

# Santa Rosa Junior College

## Program Resource Planning Process

### Civil Engineering, Surveying, and Geospatial Tech 2016

#### 1.1a Mission

##### 1.1 Mission

**Department:** The mission of the Engineering and Applied Technology Department (E&AT) is to provide excellent student learning opportunities to prepare students for careers through our Career and Technical Education, CTE, programs and to prepare students for transfer in our transfer majors. We achieve this through maintaining excellent programs, hiring excellent faculty, providing state-of-the-art technology and advocating for the needs of our students.

**Civil Engineering, Surveying and Geospatial Technology Programs:** The mission of the Civil Engineering, Surveying and Geospatial Technology Programs is to increase knowledge, improve skills and to prepare students for a career in the civil engineering, surveying and mapping professions. The program accepts its responsibility in the following areas:

- Provide a superior program for students interested in the fields of civil engineering, surveying and geospatial technology.
- Recruit, secure and retain qualified instructors to educate our students.
- Maintain a high level of instructional quality and integrity by fostering an atmosphere for student success.
- Provide superior instructional support services such as well-maintained facilities, state of the art technology, equipment and curriculum to meet the learning objectives of the program.
- Challenge students to achieve to the maximum of their abilities, making sure each understands their responsibility for their own success and encouraging life-long learning.
- Manage the resources of the program, anticipating future needs, and forcefully advocating for necessary resources to meet those needs.
- Provide counseling, tutorial and communication to assist the student in their educational and occupational goals.

#### 1.1b Mission Alignment

##### 1.1b Mission Alignment

**Department:** The programs in the Engineering and Applied Technology Department mission are in alignment with the District's mission, specifically *Student Learning*, because we offer high quality instruction, using state-of-the-art technology according to current industry standards, so that our students are prepared for transfer and/or the workforce. In addition, we are advocates of *Continuous Improvement* and several of our programs have recently been reviewed, reorganized and updated to serve our students better, they are: Civil Engineering Technology; Surveying Technology; Geospatial Technology; and Electronics Technology, which is transitioning to a Mechatronics Technology program.

**Civil Engineering, Surveying and Geospatial Technology Programs:** The District's mission is: "SRJC passionately cultivates learning through the creative, intellectual, physical, social, emotional, aesthetic and ethical development of our diverse community". Since 1965. the Civil

Engineering, Surveying and Geospatial Technology Program (formerly known as Drafting, Industrial, Engineering, Civil Engineering, Civil & Surveying Technology or Geographic Information Systems) has trained and educated students from the greater bay area for careers in the civil engineering, land surveying and mapping professions. The program continues to supply local firms and agencies with qualified technicians in these disciplines.

The Program's Mission is in alignment with the District's mission and institutional goals and initiatives. For example, the Civil Engineering Tech. and Surveying programs have been revamped and revitalized to reflect changed community needs. As of Fall 2015, the program introduced three more focused 1-year certificates in keeping with the new SRCJ "Year-to-Career" theme. Singly, they will produce competent entrants to the CESGT workforce in two to three semesters. When taken in combination over three to four semesters, they will provide students with similar breadth and depth that the previously established 2-year certificates provided. All programs participate in the assessment of Student Learning Objectives.

## 1.1c Description

### 1.1c Description

**Department:** The department consists of the following 3 transfer disciplines: Architecture (limited classes), Construction Management (under development) and Engineering; and the following 8 CTE (Career and Technical Education) disciplines: Civil Engineering Tech., Digital Media: 3-D Modeling and Animation, Electronics Tech. (soon to be Mechatronics Tech.), Geospatial Tech., Solar Photovoltaics, Surveying Tech., Water Distribution Operations, and Wastewater Treatment Operations; as well as offering several general Applied Tech/Design Graphics/CAD support courses used by several of the programs in our department, as well as other departments. Although we focus on transfer and CTE certificates, our courses are also of interest to professionals who are upgrading their skills, and to the general public

It should be noted that several of the programs are in a state of flux as industry needs have changed and programs are being revised/developed to meet current needs. For example the Electronics program is transitioning to a Mechatronics program (starting Fall 2016) and major revisions are underway in each of the Civil Engineering Tech., Surveying Tech. and Geospatial Tech. programs, as well as in the Water Distribution Operations and Wastewater Treatment Operations programs.

**Civil Engineering, Surveying and Geospatial Technology programs:** The Civil Engineering, Surveying and Geospatial Technology program currently offers three certificate and degree options. At this time, all three programs are 1-year, two to three semester offerings that prepare students for technical positions in the civil engineering, surveying and mapping professions. The new program sequence begins each fall semester, however, a student may choose to begin the program having successfully completed (with a C or better) certain no-prerequisite required courses offered in the spring and summer semesters. Students should consult with the program coordinator before proceeding in that fashion.

Currently, the first semester of the program consists of core courses dedicated to equipping students with the basic skills necessary for successful job performance. Students also choose an emphasis—either Civil Engineering, Land Surveying or Geospatial technology. Courses in the second half of the program allow students to focus on their selected discipline -- Civil Engineering, Surveying or Geospatial Technology (GIS). The revitalization of these programs is still evolving however curriculum has been sent to the Chancellor's office and recruitment is underway. A pilot curriculum was offered in the Fall of 2015 and minor adjustments were made to establish a formal Fall 2016 program offering.

All three programs are endorsed and guided by the Civil Engineering, Surveying and Geospatial Technology Professional Advisory Committee, and that is not expected to change since they are

involved with the revision effort. The committee includes prominent local representatives from public agencies, private industry, the American Society of Civil Engineers, the California Land Surveyor's Association, American Council of Engineering Companies, North Coast Builders Exchange, Association of General Contractors and Engineering Contractor's Association.

At the present time students may earn an Associate of Science degree and/or a Certificate of Achievement in Civil Engineering Technology, Surveying Technology or Geospatial Technology. The curriculum is organized so that students may meet the requirements for an Associate of Science. Students who do not desire to complete all the requirements for an Associate of Science degree may earn a Certificate of Achievement upon fulfillment of all the certificate requirements with a grade of "C" or better.

The program maintains strong connections with the CESGT industry regionally for student placement in jobs during classes and immediately after program completion. The program also maintains direct ties to a hefty industry scholarship bank of roughly \$30-40k in regionally available scholarships.

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

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

**Department:** The E&AT Department offers classes during the day, the evening and on weekends at the Santa Rosa Campus. The Engineering and Architecture classes are offered primarily during the day. Electronics, Solar Photovoltaics and Animation classes are offered primarily in the evening. While the other disciplines (Civil Engineering Tech., Surveying Tech., Geospatial Tech. and Applied Tech./Drafting) have a mix of day and evening classes, with Applied Tech./Drafting and Solar Photovoltaic classes also offered on Saturday. The Water programs courses, at the Petaluma campus, are offered in the evenings.

