cycle (started in Fall 2018), and it has completed 26 of the 30 available SLO's.

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	3	4	NO
PHYS 11	2	2	YES
PHYS 20A	2	2	YES
PHYS 20B	3	3	YES
PHYS 7	0	3	NO
PHYS 40	4	4	YES
PHYS 41	4	4	YES
PHYS 42	4	4	YES
PHYS 43	3	3	YES

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 (department total) (X20, F20, S21, X21, and F21 are the COVID-pandemic semesters)**

Semester	Headcount
X18	173
F18	1223
S19	1148
X19	165
F19	1247
S20	1121
X20	18
F20	591
S21	567
X21	90
F21	656

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)

Disc	X2018	F2018	S2019	X2019	F2019	S2020	X2020*	F2020*	S2021*	X2021*	F2021*
Chemistry	98.6%	103.2%	103.3%	106.3%	109.7%	101.6%	0.0%	92.3%	101.3%	99.2%	95.9%

*COVID-19 Pandemic

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	X2018	F2018	S2019	X2019	F2019	S2020	X2020*	F2020*	S2021*	X2021*	F2021*
Physics	92.5%	84.7%	92.0%	111.7%	89.1%	83.0%	66.7%	93.8%	91.5%	73.2%	76.7%

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 for Chemistry

Disc	X2018	F2018	S2019	X2019	F2019	S2020	X2020*	F2020*	S2021*	X2021*	F2021*
Santa Rosa	25.3	24.1	23.7	26.5	25.9	24.1	0.0	19.8	24.4	16.3	17.4
Petaluma	20.5	24.6	25.1	23.5	24.8	22.6	0.0	19.0	26.0	0.0	11.8

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 may be flawed. See the explanation above).

	X2018	F2018	S2019	X2019	F2019	S2020	X2020*	F2020*	S2021*	X2021*	F2021*
Santa Rosa	18.5	21.3	19.1	22.3	22.3	17.8	16.0	20.9	15.3	20.5	12.9
Petaluma	0.0	12.0	0.0	0.0	14.0	8.0	0.0	17.0	18.0	0.0	0.00

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

	X2018	F2018	S2019	X2019	F2019	S2020	X2020*	F2020*	S2021*	X2021*	F2021*
FTES/FTEF	13.65	16.62	16.79	12.66	17.97	16.67	0.00	8.96	12.71	7.76	8.62

*COVID-19 Pandemic

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

	X2018	F2018	S2019	X2019	F2019	S2020	X2020*	F2020*	S2021*	X2021*	F2021*
FTEs/FTEF	11.30	15.18	15.19	13.42	15.31	14.44	8.00	12.74	12.71	9.83	9.67

*COVID-19 Pandemic

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's 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	F2018	S2019	X2019	F2019	S2020	X2020	F2020	S2021	X2021	F2021
Reten	79.1%	81.5%	89.1%	80.0%	76.3%	100.0%	75.2%	78.6%	0.0%	80.6%
Comp	73.0%	76.0%	87.1%	72.4%	73.2%	100.0%	73.0%	74.3%	0.0%	77.1%
GPA	2.97	2.74	2.78	3.07	2.69	2.91	4.00	3.01	3.17	0.00

PHYSICS

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

Semester	F2018	S2019	X2019	F2019	S2020	X2020	F2020	S2021	X2021	F2021
Reten	81.5%	83.9%	89.6%	76.6%	79.2%	100.0%	80.3%	80.2%	0.0%	74.2%
Comp	79.6%	81.1%	86.6%	73.1%	78.5%	100.0%	78.2%	77.1%	0.0%	70.8%
GPA	3.00	2.87	3.04	2.71	3.11	2.47	3.12	2.99	0.00	2.75

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

TCHEMISTRY

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	2018-19	2019-20	2020-21	2021-22
White	44.3%	36.3%	38.1%	41.7%
Asian	6.3%	7.5%	7.0%	4.5%
Black	1.9%	1.9%	2.2%	1.8%
Hispanic	34.2%	37.7%	34.7%	38.5%
Native American	0.4%	0.3%	0.8%	0.5%
Pacific Islander	0.1%	0.1%	0.4%	0.1%
Filipino	1.3%	1.0%	1.4%	1.1%
Other Non White	5.0%	4.8%	6.3%	4.9%
Decline to State	6.5%	10.6%	9.1%	6.9%
Total	100.0%	100.0%	100.0%	100.0%

Gender	2018-19	2019-20	2020-21	2021-22
Male	39.6%	41.5%	41.7%	43.8%
Female	58.4%	56.2%	56.5%	54.5%
Unknown	2.0%	2.3%	1.8%	1.7%
Total	100%	100%	100%	100%

Age Range	2018-19	Percent	2019-20	Percent	2020-21	Percent	2021-22	Percent
0 thru 18	254	14.8%	317	18.9%	96	12.6%	149	11.9%
19 and 20	587	34.3%	579	34.6%	256	33.6%	481	38.3%
21 thru 25	491	28.7%	424	25.3%	240	31.5%	364	29.0%
26 thru 30	195	11.4%	189	11.3%	81	10.6%	121	9.6%
31 thru 35	93	5.4%	64	3.8%	48	6.3%	72	5.7%
36 thru 40	45	2.6%	51	3.0%	21	2.8%	29	2.3%
41 thru 45	25	1.5%	29	1.7%	10	1.3%	23	1.8%

46 thru 50	13	0.8%	13	0.8%	5	0.7%	6	0.5%
51 thru 60	8	0.5%	7	0.4%	4	0.5%	8	0.6%
61 plus	0	0.0%	0	0.0%	0	0.0%	4	0.3%
ALL Ages	1711	100.00%	1673	100.00%	761	100.00%	1257	100.00%

