

Santa Rosa Junior College

Program Resource Planning Process

Dean STEM 2021

1.1a Mission

STEM Dean's Office: The Office of the Dean provides leadership and support for the various Science, Technology, Engineering, & Mathematics departments and programs at Santa Rosa Junior College. Each department offers lower division courses that satisfy the requirements for transfer to four-year universities, general education, and career preparation. Through a collaborative process, the STEM Dean manages existing resources and acquires new ones to help with the instructional mission of the Cluster. Working with a variety of entities both inside and outside the District, the Dean's Office helps to advance the mission of inclusivity and STEM education in all of its activities.

1.1b Mission Alignment

The Dean of Science, Technology, Engineering and Mathematics (STEM) supports the mission of Santa Rosa Junior College in the following ways:

1. Student Preparation in the Areas of Transfer, Career Education, and Improvement of Foundational Skills

The STEM Dean coordinates the general education, career education, and transfer degree programs of Engineering & Applied Technology, Mathematics, Biological Science, Earth & Space Sciences, Chemistry & Physics, MESA, and the Planetarium.

In working towards this important mission, the STEM Dean's Office works collaboratively with the individual academic departments to ensure the following:

- All transfer majors within STEM align with the lower division requirements of the transfer institutions.
- Create, update, and align applicable disciplines on their Associate Degree for Transfer (ADT) to ensure a smooth pathway to CSU campuses.
- Attainment of financial resources through grants from the NSF, Strong Workforce (Career Education), and other entities to support classroom learning through the purchase of equipment and supplies, funding professional development, and other causes.

2. Comprehensive range of student development and student support.

The Dean of Science, Technology, Engineering, and Mathematics promotes student success by:

- Supporting comprehensive scheduling within and among departments to allow students efficient and timely access to STEM courses. STEM students typically take multiple lab courses simultaneously and hence need careful course scheduling among departments to accommodate their tightly-constrained needs.
- Supporting laboratory equipment upgrades, repair, and replacement to keep labs functioning.
- Supporting the updating of curriculum and programs to stay current with industry needs, especially in Career Education (CE) disciplines.
- Implementing grant-funded initiatives such as undergraduate research experiences, internships, networking training, and mentoring internations.
- Supporting supplemental learning outside the classroom such as in the Math Lab, MESA, and Mechatronics/Engineering Labs.

3. Supports economic vitality, social equity, and environmental stewardship of our region

The economy of Sonoma County is evolving, which impacts the skills students must bring to employers. Conversely, employers seek diverse job applicants that bring varied skills. The Dean's Office, in coordination with the CE Office, helps create new programs to address industry needs (e.g., Solar PV and HVAC-R), while also revamping existing programs to better position students for employment (e.g., Mechatronics and Interior Design).

4. Promotes personal and professional growth, cultivates joy at work, and in lifelong learning

The STEM Dean's Office:

- Encourages collegial relationships between faculty, classified staff, and between departments through monthly social hours and other events.
- Supports STEM faculty professional development by providing opportunities to attend workshops, professional meetings, on-campus and off-campus training, and other professional development opportunities.

5. Fosters critical and reflective civic engagement

The STEM Dean's Office:

- Encourages and promotes scientific literacy among college students and the general population by offering both General Education and majors classes in the sciences and through public outreach.
- Engages with local high schools, civic organizations, and educational institutions to support science outreach events and activities such as North Bay Science Discovery Day, Expanding Your Horizons, and Day Under the Oaks.

6. We constantly assess, self-reflect, adapt, and continuously improve.

The STEM Dean's Office:

- Encourages and supports STEM faculty in pursuit of professional development opportunities and encourages innovation in the classroom.
- Supports new initiatives and projects by faculty and staff, and student projects that expand the capabilities of the STEM Cluster.

1.1c Description

The STEM Dean's Office oversees one of the largest Clusters in the District and in the near-term is coordinating the construction of the Lindley Center for STEM Education and all associated moves and construction projects (e.g., Jeff Kunde Hall, renovation of Lark Hall, etc.). In addition, key duties coordinated or performed by the STEM Dean's office include:

- Enrollment management in collaboration with the department chairs and program coordinators;
- Coordination of all staff, adjunct, full-time, and tenure track faculty evaluations processes;
- Management of operational functions such as the budget, program review, IELM, faculty and staffing requests;
- Serves on various campus committees, advisory committees, and community boards;
- Coordinates the hiring of all adjunct faculty, full-time faculty, and staff;
- Supports all CE program logistics related to grants and reporting
- Manages external grants in collaboration with other offices on campus (e.g., NSF grants, Strong Workforce, Prop 39, etc.)
- Supports the student equity initiatives and goals of MESA
- Mediates personnel issues and student grievances

1.1d Hours of Office Operation and Service by Location

STEM Dean's Office:

Bussman Hall; M-F 8 am -5 pm

Dean's Office (Victor Tam) Bussman 1494

Administrative Assistant III (Tami Meraz), Bussman 1496

1.2 Program/Unit Context and Environmental Scan

Degree Programs, Transfer Majors, General Education, and Basic Skills

- Have there been any changes in the transfer requirements for this major, particularly at CSU or UC campuses or at other common transfer destinations in this discipline? If so, describe those.

In general, the transfer requirements established by the UC and CSU systems are relatively stable in traditional STEM majors: Biology, Chemistry, Mathematics, Physics, and Engineering. Noteworthy, is the increased popularity of ADT degrees as a pathway to the CSU system. In the STEM Cluster, only Physics and Mathematics have established ADT degrees due to their low

unit count. Because of the 60-unit cap, Chemistry has not been able to offer this degree. Efforts are currently underway to offer Geology, Environmental Science, and Biology ADT degrees in the coming year. Separately, due to enrollment impact at certain UC campuses, SRJC will need to watch carefully the status of existing TAG (transfer agreements) as impacted campuses may stop offering them in the near future.