At the Santa Rosa Campus, Drafting and CAD labs in Shuhaw Hall are staffed with a full-time (currently 10 month) classified lab assistant. An IT network administrator is responsible for maintaining our hardware and software needs. In addition there is an STNC Electronics Lab Assistant working in the Electronics program. For Spring 2016, we also have a part-time (5 hours/week) SLIA serving the Engineering program. In addition the Department has an Administrative Assistant II who works 30 hours per week, primarily during the day, with some early evening hours. At the Petaluma Campus there are no dedicated staff for the Water programs.

**Civil Engineering, Surveying and Geospatial Technology programs:** The Civil Engineering, Surveying and Geospatial Technology program begins in the Fall semester. Currently, the program is structured so that students may work and attend classes. Each discipline offers courses that require daytime field activities. Those courses are offered on 1-2 days for each discipline and the rest of the required courses are offered at night. This leaves three to four weekdays for students to hold down jobs or meet family/child care obligations if necessary. Because of limited numbers of students, we offer a comprehensive program that follows a strict course sequence. There are only a few "stand alone" courses without prerequisites.

Roughly 60% of CESGT courses have a lab component. Many of the lab courses are computer based. Some labs are field activity based. On the Santa Rosa Campus, the department has two 24-seat computer labs with high-powered graphics workstations. The workstations are equipped with all the software taught in the department. These labs are available for the student use 5-6 days a week for most of the day and part of the evening unless a scheduled course occupies the room to capacity. Open lab hours on the SR campus change each semester but are posted online and on the computer lab doors by the end of the first week of classes. There is also a 30 seat lab available to students on the Petaluma campus. This lab however, is not available to

students outside of their scheduled class time. Program administrative support is located in Bussman Service Center in the southwest corner of Bussman Hall to assist faculty, staff and students.

The program has one full time instructor / coordinator, hired in August of 2015 and 5-7 adjunct faculty members who staff the program. Adjunct instructional staff rotate teaching various courses within their discipline. There are an additional 2-4 adjuncts in a pool who can be offered teaching assignments when the need arises. All program classes are offered at the Santa Rosa campus and just the geospatial courses at the Petaluma Campus.

The sequence of courses is set up to allow the students a successful educational experience with a limited number of sacrifices to their daily routine. We are currently researching distance learning, online or hybrid courses to allow another option to the lecture portion of the curriculum.

## 1.2 Program/Unit Context and Environmental Scan

### 1.2 Program/Unit Context and Environmental Scan

**Department:** The programs in our department are varied and respond to economic conditions differently. Many of the courses in our department serve the construction industry (Architecture, Engineering, Civil Engineering Tech, Surveying, and GIS) which has experienced extremely hard fiscal times over the past few years. Because of this, many of these programs have experienced a reduction in student enrollment. As a result, most of these programs are undergoing major revisions, and the Architecture program has been discontinued awaiting enrollment demand. Now that the market has returned, it is expected that demand for CTE graduates will climb, and more students will seek transfer. In light of the changing economy a transfer Construction Management program is under development.

Although not related to the Construction Industry (except for the Solar Photovoltaics program) the Electronics program is also in this situation, as are the two Water Resources programs: Water Distribution and Wastewater Treatment. On the other hand, the Engineering program is healthy and experiencing growth and the 3-D Modeling and Animation program is finding its equilibrium.

**Civil Engineering, Surveying and Geospatial Technology programs:** During the Economic Downturn of 2008, the labor market was stagnant and jobs were difficult to obtain. Residential and commercial construction came to a halt. Enrollments declined sharply during this period and the program also suffered from the lack of a full-time faculty member to assess needed changes and provide leadership. In addition, there is some evidence that, at least in the civil engineering technology area, there are fewer jobs for technicians as increased use of advanced technology is replacing some work formerly done by technicians.

In 2014 and 2015, the program was reviewed and revised with more focused certificates and increased completion rates as an outcome. The new 1-year certificates are slowly attracting high caliber students. The program needs higher enrollment numbers. High school recruitment is important. So is recruitment among 4-year grads who need skills training to be more competitive in the work place. All students who have gone on recently have been well received. Each year the program is flooded with job requests based on its longstanding reputation of producing excellence

Keeping up with equipment and technological advances will be a challenging and expensive endeavor. These programs rely heavily on instructional and CTEA funding to meet technology needs. If this funding is reduced or eliminated, it will be difficult to maintain the industry standards necessary for successful student entry into the CESGT workplace.

More recently the architecture, engineering and construction markets have been booming and the program coordinator is receiving requests for students that cannot be filled due to moderate enrollment numbers. Based on current feedback, from companies that hire our students, it is clear that the CESGT Program still has a high profile and excellent reputation.

It has become clear that our computer laboratories can integrate with other disciplines on campus such as Agriculture, Viticulture, Natural Resource Management, Horticulture, Interior Design, Engineering, Architecture, Digital Media and Construction. Collaborative course development will be explored. The CESGT program shares similar software, hardware and equipment. The new STEM building will open many doors to effective collaboration and program growth.

Staff and professional development are important. CESGT faculty need to continue to attend conferences and seminars to keep connected to the industries we serve and the technology and growth trends occurring there. The CESGT Program continues to bring on new faculty who take pride in their roles as instructors, on being knowledgeable, highly trained and professional in their chosen disciplines. The program's practical and professional experience allows delivery of an exceptional educational and training "package" for students looking for a career in the civil engineering, surveying and mapping professions.

Student services including discipline specific tutorials, basic skills, counseling, assessment and internships are vital to student success. The ability to communicate effectively with an ever changing student population is essential. We looking forward to the future and the challenges it may bring.

## 2.1a Budget Needs

### **See Applied Technology PRPP**

#### **2.1a Budget Needs**

##### **Department:**

The department budgets (each program has one) are used effectively at this time. Overall the Department has made the switch to electronic publishing for most of our student handouts – thus reducing the need to spend as much money as previously on printing costs. And all courses that provide materials for student work are now charging fees to cover the cost of printing and other materials.

Most of the programs in our department do not have enough funds to secure the technology, other than computers, needed to teach students to industry standards, or to maintain the equipment we have - which is reflected in the budget requests for instructional equipment. See Budget Requests. And faculty and staff development funds are perennially short. Further, our department would benefit from an additional 2 months of contract for our Micro-computer Lab Specialist I, an additional 10 hours a week of work for our AAll, and we desperately need a permanent Science Lab Instructional Assistant for the department, to serve all of our programs. See Staffing Requests.

The Core Data reveals that our budgets together currently about 1% of the District's total.

##### **Civil Engineering, Surveying and Geospatial Technology programs:**

###### Operational Funds:

Operational monies for office, phone, copies, and business materials are satisfactory. This money is effectively and efficiently used by the program, so far within current allocations.

###### Professional Development:

Faculty & staff development and training is critical for all of CTE given the ever-advancing nature of technology. CESGT instructors have no budgeted program monies for something identified by the college as essential -- professional education and development. As with all occupational/technical curricula, instructors maintaining a current and acceptable level of expertise is vital to the strength, success and marketability of a CTE program.

