Instructional Program Review Report
Sierra College, 2019-2020

Department/Program Name: Mechatronics

Date Submitted: Spring 2020

Submitted By: Tony Osladil

Ideally, the writing of a Program Review Report should be a collaborative process of full-time and part time faculty as well as all other staff and stakeholders invested in the present and future success of the program at all sites throughout the district. The Program Review Committee needs as much information as possible to evaluate the past and current performance, assessment, and planning of your program.

Please attach your Department Statistics Report (DSR) and your planning report with your Program Review.

1)   **<u>Relevancy</u>: This section assesses the program's significance to students, the college, and the community.**

    1a) To provide context for the information that follows, describe the basic functions of your program.

        If applicable, also describe how the program aligns with state mandates, priorities set by external agencies, or any other relevant organizations.

    Our program is primarily focused on career-oriented technical training. Although some of our students do transfer to a university, the vast majority are looking for employment-oriented skills as maintenance technicians or similar positions within the field of mechatronics. Data collected by the department supports that we are successful in this mission. Although no comprehensive employment data exists either through the district or the state or our Sierra College Research Office or CTE Committee, data that we have collected via personal contacts shows that we have students working at over 100 local and national employers, many of which have hired more than one graduate. We know of at least three local employers that have hired 5 or more of our graduates due to the quality of the training they received here in the Mechatronics department. We align our program with the needs of employers in our community by holding 2 Industry Advisory Committee meetings every year, as well as visiting multiple employers individually to learn about the skills our graduates need to be successful in their careers. <u>Per the Evaluation team's recommendation from our last Program Review</u>, I am including the list of known employers of our graduates here.

* indicates that this employer has hired ***<u>multiple</u>*** graduates from our program.
<u>Public Utilities</u>
- City of Roseville Utilities *

- Placer County Water Agency
- East Bay Utilities (EB MUD)
- Alameda Electric
- Saber Engineering (Auburn)

Electronics / Semiconductors
- NEC / Telefunken / TSI Semiconductor*
- Keysight (formerly Agilent / HP)*
- Huntington Labs (Grass Valley)*
- Comsonics*
- Micron Technology*
- Vacuum Process Engineering*
- TE Connectivity
- Intel
- Parallax

Food and Beverage Mfg
- Nestle Water*
- Vanelli / Nates Foods*
- Anheauser Busch (Fairfield)
- HP Hood Dairy Products
- Fox Barrel Cider

Energy
- SMA Solar Technology
- Solar Edge Technologies
- Gregg Drilling and Testing

Agriculture
- Tomra Sorting Solutions*
- Sunsweet Growers*
- Orchard Machinery Corporation
- Farmer's Rice Bureau
- Pacific Coast Producers

Industrial Robotics
- JLL / Amazon Robotics*
- Schilling Robotics (Davis)*
- DMG MORI Machine Tools (Davis)*
- Kuka Robotics (San Antonio)
- Honeybee Robotics (Woodland Hills)

Printing and Mailing
- Bowe Systec*
- Harris & Bruno*

Medical / Biology
- Patterson Dental* (Roseville, Reno)

- Michrom Bioresources

Communications
- AT&T
- Verifone
- L-3 Communications
- Protronics

Defense / Security
- Kratos Unmanned Aerial Systems*
- Alpha Research and Technology*
- RFI Security & Communications
- Phoenix Logistics Inc. (Tempe, AZ)

Display Technology
- D3 LED*
- Ceronix*

Industrial Refrigeration / Furnaces
- Cryobuilt
- RSD Total Control
- Mydax, Inc.
- RETECH systems

Weather and Ocean Monitoring
- Mesotech*
- All Weather, Inc.
- Datawell

Custom Automated Systems Design
- Tesco Controls*
- Conquip*
- Cox & Sons*
- SMC Corporation*
- EDMC, Inc (Electrical Design and Motor Control)*
- George Martin Company*
- Linear Design Group
- Cascade Controls (Portland)