- Are there trends in industry or technology that could affect this discipline or major?

In industry and the current technology-driven zeitgeist, coding is considered to now be an essential skill. Although the lower division STEM academic coursework has not changed, for students to be well-prepared for the "jobs of tomorrow", computer programming and coding will need to be integrated into all STEM disciplines in the future. Additionally, students are expected to be literate across multiple STEM disciplines (aka biochemistry, bioengineering, big data, data analytics, etc.) This suggests collaboration with the Computer Sciences as well as cross-disciplinary efforts to create an environment of innovation.

- Are there new trends in general education or basic skills that affect courses in this discipline or major?

The recent statewide implementation of AB705 has drastically changed the Mathematics Department's course offerings, as well as the pre-collegiate preparation courses in College Skills. Initial enrollment data suggests that students are veering away from intermediate algebra courses, which are vital and core to many disciplines, and instead enrolling in statistics. It remains to be seen if this will affect the number of STEM majors later in the pipeline, but it is causing the Mathematics Department to adjust and offer more statistics courses, which are not part of the traditional STEM course pathway.

- What partnerships or cooperative ventures exist with local employers, transfer institutions, or other community colleges?

Due to the excellence of SRJC programs and students, Sonoma State, Cal Poly SLO, UC Davis, and UC Berkeley accept a high number of our STEM transfer students each year and are highly desirable transfer destinations. MESA collaborates with SSU to form a regional collaborative and pool resources, which help to fortify our annual Industry Shadow Day and mentoring initiatives. The Mechatronics program is partnered with Keysight, whom send their own employees through SRJC classes as part of an apprenticeship program. Finally, the Biological Sciences Department oversees 20+ internships with the Buck Institute, Pepperwood, and Bodega Bay Marine Lab -- giving students first-person, hands-on experience with research.

Career Education (CE) Certificates or Majors:

- What significant changes have occurred in the labor market that might impact demand for these courses, certificates or majors?

The economy remains strong, keeping many students working and depressing enrollments. Despite these headwinds, all STEM CE programs have been focused on sustaining enrollment numbers. Nearly all CE programs have made changes to course offerings based on feedback from advisory committees. Significantly, since the 2017 Tubbs Fire, Sonoma County has had a labor shortage in the housing industry. Because of this, we have been revamping our Solar

Photovoltaic program, creating a new HVAC-R program, and completely changing our Construction Management program to provide students quick paths into these careers.

- Are there any requirements of licensing/accrediting agencies related to this program? If so, please explain.

N/A.

- What partnerships or cooperative ventures exist with local employers, transfer institutions, other community colleges, or local high schools?

As noted above, SRJC has a strong relationship with Keysight Technology. Additionally, Medtronic has been a strong supporter, providing equipment to our engineering program.

- Has there been an increase or decrease in outside funding resources and/or industry/business support?

In recent years, the state has heavily increased funding for CE programs through the Strong Workforce initiative. Many large equipment purchases for Mechatronics, Virtual Reality, and Surveying, were funded through this grant program. Additionally, monies from Prop 39 helped fund architectural work and equipment to build a facility on the Petaluma campus to support Solar PV and HVAC-R.

Other programs/units

- Describe any changes in the social, business, cultural, educational, technological or regulatory environment that could impact your program/unit over the next three years.

All traditional STEM programs have high enrollment and efficiency numbers, while CE programs are undergoing minor changes to match industry need. Enrollment in the District has been declining for several years due to a strong economy and increasing housing costs, and were exacerbated by the 2017 fires, where over 2300+ residents left Sonoma County. Without relief in housing costs in sight, it is anticipated that enrollment will either continue to decline or flatten. Additionally, as the District grapples with the current tight fiscal environment, expansion or addition of sections will not be possible or selectively limited.

2.1a Budget Needs

STEM Dean's Office

The STEM Cluster's supplies, maintenance, and contract costs continue to increase while discretionary budgets shrink. Although enrollment has decreased, the cost of equipment and supplies does not decrease in a linear fashion; therefore, the cost of chemicals, equipment, and other supplies to each department have not experienced a similar decline, rather, with inflation and constrained supply chains, is projected to increase for the near future. Lab experiments are mandated in Course Outlines of Record. **Each department has requested additional funding augmentation for equipment maintenance, increasing cost of service contracts, and consumables.** In the past, the Dean's office has requested budget augmentation as a financial

backstop to support departments but will not make a similar request this year to remove redundancy.

2.1b Budget Requests

Rank	Location	SP	M	Amount	Brief Rationale
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2.2a Current Classified Positions

Position	Hr/Wk	Mo/Yr	Job Duties
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2.2b Current Management/Confidential Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Dean of STEM	40.00	12.00	Provides support and resources to the STEM departments and programs. Oversees schedule development, enrollment management, budget development, and Measure H-funded construction projects. Participates in faculty and staff hiring and evaluations. Coordinates curriculum development and SLO reporting. Establishes partnerships with various organizations to provide opportunities for students. Seeks funding opportunities from grant work and outside agencies, and collaborates with Student Services to support students.
Manager, MESA Programs	40.00	12.00	Oversees and manages the MESA Program. Plans student retention efforts such as Job Shadow Day, research projects, and career development workshops. Manages a constrained budget. Advocates at both the local and state level for funding and resources.