CESGT faculty and staff frequently maintain annual currency in their areas of expertise at their own expense or by applying for CTEA mini-grants. This can be a hindrance to recruiting and retaining quality adjuncts. Modest per capita funding would be an incentive for those high-quality candidates considering part-time faculty service.

Equipment: *(required # of units follow each item in parentheses)*

Most of the CESGT equipment is old and therefore significantly behind the technology curve compared to that used in modern industry and on industry projects (our clients). The revised CESGT program requires newer equipment such as robotic total stations (8), a high-definition laser scanner (1-2), GIS mapping GNSS/GPs receivers (8), land surveying GNSS/GPS receivers (8) (both capable of wi-fi network connectivity and of receiving newer, more precise satellite broadcast channels), modern digital levels (8) and soon, an Unpiloted Aerial Vehicle (UAV).

Safety Accessories:

Hard hats, safety cones, safety vests need to be upgraded and caution signs need to be purchased for survey field activities that traverse campus (crossing walkways, roadways and occupying median strips). Much of our current safety equipment is on loan from another campus (personal favor) and will need to be returned at some point. The instructor has provided traffic cones and barriers from his own company and uses his personal vehicles for on-campus equipment transport and as a safety barrier in street traffic areas.

Equipment Maintenance:

Full-maintenance and repair of major equipment has not been performed in over 10 years. Regularly used field equipment in the hands of competent field professionals should be routinely calibrated and serviced every 1-2 years. By extension of that premise, CESGT total stations should arguably be serviced every summer in order to perform within industry specifications. Precise, reliable equipment instills knowledge and confidence in students. When they measure correctly, they must confirm that promptly and move ahead. Likewise when they measure incorrectly, they must quickly recognize it before moving ahead and make appropriate corrections.

Based on recent results seen in the advanced classes, it is apparent to the students and to the instructor that some equipment is out of calibration and in need of servicing and/or replacement. This past year, the advanced classes have identified a noticeable deterioration in instrument precision on 4/8 total stations that can be easily corrected with servicing in three of the cases possibly in the fourth as well. Severe use-limiting defects were also noted in 2-3 auto levels, 1-2 Topcon total stations and 2-3 Ashtech Static GPS units.

The CESGT program has been functioning by using only those devices that are in working order. This has only worked due to the lower student enrollment experienced in the past few semesters. In anticipation of the increased student influx due to the revised certificate programs, all equipment and certain accessory equipment (rods, prisms, tribrachs, etc.) must be serviced and/or repaired or replaced over the summer of 2016 to be ready for the fall semester.

When awarded, grants, foundation funds, local donations and outside funding from CTEA allow for a small amount of expenditures for accessories and minor equipment upgrades but NOT repairs and maintenance. Without these funds on a semi-regular basis, old and new equipment investments will suffer.

The program requests funding to allow ongoing regular servicing for all scientific equipment. These efforts will also be monitored, documented and facilitated with the implementation of the new proposed SLIA laboratory assistant position.

At a time when enrollment interest is high in the newly revised certificate program, students will not graduate with the level of proficiency and expertise expected by the prospective students, the CEGST industry (our clients), and CEGST faculty without field training on properly calibrated, functional equipment.

## 2.1b Budget Requests

Rank	Location	SP	M	Amount	Brief Rationale
0001	ALL	00	00	\$0.00	See Applied Technology PRPP
0002	ALL	04	07	\$8,000.00	CEGST: Equipment Maintenance and Repair
0003	ALL	02	04	\$6,500.00	CEGST: Faculty training and professional development

## 2.2a Current Classified Positions

Position	Hr/Wk	Mo/Yr	Job Duties
See Applied Technology PRPP	30.00	12.00	

## 2.2b Current Management/Confidential Positions

Position	Hr/Wk	Mo/Yr	Job Duties
See Applied Technology PRPP	0.00	0.00	

## 2.2c Current STNC/Student Worker Positions

Position	Hr/Wk	Mo/Yr	Job Duties
See Applied Technology PRPP	25.00	12.00	

## 2.2d Adequacy and Effectiveness of Staffing

### See Applied Technology PRPP

### 2.2d Adequacy and Effectiveness of Staffing

**Department:** All Department programs share the staff allocated to the department. The current FTEF/FTESS figure is difficult to calculate because figures are given by program, not by department. However, if we add the FTEF for all programs = 7.69, and divide by the current SS (not including the Administrative Assistant) = 1.21 the ratio is 0.158 support staff per full-time faculty member equivalent - way below average...

**Microcomputer Lab Specialist I:** The recently reclassified Microcomputer Lab Specialist I for the E&AT computer labs is a ten (10) month position and does not have summer hours to assist when ALL ANNUAL significant major software and hardware upgrades are implemented. The summer months are a very critical time for the E&AT computer labs and network; arguably the most important three months of the school year when considering the logistics of operations of hardware and software updates. The reader is reminded that technology marches on and technology software manufacturers release updates throughout the year and they are implemented during the summer months. It is a real scramble to effect these operations across two labs and a network while summer classes are also in session. These activities must be co-organized with IT's hardware specialist around the summer course offerings which will be

increasing due to the need to extend the new Year-to-Career courses into a third summer semester. This FT position needs to be a 12 month position.

**Department Administrative Assistant II:** A position that effectively serves 13 growing programs and a Department Chair requires a full time presence during the work week. The new department AA remains a 30 hour/week position with NO student assistant. Current classified and management employees are periodically being utilized beyond their full capacity and routine tasks and routine deadlines are being missed as a result. Programs suffer and faculty become frustrated beyond what is bureaucratically tolerable. This position needs to be increased from 30 to 40 hours/week. Student Assistant support should be re-explored in a progressive fashion starting with a half time position. The reviewer is encouraged to not settle for what manages to barely get done in 30 hours; please consider what more could be done in that additional 10 hours.

**Science Lab instructional Assistant (SLIA):** Currently the SLIA needs of the department are inadequately being met by an STNC position (CEGST 10 hours/week) and 5 hours of overtime for a classified employee in the Physics/Chemistry Department (for Engineering). Having adequate program support is critical to the success of our programs. At the least a full-time SLIA is needed to support the Engineering and CEGST programs. Set-up for labs, maintaining equipment and assisting in the labs are critical functions, without which the quality of instruction suffers and students are not served well. The current level of support, though better than nothing, is not adequate to address the needs of the department. Lack of continuity and job ownership inherent in the STNC position is also a negative factor. There is enough work to be done in our programs to keep a SLIA occupied 40 hours per week.

**Lab Assistant:** Currently the Lab Assistant needs of the department are being served by a 25 hour per week STNC position for the Electronics (20 hours/week) and Engineering (5 hours/week) programs. The needs in the Electronics program have been consistent for the past 30 years and will be increasing as the transition is made to Mechatronics and the Maker Space is established. It is time to hire a full-time Lab Assistant or Science Lab Instructional Assistant to serve the Electronics program.