Testing and Calibration
- The EMC Shop*
- Micro-Precision Calibration
- Gold Standard Diagnostics (Davis)
- Quest Integrity (Seattle)
- KenMar Instrumentation
- Comsonics

Entertainment / Leisure
- Cirque Du Soleil* (Las Vegas)

- Sugar Bowl Ski Area*
- Squaw Valley Ski Resort*
- Mammoth Mountain Ski Area
- Red Hawk Casino
- Thunder Valley Casino
- Chuck E. Cheese
- See Sound Shop
- Magico Loudspeakers
- Miranda Technologies

Transportation
- Siemens* (Light Rail Car Mfg.)
- Union Pacific Railroad*
- Clipper Creek*
- Lockheed Martin
- Nissan
- Aerojet
- LSM Racing Products
- Autometrics
- Intermotive
- Roadware Group, Inc.
- HyperLoop Tech
- Freedom Aero Service

Infrastructure (Construction, Plumbing, Compressed Air, etc.)
- Sierra Pacific Lumber*
- Smartrise (Elevator) Engineering*
- Atlas Copco Group
- Hilton Worldwide Utilities
- Nutter Electric
- Elevator Controls Corporation
- SJE-Rhombus / Primex (Vacaville)

OTHER
- POS Portal (Point-Of-Sale terminal sales and repair)
- Scott Machinery (Metalworking Equipment Sales and Support)
- Simply Country, Inc. (Ranch and Pet Supplies)
- The Gun Range (Automated Reloading)
- NCV Incorporated (Vending Technology)
- Celera Motion (Precision Motor and Encoder Manufacturing)

1b) How does your program support the District Mission, Vison Statement, and Core Values, quoted below?

Sierra College Mission

The mission of Sierra College is to provide an inclusive and safe educational environment where learners are supported while challenging themselves and achieving their goals.

Sierra College Vision Statement

Sierra College will be the preferred destination for higher education and training in our region while eliminating achievement gaps among our students.

Sierra College Core Values

The following core values will establish our ethical principles and will guide our institutional decision-making. Sierra College will:
1. Empower students in their education.
2. Strive toward student success and continuous improvement.
3. Be an inclusive and equitable community.
4. Be responsive to the education and workforce needs of our local community and businesses.
5. Demonstrate collaboration with all stakeholders in decision making.
6. Manage all resources in a manner that is sustainable and responsible.
7. Support and model excellence and innovation in teaching, learning, scholarship, and creativity.

Our program offers specialized and technically challenging career training in a safe and inclusive environment.

We work to improve our inclusivity by actively recruiting traditionally under-represented groups and have policies in place to unsure that these groups feel that they are a key part of our department. For example, we actively recruit female students to be lab assistants to develop a departmental culture that is not male-centric. We support outreach events that are specifically geared toward young women and people of color that have been traditionally under-represented in the technology field. We have also worked with local agencies to coordinate the development of students to work as one-on-one classroom aides for fellow students with learning disabilities and we adjust classroom procedures as needed to provide access and support the equitable inclusion of these students. Multiple disabled students that would otherwise not have been able to complete our program have successfully earned their certificates as a result of these efforts.

We provide a safe environment for students. Our environment is physically safe because despite working with potentially lethal electricity and machines, we have never had a serious accident due to our rigorous safety culture. We also provide a psychologically safe environment by having our instructors and staff well-trained on harassment, safe-spaces, equity and other key concepts needed to create an environment where all students feel safe and welcome.

We have had multiple employers inform us that our department is their preferred source for skilled technician candidates for their company. This is best demonstrated by a quote from an email of a local hiring manager: "Thanks again Tony, for keeping Tesco engaged with the

Mechatronics Department's activities. We've had a number of internal conversations about Sierra in the context of hiring plans and we're on the same page - that *Sierra will be our go-to resource for Field Service needs*. Cooper Greene, Tesco Controls." (emphasis mine) We feel that this clearly demonstrates that the Mechatronics department is our local industry's "preferred destination for training in our region" (to quote from the Sierra College Vision Statement).