2.2c Current STNC/Student Worker Positions

Position	Hr/Wk	Mo/Yr	Job Duties
	0.00	0.00	

2.2d Adequacy and Effectiveness of Staffing

Staffing Requests

Administrative Assistant II: The 100% AAll position that supports CHEM/PHYS, BIO SCI, and E&SS currently remains vacant after two attempts at an internal hire. It is requested that this position not be eliminated and be recommended for recruitment again as it supports nearly all of the lab science departments in STEM.

Administrative Assistant III: The dedicated AAlll position to STEM was eliminated as a part of current District cost saving measures. Without hiring additional District personnel, allocation of a dedicated AAlll to the STEM Cluster from an existing District position will help with administration of required tasks such as evaluations, budgets, grant reporting, department support/oversight, etc.

Student Support Specialist II: The retention and support of students is even more important in the context of the SCFF. Academic support for students outside of the classroom has been limited, except for the Math Lab and MESA program. In order to provide and coordinate a broad array of academic, career, internship, and financial resources directly related to CE and transfer pathways in STEM, a Student Support Specialist II is requested. With the construction of the Lindley Center for STEM Education, a new 2,000-square space will be at the center of the building to provide academic support which will need to be staffed with an individual knowledgeable of impactful programs that help with degree/certificate completion, job placement, transfer, and addressing academic barriers.

2.2e Classified, STNC, Management Staffing Requests

Rank	Location	SP	M	Current Title	Proposed Title	Type
0001	Santa Rosa	06	07	VACANT - CHEM/PHYS, BIO SCI, & ESS AAll	Administrative Assistant II	Classified
0002	Santa Rosa	06	07	ELIMINATED - None	Administrative Assistant III	Classified
0003	Santa Rosa	02	01	None	Student Success Specialist II, 100%	Classified

2.3a Current Contract Faculty Positions

Position	Description
See Departmental PRPPs	See Departmental PRPPs

2.3b Full-Time and Part-Time Ratios

Discipline	FTEF Reg	% Reg Load	FTEF Adj	% Adj Load	Description
Applied Trechnology	0.9100	42.0000	1.2500	58.0000	
Architecture	0.2000	100.0000	0.0000	0.0000	
Astronomy	1.5700	40.0000	1.4000	60.0000	
Biology	6.1300	68.0000	2.9500	33.0000	
Chemistry	5.1700	45.0000	5.5000	55.0000	
Civil & Surveying Technology	0.2700	47.0000	0.3100	54.0000	
Construction Management Technology	0.2000	100.0000	0.0000	0.0000	
Earth and Space Sciences	0.1600	74.0000	0.0200	27.0000	
Electronic Technology	0.7000	100.0000	0.0000	0.0000	This program is discontinued, to be replace by the Mechatronics program.
Engineering	0.8000	47.0000	0.9000	53.0000	
Environmental Science	0.4100	50.0000	0.4000	49.0000	
Geographic information Systems	0.2700	99.0000	0.0000	0.0000	This program is being placed on hiatus starting Fall 2019 pending Board approval.
Geography	0.0000	0.0000	1.4200	100.0000	
Geology	1.5000	82.0000	0.3300	18.0000	
Mathematics	25.9700	60.0000	13.9700	40.0000	
Meteorology	0.0000	0.0000	0.3500	100.0000	
Microbiology	0.9300	50.0000	0.9300	50.0000	

Discipline	FTEF Reg	% Reg Load	FTEF Adj	% Adj Load	Description
Physics	3.8000	82.0000	0.7300	19.0000	
Physiology	1.6000	80.0000	0.0000	20.0000	
Surveying	0.3300	101.0000	0.0000	0.0000	
Waste Water Treatment	0.0000	0.0000	0.3700	100.0000	
Water Treatment	0.0000	0.0000	0.6800	100.0000	

2.3c Faculty Within Retirement Range

See individual Department PRPPs.

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

Historic Faculty Staffing Requests:

FALL 2020

One new faculty member was hired each in Biological Sciences (Anatomy) and Math with a start date of Fall 2021.

FALL 2019

Current Overview for Fall 2019: To address the current difficult fiscal situation of the District, an Early Retirement Incentive was implemented in Spring 2019. For STEM, the following faculty will be retiring by December 2019:

- 2 faculty in Biological Sciences (Robin Fautley; Susan Wilson)
- 3 faculty in Mathematics (Dave Ohlsen; Gale Bach; Dan Munton); 2 other faculty members retired pre-ERI in 2018-2019 (Deb Albers; Paul Vetrano); Bic Ha Dovan (Petaluma) will also be retiring.

The STEM Cluster has not been able to adequately staff courses in high demand disciplines -- such as Mathematics, Biological Sciences, and Chemistry -- with adjunct faculty members due to a competitive job market both in academia and private industry. Despite holding adjunct hiring committees in nearly all STEM departments both in the Fall and Spring semesters, nearly all departments have empty adjunct faculty pools. Fill rates in most STEM courses exceed 100% in addition to maintaining moderately high productivity rates. To provide more stability in faculty staffing, additional full-time positions are ideal to limit reliance on temporary part-time positions. As of July 1, 2019, it is anticipated the following requests will be made to the Faculty Staffing Committee in September:

- 2 positions in Biological Sciences (+1 roll over position for Petaluma)
- 2 positions in Mathematics
- 1-2 positions in Chemistry

Please see each individual department PRPP for additional data and rationale.

NOTE #1: Due to budget constraints, faculty staffing did not take place in Fall 2018.

NOTE #2: For historic record keeping, below are the positions presented to the Faculty Staffing Committee in Fall 2017. Pending an update from the VPAA, it is unclear if positions will be presented in Fall 2018.

