

Santa Rosa Junior College

Program Resource Planning Process

Chemistry and Physics 2023

1.1a Mission

During this (2022-2023) academic year, the SRJC Chemistry and Physics Department members worked on drafting a newly updated department mission statement. The following is the new department mission statement: “The Department of Chemistry & Physics at Santa Rosa Junior College is committed to creating an environment that is welcoming, supportive, mutually respectful to all, and is free from the barriers that have traditionally discouraged certain groups from full participation in our fields. We strive for excellence not only in teaching, but also in helping our students maximize their potential to succeed.” This statement will be posted on our department website and will be shared on our class syllabi.

CHEMISTRY

The mission of the Chemistry program will continue to be to provide a comprehensive program for general education, transfer, and career and technical education students and to engage in inclusive 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. We strive to share our passion and knowledge of chemistry with our students in a safe, inclusive, intellectually stimulating environment.

PHYSICS

The primary mission of the Physics program is to offer the physics coursework and 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 activities.

1.1b Mission Alignment

The mission and goals of the SRJC Chemistry and Physics Department align directly with the mission, vision, and values of Santa Rosa Junior College. Specifically, by offering exceptional teaching, we focus on preparing students for STEM transfer and CTE disciplines that require chemistry and/or physics.

Chemistry:

In terms of Strategic Planning Goals, some of the ways the Chemistry program is directly involved are the following:

1. We foster academic excellence and maximize education learning outcomes by offering rigorous, relevant, and up-to-date curricula.
2. We hire and mentor outstanding faculty.
3. We strive to serve our diverse community through our program by creating a safe, inclusive, intellectually stimulating learning environment.
4. We contribute toward a culture of sustainability by being aware of our program's impact on the environment and choosing responsible and sustainable practices and experiments.

PHYSICS

The Physics program offers lower division academic coursework, which builds the knowledge and skills of our transfer and general education students. The program also provides support services targeted to STEM students to improve student success and professional development.

The Physics program strives to participate in the district's college initiatives. Some of these ways include:

1. The program faculty represents the college in many community and professional organizations and works to improve K-16 articulation.
2. The Physics faculty members have developed SLO's for our department's majors and all of our department's classes.

1.1c Description

Currently, the Chemistry Program is housed in Bech Hall, while the Physics Program uses two different buildings – Analy Hall for the physics faculty offices and two rooms in Lark Hall (one for lectures and the other for the labs).

We will soon be moving to the Lindley Center for STEM Education. The Chemistry classrooms and labs will be on the 3rd floor, while the physics labs and classrooms will be on the 2nd floor. This will be the first time both programs will be housed in the same building, and we look forward to a better collaborating environment. We are also excited that MESA (Math Engineering Science Achievement) will be housed in Lindley Center as the Chemistry & Physics department has worked very closely with MESA for many years to develop programs to attract and retain students who are from the underrepresented populations, backgrounds that place them at a disadvantage, or with economic challenges.

We believe that the partnership has been very successful in maintaining and growing support activities in the face of diminishing department resources. The department also supports MESA's research poster projects related to the chemistry and physics disciplines.

Both programs are proud to host a wide range of excellent auxiliary services to enrich our students' academic and professional development. For example, both the Physics and Chemistry programs coordinate student participation in clubs such as the SRJC Chemistry Club, Physics Club, the Women in Science and Engineering (WISE) Club, and with the cooperation of the Engineering program, the Engineering Club (TEC).

Our department is interested in serving our community. For example, we regularly do middle school outreach programs, host high school science class tours, and participate in professional organizations. We also participate in the North Bay Science Discovery Day. In addition, we are interested in offering community education courses, conference presentations, and participation in professional organizations.

CHEMISTRY

Currently, the Chemistry Program is staffed by nine full-time and over seven associate instructors with great enthusiasm for teaching. Two of the full-time faculty members are now at the Petaluma campus. 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, GC-MS, 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. And high standards for environmental health and safety are diligently maintained.

PHYSICS

Currently, there are three full-time and three associate faculty members in the Physics Program who are all passionate educators. And the Physics Program is assisted by a Physics SLIA. 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, AS degree in Physics is offered. We also offer courses to fulfill general education requirements and self-enrichment goals, although recent schedule reductions have 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.