Our innovative program is always evolving to provide continuous improvement to meet the needs of students and local businesses. We take our curriculum 100% from the employers in our local community at our annual Advisory meetings and individual employer visits and are therefore highly responsive to the workforce needs of our local businesses.

1c) Please describe how your program supports ISLOs (Institutional Student Learning Outcomes): Communication, Technology and Information Competency, Critical and Creative Thinking, and Citizenship?

We support all of the college's ISLOs:

- We support **Communication** by including written and verbal presentation components in most of our classes. For example, students in our MECH-54 class must write technical reports on their lab exercises that thoroughly but succinctly explain their lab exercises, similar to writing an article for a technical journal. In MECH-54, MECH-90 and MECH-25 students must make a formal verbal presentation (approx. 15 minutes long) of their semester capstone projects. Students are also taught to critically listen and apply in lab the critical information they receive. If they do not actively listen, they will not be able to complete the lab exercises successfully.
- We support **Technology and Information Competency** because our program is based on real-world applications of technology which includes learning how to access, evaluate and apply up-to-date, industry-standard technical information on electric motors, electronic sensors, hydraulic valves and specialized industrial control computers.
- We support **Critical and Creative Thinking** by, among other things, having each student design and build a unique "capstone project" in their MECH-90 course. Since each project is unique and thought up by the student, they are required to inquire about various technologies and analyze how they can be applied to the student's project. Since no new unique design is ever perfect the first time, they must problem solve to resolve differences in their original idea to the final project. Due to the minimal boundaries placed on the project, the students are able to express their individual interests and aesthetics.
- We support **Citizenship** by emphasizing personal responsibility in all practices in our departments including safe industrial practices, constructive interaction with other students, and overall professional behavior. We do this to prepare them to use these skills in their career. Also, since Mechatronics is a huge aspect of societal infrastructure (power generation, water processing, etc.) we emphasize how the work that they do will affect the sustainability of natural resources.

1d) Program offerings align with which of the following mission categories; check all that apply:

☒Transfer ☒Career Technical Education   ☒AA/AS/T/Certificates
☐Basic Skills ☒Personal Development/Enrichment.   ☒Lifelong Learning

Please analyze your department's performance in supporting the mission categories marked in 1c above. Provide evidence in support of this analysis, including data from the dashboard relevant to this evaluation. Relevant data includes the equity and diversity goals of the department and College.

If any of the following apply to your program, please address them in your analysis.
- Degrees, certificates, and/or licenses your department has generated:
  o The alignment of these awards with the district's mission and/or strategic goals. (See the district "Awards Data File, available from Research and Planning, for your numbers).
- Job placement or labor market information for your program's awards and licenses.
- The contribution your program makes to student transfer.
- Participation in basic skills programs.

Please address any developments related to Guided Pathways and Interest Areas that have impacted and/or will impact your program's support for these goals.

Our program does have students that are focused on transfer, personal development and/or lifelong learning and we support these students in their goals. However, the vast majority of our students are interested in Career Technical Education, so this response will focus on that aspect. In the last three years, our department has generated 124 certificates/ AA degrees and 62 skills certificates. Just as important, our students are obtaining employment within this field after graduating. Although no comprehensive employment data is available, self-reported data from graduates and employers shows that our students are employed at over 100 mechatronics-industry employers (listed above), bringing needed skills to the local workforce. These results directly align with the Colleges mission of providing effective career training for students.