1. Engineering & Applied Technology (E&AT); emphasis in Engineering transfer, focus on Civil Engineering and Civil Engineering Technology. **This request is for a retirement hire.** The E&AT Department is tied with having the lowest FT/PT faculty ratio in the STEM Cluster (42% FT vs. 59% PT). In addition to Engineering, there are 10 CTE sub-disciplines which are mostly staffed by adjunct faculty. Student who major in engineering take courses in all STEM disciplines, usually completing all advanced course sequences in multiple departments. In other words, engineering students generate the most FTES per individual student and take the most units/credits in STEM. Due to the lack of Engineering FT faculty, it has been difficult to staff necessary engineering courses for transfer students. Nearly all engineering adjunct faculty members hold full-time jobs at local companies, making their availability limited and their turnover high. An additional full-time faculty would permit offering robotics courses and other project-based classes on top of staffing existing courses. Additionally, a FT faculty member with a Civil Engineering background can help further support the Civil Engineering Technology program, as well as help revitalize the Construction Management program.

Below is the narrative summary of last year's request to the Faculty Staffing Committee:

The Engineering & Applied Technology Department is requesting a full time faculty member to support the departments programs related to Civil Engineering. This position would anchor Petaluma's Water & Wastewater Technology programs as well as the Civil & Environmental engineering portions of the existing Engineering Transfer Program (Santa Rosa). The position would also support the existing Civil Engineering Technology program that currently is coordinated by a full time faculty member from the surveying discipline. The position is also required for the restoration of a Construction Management program. This position would also be our anchor for the Petaluma Campus (currently no full time faculty load in Petaluma). This position has been previously described in PRPP's, yet represents a new formulation that reacts to the spate of retirements and new hires and addresses our most urgent need for a civil engineer for the above programs and to have a full time Petaluma presence. There has been significant growth in the engineering transfer program over the past decade, but this is a replacement position. This will consolidate adjunct positions, but is a replacement position.

The number of adjunct in the department has fluctuated markedly over the past two years because of 4 retirements, a sabbatical, and 3 hires. The currently active faculty list has 40 adjunct faculty, 22 of whom are teaching this semester (7 in Petaluma). Finding adjunct faculty is always a challenge because of the diversity of disciplines and our reliance on professionals in engineering related fields. Almost all of our faculty have full time jobs and most only teach for a few years before career or family demands pull them away. We have no 60% adjuncts with years of stable teaching experience but must instead rely on a churning pool of excellent professionals willing to teach only one class (currently only one adjunct faculty member in these disciplines is teaching above a 20% load). The department averages more than one screening/interview cycle each semester and has had a half dozen emergency hires in the past couple years. The department was forced to suspend a program (Solar Photo-voltaic Technician) for this year because of the resignation of the adjunct faculty lead. We currently have a "staff" course in civil engineering tech for proof #2 for the Spring, with plans to conduct an adjunct screening starting next month.

The department has FT/PT load ratio of 43%/57%. We currently have 4 full time faculty to serve 13 certificates and 11 majors in 9 disciplines with industry and SRJC administration requesting new and renewed programs in another 4 areas. The department has lost 5.4 faculty in the last 7 years (Sullivan, Miller, Sikes, Pasqualetti, Ataiyan [40%],

and Sweitzer). The department has gained only 3 faculty members (Parks, Grandmaison, and Papa). The department has never had a Petaluma FT presence, and this position would meet that need.

This faculty member would be a civil engineering generalist able to teach: ENGR (3 classes) WTR & WTR (8 classes), CEST (6 classes), CONS (TBD), APTECH (3+). The faculty member would also interface with local industry and represent the college at regional conferences and initiatives related to civil engineering. The class size and enrollment efficiencies vary depending on the disciplines above, as do the enrollment demand. Engineering has had extremely strong demand and enrollment these past three years, with added sections. This growth would have been even larger if we had had adequate lab staffing. Student demand in some of the department's CTE disciplines has suffered because full time faculty were not replaced in a timely manner. You can't run successful programs without full time anchor faculty.

Engineering drives enrollment in math, chemistry and physics, with engineering students making up majority of the enrollment in the calculus level courses in those departments. Engineering's approximately 70 transfer students a year is about a third of the transfer students in STEM. Dr. Ataiyan's recent retirement leaves this essential program with only one full time faculty member. This position is also essential to merge the Engineering and Applied Technology halves of the department. The department is striving to transition to a new mode of functioning, in which faculty have overlapping spheres of expertise so they can effectively support one another. The department is behind in curriculum, programs, SLO assessments, and faculty evaluations because we do not have sufficient full time faculty to manage the 100+ courses, 13 certificates, 11 majors, and 40 adjunct faculty. The department cannot realistically implement the proposed Construction Management program until this position gets filled. Similarly, some course offerings in Engineering are on hold until we can meet the staff and faculty needs. The department would like to also add its engineering GE class to build on its successful architecture GE classes. If we delay this essential hire, we also delay growth and strength in the T&E half of STEM.

Engineering has awarded 47 AS degrees these past three years, but has also transferred ~200 students. Water/Wastewater has awarded 13 AS degrees and 24 certificates these past three years. Civil Engineering Technology has awarded 3 AS degrees and 3 certificates these past three years. Demand for employees in both the local and statewide civil engineering related disciplines is soaring for both technicians and engineers. If the College is to meet this demand, we need to move this position. Thank you for your consideration.