**Civil Engineering, Surveying and Geospatial Technology program notes:** Currently, the CEGST Program has had the benefit of a STNC SLIA and this has unearthed numerous duties that have been neglected due to years of program expansion and the last three years of limited part-time program coordination. These duties are:

- attending all field labs and providing direct student support and direct instructor support - 6 hours per week in the Fall, 9 hours per week in the Spring
- supply and equipment ordering and record keeping,
- locker room and secondary equipment room maintenance and organization,
- equipment maintenance/tracking/monitoring including documentation and filing systems associated with same,
- organization and cataloging of the evolving CEGST map library which has grown from recent acquisitions and donations of archival reference maps and the annual influx of stellar (and award \$\$ winning) student work products of all of the advanced surveying and mapping classes.

The 6-month 2016 STNC SLIA position has just scratched the surface of defining the CEGST program specific position description of that job. In the past, these duties were performed in a limited fashion by previous program instructor/coordinators when there was time in between all the normal required coordinator administrative activities.



The CESGT Program requests a half time (20 hrs / week) SLIA dedicated to the CESGT Program. The position could be a shared position with Engineering to allow benefits and thereby attract and retain a more highly qualified and motivated candidate.

## 2.2e Classified, STNC, Management Staffing Requests

Rank	Location	SP	M	Current Title	Proposed Title	Type
0000	ALL	00	00	See Applied Technology PRPP		Classified

## 2.3a Current Contract Faculty Positions

Position	Description
See Applied Technology PRPP	

2.3b Full-Time and Part-Time Ratios

Discipline	FTEF Reg	% Reg Load	FTEF Adj	% Adj Load	Description
See Applied Technology PRPP	0.0000	0.0000	0.0000	0.0000	

## 2.3c Faculty Within Retirement Range

### See Applied Technology PRPP

#### **Department:**

Of the current continuing (2) and the newly hired (2) full-time faculty none have indicated any interest in retiring in the near future, although at least one of them is eligible for retirement. However, we are working with a void in the Engineering program, since the replacement for the retired 50% instructor has not been filled. See Faculty Staffing Requests. Several of the adjunct faculty are within retirement age, and we lose a few each year. We interview for adjunct faculty pools on a regular basis.

#### **Civil Engineering, Surveying and Geospatial Technology programs:**

For the past three years, the CESGT Program was coordinated by a part-time instructor. This changed with the 8/13/2015 hiring of the new full-time civil engineering, surveying and geospatial technology instructor/program coordinator. Three adjunct faculty members (Civil, Survey and GIS) retired and one withdrew from teaching as of the end of the Spring 2015 Semester.

There is currently one newly hired (8/13/2015) Instructor / Coordinator for the CESTG Program.

Three (3) adjunct faculty members have retired from full time positions outside the district and no longer teach in the program, (Foster: Civil Engineering, O'Connor: Surveying and Smith: GIS). One (1) adjunct has decided to withdraw from the pool, (Coleman: Civil Engineering/CAD)

The remaining two adjunct instructors (GIS, one course each) are not within retirement range. The remaining single adjunct instructor in land surveying is not in retirement age range.

Newer hires are not in retirement range

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

### See Applied Technology PRPP

#### **Department:**

We need one faculty position immediately:

- **Engineering:** This is a replacement and growth position. The engineering program has grown in the past few years and we have experienced the sad necessity of having to close classes and leave students unserved in a timely manner, and with the loss of the 0.5 position, a new faculty member is needed. There is more than enough load in the engineering program for another faculty member in this program. There will still be a need for adjunct faculty in the program. Note: it is difficult to recruit adjunct faculty for this discipline, as most are already working in industry.

We will need an additional faculty member in the near future:

- **Architecture/Construction Management:** This is a replacement position for a retiring full-time faculty member (May 2016). When the first year in the Architecture is offered again and the proposed transfer Construction Management program is launched (Fall 2017), there will be

ample load for a full-time faculty member as well as several adjunct faculty. Note: it is difficult to recruit adjunct faculty for this discipline, as most are already working in industry.

We will continue to interview adjunct faculty members to keep options available.

### **Civil Engineering, Surveying and Geospatial Technology programs:**

The average age of professional land surveyors is 59 and the majority are still employed. There is a scarcity of junior surveyors entering with full-licensure. Given the recent upturn in the economy, fewer qualified professional surveyors and civil engineers are interested in teaching part-time. When the economy is slow, there are more professionals with varying expertise available as instructors.

It is also increasingly difficult during the Fall and Spring semesters to effectively recruit everywhere necessary within the broadening discipline of CESGT. The program coordinator is engaged in this activity.

### **Adjunct Faculty:**

Part-time faculty will also need to be replaced AND increased as the role of the new full-time coordinator evolves and the revised program develops.

Progress has already been made in new adjunct hirings to support new/revised courses and the recent attrition mentioned above. Three are already teaching 1-2 courses, they are:

- Jessica MacClanahan a registered civil engineer specializing in the management of capital improvement projects has been hired to replace one of the civil engineering retirees (Foster) who taught the two public works courses.
- Jennifer Robinson, an accomplished drafter–designer and SRJC CESGT graduate, has been hired to replace one of the civil engineers (Coleman) who recently withdrew.
- Leonard Gabrielson, PLS the current Sonoma County Surveyor, has been hired to replace one of the land surveying retirees (former Sonoma County Surveyor, O'Connor) who retired from teaching and from county service.

The above three hires ALMOST bring the program up to the minimum of (4.71667 FTE) full-time and adjunct expertise and bodies necessary to maintain the program at current reduced levels. When the program reaches full swing similar to before the down turn, an additional 4-6 adjuncts will be needed to ensure against illness, vacation or some other manner of loss (5.00-6.00 FTE).

Neal King PLS, CP; a land surveyor and certified aerial photogrammetrist has recently been added to the adjunct pool.

Additional adjunct faculty is required especially in the area of construction surveying and route surveying. The program continues to search.

The first CESGT pilot curriculum began fall of 2015 and some minor changes have been implemented for fall 2016. Recruitment in high schools has begun as of spring 2016. The Professional Advisory Committee has been revitalized and streamlined and is providing needed feedback

The part-time instructors that currently exist in the program are knowledgeable and dedicated. This is good because it is generally difficult to retain qualified instructors because of competing industry workload, part-time faculty compensation, class room workloads, field lab workloads and constant updating of software in CESGT computer labs. They must be supported too.

The program presently has a need to fill adjunct faculty pools in all three disciplines.

As of June 2016, the E&AT will have no tenured full-time instructors at this time beyond the Engineering FT position who has just returned from sabbatical; no sabbatical leaves are anticipated. That position will be assuming the role of Department Chair for the next 3 years, therefore additional support from the engineering pool will be required to make up the reassigned time.