1.1d Hours of Office Operation and Service by Location

CHEMISTRY

While we are not back to the pre-pandemic level, the Chemistry Program is back to offering more classes. At the Santa Rosa campus, the chemistry program typically offers classes from 7:30 am until 6:00 pm Mondays thru Thursdays, and we are starting to offer classes on Fridays as well. In addition, one day a week, typically on Tuesdays, we offer evening/night classes one day a week. We also offer classes on Saturdays from 9:00 am until 3:00 pm. At the Petaluma campus, we are also beginning to offer more classes now that there are two chemistry labs.

We plan to offer more evening/night courses starting the next academic year. For example, during the upcoming fall semester (Fall 23), we will offer CHEM 42, CHEM 60, and CHEM 3AL on Tuesday and Thursday evenings/nights. We will also offer an evening CHEM 42 at the Petaluma

campus. 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 to the evening. Moving into the Lindley Center will allow us to be more flexible with our schedule and offerings. Also, as more science and math classes are offered in Petaluma, the Physics program recognizes the need to offer more physics classes at the 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. For example, our CHEM 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.

There is a possibility that the department will offer an AST Chemistry degree in the future now 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). In addition, the program is aware that the cannabis industry may bring more opportunities for Sonoma County residents, and some members of the Chemistry Program are starting to think about offering training in this innovative field.

PHYSICS

The physics program is also 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 interested in programs such as biology, physical therapy, and kinesiology.

2.1a Budget Needs

Both the chemistry and physics programs need to see our discretionary budget increased significantly or at least restored to the 2016~2017 academic year level. We can no longer operate at the current budget.

CHEMISTRY

The significant cut to our 4000 and 5000 accounts has yet to be restored, and we have been working with a demoralizing budget level. Despite the fantastic efforts of our amazing lab coordinator (Milena Kalagorgevich), we will most likely be in the red by the end of this academic year cycle. As mentioned before, inflation is evident in the cost of all supplies and chemicals. For example, the Air Gas rental fees have increased by 9~10%, and the liquid nitrogen cost went up from \$2.25/L to \$12/L before taxes and hazmat fees (With taxes and hazmat fees, the price is around \$17/L.) We are seeing, on average, about a 25~30% increase in price, which we anticipate is the new normal.

The chemistry program has been quite frugal with our funds; we look for the lowest price on nearly 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. Also, with the upcoming move, we will need to replenish reagents that we had to get rid of due to expiration. 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 and to stay current.

PHYSICS

The physics program is struggling to survive on the allocated annual budget; 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 support our 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
0000	ALL	00	00	\$0.00	
0001	ALL	04	01	\$2,500.00	Annual site license required for ChemDraw Pro. Ongoing fee.
0002	ALL	02	01	\$80,000.00	or restoration of chemistry budget to 2016~2017 level
0003	ALL	02	01	\$4,000.00	or restoration of physics budget to 2016~2017 level
0004	ALL	02	04	\$10,000.00	Increase/restore staff travel budget for professional development activities.
0005	ALL	02	02	\$8,000.00	Restore grader budget
0006	ALL	01	01	\$50.00	2YC3 (Two-Year College Chemistry Consortium) College Sponsorship
0007	ALL	02	01	\$3,000.00	Student employees: Support 150 hours of work

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 (Currently 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	55.00	10.00	We currently have four student lab assistants in chemistry, totaling 55 hours a week. Unfortunately, this is not enough.

2.2d Adequacy and Effectiveness of Staffing

There is 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 AAI for the STEM lab departments, meaning this is a shared AAI position between the biology, chemistry & physics, and earth & space science departments. Unfortunately, we are all housed in different buildings. Also, given the increasing number of tasks required for this position, we are unsure how this will work out.

CHEMISTRY

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 is the SLIA for the Santa Rosa campus. We strongly believe that we have the best stockroom in all of the CCCs.

There is currently a vacancy in the SLIA position at the Petaluma campus. The District understands the importance of this position, and we are now hiring one. With the increase in offering at the Petaluma campus, the Petaluma chemistry program cannot survive without a SLIA. We would, however, like this position to be upgraded to a full-time SLIA position in the future. ~~And with the 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 to 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 (a total of 150 hrs per week per semester) for the 2023~2024 academic year at the Santa Rosa campus. With the upcoming move, the stockroom needs as much help as possible; we need student assistance to successfully offer all of the sections we hope to offer during the 2023~2024 academic year. We may also need one or two student workers at the Petaluma campus moving forward.