2. Chemistry: This is a retirement hire. A full-time chemistry faculty member will be retiring after Spring 2018. The current FT/PT ratio for the chemistry department is 45% versus 55%, which is on the lower end when compared to other STEM disciplines. Loss of 1 FTEF without replacement would drop this ratio below 40% FT faculty. The Chemistry Department continues to expand with an increase of offerings on Fridays, weekends, and evenings. Additionally, with the proposed Petaluma Science Wing, additional chemistry courses will be offered in the south county, in which faculty from the Santa Rosa campus may rotate into to provide support. No adjunct faculty pool exists for chemistry despite conducting adjunct hiring this past year. Due to the limited number of chemistry companies in the area, there is an extremely limited supply of professional chemists to draw from. Noteworthy, five current adjunct faculty members commute to SRJC from outside of Sonoma County. Allocation of another FT faculty member will help to maintain FTES growth and support additional high demand courses (e.g., CHEM 60, CHEM 42, CHEM 1A) at a time when the department is experiencing growth. **POSITION FILLED, with new faculty member starting Fall 2018.**

3. Mathematics: This is a retirement hire. A full-time mathematics faculty member officially retired in Spring 2017. (Of note is that recent hires of FT math faculty do not make up for the number of retirements in recent years so the department has been continually running at a FT faculty deficit.) Demand for Math courses is extremely high and enrollment has continually been growing. Nearly all math courses have fill rates exceeding 100%, and many courses close during priority registration or first day of open registration. In Spring 2017, three FT positions were solicited, with only two positions being filled. The two new FT faculty members however are current adjuncts, which means there was only a 0.67 FTEF increase overall by filling two of the three FT positions. Although the third position (assigned to the PET campus) is being rolled over to 2017-2018, there is not sufficient full-time faculty to support student demand. Hiring and retaining adjunct faculty is difficult with no faculty currently in the adjunct pool -- despite holding adjunct hiring committees in both Fall 2016 and Spring 2017. Due to the difficulty in hiring adjunct faculty, and with 9 FT faculty within retirement range (that is 36% of the FT faculty total), the Math Department is in a dire situation. Allocation of a FT position is warranted and highly suggested.

Below is the narrative summary submitted to the Faculty Staffing Committee last year:

1. Position Requested Introduction

- The Math Department is requesting **two additional** FT faculty positions for Fall 2017.
- These two additional positions would be primarily assigned to the Santa Rosa Campus. This request is in addition to the current approved FT faculty search, in which 2 positions are allocated to Petaluma and only 1 to the Santa Rosa campus.
- This position was mentioned in the previous PRPP.
- This is not a growth position, as it is requested to keep up with the current rate of retirements and unmet student demand.
- This position will teach primarily credit courses and can also assist the math department in working with student equity and basic skills programs.

2. Current Contract Faculty Considerations

- This position request is to maintain current course support levels.
- There are approximately 30 adjunct faculty members with most on the SR campus.
- The availability of adjunct faculty in mathematics is extremely limited if non-existent. Sonoma County currently lacks large industry sectors to attract qualified individuals, and Sonoma State does not have a Master's granting program in Math.
- Interviews for adjunct positions have been performed every semester for the last three years. From these efforts, only four qualified applicants became adjunct faculty, and two of these became emergency hires.
- There is an extreme shortage of qualified applicants to fill necessary course offerings. The unavailability of eligible adjunct instructors has negatively impacted staffing.

3. Current Adjunct Faculty Considerations

- The current FT/PT ratio is 59%-to-41%.
- There are currently 26 contract faculty in the department. Two FT faculty members serve on AFA with a combined release time of 95%. Several FT faculty

members take on unwanted overloads in order to serve students. For Fall 2016, FT faculty have a combined 62.54 units of **overload** at the Santa Rosa campus -- more than 4 FTEF.

- In the past six years, 10 faculty positions have been vacated (8 SR, 2 Pet) while at the same time 10 faculty members were hired (9 SR, 1 Pet); therefore, there has been no net gain of FT faculty while enrollment has increased. The department is also heavily impacted by sabbatical leaves starting Spring 2017 (1 approved). Every subsequent semester will potentially see two faculty members on sabbatical through the end of 2018-2019.

4. Instructional Impact

- The additional FT positions would teach the full range of courses in the math department. Demand has increased across the board at Santa Rosa campus, with a “clicks-after-close” report suggesting 18 additional sections should be offered to meet demand last semester.
- The average class size is 37.2 in Spring 2016, with a 6-semester average of 38.9. Note, class size is ordinarily 28 students, with faculty regularly accepting 6 additional students off the wait list. The fill rate averages 116% over the past 6 semesters.
- Demand is extremely high for the classes these new positions would teach. Student numbers have increased due to enrollment limitations in the UC and CSU and increasing college costs. Students needing higher-level mathematics courses have increased. Sections routinely close before open enrollment. New sections that would fill cannot be offered due to lack of staffing. In a time when student outreach and recruitment to SRJC are a priority, not serving students already on campus is a contradiction of objectives.
- Resources exist to support the courses that will be taught by these new faculty members.

5. District and Departmental Need and Goals

- Degree completion and transfer are two primary goals of the department and District. Providing sufficient sections and faculty to teach classes in these pathways are imperative to achieving these objectives.
- This request is to meet current unmet demand and address growing interest in STEM.
- All curriculum review, SLO assessments, and faculty evaluations are current.
- The situation in the math department is dire. Currently, a one-year FT emergency hire for 2016-2017 is being utilized as a stop-gap. Another full-time one-semester emergency hire was approved for Spring 2017 since 8 unstaffed sections existed. All adjunct faculty are at their load capacity. Emergency hires are not the solution to staffing needs. Of additional concern is the loss of adjunct faculty to FT positions

at other colleges, and at least 4 FT faculty at retirement age who may retire simultaneously in the very near future.