(Note: In our last program Review the Evaluation Team suggested that we had a "missed opportunity to develop employment data" and that our department should "find their own process" for developing labor market data. We want to be clear that we closely work with the Research Office and the CTE Committee to improve our labor market data. However, our department does not have the people nor financial resources to develop comprehensive labor market data showing exact demand or the percentage of our students employed in their field. This data is very difficult to obtain and attempts to do so require large investments of time and/or money. If further information documenting how acquiring this data is beyond the capability of a single department, please discuss this topic further with Eric Cooper in Research or CTE Dean Darlene Jackson.)

Although a minority of our students are focused on transfer, we feel that it is important that our classes have the academic rigor to prepare those that do transfer to be prepared for the academic challenges of bachelor's degree coursework. The following quote from one of our graduates, although only one data point, provided us with value feedback in this regard: *"I have settled in San Jose pretty well. School and classes are going very well. Something that I think it is interesting and maybe you can share with your students, is how so far, most of my classes at Sierra were more challenging and required a higher degree*

of intelligence that the classes here at San Jose State, one of the top tech schools in the nation. The hands-on practical knowledge that I gained with the Mechatronics program has immediately contributed to me standing out amongst my peers. I am currently doing graduate research on IoT and Autonomous vehicles under a well-respected professor here. The thing that got me the position was not good grades or having connections, but rather the hands-on experience in management, project planning, electronics, fabrication and programming concepts that were learned out of both the Mechatronics program and the Sierra College Robotics team. I see that in hind-sight, Sierra College was such a unique community of driven people and resources provided to students just waiting to be utilized. I truly believe that Sierra is one of the best community colleges in California."

We promote the college's Interest Area efforts by providing suggested coursework to our students in other departments within our Interest Area such as Welding, CIS/IT and DES. Starting in Fall 2020 we have changed our Mechatronics certificate and degree to require a course from the DES department, DES-3D (due to input from our Industry Advisory Committee). Our department was also actively involved in the development of the newest program in our Interest Area, Advanced Manufacturing (ADVM). We worked with other departments in our Interest Area to define the labor market need for ADVM, develop interdisciplinary certificate requirements and mentor the new ADVM department chair.

Our diversity goals continue to be to increase the number of historically under-represented groups in the field of technology. The % of non-white students in our program trails somewhat behind the college as a whole. Hispanic: 15% for our department versus 21% for the college, Asian: 3.5% versus 5%, and African American 1.3% versus 2%. As noted above, technology fields are historically under-represented by non-white students, so our numbers indicate that this situation is improving from historical levels and may be approaching the levels of other programs that have been more historically diverse. We will continue our efforts to recruit non-traditional student enrollment. We have met with the Dean of Student Equity to discuss strategies and plan direct outreach to campus groups such as Umoja, Puente, Guardian Scholars and others.

> 1e) Optional Additional Data: Describe any other relevant contributions of your program to the district mission, goals, outcomes, and values not incorporated in the answers above. Examples include but are not limited to contributions to student equity and success, diversity, campus climate, cultural enrichment, community ties, partnerships and service. Please include specific data and examples when these are available and relevant to the analysis.

Our department is highly supportive of the district's partnership with Hacker Lab, supporting their mission of developing local entrepreneurship. Our instructors and emeritus instructors provide consultation and teach classes at Hacker Lab. We also have participated in all of the Maker Fairs held on campus, hosting booths to perform outreach to the community. We also host scores of middle and high school students for tours of our labs during "CTE Days" every year. Last spring and this coming spring our department, and the Robotics Club that we mentor, host the "Nor Cal Robotics Expo" to promote interest in our community in STEM/STEAM education by hosting competitive and art robotic events as well as promoting our CTE departments. (www.NorCalRoboticsExpo.org)

2) **<u>Currency</u>:** **This category assesses the currency of program curricula and instruction as dictated by Title 5 and the currency of efforts in meeting accreditation standards as well as improving pedagogy and engaging in professional development.**

2a) Curriculum: Describe any developments in your program's curricula since the last Program Review, including discussion of any projected changes. Please describe the process and criteria for curriculum development and review, including state and/or professional mandates, for developing, evaluating and revising curriculum, including the use of SLOs. Please note as part of this analysis if you have completed Curriculum Review.