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	Physics Science Lab Instruc Asst, 100% (11 mo)	Coordinator, Science Labs, Physics, 100% (12 mo)	Classified
0003	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 (9)	There are nine contract faculty members in our program. This number, however, is somewhat misleading. Our effective FT number is about 7.3 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%).
Full Time Physics Instructor (3)	The physics program currently has three full-time instructors.

2.3b Full-Time and Part-Time Ratios

Discipline	FTEF Reg	% Reg Load	FTEF Adj	% Adj Load	Description
~	0.0000	0.0000	0.0000	0.0000	
Chemistry (2022~2023 academic year)	15.1400	60.6800	9.8100	39.3200	Of the ninefull-time faculty members, three have reduced teaching loads for a variety of reasons.
Physics(2022~2023 academic year)	7.8700	81.3900	1.8000	18.6100	The physics program has three 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 in the chemistry program. One will be retiring at the end of the F23 semester (on reduced load), and another chemistry faculty member is considering retiring in the next three years. We also had an unexpected retirement in the physics program during summer of 2022, and this position has not been filled.

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

We are requesting two full-time faculty members (one in physics and one in chemistry) for the department.

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. We have lost one full-time faculty position; one faculty member retired and was not replaced. We 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.

For the Chemistry Program -

The Chemistry program appreciates and embraces the rewards of a diverse, inclusive, healthy learning and working atmosphere. We are proud of our deep commitment to excellence in education, and we are committed to providing a learning environment that is warm, safe, and collegial, where we all work together cooperatively and collaboratively. To teach and prepare students for a diverse and constantly changing world, modern (and well-maintained) instrumentations are utilized in our Chemistry lab classes.

Currently, there are nine contract faculty members in our program. This number, however, is somewhat misleading. Our effective FT number is 7.6, 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%). In addition, one of our colleagues, Prof. Tatjana Omrcen, is retiring at the end of the Fall 2023 semester, and we are asking for a retirement replacement position. We need the replacement position to operate at our maximum strength.

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. While there has been a slight decline in the FTES/FTEF ratio over the past few years, there continues to be high demand for many

Chemistry courses. Most of the CHEM 42, 60, and 3A/3AL sections close during priority enrolment, and students' demand certainly warrants additional sections. As multiple chemistry courses are required or prerequisites for other STEM and allied-health majors, not offering enough sections will have severe and catastrophic consequences on students. We have been relying heavily on our part-time faculty members to offer as many sections as possible. There are eight associate instructors, as many of our associate faculty members have retired, and the FT-to-PT ratio is near 60:40 . This ratio is far smaller than the recommended 75:25 FT: PT ratio by the American Chemical Society. We will continue to depend on our fantastic adjunct faculty instructors as necessary. Unfortunately, attracting high-quality part-time faculty like our current ones has proven challenging due to a lack of industry in the area that employs chemists. In addition, the part-time faculty members are not required to perform college service, and we cannot expect them to contribute to the other aspects of running a successful Chemistry program. Also, some of our current part-time instructors are approaching retirement age. To maintain continuity to fulfill department/program responsibilities, and to support our program's vision and goals, we need the retirement replacement FT faculty member.

3. 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 a small but significant improvement. For example, there has been an increase in Latinx students in our Chemistry program. While this is encouraging, we could and need to do much better. One of our primary missions for the foreseeable future is to assist and increase the number of underrepresented students in the STEM field. We will actively seek candidates who share our passion for promoting diversity and inclusion in the STEM discipline. For the new FT hire, we will look for a most qualified candidate who shares our passion for equity in STEM. The new FT hire will be someone who will be a role model for underrepresented STEM students and work with current department members to improve equity and diversity in STEM.

4. Science and technology have direct impacts on almost every aspect of our daily lives, and according to the AAAS report titled "STEM and the American Workforce," it was reported that STEM supports two-thirds of US jobs, 69% of 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 retirement replacement position is crucial to offer more courses and offer inclusive learning environments to find ways to increase diversity in STEM. In this ever-changing world, it is important for the members of the STEM field to represent the diversity of the society that we live in. Having a wide range of experiences and perspectives can benefit everyone.