6. Degrees, Certificates, Prerequisites, and/or General Education

- The 3-year average for AA Degrees in Math is 18.33, and the ADT in Math is 15.67. These are strong numbers. It is noted that a majority of students taking math classes are fulfilling requirements for nearly all other programs at SRJC.
- Math 155 (or equivalent) is a required GE course for all local AS/AA degrees. Additional faculty positions will help alleviate the bottleneck.

7. CTE Positions – not applicable

8. Position Mandates – not applicable

9. District Impact – no additional comment

2.3e Faculty Staffing Requests

Rank	Location	SP	M	Discipline	SLO Assessment Rationale
0001	ALL	01	01	See RANKED Spreadsheet & Rationale	

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

None.

2.4c Instructional Equipment Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
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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	06	07		0	\$0.00	\$0.00			

2.4f Instructional/Non-Instructional Software Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
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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

None.

3.1 Develop Financial Resources

One of the STEM Dean's Office's primary objectives is to identify financial resources to support the educational mission of the STEM Cluster. Financial resources have historically been provided through grants (internal and external) as well as donations. Regarding grants, the Dean's Office has helped faculty with understanding grant logistics, the application process, and taken lead in budget management. For donations, the Dean's Office works with the District Foundation office as they engage donors or STEM-affiliated corporations.

Through grants, the STEM Cluster has been able to support undergraduate research experiences, which have helped with student retention and engagement, and develop new resources and courses to mentor students as they head into a STEM career. Grants have also provided the opportunity to revitalize and build new programs - such as Solar Photovoltaic and HVAC-R - addressing urgent needs within the local community.

Grants

2016-2019: National Science Foundation Grant: Course-Based Research Experience; \$300,000 (in collaboration with Dean of Instruction & Strategic Program Development)

2018-2023: National Science Foundation Grant: S-STEM MILES; \$650,000 (in collaboration with Dean of Instruction & Strategic Program Development)

2017-2020: Strong Workforce Grant - Solar PV, HVAC-R, & Construction Management; approx. \$300,000 (primarily managed by STEM Dean's Office and Petaluma Instructional Dean)

2017-2018: Prop 39 Grant - Solar PV, HVAC-R, & Construction Management; approx. \$65,000 (primarily managed by STEM Dean's Office and Petaluma Instructional Dean)

Continual Grants

2018-2020: MESA. SRJC has been successful in the grant application process for remaining a host of the MESA program. Darci Rosales, MESA Manager, currently serves as President of the state-wide MESA Directors Association and helps to maintain vital contacts with the Chancellor's Office. In Spring 2020, the CCCCO is again requesting applications for grants to maintain continued funding for the MESA Program. MESA receives approximately \$70,000 from the CCCCO to support all program activities and an additional \$80,000 to fund an 80% Program Specialist through Student Equity funds. The MESA Manager position is District-funded.

Measure H (Capital Projects)

The \$410M Measure H Bond, in addition to funding renovations and new buildings, also helps to fund new equipment and furniture that will be used in the Cluster's instructional programs.

- Lindley Center for STEM Education: The \$100M project is allocated a small FF&E budget to help purchase new, large pieces of equipment (e.g., industrial CNC, 3D printers, HPLC, etc.) to furnish the new lab spaces. Related is the purchase of new furniture for Jeff Kunde Hall -- swing space as Shuhaw is torn down for the Lindley Center.
- Baker Hall Lab Renovation: This \$1-2M project is focused on remodeling a central lab stockroom. Coordination of any new equipment purchases will fall to the department and Dean's Office.
- Planetarium Feasibility Study: Approximately \$25,000. The Astronomy Program and Dean's Office have jointly moved the study forward to determine a fiscally-responsible future for the Planetarium. Discussions are ongoing.

3.2 Serve our Diverse Communities

The STEM Cluster is committed to serving the diverse college population and local community of Sonoma County.

Cluster Initiatives

The MESA (Math, Engineering, and Science Achievement) Program continues to be a source of pride within the STEM Cluster and SRJC. Its original mission is to support first-generation and disproportionately impacted students majoring in STEM transfer to four-year institutions. The program supports over 150 students, with transfer cohort sizes of approximately 60+ each year. The MESA Program has an over 95% transfer rate, well above that of the general College population. Support and retention activities include Industry Shadow Days, mentoring, peer tutoring, university site visits, internships, and multiple workshops focused on career and academic development.

The recent NSF S-STEM grant helps to fund scholarships to academically high achieving, low-income students. Beyond financial assistance, this program has developed a UC and CSU transferable course focused on teaching students career skills in STEM, such as reading research papers, giving poster presentations, landing internships, understanding how university research works, networking, etc. The course was offered in Spring 2019 with great success and will continue to be supported. The grant also funds mentoring activities, industry shadow days and other activities.

The STEM Cluster participates heavily and regularly in the District's Day Under the Oaks Celebration each Spring. This event acts as a great outreach tool to not only inform the community on what is happening in STEM but hopefully target students that would not ordinarily consider an educational path in the sciences. The following clubs and departments have regularly participated: Mechatronics, Physics, Chemistry (Chemistry Magic Show), Engineering, Interior Design, Mathematics, Geology, and Biological Sciences.

Annually, the STEM Cluster participates in Expanding Your Horizons, an event encouraging middle school girls to pursue careers in STEM. In partnership with Medtronic, Keysight, and Sonoma State, this event exposes students to hands-on science and engineering experiments. The event alternates between Sonoma State and SRJC every other year, with SRJC hosting most recently in 2019. Over 150-200 girls participate annually. STEM Cluster faculty and staff have acted as workshop presenters and speakers, and also helped with the logistics of hosting and advertising the event.

