Santa Rosa Junior College

Program Resource Planning Process

Chemistry and Physics 2024

1.1a Mission

During the past (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

Until Spring 2024, the Chemistry Program was housed in Bech Hall, while the Physics Program used 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).

In January 2024 both programs moved to the Lindley Center for STEM Education. The Chemistry classrooms and labs are on the 3rd floor, while the physics labs and classrooms are on the 2nd floor. This is the first time both programs have been housed in the same building, and our share office space and better lab proximity has contributed to a more collaborative environment between our programs. We are also excited that MESA (Math Engineering Science Achievement) and the Avanzando grant staff are housed in Lindley Center. The Chemistry & Physics department has worked very closely with MESA for many years (and Avanzando more recently) 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 eight full-time and around ten associate instructors with great enthusiasm for teaching. Two of the full-time faculty members are working on the Petaluma campus. In addition to regular daytime classes, the program offers evening and weekend classes on the Santa Rosa campus. We strive to maintain high educational standards and place emphasis on quality undergraduate instruction.

The Chemistry program takes pride in well-maintained and equipped laboratories that include computer-based data acquisition stations, a data analysis lab, as well as the equipment typically found in academic laboratories. Modern instruments

regularly used by students include a GC/MS, NMR, FTIR, MP-AES, gas chromatographs, microwave reaction system, and a set of 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

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 has seen a steady increase in enrollment for the past several years. At the Santa Rosa campus, the chemistry program typically offers classes from 7:30 am until 6:00 pm Mondays thru Thursdays, as well as several labs on Fridays. In addition, we offer evening/night introductory classes (Chem 60, Chem 42 and Chem 3AL when possible) one day a week and Saturday classes from 9:00 am until 3:30 pm. At the Petaluma campus, we are also beginning to offer more classes now that there are two chemistry labs. 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. Being in 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 main 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 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).

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. The main (calculus-based) sequence for Engineering and Physical Science students is Phys 40, 41, 42 and 42. Courses such as Physics 20A, 20B and 11 prepare students interested in programs such as Biology, Physical Therapy, and Kinesiology.

2.1a Budget Needs

Both the chemistry and physics programs have been operating significantly in the red with expenses related to moving into the new building. Some of these

expenses will be less in the next year, but other costs will increase and/or be ongoing. We acknowledge the limitations of state funding and District resources as well as current budget allocations, and also appreciate the ongoing flexibility in these budgets as needs emerge.

CHEMISTRY

Supplies (4390): As noted above, many moving-related supplies and purchases for new equipment were put into the chemistry budget during 2023-2024, which cuased the supplies expenditures (4390) to run nearly $45,000 over budget. It is important to note that there are still move-related items that are likely to incur costs in the coming year. Some sets of glassware for lockers are still incomplete, and some of the chemicals from Bech hall that had expired and were disposed of will need to be replaced. Furthermore, in addition to the move, the supplies budget has been stretched thin for the past several years and there is a significant chance of continued budget overruns related to enrollment increases and cost increases if these factors are not taken into consideration.

The chemistry program has been quite frugal with our funds since the budget cuts of 2018-2019. Whenever we can, we look for the lowest price on items we purchase rather than only when it is required by purchasing regulations. This year, as at other times, we have purchased equipment using our own funding through the SRJC Foundation. Having said that, we estimate that a *bare minimum* of $20,000 is needed for the Santa Rosa supplies budget to cover regular operations, and anticipate an additional $10,000-20,000 in ongoing one-time purchases related to the move. We do depend on regular purchases of chemicals and glassware, which both require replenishment for the program to function.

Equipment Rental (5630): Through the fantastic efforts and tireless work of our lab coordinator (Milena Kalagorgevich), we were able to secure significantly better and more consistent pricing on cylinder rentals and compressed gases from Airgas. Anticipated needs are around $3500, compared to $4580 in 2022-2023.

Equipment service (5652): Expenses for maintenance of our our deionized water system are expected to increase from the costs in Bech hall of around $2000/year for replacement of ion exchange resin cartridges. Quotes for maintaining the DI system in Lindley suggest a cost of approximately $10,000-$15,000/year to service the more sophisticated water system which in addition to the ion exchange resins includes a water softener, reverse osmosis unit and UV sterilizer. The system requires periodic sanitization as well. We are still trying to understand the maintenance needs of this system and are also unsure of whether we are responisble for maintaining it or if facilities will be covering the costs and

providing access to the vendor who will do the bulk of the work. We look forward to clarity on these issues and adequate maintenance of our new system in the coming fiscal year.