2.3e Faculty Staffing Requests

Rank	Location	SP	M	Discipline	SLO Assessment Rationale
0001	Santa Rosa	02	01	Chemistry	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. While there has been a slight decline in the FTES/FTEF ratio over the past few years, there continues to be high demand for many Chemistry courses. Most of the CHEM 42, 60, and 3A/3AL sections close during priority enrolment, and students' demand certainly warrants additional sections. As multiple chemistry courses are required or prerequisites for other STEM and allied-health majors, not offering enough sections will have severe and catastrophic consequences on students. We have been relying heavily on our part-time faculty members to offer as many sections as possible. There are eight associate instructors, as many of our associate faculty members have retired, and the FT-to-PT ratio is near 60:40 . This ratio is far smaller than the recommended 75:25 FT: PT ratio by the American Chemical Society. We will continue to depend on our fantastic adjunct faculty instructors as necessary. Unfortunately, attracting high-quality part-time faculty like our current ones has proven challenging due to a lack of industry in the area that employs chemists. In addition, the part-time faculty members are not required to perform college service, and we cannot expect them to contribute to the other aspects of running a successful Chemistry program. Also, some of our current part-time instructors are approaching retirement age. To maintain continuity to fulfill department/program responsibilities, and to support our program's vision and goals, we need the retirement replacement FT faculty member.
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 (need to update)

Justification for items on the Instructional Equipment Request spreadsheet:

Item #1 Coulomb's Law Apparatus. Classic and versatile physics experiment. Through careful explorational setup, the students can study the dependence of electric force on distance and charge. It can be used for simple experiments as well as for more advanced experiments where the students can study the deviations from the expected theoretical calculations.

Item #2 - Periodic Tables. Periodic tables are must-haves in chemistry classrooms and labs. As we move to the new building with classrooms and five labs, we want to furnish them with updated, big periodic tables.

Item #3 - Photoelectric Effect Apparatus. Students can experiment to confirm Einstein's theory that light behaves like particles when interacts with matter and can collect data to experimentally determine Planck's constant.

Item #4 - Hot plate/stirrer with temperature control probe. The hotplate-stirrer is used for mixing and heating solutions for a great variety of chemical reactions such as synthesis, especially in the field of organic chemistry. As some of the reactions can be temperature sensitive, it is important for students to be able to control the temperature. For these reasons, we are requesting hot plate/stirrer with temperature control probe.

Item #5 Blackbody Radiation Apparatus This is the key experiment that led to the development of quantum mechanics. Allows students to observe the blackbody spectrum, collect data, make inferences for temperature of the object, and compare it to the theoretical value.

Item #6 -Portable X-Ray Fluorescence Analyzer (XRF) for Petaluma chemistry program -A portable X-Ray Fluorescence Analyzer is a 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 chemistry courses offered in Petaluma, such as CHEM 42, 60, and 100

Item #7 - 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 #8 - 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 #9 - 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 #10 - The 0-500-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 11 (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 #12 - 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.

#2

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

In the physics program, we need items #1, #3, #5, and #6. For the chemistry program, #2 is the highest priority, and #4 would help better teach our students.

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	Coulomb's Law Apparatus	12	\$2,250.00	\$27,000.00	Saska Gjorgjievska	Lindley	Saska Gjorgjievska
0002	Santa Rosa	01	01	Periodic Table (8'x4')	20	\$255.00	\$5,100.00	Masanori Iimura	Lindley Center 3rd Floor	Mas Iimura
0003	Santa Rosa	01	01	Photoelectric Effect Apparatus	12	\$2,600.00	\$31,200.00	Saska Gjorgjievska	Lindley	Saska Gjorgjievska
0004	Santa Rosa	01	01	Hotplate/magnetic stirrer with temperature control	30	\$1,400.00	\$42,000.00	Masanori Iimura	Bech Hall	Masanori Iimura
0005	Santa Rosa	01	01	Blackbody Radiation Apparatus	6	\$2,200.00	\$13,200.00	Saska Gjorgjievska	Lindley	Saska Gjorgjievska
0006	Santa Rosa	01	01	X-Ray Fluorescence Analyzer	1	\$32,000.00	\$70,000.00	Masanori Iimura	PC 103	Milena Kalagorgevich
0007	Santa Rosa	01	01	DC Power Supply 18V, 5A	4	\$360.00	\$1,000.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0008	Santa Rosa	01	01	LCR Meter	4	\$300.00	\$1,200.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0009	Santa Rosa	01	01	HV Power Supply	3	\$903.00	\$2,709.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0010	Santa Rosa	01	01	0-500 Volts DC Power Supplies	3	\$956.00	\$2,868.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0011	Santa Rosa	01	01	High-Performance Liquid Chromatography Columns	3	\$1,000.00	\$3,000.00	Masanori Iimura	Bech Hall	Milena Kalagorgevich
0020	Santa Rosa	01	01	Polarimeter	1	\$30,000.00	\$30,000.00	Masanori Iimura	Bech Hall	Masanori Iimura