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	2018-19	2019-20	2020-21	2021-22
White	43.2%	37.1%	45.0%	35.6%
Asian	11.4%	8.4%	8.0%	8.2%
Black	2.1%	2.0%	1.9%	2.4%
Hispanic	26.0%	32.9%	28.4%	34.9%
Native American	0.0%	1.0%	0.3%	0.5%
Pacific Islander	0.0%	0.0%	0.3%	0.2%
Filipino	0.9%	0.9%	0.5%	0.7%
Other Non White	8.7%	5.8%	6.7%	6.7%
Decline to State	7.6%	11.8%	8.8%	10.7%
Total	100.0%	100.0%	100.0%	100.0%

Gender	2018-19	2019-20	2020-21	2021-22
Male	63.8%	62.6%	63.9%	70.0%
Female	32.9%	35.3%	33.7%	29.1%
Unknown	3.3%	2.1%	2.4%	0.9%
Total	100%	100%	100%	100%

Age Range	2018-19	Percent	2019-20	Percent	2020-21	Percent	2021-22	Percent
0 thru 18	110	13.5%	125	15.5%	87	13.9%	68	12.4%
19 and 20	273	33.5%	280	34.8%	220	35.3%	207	37.6%
21 thru 25	299	36.7%	284	35.3%	197	31.6%	182	33.1%
26 thru 30	85	10.4%	64	8.0%	64	10.3%	45	8.2%
31 thru 35	28	3.4%	29	3.6%	29	4.6%	27	4.9%
36 thru 40	15	1.8%	15	1.9%	15	2.4%	6	1.1%
41 thru 45	2	0.2%	3	0.4%	6	1.0%	7	1.3%
46 thru 50	1	0.1%	3	0.4%	2	0.3%	5	0.9%
51 thru 60	1	0.1%	1	0.1%	0	0.0%	0	0.0%
61 plus	0	0.0%	1	0.1%	4	0.6%	3	0.5%
ALL Ages	814	100.0%	805	100.0%	624	100.0%	550	100.0%

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
0001	ALL	03	05	Support BIPOC and other minority STEM students	Encourage students (especially underserved/underrepresented group) to go into STEM field	ongoing	Some members of the department are starting to identify courses where BIPOC students need more help.
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	We are working with the District and STEM dean to offer more classes. And be more flexible with the schedule.
0001	ALL	03	04	Continue having honest (and perhaps uncomfortable) conversations about race at workplace and in class	Working together to find solutions toward a better workplace/society	ongoing	We are starting to have difficult uncomfortable conversations in dept meeting to address this. We support and trust each other.
0001	ALL	01	07	hire retirement replacements	need to hire retirement replacement for a lab coordinator (CHEM) and a SLIA (physics)	2021~2022	We have filled the chem lab coordinator position, but that left an opening in SLIA Petaluma position. Need to hire one immediately. Also still need to hire a replacement for Physics SLIA.
0002	ALL	08	06	more open and honest communications with two campuses and the two Deans	Work together to find solutions	ongoing	we are starting to communicate more with Petaluma. But definitely need to do a better job.
0003	Petaluma	01	01	Offer more Physics courses in Petaluma.	Expand Chemistry and Physics programs in Petaluma	2022~	We are starting to offer more sections of chemistry in Petaluma, and we will be offering PHYS 40 for dual-enrollment students starting Fall 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~	We have completed the FT CHEM hiring interviews in early March.
0005	ALL	01	01	complete SLO assessments	Course improvement	next three years	We have completed 19 out of 40 SLO's in chemistry and 26 out of 30 SLO's in Physics. We should have done more.

6.2b PRPP Editor Feedback - Optional

6.3a Annual Unit Plan

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
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. Will work closely with HSI-STEM grant. (One of us is the STEM faculty coordinator for the HSI-STEM grant)
0001	ALL	01	01	Find ways to deal efficiently/effectively with the potential bottlenecks resulting from this COVID-19 pandemic	assist with student completion	ongoing	financial support to offer more classes/labs. Need to find ways to be more flexible with schedule. Definitely need the SLIA-Petaluma position and the PHYS SLIA position to be filled.
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. The members of the CHEM/PHYS work together well. We know that this needs to happen to initiate real and substantive changes in our department.
0001	ALL	01	07	hire a retirement replacement for PHYS-SLIA	need to hire retirement replacement for a PHYSICS SLIA. Without this position, the physics program would suffer.	immediately	we need to hire someone for this position immediately, or the physics program would be hurting. Money - if we can make this position a full-time 100 % position, it would be more attractive.
0001	Petaluma	01	07	hire a CHEM SLIA-Petaluma	need to hire someone to fill the vacancy in the CHEM-SLIA Petaluma position. If this position does not get filled, we would not be able to successfully offer classes in Petaluma	immediately	Money. If this is a FT position, it would make it more attractive.
0001	ALL	06	04	more open communication with the dept associate faculty members	to have more meaningful conversations with our amazing associate faculty members and assist them.	ongoing	Time. Would like to offer department chair office hour to have meetings with the associate faculty members
0001	Santa Rosa	04	07	plan for move to the Lindley Center during the summer of 2023	we need to start planning for our move to the Lindley Center. And start thinking about other summer activities. Summer classes?	this year (need to start soon)	Money, time, understanding
0001	ALL	06	04	Breathe and recharge	many of us are burned out. Need to do something different (and fun!) as a department to take a break and recharge before the next academic year	Summer 2022 (before Fall 2022)	money and time

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
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.
0003	ALL	01	01	start offering more evening sections	offer more evening sections to help students	2022~	time and money (need to pay staff OT hours/time differential)
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	time and money.