Student employees (2361): We relied heavily on student help during the move, and have continued to depend on their assistance to keep the labs running smoothly in Lindley and to try to protect our very hard working lab staff from burnout. We are requesting 50 hours/week of student time, which amounts to around $40,000. This is a large expenditure, but is significantly less expensive than hiring another full-time staff person to do the needed work.

Other accounts: Major impacts to Petaluma budgets and other Santa Rosa budgets are not anticipated at this time, and we hope that the current adequate funding levels will continue.

PHYSICS

The physics program is struggling to survive on the allocated annual budget; the program is always in the red. We ask the District to augment the Physics supplies budget (4390) 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. The supplies budget is also needed to periodically repair and replace broken or uoutdated physics equipment, much of which is over 30 years old.

The request for $10,000 is to make progress toward fully equipping both of the physics labs in Lindley with a 13 sets of equipment for each experiment.

2.1b Budget Requests

Rank	Location	SP	M	Amount	Brief Rationale
0001	ALL	04	01	$2,500.00	Annual site license required for ChemDraw Pro. Ongoing fee.
0001	ALL	02	01	$28,000.00	Minimum level of funding for Santa Rosa and Petaluma Chemistry Supplies (4000s) budgets
0001	ALL	02	01	$5,000.00	Repair and replacement of existing Physics equipment (4390)
0001	ALL	01	01	$9,500.00	Chem equipment rental and service (5000s - except ChemDraw and DI water)
0002	ALL	01	01	$6,000.00	Estimated annual maintenance for Lindley DI water system
0003	ALL	02	01	$40,000.00	Chem student employees: Support 50 hours of work/week (10 months)
0004	ALL	02	01	$20,000.00	Additional one-time supplies for Chemistry in Santa Rosa related to the move
0004	ALL	01	01	$10,000.00	Puchasing new equipment to fully equip second Physics lab
0005	ALL	01	01	$2,000.00	Restore campus subscription access to Journal of Chemical Education
0006	ALL	01	01	$50.00	2YC3 (Two-Year College Chemistry Consortium) College Sponsorship
0007	ALL	01	02	$10,000.00	Increase/restore staff travel budget for professional development activities.

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
Administrative Assistant (Chem & Phys)	16.00	12.00	Assist with maintaining supply levels in classrooms, manage paperwork, facilitate communication between departments, etc.

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	50.00	10.00	We currently have four student lab assistants in chemistry, totaling 50 hours a week. They provide key help to our full-time staff and free up some of their time to manage aspects of the labs that require more experience.

2.2d Adequacy and Effectiveness of Staffing

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 stronlgy believe that we have the best stockroom in all of the CCCs. A new associate instructor this semester wrote, "The good people in the stockroom are the best and the most professional staff, the chemistry department must be proud of them!" We heartily support this sentiment.

As of August 2023, we are glad to have a new part-time (40%) administrative assistant for the Department of Chemistry & Physics. Splitting time between multiple departments makes the job a bit of a juggling act for our new Guy Tillotson, but we appreciate the support he is able to provide, not least of which was crucial for a successful move to Lindley.

Petaluma currently has a 60% SLIA supporting Chemistry, Animal Health and Wastewater classes. For Fall 2024, we are offering six sections of Chem 60, one section of Chem 42, alongside a number of Animal Health that require lab support. It is important for instructors to be able to communicate with the lab SLIA weekly, and also for the SLIA to be able to check the labs between sections so that instructors are not made responsible for resetting a lab for the next section (or their own). The current level of staffing means that some instructors do not see the stockroom staff at all. We would like to see the Petaluma Chem/Animal

Health/Wastewater SLIA position increased to full time (40 hours/week, 12 month) position to be able to support the students and instructors in labs adequately.