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	Three-year License for ChemDraw Pro Software (on-going...cheaper than annual license)	1	\$7,000.00	\$7,000.00	Mas Imura	Bech Hall	Milena Kalagorgevich

2.5a Minor Facilities Requests

Rank	Location	SP	M	Time Frame	Building	Room Number	Est. Cost	Description
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2.5b Analysis of Existing Facilities

CHEMISTRY

Currently, 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 associate 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 move to the new science building which will alleviate the space constraints felt for associate 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.

On the Petaluma campus, there now are two Chemistry laboratory classrooms, and we are starting to offer more chemistry classes in Petaluma. However, as mentioned in the previous section, to do so, we need the SLIA position in Petaluma (which is currently vacant) 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 and labs are taught in Lark Hall. The physics program are 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 for student success and those that will help us update and add to the instrumentation and equipment we use in our laboratory curriculum. Many Department of Chemistry and Physics members are actively involved in grant proposals. We are also seeking funding and assistance for expanding our program in Petaluma.

3.2 Student Success and Support

Diversity is beautiful, diversity is important, and diversity is the key to solving future problems. A diverse society will lead to innovations and inspire new ideas. The staff and faculty members of the SRJC Chemistry-Physics department deeply embrace the rewards of being a part of a diverse, equitable, and inclusive society. Diversity and inclusion are essential in 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 are like a family, although we may sometimes seem a bit dysfunctional. Nevertheless, 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 department members including classified staff. One thing that we would like to do is to develop more discipline-specific workshops for FLEX and on PDA Days.

3.4 Campus Climate and Culture

The SRJC Chemistry & Physics Department aspires to be a place where everyone's uniqueness is celebrated and appreciated. The department members strive to create and provide a safe, inclusive, intellectually stimulating environment, both in and out of the classroom, where any individual or group can feel welcomed, respected, valued, and supported.

4.1a Course Student Learning Outcomes Assessment

CHEMISTRY

The Chemistry Program has completed the assessment of 19 of the 40 available SLOs. The members of the program care deeply about student learning and thus are always discussing student learning outcomes with each other in our department/program meetings and use them to find ways 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 has assessed 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	YES
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

Type	Name	Student Assessment Implemented	Assessment Results Analyzed	Change Implemented
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
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

Type	Name	Student Assessment Implemented	Assessment Results Analyzed	Change Implemented
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 offers a schedule that is as balanced and convenient as possible, given the constraints of the facility and staffing. At the Santa Rosa campus, the number of classes we can schedule is limited by the number of lab spaces we have. We do anticipate that the move to the Lindley Center will alleviate that. On the Petaluma Campus, the Chemistry Program offering is limited because the current laboratory facilities are 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 would 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 are also starting to offer move evening courses. Starting this Fall (Fall 23), we will offer one section of CHEM 42, one section of CHEM 3A, one section of CHEM 3AL, and one section of CHEM 60 during the evening hours at the Santa Rosa campus. We will also offer an evening CHEM 42 section at the Petaluma campus to attract dual-enrollment and working students. We have also started to offer more Friday sections, and we will continued to offer a Saturday section of Chem 42.

It appears that we could add more sections of Chem 60 each semester and they would fill. However, it is limited by lack of space and/or staffing.