### 2.3e Faculty Staffing Requests

Rank	Location	SP	M	Discipline	SLO Assessment Rationale
0001	ALL	02	01	See Applied Technology PRPP	

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

### See Applied Technology PRPP

#### Department:

Each program in the department has different equipment, technology and software needs necessitated by their unique disciplines, or facilities they inhabit. Many of our programs require major investments in equipment and technology to provide industry standard education. Many of our needs have a technology component as the E&AT Department has 4 computer labs and 1 manual drafting lab. Currently all E&AT programs (as well as programs in other departments) share our labs. This year our needs reflect the major changes underway in the Electronics/Mechatronics Program, and the Civil Engineering Tech, Surveying and GIS programs as they begin to upgrade to industry standards, and the growth in the Animation program. In the past programs in our department have received CTE funding for equipment, and we will be applying for that again.

#### Civil Engineering, Surveying and Geospatial Technology programs:

Instructional equipment is the most essential aspect of this program. All of the program's current equipment is old and in clear need of updating, maintenance, repair and/or servicing. In many cases, faulty/damaged equipment is not meeting the needs of the faculty and students. Instructors are currently compensating by combining classes, allowing larger field groups per lab where equipment is broken and on occasion, using their own or outside equipment. CESGT faculty also need annual training on new hardware and new software products to remain current in the industry. *Essentially, this program is running on duct tape, baling wire and fumes and needs a retooling and a refueling in order to attract the new students and to grow.*

#### Existing CESGT equipment (model year in parenthesis) currently in use:

- 08 (2007-2004) Topcon manual Total Stations (5 Sokkia Total Stations were retired due to damage and software incompatibility)
- 08 (1995) Wild Auto Levels (2 are broken and give faulty readings)
- 08 (1998) ProMark 2 Static GPS receivers (2 are broken and give faulty readings)
- 10 (2006) Topcon HiPer Ga GNSS Receivers (5 Base & 5 Rovers)
- 08 (2003) Trimble GeoXH Mapping Grade GPS Receivers (software has expired and renewal is prohibitively expensive)
- 04 (2008) Topcon GRS1z GIS Mapping Grade GNSS RTN Receivers (discontinued, still usable but must be replaced with network rovers above)

- 12 (2008) Topcon FC-250 Data collectors
- Assorted steel tapes, pocket tapes, compasses, rods, prisms, tripods and walkie-talkies.

The program cannot generate revenue by selling off old equipment. This year the program coordinator has asked about trade-in valuation and all of the pre-2009 equipment is so out of date that they are not worth any trade in value.

**New CESGT equipment is needed** STARTING NOW and over next two years to effectively and efficiently instruct current and incoming students in new certificate programs requiring new technology. That equipment is listed below AND itemized by unit cost and total cost in a separate **SUMMARY SPREADSHEET** provided to the STEM Dean.

- 02 Motorola commercial grade radio communication systems (8/10 purchased last month w/ 2015 PRPP funding)
- 08 Topcon DS series (six DS203+two DS201 models) robotic total stations and software
- 08 Topcon FC5000 tablet, wi-fi equipped data collectors/controllers – these data collectors will operate every piece of Topcon equipment currently owned and planned for recent purchase.
- 08 Topcon HiPer SR real-time network (RTN) capable GIS mapping GPS receivers and software
- 08 Topcon HiPer V real-time kinematic (RTK) capable survey grade GNSS receivers (4 base receivers+ 4 rovers, wi-fi capable) and software
- 08 digital levels and rods and software
- 01 Topcon GLS-2000 high definition 3-D laser scanner and software
- 01 Remote controlled photogrammetric/LiDAR equipped UAV

The CESGT program needs to update to newer technology-based equipment so as to prepare technicians and future surveyors/civil engineers in the proper use and interpretation of measurement data generated from these newer products currently found in the workplace. This is additionally critical so that the program can attract students from all over northern and north-central California and southern Oregon and eventually develop a program that attracts out-of -state and international students (in discussion/development).

CalTrans (CA DOT), the largest employer of land surveyors in the world and the 5th largest employer of civil engineers in the world, along with county, municipal and private sector survey crews, are using GPS, digital levels, robotic total stations and



high definition 3D laser scanning hardware and software DAILY on projects to optimize productivity, consistency and quality. This is further confirmed via PAC, program coordinator research and working student feedback.

Each spring, for the last 4 years, the CESGT Program has 100% student employment placement in the regional engineering, land surveying and geospatial industry workplace. We currently maintain a job board with 20 new postings since January 2016 and are still receiving roughly 1-2 requests per week many of which will remain unfilled due to a lack of graduating students. This is expected to change with increased recruitment in high schools. The program coordinator maintains direct communication and feedback from employers on students AND from students on employers. From this feedback, it is known that the program is beginning to place large numbers of students where robotic instruments, GPS and 3D laser scanning are an everyday application in the field. The program is not able to offer lab time on robotic total stations and 3D laser scanners in our current courses where this could easily be accomplished using the current course sequence if the equipment were available.

The entire CESGT program is highly recognized around the state, however more recently our GPS curriculum component has become ultra-successful and well-known. Satellite based land surveying is still gaining traction in small to mid-sized practices. Oftentimes CESGT students are hired and are able to purchase GPS survey equipment and establish GPS surveying protocols at practices **when they first walk in the employer's door!** This includes assisting the proprietor/supervisor in using the software and hardware for routine surveys. Last month, a prominent Marin County practice grabbed its SEVENTH employee from the program with THREE of those in the last year and a half because they had advanced GPS skills (from the two year program) among their other survey skills gained at SRJC.

It is noteworthy that since January 2016, FOUR local survey companies have purchased Unpiloted Aerial Vehicles (UAVs) or drones. Two of those companies have purchased two UAVs for a total of six drones in the greater Santa Rosa Area. The program is ready with an adjunct in the pool (Neal King) with laser scanning experience and photogrammetry certification. We want to be recognized as the education and training center for ALL modes of measurement technology.

Addressing our low enrollment numbers for a moment; the average graduating class sizes at the three other 2-year certificate programs in California are 13-16. Comparing this year's graduating class at Fresno State of 26 students, **our combined numbers are similar across the board.**

SRJC CESGT Fall 2015 census date enrollment numbers were: GIS 8-10, CEST 12-17, Survey 11, ApTech math course 16

SRJC CESGT Spring 2016 census date enrollment numbers were: GIS 8-10, CEST 12-17, Survey 6-10,

Our continued distinction with moderate volumes of students is also reflected in the number and amount of scholarships awarded to SRJC CESGT students from CalTrans, California Land Surveyors association (CLSA), American Society of Civil

Engineering (ASEC) and the American Council of Engineering Companies (ACEC). Of the roughly \$65k of scholarships available to survey and civil engineering students statewide at 2 and 4 year colleges, SRJC students were awarded \$10,750 of that amount.