In addition, we are also requesting 55/week hours of support from student workers per semester for the 2024~2025 academic year at the Santa Rosa campus. These employees are critical in providing basic help washing glassware, cleaning and prepping labs, and taking care of other tasks that otherwise would demand excessive time from our full-time employees. Petaluma may also benefit from 1-2 student employees in the future, if the SLIA position there cannot be increased in the near term.

PHYSICS

We hired in August 2023 a full-time Science Lab Instructional Assistant (SLIA) position for Physics, a much-needed support role, especially considering the work required to move equipment and settle it into Lindley.

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 eight contract faculty members in our program after one retirement this year. This number, however, is somewhat misleading. Our effective FT number is about 6.5 as one member of our program has significant release time for AFA duties (92.5%), and another has department chair release time (40%), in addition to 5-15% release time for other FT faculty duties.
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
Chemistry (2022~2023 academic year)	15.1400	60.6800	9.8100	39.3200	Of the 8 full-time faculty members, about 1.5 FTEF are allocated to release time 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

Chemistry
Spring 2024 - One FT Chem retirement (unfilled)
Spring 2026 - One FT Chem retirement expected

Physics
Summer 2022 - One FT Phys retirement (unfilled)

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 word 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 eight contract faculty members in our program. This number, however, is somewhat misleading. Our effective FT number is around 6.6 as one member of our program has significant release time for AFA duties (92.5%), another member has department chair release time (40%) and there are other small amounts of FTEF (5-15%) allocated to release time. Tatjana Omrcen officially retired at the end of the Spring 2024 semester, and we have been asking for a replacement of her 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. We have are ten or more 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 AND PHYSICS (need to update)

Justification for items on the Instructional Equipment Request spreadsheet:
==========
==========
Items 1-5 are intended for IELM funding sources.

Item #1 - **Interferometer Kit**. Interferometers are tools that utilize properties of light to make very precise measurements. As such, they are used in many fields of science and engineering. The instrument aids student's learning of important wave phenomena concepts related to light. The instrument will be used for class demonstrations, as well as for out-of-classroom projects to provide students with hands-on experience and research.

Item #2 - **Burets:** These are used by students in general chemistry classes at least once a semester for titration analysis.

Item #3 **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 #4 - **Chiller for Rotavap:** This is used to consense solvent vapors on the rotavap. It is not essential but would be helpful.

Item #5 - **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 Plank's constant.
==========
==========

Items numbered 10 and above are intended to be puchased with Avanzando grant funding.

Item #10 **- MP-AES torch:** This part is critical for operation of the atomic emission spectrometer used in Chem 3B. It is used to contain the plasma where students can detect the presence and quantity of metals (such as copper, cobalt and

many others) to determine their concentrations. It is a backup part in case the one we are using breaks.

Item #11 - **Sets of lenses and mirrors**. These are an integral part of several different laboratory experiments. Students study how images form by different combinations of mirrors and lenses.

Item #12 - **MP-AES spray chamber:** This part is critical for operation of the atomic emission spectrometer used in Chem 3B. It is used to aerosolize students' samples for incorporation into the plasma. It is a backup part in case the one we are using breaks.

Item #13 - **Meat thermometers**. Several thermodynamics labs require thermometers; most of the old ones are broaken.

Item #14 - **Vacuum traps:** These traps are needed to condense student-generated vapors and protect the vacuum system and pumps in the new building.

Item #15 - **Wave drivers**. These are mechanical vibrators that produce waves on strings. Students need them in the lab to produce standing waves and conduct appropriate analysis.

Item #16 - **Bump traps (size 14/20) 250 mL:** Students need to use these traps when evaporating of solvents on the rotavap for organic chemistry

Item #17 - **Spectrometer**. Spectrometers measure the radiation from different sources, based on which the composition of the source can be determined. Spectrometers are fundamental tools in astronomy. The instrument will be used for class demonstrations to aid students' learning, as well as for out-of-classroom projects to provide students with valuable hands-on experience with the principles of spectroscopy and to deepen their understanding of light and atomic structure.

Item #18 - **Bushing adapter for rotavap (size 14/20 to 19/22):** These adapters allow students to connect glassware with different size fittings

Item #19 - **500 mL filter flasks:** Students use these flasks in chemistry labs to filter solutions quickly.

Item #20 - **Buchner funnels:** Students use these items in general chemistry labs at least once a semester as part of a filtration setup.