Student Headcount (department total) (** X20, F20, S21, X21, F21, and S22 are the COVID-pandemic semesters)

Semester	Headcount (SR campus)	Headcount (Petaluma campus)	Headcount (other)*	Headcount (total)
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X19	98	43	0	141
F19	778	149	0	927
S20	727	181	0	908
X20	2	0	0	2
F20	277	19	138	434
S21	195	26	255	476
X21	49	0	70	119
F21	383	71	111	565
S22	392	111	158	661
X22	78	36	0	114
F22	617	208	16	841

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, Mon~Thurs, 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 more Physics courses there.

Student Headcount (department total) (X20, F20, S21, X21, F21, and S22 are the COVID-pandemic semesters)**

Semester	Headcount (SR campus)	Headcount (Petaluma campus)	Headcount (other)*	Headcount (total)
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X19	67	0	0	67
F19	469	14	0	483
S20	394	8	0	402
X20	16	0	0	16
F20	314	17	0	331
S21	372	18	0	390
X21	41	0	0	41
F21	273	0	0	273
S22	267	14	0	281
X22	25	0	0	25

5.2a Enrollment Efficiency

CHEMISTRY

While there is a slight decline in the average enrollment efficiency, we are still typically over the district goal of 95%. Courses such as CHEM 60, CHEM 42, CHEM 3A/3AL, CHEM 3B, CHEM 12A, and CHEM 100 were traditionally filled to the maximum (or beyond) by the first census pre-pandemic, which has not been the case since the F20 semester. However, we are starting to see an increase, which is encouraging. STEM courses still remain to be in high demand, even as enrollment in other courses is declining.

Enrollment Efficiency for the Chemistry Program (All locations)

Disc	X19	F19	S20	X20	F20	S21	X21	F21	X22	S22	F22
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Chemistry	106.3%	109.7%	101.6%	0.0%	92.3%	101.3%	99.2%	95.9%	95.5%	79.2%	93.0%
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*COVID-19 Pandemic

PHYSICS

Post-pandemic, the Physics program, like many other disciplines, has seen a decline in enrollment efficiency. However, we are noticing enrollment efficiency increasing. A more flexible schedule, which is possible after moving to the Lindley Center, will help alleviate that.

ALL Locations Enrollment Efficiency

Disc	X19	F19	S20	X20	F20	S21	X21	F21	S22	X22	F22
PHYSICS	111.7%	89.1%	83.0%	66.7%	93.8%	91.5%	73.2%	76.7%	72.6%	44.6%	78.8%

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 (except during the pandemic semesters). 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 24 students per section, depending on the room and the course.

Average Class Size for Chemistry

Disc	X19	F19	S20	X20	F20	S21	X21	F21	S22	X22	F22
Santa Rosa	26.5	25.9	24.1	.0	19.8	24.4	16.3	17.4	20.4	19.5	23.7
Petaluma	23.5	24.8	22.6	0.0	19.0	26.0	0.0	11.8	15.9	18.0	23.1
Other	0.0	0.0	0.0	0.0	9.9	11.1	10.0	10.1	14.4	0.0	16.0
ALL	25.5	25.7	23.8	0.0	15.0	14.9	11.9	14.5	17.8	19.0	23.4

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. This is because the Physics program has been creative to allow all possible combinations of lab/lecture so students have all possible options. For example, if Phys 41 has two lectures and two labs each, there would be 4 sections. This means that class size records of 4 sections will be at 10 students even if each lecture has 20 and each lab has 20 students.

ALL Locations Average

Class Size (data may be flawed. See the explanation above).

Disc	X19	F19	S20	X20	F20	S21	X21	F21	S22	X22	F22
Santa Rosa	22.3	22.3	17.8	16.0	20.9	15.3	20.5	12.9	14.1	12.5	13.8

Petaluma	0.0	14.0	8.0	0.0	17.0	18.0	0.0	0.0	14.0	0.0	10.0
ALL locations	24.4	24.3	21.4	16.0	17.0	15.1	13.3	13.9	16.5	17.4	20.2

Lecture classes in physics have approximate enrollment limits of about 20, and physics lab classes have limits of 20. We have been allowing students over the class limit for some Physics lectures and labs.

Before the pandemic, the average class sizes were steady. Unfortunately, the COVID pandemic resulted in declined enrollment in our physics courses.