As relevant, please address the impact of the development of Interest Areas and Guided pathways on curriculum and program planning and assessment

Since the last Program Review we have updated our MECH-25 computer course to better align with the rest of our program and industry needs and also changed the name to reflect these improvements. Having been approved by the Curriculum Committee, starting in fall 2020 this course will be named "Computers for Robotics and Automation" and will have significantly increased robotics content. Also starting fall 2020 our Mechatronics certificate and degree will require an additional course, DES-3D, due to the suggestion of our Industry Advisory Committee and the improved alignment of our two departments through the Interest Area implementation.

Besides talking the above changes through the Curriculum process, our department also completed the Curriculum Review process since the last PR was done.

Our process for curriculum development is that every year we have two Industry Advisory Committee meetings with local employers where they give us direct, actionable input on the currency of our curriculum relevant to current industry standards and needs. For example, in the last year we have added multi-axis robotic arm programming to our MECH-25 course. Per the Evaluation team's recommendation from our last Program Review, I am including the list of our Industry Advisors here.

- Siemens (Railcar division)
- TSI Semiconductor
- City of Roseville utilities
- Pride Industries
- Squaw / Alpine Ski Resort
- Vacuum Process Engineering
- Kratos Defense Systems
- Aqua Sierra Controls
- Sunsweet Foods
- Comsonics
- Harris & Bruno
- Tomra Sorting Solutions
- Mesotech
- LH Airco
- Mallard Creek
- Atlas-Copco
- Farmer's Rice Bureau
- Sierra Pacific Lumber
- VSP One
- George Martin Company

- Pacific Coast Producers
- DMG Mori
- Greenheck
- Smartrise Elevator
- JLL / Amazon Robotics
- Patterson Dental
- Tesco Controls

2b) Student Learning Outcomes Assessment: Analyze your program's assessment of course outcome, analysis of results, and improvements/changes made to the program as a result of this assessment. Please provide specific data and analysis in the space provided.

We have used our Planning and Assessment meetings to analyze the results of our assessments with both full-time and part-time faculty. Specific changes as a result of this are improved laboratory instructions during MECH-1 battery construction exercises, modifications to MECH-14 lectures to emphasize the importance of reducing sharp edges in finished projects and significant updates to lecture content prior to an AC Motor Control lab.

Per the Evaluation team's recommendation from our last Program Review, we have greatly increased the number of CSLOs that we assess from simply assessing one CSLO per course to assessing 2 or all 3 CSLOs per course. This can be seen in the SLO summary spreadsheet and will be our standard practice from now on.

In the space below, please describe or attach the cycle you have developed for outcomes assessment. You can also attach the cycle as a PDF or other file.

Our completed and in-progress SLO spreadsheets are attached to this submission. We plan to follow the established course assessment pattern in future semesters.

2c) Professional development: Please describe how your department's individual and group activities and professional development efforts, including Flex activities, serve to improve teaching, learning and scholarship.

Please describe any staff development needs you have identified based on this analysis.

For us as a Career and Technical Education program, professional development centers around staying current with industry and disseminating that information amongst our staff. We keep our program current by regularly visiting local industry to review the equipment and techniques currently used in industry. We also have two formal Industry Advisory Committee meetings per year where we bring in local industry representatives to review our curriculum and suggest updates.

Our faculty subscribe to and read multiple industry monthly publications on a wide range of mechatronics-related topics such as computers, hydraulics, sensors and motors

Our faculty have also attended various conferences such as the Make/Shift conference on best practices for college maker spaces, a conference on the future of automotive education to make informed decisions as part of the Automotive Department Vitality Committee and Tony Osladil both attended and presented at a conference in Hangzhou, China on innovation in education. (Full cost of travel paid by the conference organizers.) https://www.theunion.com/news/local-news/sierra-college-mechatronics-program-featured-at-conference-in-china/

These activities serve to keep our staff well-connected to industry needs and technical education initiatives to keep our program and ourselves current.