Annually in the Fall, the STEM Cluster participates in the North Bay Science Discovery Day event at the Sonoma County Fairgrounds. Each year, multiple departments exhibit experiments and displays including Mechatronics, Chemistry, Physics, Math, and Biological Sciences. This is the largest STEM event in the North Bay, attracting over 10,000 attendees and helps to share the joy of discovery with the community.

3.3 Cultivate a Healthy Organization

The STEM Dean's Office helps to cultivate a healthy organization by promoting communication across departments and supporting individual professional development.

Classified staff in the STEM Cluster are encouraged to partake in multiple District-sponsored events and committees such as Arts & Lectures, Classified Academic Senate, Student Equity Workshops, and SEIU. On a monthly basis, the Administrative Assistants across all departments meet with the STEM Dean to discuss and communicate concerns, as well as share best practices across the Cluster. In anticipation of the pending District reorganization, the Cluster also held a listening session for all classified staff with the Dean, as this constituent group will be most impacted by staffing changes. Many classified staff have been afforded release time to take classes in Spanish, Human Resources, and other disciplines for professional growth. With multiple building projects across STEM, the classified staff have been heavily engaged and act as co-chair with faculty and administration during the design and planning process.

The Dean's Office encourages faculty to attend conferences and networking opportunities, even with what little funding is available. To help facilitate communication, the Dean meets with all department chairs and CE coordinators on a biweekly or monthly basis, in addition to monthly meetings with all chairs and coordinators to discuss important and pressing issues facing the Cluster.

The Cluster continues to host multiple social gatherings on Thursday or Friday afternoons for all faculty and staff, in addition to the annual Holiday Party. These activities outside normal campus operations help to foster comradery and connect individuals with those they do not see on a daily basis.

3.4 Safety and Emergency Preparedness

In the STEM Cluster, all departments adhere to the safety protocols within their discipline, especially as it pertains to chemical or biological hazards as well as hazardous waste disposal. The Cluster communicates regularly with the Office of Environmental Health & Safety and is audited on an annual basis.

Regarding Bussman Hall where the Dean's Office is located, a building safety supervisor has been identified. Additionally, Bussman Hall is stocked with emergency safety equipment such as blankets, reflective vests, tarps, cones, first aid kit, flashlight, and water.

In the event of a large-scale emergency, the Dean has participated in drills as part of the District Emergency Operations Center, facilitated by EH&S.

3.5 Establish a Culture of Sustainability

STEM Cluster faculty and staff are extremely involved with sustainability efforts across the District.

The Spring semester weekly Environmental Forum is part of the STEM curriculum in the Earth & Space Sciences Department, and multiple faculty play key roles in the highly effective District Sustainability Committee. Sustainability has also been a guiding principle during the design and planning phases of the new Jeff Kunde Hall and Lindley Center for STEM Education. Even in the classroom, faculty have been switching from disposable dry erase markers to refillable ones that lower cost and waste.

4.1a Course Student Learning Outcomes Assessment

The various STEM Cluster Departments have been making progress in implementing assessments through all their courses spread over a 6-year timeline. As of July 25, 2019, the following submissions have been logged in Formstacks:

Biological Sciences: 33 submissions
Chemistry & Physics: 4 submissions
Earth & Space Sciences: 7 submissions
Engineering & Applied Technology: 37 submissions
Mathematics: 0 submissions

4.1b Program Student Learning Outcomes Assessment

Please see individual department PRPPs for Program-level Student Learning Outcome assessment data.

4.1c Student Learning Outcomes Reporting

Type	Name	Student Assessment Implemented	Assessment Results Analyzed	Change Implemented
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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
N/A																

4.2b Narrative (Optional)

5.0 Performance Measures

Not applicable. Please see individual Department PRPPs.

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

Not applicable. Please see individual Department PRPPs.

5.2a Enrollment Efficiency

Overall, the STEM Cluster has an extremely high enrollment efficiency (fill rate) across the five different departments. These efficiencies have remained stable year-over-year.

Summer 2019: 92%

Spring 2019: 99%

Fall 2018: 104%

Summer 2018: 94%

Spring 2018: 102%

Fall 2017: 104%

Summer 2017: 93%

Spring 2017: 103%

Fall 2016: 106%

Summer 2016: 94%

5.2b Average Class Size

Not applicable. Please see individual Department PRPPs.

5.3 Instructional Productivity

Overall, the STEM Cluster is moderately productive based on the metric of 17.5 FTES/FTEF. Due to smaller class sizes and lab hours, many departments will have a smaller productivity ratio despite having high fill/efficiency rates. Productivity has remained relatively stable over the past three years with slight variations.

(Historic productivity given in FTES/FTEF):

Summer 2019: 14.32

Spring 2019: 16.40

Fall 2018: 16.13

Summer 2017: 13.74

Spring 2018: 15.99

Fall 2017: 16.51

Summer 2017: 13.91

Spring 2017: 16.30

Fall 2016: 17.18

Summer 2016: 14.26

5.4 Curriculum Currency

See STEM Academic Department PRPPs for specifics; however as of Summer 2019, all courses in STEM are up-to-date based on the curriculum review schedule (Title V).

5.5 Successful Program Completion

Not applicable. Please see individual Department PRPPs.

5.6 Student Success

Not applicable. Please see individual Department PRPPs.

5.7 Student Access

Not applicable. See STEM Academic Department PRPPs.

5.8 Curriculum Offered Within Reasonable Time Frame

Not applicable. See STEM Academic Department PRPPs.

5.9a Curriculum Responsiveness

Not applicable. See STEM Academic Department PRPPs.

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

Not applicable. See STEM Academic Department PRPPs.

5.10 Alignment with Transfer Institutions (Transfer Majors ONLY)

Not applicable. See STEM Academic Department PRPPs.