*Recognizing that there are many deserving departments and programs --- this program is revitalizing and needs new equipment to attract more students and to continue to train IMMEDIATELY EMPLOYABLE technicians in today's leading areas of technology. SRJC is one among four other similar programs in California. Two are in southern California and one is in the south SF bay area and one is in the Sierra foothills. They have all adopted the SRJC curriculum in one form or another. In that we may be competing for some of the same students as the two central California campuses and the 4-year program at Fresno state, we want to distinguish ourselves on our superior instruction AND superior learning environment which includes the most current and relevant equipment being used in the workplace. The CESGT program's work products are three-fold: a.) immediately employable technicians, b.) transfer students to 4-year programs and c.) returning professionals seeking training on newer technology -- all in that order.*

### **Additional Equipment Related Projects**

The CESGT program requests the construction of regulation spec roof/building mounts for GPS broadcast receivers which will safeguard against potential theft of the two GPS receivers which currently run UNATTENDED over control monuments, in open sky, cordoned off, designated spaces on Bear Cub Way during Survey and GIS field operations. The program coordinator is willing to work with Industrial and Trade Technology and Facilities Management to construct and install these mounting brackets and to draft official usage protocols for security and safety purposes.

The CESGT also program plans to establish an NGS regulation continuously operating GPS reference base station (CORS) on the SRJC Campus. This project will be presented as a separate jointly-funded project (with CLSA, CSRC, USGS and NGS) that will benefit the CESGT program, the newly evolving SRJC Precision Agriculture Program and the Earth and Space Science Program.

### **UNIQUE MONEY-SAVING COORDINATOR ACTIVITIES**

*Currently, the program coordinator has negotiated substantial educational discounts on hardware (equipment) from Topcon USA and **FREE** software agreements/subscriptions with Topcon USA and MicroSurvey CADD. This amounts to a **savings** of over \$ 36-45k annually also because the program purchases Survey and GIS mapping equipment that utilize the SAME software applications.*

*The program also subscribes to a community college consortium for GIS software obtaining 75+ seats of industry leader GIS software that retails at \$17k per seat. This agreement also permits **FREE** student access to the online courses and software utilities that industry and individual private purchasers must pay for.*

## FOOTNOTES

**No CTEA equipment monies were awarded last year or as of yet, this year.**

A modest application for a CTEA grant of \$ 45,080.25 was submitted this year for:

A single Topcon DS201

Three Hiper SVs and Three FC5000s

## 2.4c Instructional Equipment and Software Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	Santa Rosa	04	07	Replacement Projection unit for 1752	1	\$2,000.00	\$2,000.00	R. Grandmaison	1752 Shuhaw	rgrandmaison@santarosa.edu
0001	ALL	00	00	E&AT DEPARTMENT listing first - then CESGT	0	\$0.00	\$0.00			
0002	Santa Rosa	01	01	PLC Lab training station and control software	1	\$30,000.00	\$30,000.00	MJ Papa	1447 Bussman	mpapa@santarosa.edu
0003	Santa Rosa	02	01	Topcon DS 203 Robotic Total Stations	6	\$15,025.00	\$90,152.00	R. Parks	1799 Shuhaw	rparks@santarosa.edu
0003	Santa Rosa	02	01	Topcon FC5000 Tablet Data Collectors	8	\$1,496.25	\$11,970.00	R. Parks	1799 Shuhaw	rparks@santarosa.edu
0004	Santa Rosa	04	07	Elmo projection system	2	\$2,500.00	\$5,000.00	MJ Papa	1452 Buss. and SWCenter/Solar	mpapa@santarosa.edu
0005	Santa Rosa	04	01	Laser scanner/printer	1	\$5,500.00	\$5,500.00	G. Mansour	1752 Shuhaw	gmansour@santarosa.edu
0006	Santa Rosa	02	01	Industrial Robotic arm w/teaching pendant	1	\$40,000.00	\$40,000.00	MJ Papa	1447 Bussman	mpapa@santarosa.edu
0007	Santa Rosa	02	01	Faceware Markerless Facial Mocap System	1	\$6,975.00	\$6,075.00	R. Grandmaison	1799/1751 Shuhaw	rgrandmaison@santarosa.edu
0008	Santa Rosa	02	01	Perceptioin Neuron Body Mocap System	1	\$1,550.00	\$1,550.00	R. Grandmaison	1799/1751 Shuhaw	rgrandmaison@santarosa.edu
0009	Santa Rosa	02	01	Topcan DS201 Robotic Stations	2	\$17,497.35	\$34,997.70	R. Parks	1799 Shuhaw	rparks@santarosa.edu
0010	Petaluma	02	01	Hach Ph Probes	5	\$220.00	\$1,100.00	V. Bertsch	Petaluma	vbertsch@santarosa.edu
0011	Petaluma	02	01	Quincy Lab 12-140E Incubator	1	\$710.00	\$710.00	V. Bertsch	Petaluma	vbertsch@santarosa.edu
0012	Petaluma	02	01	Hach Pocket Chlorimeter II	2	\$450.00	\$900.00	V. Bertsch	Petaluma	vbertsch@santarosa.edu
0013	Santa Rosa	02	01	VR Headset (Playstation or Oculus Rift)	1	\$600.00	\$600.00	R. Grandmaison	1799/1751 Shuhaw	rgrandmaison@santarosa.edu
0015	Santa Rosa	02	01	Greenscreen kit	1	\$1,000.00	\$1,000.00	R Grandmaison	1799 Shuhaw	
0016	Santa Rosa	02	01	Topcon HiPer Network Rover Kit	8	\$6,489.00	\$51,912.00	R. Parks	1799 Shuhaw	rparks@santarosa.edu
0017	Santa Rosa	04	01	Laser scanner/printer	1	\$5,500.00	\$5,500.00	G. Mansour	1799 Shuhaw	gmansour@santarosa.edu
0018	Santa Rosa	02	01	25 task chairs	25	\$150.00	\$3,850.00	MJPapa	1452 Bussman	mpapa@santarosa.edu
0018	Santa Rosa	04	01	Topcon GLS 2000 3D Laser scanner and software	1	\$52,346.25	\$52,346.25	R. Parks	1799 Shuhaw	rparks@santarosa.edu
0019	Santa Rosa	02	01	Topcon HiPer V GNSS Base/Rover Kit	4	\$16,140.00	\$64,560.00	R. Parks	1799 Shuhaw	rparks@santarosa.edu
0020	Santa Rosa	02	01	Topcon DL-503 Digital Level w/Rod kit	8	\$1,661.25	\$13,290.00	R. Parks	1799 Shuhaw	rparks@santarosa.edu
0021	Santa Rosa	02	01	Traffic safety items (vests, cones, signs, stand)	1	\$2,029.00	\$2,029.00	R. Parks	1799 Shuhaw	rparks@santarosa.edu