> 2d) Optional Additional Information: Please describe and explain any additional information that supports your evaluation of your program's success.

Effectiveness of a CTE program primarily centers around its ability to produce graduates that are highly attractive to local businesses. By providing well-qualified entry-level employees, we create a win-win-win for our students, local businesses and the college overall. Our ability to do this is best exemplified by the fact that for the last 4 years our department has hosted a career fair every fall and spring for just our Mechatronics graduates and every one of them has been attended by 12 to 15 employers competing for our graduates. Our program creates such well-trained graduates that some employers have hired 4 or 5 graduates in a single day from this event.

I will also add another quote from a local hiring manager's email: "I would like to commend you on how well you do to prepare the students for the industry. The students I have hired that have gone through your program far surpass the students that have hired through other college and engineering programs." - L. Smith - Product Support Manager, Smartrise Engineering

3) **<u>Effectiveness</u>:** **This section assesses the effectiveness of the program in light of traditional measurements.**

> 3a) Retention and Success: Assess and evaluate the three-year trends in your program's data contained in the DSR and analyze any relevant information found in the data dashboard related to retention and success.   Please include the results of any relevant outcomes assessments, as appropriate. Address separately the data for on ground and online courses, as well as the data for the campus or centers at which you operate. Please describe any challenges experienced by your program. If you determine that you need to improve the program's performance, please describe how you plan to achieve this goal.
>
> > As relevant, please address your program's role in the development of Interest Areas and Guided pathways and the impact of these developments on program planning and assessment.
>
> **NOTE:** Per the instructions on the DSR website, I emailed the research office for a .pdf copy of my department DSR. I have received no reply. Therefore, **I have no DSR to attach to this Program Review**. If they eventually send me a pdf file, I will forward it to the PR committee.

On average, our department's retention and success data slightly exceeds the college's overall results. Our department's overall retention and success percentages are 89% and 76%, versus the college's 87% and 74% (respectively). There is a normal random semester-to-semester variation in our results: from 80 – 100% in retention and 74 - 80% in success with no detectable trends over the last three years.

Since we are a hands-on, project-based program we do not offer online courses and so can not provide any data in that regard.

Our success rate is very similar over all 3 campuses, only varying 4%, from 73 – 77%, across all 3 campuses. Tahoe-Truckee has our lowest rate, at 73%, but since the number of students there is so low (58 out of 2949), it is difficult to draw any meaningful conclusions from this data.

Our retention rate is also similar over all 3 campuses, only varying 6%, from 84 – 90%, across all 3 campuses. Tahoe-Truckee has our lowest rate, at 83%, but again, the low number of students there makes it difficult to draw any meaningful conclusions.

3b) Enrollment Trends: Assess and evaluate the three-year enrollment trends in your program's DSR data. In addition, analyze any relevant information found in the data dashboard related to these trends. Include an analysis of fill rates, wait lists, course cancellations, program completion, and classroom use. Address separately the data for on ground and online courses, as well as the data for the campus or centers at which you operate. Please describe any challenges experienced by the program. If you determine that you need to improve the program's performance in any way, please describe how you plan to achieve this goal.

As relevant, please address your program's role in the development of Interest Areas and Guided pathways and the impact of these developments on program planning and assessment.

There are no discernable enrollment trends in our program in Rocklin over the last 3 years, except to show overall gain of 10%. Our fall semester enrollment grew each fall, while our spring enrollment dropped in year 2 and then and then grew in year 3. So, as mentioned, there is no distinct trend but there is incremental growth. Considering the fact that enrollment in career-technology programs typically declines during extended economic booms, this growth is very good news.

The enrollment trend at NCC is troubling, dropping from 105, to 83 to 53 students over the last 3 years. We are working directly with Dean Ortiz to address this issue, but she has not identified any issues with our program that would cause this drop. It is most likely related to overall trends at NCC.