Item #21 - **centigram balances (500 g):** These will replace student balances that were damaged in the move from Bech hall.

Item #22 - **Teflon dropper bottles (4 pk):** These items are routinely used by students to dispense small quantities of chemicals.

==========
==========

Non-instructional Item #1 - high capacity balance (10 kg): This will replace a key balance in the stockroom that was damaged in the move from Bech hall.

==========
==========

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 progams 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 do what we can to repair 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 also slowly beginning to see a backlog of unrepaired equipment.

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	Interferometer Kit	1	$2,700.00	$2,700.00	Saska Gjorgjievska	Lindley Center	Saska Gjorgjievska
0002	Santa Rosa	01	01	Burets for titration	30	$300.00	$8,250.00	Joe Fassler	3rd Floor Lindley	Milena Kalagorgevich
0003	Santa Rosa	01	01	Blackbody Radiation Apparatus	6	$2,200.00	$13,200.00	Saska Gjorgjievska	Lindley	Saska Gjorgjievska
0004	Santa Rosa	01	01	Chiller for rotavap	1	$1,823.00	$1,823.00	Joe Fassler	321 Lindley	Milena Kalagorgevich
0005	Santa Rosa	01	01	Photoelectric Effect Apparatus	12	$2,600.00	$31,200.00	Saska Gjorgjievska	Lindley	Saska Gjorgjievska
0010	Santa Rosa	01	01	MP-AES Torch	1	$912.00	$912.00	Joe Fassler	341 Lindley Center	Milena Kalagorgevich
0011	Santa Rosa	01	01	Sets of lenses and mirrors	13	$53.80	$700.00	Saska Gjorgjievska	Lindley Center	Saska Gjorgjievska
0012	Santa Rosa	01	01	MP-AES Spray Chamber	1	$934.00	$934.00	Joe Fassler	341 Lindley Center	Milena Kalagorgevich
0013	Santa Rosa	01	01	Meat Thermometer	13	$18.30	$238.00	Saska Gjorgjievska	Lindley Center	Saska Gjorgjievska
0014	Santa Rosa	01	01	Vacuum traps	10	$173.00	$1,727.00	Joe Fassler	321 Lindley	Milena Kalagorgevich
0015	Santa Rosa	01	01	Wave Drivers	6	$180.83	$1,085.00	Saska Gjorgjievska	Lindley Center	Saska Gjorgjievska
0016	Santa Rosa	01	01	Bump traps for rotavap (size 14/20)	3	$270.00	$1,078.00	Joe Fassler	321 Lindley	Milena Kalagorgevich
0017	Santa Rosa	01	01	Spectrometer, 350 nm - 700 nm	1	$2,850.00	$2,850.00	Saska Gjorgjievska	Lindley Center	Saska Gjorgjievska

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0018	Santa Rosa	01	01	Bushing adapters (size 14/20 to 19/22)	2	$48.00	$96.00	Joe Fassler	321 Lindley	Milena Kalagorgevich
0019	Santa Rosa	01	01	500 mL filter flasks (case of 18)	1	$473.00	$473.00	Joe Fassler	3rd Floor Lindley	Milena Kalagorgevich
0020	Santa Rosa	01	01	Buchner funnels (case of 6)	5	$219.00	$1,095.00	Joe Fassler	3rd Floor Lindley	Milena Kalagorgevich
0021	Santa Rosa	01	01	Centigram balances - up to 6	6	$445.50	$2,673.00	Joe Fassler	3rd Floor Lindley	Milena Kalagorgevich
0022	Santa Rosa	01	01	Teflon dropper bottles (4 pack)	1	$484.00	$484.00	Joe Fassler	3rd Floor Lindley	Milena Kalagorgevich
0901	Santa Rosa	01	01	DC Power Supply 18V, 5A	4	$360.00	$1,000.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0902	Santa Rosa	01	01	HV Power Supply	3	$903.00	$2,709.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska
0903	Santa Rosa	01	01	Polarimeter	1	$30,000.00	$30,000.00	Masanori Iimura	Bech Hall	Masanori Iimura
0905	Santa Rosa	01	01	0-500 Volts DC Power Supplies	3	$956.00	$2,868.00	Saska Gjorgjievska	Lark/Lindley	Saska Gjorgjievska