0022	ALL	00	00	CESGT Prioritized list follows	0	\$0.00	\$0.00			
0023	Santa Rosa	01	01	Topcon DS203 Robotic Total Stations	6	\$15,025.35	\$90,152.00	Reg Parks	1799 Shuhaw Hall	Reg Parks (707) 527-4376
0024	Santa Rosa	01	01	Topcon FC5000 Tablet Data Collectors	8	\$1,496.25	\$11,970.00	Reg Parks	1775 Shuhaw Hall	Reg Parks (707) 527-4376
0025	Santa Rosa	01	01	Topcon DS201 Robotic Total Stations	2	\$17,497.35	\$34,997.70	Reg Parks	1775 Shuhaw Hall	Reg Parks (707) 527-4376
0026	Santa Rosa	01	01	Topcon HiPer Network Rover Kit	8	\$6,489.00	\$51,912.00	Reg Parks	1775 Shuhaw Hall	Reg Parks (707) 527-4376
0027	Santa Rosa	01	01	Topcon GLS 2000 3D Laser Scanner and software	1	\$52,346.25	\$52,346.25	Reg Parks	1775 Shuhaw Hall	Reg Parks (707) 527-4376
0028	Santa Rosa	01	01	Topcon HiPer V GNSS Base/Rover Kit	4	\$16,140.00	\$64,560.00	Reg Parks	1775 Shuhaw Hall	Reg Parks (707) 527-4376
0029	Santa Rosa	01	01	Topcon DL-503 Digital Level w/Rod Kit	8	\$1,661.25	\$13,290.00	Reg Parks	1775 Shuhaw Hall	Reg Parks (707) 527-4376
0030	Santa Rosa	01	01	Traffic Safety Items (vests, cones, signs, stand)	1	\$2,029.00	\$2,029.00	Reg Parks	1775 Shuhaw Hall	Reg Parks (707) 527-4376
0036	ALL	00	00		0	\$0.00	\$0.00			

## 2.4d Non-Instructional Equipment, Software, and Technology Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	Santa Rosa	04	07	Replace broken blinds	2	\$400.00	\$800.00	R. Grandmaison	1752 Shuhaw	rgrandmaison@santarosa.edu
0002	Santa Rosa	04	07	Repace clerestory curtains w/blinds	4	\$400.00	\$1,600.00	R. Grandmaison	1752 Shuhaw	rgrandmaison@santarosa.edu
0003	Santa Rosa	01	07	Two Roof Mounts for GPS receivers	2	\$0.00	\$5,000.00	Reg Parks	TBA	x4376
0004	ALL	00	00		0	\$0.00	\$0.00			

## 2.5a Minor Facilities Requests

Rank	Location	SP	M	Time Frame	Building	Room Number	Est. Cost	Description
0001	Santa Rosa	04	01	Urgent	See Applied Technogy PRPP	Shuhaw 1799	\$0.00	

## 2.5b Analysis of Existing Facilities

See Applied Technology PRPP

## 3.1 Develop Financial Resources

See Applied Technology PRPP

## 3.2 Serve our Diverse Communities

See Applied Technology PRPP

## 3.3 Cultivate a Healthy Organization

See Applied Technology PRPP

## 3.4 Safety and Emergency Preparedness

BUILDING AND AREA SAFETY COORDINATORS						
Bldg #/Name	BSC Area	ASC Area	Department	Name	Responsible Area	Phone
<i>Engineering &amp; Applied Technology - Bussman Hall</i>						
Bussman Hall #1400				To Be Decided	Bussman Hall	Employee Phone #
Bussman Hall #1400	Bussman South Offices	Bussman Service Center	Bussman Service Center	Dawn Urista	Bussman Hall rm. 1471-1478	707-524-1535
Bussman Hall #1400	Bussman Classrooms	STEM Dean (Asst.)	STEM Dean (Asst.)	Lynn Dolce	Bussman Hall rm. 1447 - 1454	707-527-4400
<i>Applied Technology, Engineering &amp; Physics - Shuhaw Hall</i>						
Shuhaw Hall #1700	Shuhaw North Wings	Applied Technology, Engineering & Physics (ATEP)	Applied Technology, Engineering & Physics (ATEP)	Greg Davis	Shuhaw Hall rm. 1751 - 1799	707-527-4750

See Applied Technology PRPP

## 3.5 Establish a Culture of Sustainability

See Applied Technology PRPP

## 4.1a Course Student Learning Outcomes Assessment

See Applied Technology PRPP



CEST 65 Public Works Plan Interp and Est	X	X	X	X	X		X	X	X	X	X	X				X
CEST 81 Engineering	X	X			X		X	X		X	X	X				X
CEST 85 CAD for Civi	X	X			X		X	X		X	X					X
GIS 40 Intro to GIS	X	X	X	X	X		X	X	X	X	X	X	X		X	X
GIS 51 Intrm GIS	X	X	X	X	X		X	X	X	X	X	X	X			X
GIS 52 Adv GIS	X	X	X	X	X		X	X	X	X	X	X	X			X
GIS 53 Cartography	X	X	X	X	X		X	X	X	X	X	X	X			X
GIS 54 Data Acq	X	X	X	X	X		X	X	X	X	X	X	X			X
GIS 55 GIS Ap Earth Sci	X	X	X	X	X		X	X	X	X	X	X	X			X
GIS 56 Land Plng GIS	X	X	X	X	X		X	X	X	X	X	X	X			X
SURV 50 Intro to Pla	X	X	X	X	X		X	X	X	X	X					X
SURV 51 Plane Survey	X	X	X	X	X		X	X	X	X	X					X
SURV 53 Route Survey	X	X	X	X	X		X	X	X	X	X					X
SURV 56 Intro to GPS	X	X	X	X	X		X	X	X	X	X					X
SURV 57 Adv GPS	X	X	X	X	X		X	X	X	X	X	X	X			X
SURV 58 Evid & Proc	X		X	X	X		X	X	X	X	X	X				X
SURV 59 Boundary Con	X		X	X	X		X	X	X	X	X	X				X

## 4.2b Narrative (Optional)

## 5.0 Performance Measures

### See Applied Technology PRPP

#### Civil Engineering, Surveying and Geospatial programs:

The civil engineering, surveying and geospatial technology program has served the county and greater bay area for over 60 years. Virtually every firm and local agency within our disciplines has at least one employee from our graduates. Some of these firms and local agencies have staffs consisting of 100% graduates for our program. In select cases, the principals of the firms are grads of the CESGT Program.

The downturn in the economy hit these programs very hard and student enrollments have drastically fallen. This was the perfect time to re-examine all the programs in this area to determine the changing needs of industry and how the CESGT programs and students can best meet them.

Beginning in 2014 and through 2015 up until August the changes were researched and implemented by a part-time instructor/program coordinator. On 8/13/2015 a full-time instructor/program coordinator was hired and by Mid April, 2016 all changes for three streamlined 1-year programs were submitted to the Chancellor's office by the SRJC Curriculum Office,

The 2015 and early 2016 job market indicators show that recovery is underway and job requests for students currently exceed student enrollment.

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



### **See Applied Technology PRPP**

The department tries hard to schedule classes at times and in places convenient to students. As the programs change and evolve, there is some experimentation with scheduling to finetune our efforts. We recently surveyed our students and are in the process of analyzing that data to determine if we can do a better job in this area.

### **Civil Engineering, Surveying and Geospatial Technology programs:**

Program sequences are set up to allow the student to complete in four semesters and achieve an Associates Degree and/or a Certificate of Achievement. Typically courses are offered at least once per year. However, the recent drop in enrollments required a re-calibration of the program and that typical pattern is not able to be honored with inadequate student enrollment. As a result the programs are under review and are being re-vitalized to respond to changing industry needs.