5.3 Instructional Productivity

CHEMISTRY

Instructional Productivity (ALL Locations)

	F22	S23
FTES/FTEF	12.1	11.9

Up to about five years ago, the Chemistry Program has averaged well above the college-wide productivity goal of 18.7. But unfortunately, we are noticing a decrease in FTES/FTEF productivity. And During the F22, our FTES/FTEF productivity went down to 12.1, and in S23, our productivity value was at 11.9.

The major cause of this low productivity value is the change in enrollment due to the pandemic. However, we have noticed a decline in college enrollment even before the pandemic. 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.

PHYSICS

ALL Locations FTES/FTEF Productivity

	F22	S23
FTES/FTEF	9.9	9.5

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.

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 3A/3AL -Chem 3B-Chem 12A-Chem 12B. Students who have taken high school chemistry can petition to move directly into CHEM 3A/3AL, 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 3A/3AL, and Chem 3B (not this summer due to the upcoming move) in the summer so that a student can still complete Chem 12B at the end of the fourth (non-summer) term. We also try to offer an evening sequence for Chem 42-Chem3A/3AL-Chem 3B for those students who work during the day. We also offer Chem 60 in the evening and Chem 42 on Saturday.

The Chemistry program has awarded a total of 17 degrees over the past four years. (six in 2019~2020, four in 2020~2021, six in 2021~2022, and one in 2022~2023). 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 30~50 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 3A or Chem 3B 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

CHEMISTRY

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.

ALL Locations

Semester	X19	F19	S20	X20	F20	S21	X21	F21	S22	X22	F22
Reten	89.1%	80.0%	76.3%	100.0%	75.2%	78.6%	0.00%	80.6%	80.9%	88.4%	80.4%
Comp	87.1%	72.4%	73.2%	100.0%	73.0%	74.3%	0.0%	77.1%	77.5%	85.7%	75.9%
GPA	3.07	2.69	2.91	4.00	3.04	3.17	0.00	2.99	2.96	3.14	2.85

PHYSICS

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

ALL Locations

Semester	X19	F19	S20	X20	F20	S21	X21	F21	S22	X22	F22
Reten	89.6%	76.6%	79.2%	100.0%	80.3%	80.2%	0.00%	74.2%	86.2%	91.3%	83.0%
Comp	86.6%	73.1%	78.5%	100.0%	78.2%	77.1%	0.0%	70.8%	83.5%	91.3%	79.9%
GPA	3.04	2.71	3.11	2.47	3.12	2.99	0.00	2.75	2.94	3.17	2.77

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

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.

ALL LOCATIONS

Ethnicity	2019~20	2020-21	2021-22	2022-23
White	36.3%	38.1%	41.2%	37.0%
Asian	7.5%	7.0%	4.8%	5.4%
Black	1.9%	2.2%	1.9%	2.0%
Hispanic	37.7%	34.7%	38.5%	40.3%
Native American	0.3%	0.8%	0.4%	0.4%
Pacific Islander	0.1%	0.4%	0.0%	0.2%
Filipino	1.0%	1.4%	1.0%	1.2%
Other Non-White	4.8%	6.3%	4.8%	6.2%

Decline to State	10.6%	9.1%	7.5%	7.1%
Total	100%	100%	100%	100%

Gender	2019~20	2020-21	2021-22	2022-23
Male	41.5%	41.7%	44.6%	42.1%
Female	56.2%	56.5%	53.8%	55.5%
Unknown	2.3%	1.8%	1.7%	2.3%
Total	100%	100.0%	100.0%	100.0%

Age Range	2010-20	Percent	2021-21	Percent	2021-22	Percent	2022-2396	Percent
0 thru 18	317	18.9%	96	12.6%	143	12.4%	272	16.8%
19 and 20	579	34.6%	256	33.6%	454	39.4%	57	35.2%
21 thru 25	424	25.3%	240	31.5%	311	27.0%	427	26.3%
26 thru 30	189	11.3%	81	10.6%	111	9.6%	184	11.3%
31 thru 35	64	3.8%	48	6.3%	70	6.1%	89	5.5%
36 thru 40	51	3.0%	21	2.8%	29	2.5%	47	2.9%
41 thru 45	29	1.7%	10	1.3%	19	1.7%	19	1.2%
46 thru 50	13	0.8%	5	0.7%	4	0.3%	9	0.6%
51 thru 60	7	0.4%	40	0.5%	7	0.6%	5	0.3%
61 plus	0	0.0%	0	0.0%	3	0.3%	0	0.0%
ALL Ages	1673	100.0%	761	100.0%	1151	100.0%	1623	100.0%

PHYSICS

Data listed below indicates a steady increase in the percentage of Hispanic students in Physics.