2.4d Non-Instructional Equipment and Technology Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	Santa Rosa	01	01	High capacity balance (10 kg) for stockroom	1	$1,510.00	$1,510.00	Joe Fassler	371 Lindley	Milena Kalagorgevich

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 Iimura	Lindley 3rd Floor	Milena Kalagorgevich

2.5a Minor Facilities Requests

Rank	Location	SP	M	Time Frame	Building	Room Number	Est. Cost	Description
0001	ALL	02	04	Urgent	Lindley	3rd floor restrooms	$25,000.00	Hygeine. Put paper towel dispensers back in bathrooms or get quieter, more effective hand dryers
0002	ALL	02	04	Urgent	Lindley	Many lecture rooms and labs	$1,500.00	Hygeine and chemical safety. Need soap dispensers and paper towel dispensers in many of the labs and lecture rooms.
0003	Santa Rosa	04	07	1 Year	Lindley	314, 316, 322	$500.00	Knee- to shoulder- height frosting for associate office space and student consultation rooms

2.5b Analysis of Existing Facilities

CHEMISTRY

After operating out of Bech hall for 56 years, the chemistry program in Santa Rosa moved to the 3rd floor of the newly constructed Lindley Center in January 2024, in time for the beginning of the spring semester. The 3rd floor of the Lindley Center includes:

- Three 25-student general chemistry labs now dedicated to specific chemistry classes (Chem 42, 3AL, 3B)
- One 18-student organic chemistry lab with fume hoods for each pair of students, dedicated to Chem 8, Chem 12A and Chem 12B
- One 25-student lab dedicated to Chem 60
- An instrument room, housing around 15 computer stations and most of our specialized instrumentation
- A data analysis lab with 25+ computers for students to use
- Two large (80 student) lecture halls
- Two small (25 student) lecture halls, one dedicated to chemistry classes, and another designated as swing space
- A chemical stockroom, which includes an office for our amazing stockroom staff and ample space for preparation of experiments and materials.
- Mail and copy room for staff use
- A ktichen and break room for staff use
- Shared office space for associate faculty and smaller shared rooms for office hours: knee- to shoulder-height frosting for the glass in these spaces is requested.
- Full-time faculty offices
- Open study areas for student use, which have been quickly and thoroughly adopted by students
- Restrooms for student use
- A wellness room for lactation
- Limited storage space outside the stockroom and instructional areas
- Air conditioning and heating
- Windows providing access to daylight

We are still getting settled in this facility, but have found most of its features to be functional, thanks to the support of capital projects.

Requests:

3rd floor bathrooms have loud and ineffective hand dryers. We request bringing back the option of paper towel dispensers or purchase more effective and quieter hand dryers.

Hand soap and paper towel dispensers still need to be installed in a number of the labs and lecture halls.

Window frosting has been requested by faculty members using 316, 318 (student consultation rooms) and 322 (associate office space).

Chemistry - Petaluma

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.

Shower curtains were installed in the Petaluma labs this year, which is an important component of the lab safety systems that was missing.

PHYSICS

The faculty members, classes and labs of the Physics program have been moved from Analy Village and Lark Hall to their own space in Lindley. These include:

- Two 24-station physics labs (284 and 290 Lindley)
- A 36-student lecture hall (296 Lindley)
- A 45-student lecture room (295 Lindley)
- A large lecture hall (138 Lindley), serving as a medium-term replacement for 295, which has vibration and noise issues (hopefully being addressed)
- A storage/lab preparation area

A number of minor to moderate improvements have been requested and approved or are in process for the Physics program. We look forward to their final resolution in the coming year.

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.

3.5 Establish a Culture of Sustainability

Whenever possible, we try to convey the concepts of sustainability in our classes. For example, Green Chemistry concepts are introduced and discussed in courses such as CHEM 42, CHEM 12A, and CHEM 12B. The most significant potential for a direct environmental impact of the Department of Chemistry and Physics arises from its Chemistry laboratory instruction program. To that effect, the Chemistry program is deeply committed to teaching labs that are safe and achieve the desired learning outcomes while minimizing the use of toxic, dangerous, rare, and/or expensive chemicals. Whenever possible, any environmentally risky experiments are performed on a microscale, which uses less than a 1/100 of the resources used by more traditional experiments. Even the more benign experiments are conducted on the smallest scale that is practical, in order to preserve natural resources and minimize cost.