Facilities and equipment sometimes limit the number of students enrolled into a class. In the past, additional sections have been added to accommodate students in the program. Resizing courses and schedules has shown an increase in student success.

There continues to be a demand for the “latest and greatest” in technology. We continue to offer the courses that meet the needs of the community and profession. The expansion of the program to include geospatial technology is just one of the ways we have accomplished this. We rely very heavily on the advisory committee to guide us in our decision-making.

We continue to concentrate our offering at the Santa Rosa campus. We will continue to look for the best available locations to offer courses as well as times and days. We are looking into offering some of our courses on-line and via the internet with pod casting. Since there is a lab component associated with the majority of the courses it is difficult to accommodate on-line and non-traditional instruction. We are looking into the distance learning or hybridized lecture of our courses.

## 5.2a Enrollment Efficiency

**See Applied Technology PRPP**

## 5.2b Average Class Size

**See Applied Technology PRPP**

## 5.3 Instructional Productivity

**See Applied Technology PRPP**

## 5.4 Curriculum Currency

### See Applied Technology PRPP

Curriculum is updated on a regular basis. With so many different programs and courses it is difficult for the adjunct program coordinators to keep things up to date. There are still a few courses that need to be updated, but that should be completed prior to Fall 2016.

### Civil Engineering, Surveying and Geospatial Technology:

The 2015-16 academic year saw the review of all curriculum, and the programs they belong to, to verify that it is meeting the needs of the industry. Curriculum changes also reflect the technology changes and advisories from the field, and the advisory committee.

Our software is updated every other year, and hardware every five years.

We are participating in curriculum development and research with other state programs and community colleges with similar programs.

## 5.5 Successful Program Completion

### See Applied Technology PRPP

This is the data from the Fact Book:

Degrees by program:	7/8	8/9	9/10	10/11	11/12	12/13
0957.3 2017 Civil and Surveying Technology: Land Surveying	6	6	6	4	0	1
0957.3 2016 Civil and Surveying Technology: Civil Engineer	3	2	4	6	0	0
2206 2053 Geospatial Technology	0	0	0	1	0	0

### Certificates by Program:

0957.3 3267 Civil and Surveying Tech: Civil Engineering T	na	7	13	11	2	0
0957.3 3268 Civil and Surveying Tech: Land Surveying T	na	9	8	3	2	0
220610 3003 Geospatial Technology T	na	0	0	0	1	0

Receiving a degree requires the completion of general education classes in addition to the discipline courses.

The data for degrees and certificates in the fact book do not reflect the data we keep in our programs files., which reflects more completerrs of certificates....

Approximately 1% transfer to a four-year institution. We also have a very high % of students passing the first of their licensing exams. 75% of those taking the exam pass the first time as compared to the national average 34%.

## 5.6 Student Success

### See Applied Technology PRPP

## 5.7 Student Access

**See Applied Technology PRPP**

## 5.8 Curriculum Offered Within Reasonable Time Frame

**See Applied Technology PRPP**

**This section for CESGT was not updated for 2016**

Our programs are intended to certify that students successfully completing the program are prepared to enter careers associated with the certificate or degree. The new CESGT certificates or degrees usually take two - three semesters to complete. These programs are approved by the California Community College Chancellor's Office.

Our programs prepare students for technical positions in the civil engineering, land surveying and geospatial professions. The program sequence typically begins in the fall semester. However, a student may choose to begin the program by enrolling in required courses offered in the spring and summer semesters. The first semester of the program consists of core courses dedicated to equipping students with the basic skills necessary for successful job performance. The second semesters of the program, students choose an emphasis—either Civil Engineering, Land Surveying or Geospatial Technology. Courses in this half of the program allow students to specialize in a particular discipline within their chosen field.

Our recommended sequence of courses allows the students to progress through the four semesters and receive their certificate and/or degree. We have not had to rotate the course offerings during these cuts. We have been efficient in course offerings with an increase in student limits to accommodate their educational plans.

## 5.9a Curriculum Responsiveness

**See Applied Technology PRPP**

**This section for CESGT was not updated for 2016**

The civil engineering, surveying and geospatial technology program advisory committee officially meets twice a year in each semester. Unofficially members of the committee also are members of the professional societies of the three disciplines. This advisory committee is very active and committed to having the best programs, equipment, curriculum and instruction in the state. The committee includes prominent local representatives from public agencies, private industry, the American Society of Civil Engineers, the California Land Surveyor's Association, Association of Civil Engineering Companies, GIS Professionals, North Coast Builders Exchange, Association of General Contractors and Engineering Contractor's Association. All of our members have the distinction of hiring students from our program. Some of our members are former students of the college. All are very knowledgeable of the history of the program, quality of students coming out of the program and the guidance necessary to have such a program.

We invite all of our faculty to the advisory committee meetings. They are there as non-voting members and for informational reference only. We also invite key staff and administration from the college to the meetings. Only one of the advisory committee members is also an adjunct faculty member. The diversity of the membership is a direct reflection of the diversity of the disciplines we represent.

Equipment, hardware, software and technology is an area of great interest to the committee. Our curriculum, courses, sequence and student learning outcomes are discussed frequently.

Program leadership consults with similar programs at other community colleges.

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

**See Applied Technology PRPP**

**This section for CESGT was not updated for 2016**

We currently have articulation agreements with Piner high School for Geospatial Technology. Their Career Pathway will directly feed students into our certificate or degree programs.

We have "unofficial" agreements with all the high schools in the county for manual drafting and intro to AutoCAD.

We are working on placement type exams to better assess the students knowledge, skills and abilities prior to enrolling in classes.

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

**See Applied Technology PRPP**

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

**See Applied Technology PRPP**

**This section for CESGT was not updated for 2016**

Civil Engineering, Surveying & Geospatial careers are emerging from established professions that use geospatial technologies or require specific skill competencies. Of the 21 high-growth occupations identified as civil engineering, surveying or geospatial related, more than half require a bachelors degree or higher, with the bulk of the remaining occupations needing associate degrees or post-secondary vocational education.

In Sonoma County for the time period of 2010-20 there will be 160 jobs for civil engineering technicians with an average of 6 new openings per year - though statewide there is a need for 150 technicians per year. In that same time period there are

projected to be 80 jobs for surveying and mapping technicians at the rate of 2 new positions a year in Sonoma County with 100 needed per year in the state.. There was no data dealing specifically with GIS technicians.

## 5.11b Academic Standards

**See Applied Technology PRPP.**

6.1 Progress and Accomplishments Since Last Program/Unit Review

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
0001	Santa Rosa	08	01	See Applied Technology PRPP	Program effectiveness		

## 6.2a Program/Unit Conclusions

Location	Program/Unit Conclusions
Santa Rosa	See Applied Technology PRPP

## 6.2b PRPP Editor Feedback - Optional

—

6.3a Annual Unit Plan

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
0000	ALL	00	00	See Applied Technology PRPP			