Ethnicity	2018-19	2019-20	2020-21	2021-22
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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 (3A/3AL - 3B) 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. In addition, Chem 60 and Chem 42 are offered every semester, and we also try to offer one evening section of CHEM 60 and a weekend section of CHEM 42 every semester.

PHYSICS

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

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 3A/3AL, 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

Both the chemistry and physics programs monitor and discuss academic standards regularly through the evaluation process and curriculum updates. In addition, student Learning Outcome assessments are performed and discussed frequently, and the results and discussions are implemented 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	working closely with MESA-Avanzando. Many of us have participated in STEM-related CoP. Drafted the SRJC CHEM-PHYS Dept mission statement. More to do
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	Working to offer more classes. Will offer more evening and weekend classes. (ongoing)
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. WE have started to have more discussion. Some have been uncomfortable. Still a lot more to do, but we all know that this is important.
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	This position has yet to be filled. This position needs to be a full-time 100% position. (We need to do this immediately.)
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	Finally, in the interview stage. Hopefully, we'll have someone by the beginning of the F23 semester. .
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	Tried dept chair office hour. Need to do more of that in F23.
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)	Many (too many) roadblocks. Need more communication from the District. Feel like we are not provided with all the necessary info
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)	This is a serious issue. I think the District needs to understand that there are many who are just completely burned out. Many are feeling underappreciated and unheard. I would not be surprised if there is a major exodus...

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
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 - still work in progress. I really would like to work on this. Not just with the Dean, but with all administrators.
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. Need to work better with Petaluma Dean.
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). Hoping that the move will help.
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. Need another FT for the physics program, and also one for the Chem program.
0005	ALL	01	01	complete SLO assessments	Course improvement	next three years	time and money.

6.2b PRPP Editor Feedback - Optional

Can we start the PRPP during the fall semester? Also, I think it might make more sense to work on PRPP with the Dean.

6.3a Annual Unit Plan

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
0001	ALL	01	01	Ensure proper levels of faculty and classified staffing.	Hire an additional full-time faculty members - one in physics and one in chemistry	ongoing	Financial support for hiring faculty members.
0001	ALL	02	02	Support BIPOC and other minority STEM students	Help our BIPOC and under-represented STEM students achieve their goals	ongoing	financial support. moral support
0001	ALL	04	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	Santa Rosa	04	02	successful move to the Lindley Center	We want to have a "smooth" move-in to the Lindley Center	This year!	Too many roadblocks. We were initially told to be prepared for the move during Summer 2023. And now, we are told that it might not be till the fall. We would like more frequent communication. Trust and transparency.
0001	ALL	01	04	Breathe and recharge	We (faculty and staff) are all feeling burned out. This is a serious crisis, and something needs to be done immediately. We all enjoy what we do - we are passionate about teaching and working with our students. But it is also true that many of us are unhappy. We feel underappreciated and unheard. And I know that many of us are starting to think seriously about exit strategies.	IMMEDIATE LY	Support and understanding from the District. Please consider the mental health of the faculty and staff members!
0002	ALL	04	06	more open and honest communication with our Dean and the administration	Work together to find solutions. We need to improve on this. We still feel that we are not being heard.	ongoing	Support, trust, and transparency
0002	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.

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
0002	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.	now	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.
0002	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
0002	ALL	04	05	better support for our student clubs	We would like to support the SRJC chem club and the Physics club better. We would like to help them with outreach	ongoing	time
0002	ALL	03	05	more outreach	We would like to start doing more outreach programs. One of us is doing outreach at a local Spanish immersion school every year, but we should be doing more	ongoing	
0003	Petaluma	01	01	Offer more Physics courses in Petaluma.	Expand Chemistry and Physics programs in Petaluma	2023~	Financial support for lab equipment and additional classified staffing needed.
0005	ALL	01	01	complete SLO assessments	Course improvement	soon	time and money.