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

4.1a Course Student Learning Outcomes Assessment

CHEMISTRY

The Chemistry Program 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
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 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)
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)
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	
Chemistry	106.3%	109.7%	101.6%	0.0%	92.3%	101.3%	99.2%	95.9%	95.5%	79.2%	9

*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	
PHYSICS	111.7%	89.1%	83.0%	66.7%	93.8%	91.5%	73.2%	76.7%	72.6%	44.6%	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 (except duringthe 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	
Santa Rosa	26.5	25.9	24.1	.0	19.8	24.4	16.3	17.4	20.4	19.5	
Petaluma	23.5	24.8	22.6	0.0	19.0	26.0	0.0	11.8	15.9	18.0	
Other	0.0	0.0	0.0	0.0	9.9	11.1	10.0	10.1	14.4	0.0	
ALL	25.5	25.7	23.8	0.0	15.0	14.9	11.9	14.5	17.8	19.0	

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
Santa Rosa	22.3	22.3	17.8	16.0	20.9	15.3	20.5	12.9	14.1	12.5
Petaluma	0.0	14.0	8.0	0.0	17.0	18.0	0.0	0.0	14.0	0.0
ALL locations	24.4	24.3	21.4	16.0	17.0	15.1	13.3	13.9	16.5	17.4

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%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
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	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 perhpas 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	Completed	This move occurred during the 23-24 winter break and went as smoothly as possible due to the heroic efforts of our stockroom and administrative support staff, as well as excellent and responsive support from capital projcets and media services as well as IT.
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.	IMMEDIATELY	Having mostly completed the move has helped to some degree with the sense of burnout. Several faculty members have either been on sabbatical or are going on sabbatical. Some are nearly due for sabbatical. Several support staff are taking a month off at the end of the spring semester. These periods of rest are helpful, though not a panacea for frustration.
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	Questions around the move to Lindley led to much anxiety and not a small amount of tension, some of which has resolved. Further resolution is uncertain but possible.
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	Enrollment has begun to recover although we find students are not always consistent in attending class, etc. Hopeful that the educational setbacks related to COVID are trending downward.

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
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.	Completed	Leo hired fall 2024
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	New department chair - have gotten to know our amazing associates better this semester. Need to continue hiring and training on an ongoing basis.
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	Physics club has been very successful and active this year, as has the chemistry club. We have hosted several student lunches paid for through the SRJC Foundation. Faculty participation can be difficult to secure on a weekly basis, but students have met consistently each week and done a number of interesting projects.
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	Students set up demonstrations for the North Bay Science Festival and ribbon cutting for the Lindley Center.
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	Physics courses are up to date in the old assessment system. Chem courses are also starting to be assessed using the new Insights platform

6.2b PRPP Editor Feedback - Optional

Budget requests are linked to college mission and goals, but the college budget is organized using the state's Budget and Accounting Manual (BAM). Requests would be more clear and easier to analyze and track from year to year if specific activity and account codes were part of each request.

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 perhpas 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	04	Breathe and recharge	Continue to look for ways to foster community and positive engagement in the workplace, address issues as they arise and try to keep setbacks in perspective.	ongoing	Support and understanding of coworkers inside and outside the department.
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. Intentional effort is needed to foster points of engagement with associate faculty.
0002	ALL	04	03	Help student clubs as well as faculty/staff build community	Provide times and places for students to meet and work together on club projects or activities / provide opportunities for faculty and staff to socialize in a more relaxed environment	ongoing	Thoughtful planning of events. Foundation funding is being used to facilitate lunches.
0002	ALL	02	03	Increase coordination and collaboration with MESA and Avanzando programs	Build stronger connections with new managers and staff, encourage student participation	ongoing	Engage faculty in the work being done through these programs
0003	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 could be doing more	ongoing	Money for supplies / time for faculty participation
0003	ALL	01	02	Look for ways to increase collaboration between STEAM departments	Organize social events, identify and develop areas for collaboration	ongoing	Time and creative outputs for collaboration
0005	ALL	01	01	complete SLO assessments	Course improvement	as needed	time and money.