5.11a Labor Market Demand (Occupational Programs ONLY)

Not applicable. Engineering & Applied Technology is the only department within STEM that has Career Education programs. Please see their PRPP for more information.

5.11b Academic Standards

Not applicable. See STEM Academic Department PRPPs.

6.1 Progress and Accomplishments Since Last Program/Unit Review

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
0001	ALL	04	01	Manage and facilitate design and planning of STEM Building	Review DSA-submitted plans for data and power, determining the FF&E budget, identifying equipment to purchase, and identifying furniture systems with consultants. Collaborate with Project Manager to address details and construction elements that impact instruction.	Fall 2019 thru Fall 2022	With a new opening date (Fall 2023), and new project manager, efforts are under way to finalize an FF&E budget, determine electrical outlet locations, furniture, interiors, and re-engage steering committee to make decisions regarding elements impacting instruction.
0002	ALL	04	01	Oversee move to Jeff Kunde Hall and remedy issues during first year of occupation	Work with Project Manager and Capital Projects to identify and fix any building issues during first year of occupation	Fall 2019 to Fall 2020	Complete.
0003	ALL	04	01	Oversee remodel of Baker Hall 1805 & 1850	Work with Biological Sciences faculty and staff to pre-plan for Summer 2020 renovations - including equipment storage, scheduling conflicts, and additional detailed design work.	Fall 2019 through Summer 2020	Construction is taking place from Spring 2021 thru Fall 2021. Currently in communication with PM, faculty/staff, architect, FacOps, and Media Services to upgrade various areas around the building.
0004	ALL	08	01	Relaunch the Solar Photovoltaic Program and Design New HVAC Program	Work with industry advisors to develop new content for solar PV & HVAC programs. Purchase additional equipment and coordinate lab design activities for new site at Petaluma campus.	Fall 2019 through Fall 2021	Solar PV program certificates and COR are complete. Offered first class (RENRG 101) and working with advisory group to adjust program as needed to address industry demands. HVAC CORs and certificates require additional input and work from advisors. Spending down equipment grant money which expires December 2021. Additional efforts focused on Construction Center planning and design.
0005	ALL	04	01	Develop new plan for Planetarium	Investigate potential ideas for a modern Planetarium. Design a plan that leverages public-private partnerships, donations, and Measure H funding.	Fall 2019 through Spring 2020	Plans provided by consultants require a District investment of \$12M to completely renovate and overhaul the space. COVID and staffing are large barriers to opening.
0006	ALL	07	01	Pursue additional grant funding opportunities	Work with faculty and OIR to identify new funding opportunities, including NSF or state grants.	Fall 2019 and ongoing	In addition to Strong Workforce funding which is available each year, we are currently awaiting word on the DOE HSI STEM grant (2021) and will be submitting an NSF ATE grant in October 2021. Also collaborating with SSU on an NSF IUSE grant.

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
0007	ALL	02	01	Institutionalize existing STEM student research internships.	Organize and institutionalize STEM student research internship program in the STEM Dean's Office; identify financial resources for students; identify new community partners; institutionalize application process for students.	Fall 2019 and ongoing	This goal is a key component of the DOE HSI STEM grant and SSU NSF IUSE grant which were submitted this year. The hope is these grants will provide financial resources to institutionalize internship experiences for students.
0008	ALL	07	01	Implement new STEM fund raising opportunities	Work with Foundation and faculty to identify potential fund raising ideas to support students	Fall 2019 and ongoing	Currently collaborating with the Foundation to attract major donors for the Lindley Center for STEM Education.

6.2b PRPP Editor Feedback - Optional

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6.3a Annual Unit Plan

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
0001	ALL	04	01	Coordinate remaining design and interior elements that impact instruction in Lindley Center for STEM Education.	Review DSA-submitted plans for data and power, determining the FF&E budget, identifying equipment to purchase, and identifying furniture systems with consultants. Collaborate with Project Manager to address details and construction elements that impact instruction.	Fall 2021 thru Fall 2023	FF&E funds from Measure H; Collaboration with Capital Projects and Harris Group Project Management Staff.
0002	ALL	04	01	Oversee remodel of Baker Hall 1805 & 1850	Collaborate with PM, architect, campus departments, and faculty/staff to confirm construction details and provide specific discipline information to contractors.	Fall 2021 thru Spring 2022	Measure H Funding (approx. \$1.5M to 2.0M); Capital Projects collaboration
0003	ALL	08	01	Evaluate and Build-out Solar Photovoltaic Program and Complete Design of New HVAC Program	Attract larger and specific student populations to the Solar PV program and complete purchase of needed lab equipment. Also complete CORs for HVAC-R courses and certificates.	Fall 2021 thru Fall 2023	Strong Workforce funding (equipment); Measure H (facilities); FEMA grant
0004	ALL	02	01	Institutionalize existing STEM student research internships.	Organize and institutionalize STEM student research internships; identify financial resources for students; identify community partners	Fall 2021 and ongoing	Grant funding for internship coordinator, student stipends, research costs, supplies, etc.
0005	ALL	07	01	Implement new STEM fund raising opportunities	Work with Foundation and faculty to identify potential fund raising ideas in connection with Lindley Center for STEM Education	Fall 2021 and ongoing	Donations from local companies; assistance with marketing from Public Relations; contacts with potential donors from Foundation
0006	ALL	01	01	Implement an initiative to address STEM equity gaps	Create a specific outcome/goal and Master Plan with faculty and staff to address the equity gap in certain STEM courses.	Fall 2021 and ongoing	Data and information from OIR; commitment from faculty/staff across all STEM departments.