Our enrollment at TTC is small and steady, ranging from 13-15 each semester over the last 3 years.

Our Rocklin fill rate trends are good, with fall fill rates increasing each fall semester from 88% to 92% to 94% over the last 3 years. Spring fill rates are lower but also climbing, from 76%, to 86% to 88% over three years. We have recently engaged with Sierra College Marketing to improve awareness of our program among the local community in order to further improve these numbers.

Our NCC And TTC fill rates are noticeably lower and more variable, ranging from 50% to 85%. We continue to work with both site deans and Outreach CELs to improve enrollment, but are fighting significant trends in local demographics at both sites.

Our "sections with waitlists" percentage varies greatly from semester to semester, from 3.7% to 16%. These numbers indicate a healthy demand for our courses but nothing we would consider excessive or chronic. To reduce the impact of being waitlisted on students, our instructors regularly accept students beyond the listed capacity of the course to minimize impacts on student's graduation date plans.

We have had no course cancellations in Rocklin over the past 3 years. We have had multiple course cancellations at NCC and TCC, which also signifies struggling enrollment at those two centers.

Overall, it is obvious that the program is healthy at Rocklin and struggling at NCC and TTC. We are working with those centers and trying other options such as changing scheduling of courses to better fit into student schedules, as well as increasing outreach efforts, but so far have not found a solution to variable / declining enrollments at those centers.

The previously mentioned addition of DES-3D to our Mechatronics certificate and degree will increase enrollment in that course, demonstrating some of the advantages of cross-disciplinary Interest Area coordination.

3c) Equity: Analyze and evaluate your program's performance in promoting and/or achieving equity. Based on this analysis, describe any plans you have to sustain or improve the program's contribution to student equity as a central component of student success.

I believe that our performance in promoting and achieving equity was sufficiently covered in sections 1b and 1d. We continue to look for opportunities to improve our efforts. We understand that true diversity is not just being *open* to students of historically under-represented groups (such as females, non-white and disabled students) but actually continuously *changing the culture* of the department to provide a welcoming, supportive and encouraging environment to a diverse student population.

3d) Optional information: Please describe and evaluate any additional relevant information supporting the evaluation of your program.

Although previously stated, I would like to reiterate the main reason why we as a Career Technical program feel we are effective. Our department's main purpose is to train people to be employable in local industry. We feel we do that extremely well. No comprehensive data is available from the district, state or the college Research Department, but data generated through personal contacts shows our graduates are employed at over 100 local companies. More importantly, over 1/3 of those employers have come back and hired a second, third or more graduates after seeing the quality of the skillset of their first Sierra Mechatronics graduate. Over the last 4 years we have held a career fair every semester for employers to meet just our graduates and have had 12-15 employers attend each one. These numbers clearly demonstrate that we are an effective and successful department.

While being successful in our main mission (above), we are also actively improving our department's diversity and equity, and actively supporting the college's Guided Pathways / Interest Area efforts.

3e) Analysis and Planning: Referring to the analysis in 3a-d, your ongoing planning and assessment documents, and any relevant information from section 2 above, please describe your program's plans to maintain or increase its effectiveness and analyze and evaluate your efforts to achieve these goals.

Overall we feel we are on the right track and therefore our goal is to provide continuous improvement to what we are already doing. We use our industry partner suggestions and our SLO assessments to continually improve our course content and instructional methods We have recently partnered with marketing to increase public awareness of our program and thereby increase enrollment. We have plans to increase our engagement / recruitment with historically under-represented student groups on campus via outreach to Umoja, Puente and others. We continue to search for opportunities to further increase inter-department synergy, especially within our Interest Area, such as our recent addition of DES-3D to our certificate / degree and our support of the ADVM department.

We expect a significant struggle to improve our enrollment numbers at NCC and TTC, but are actively engaged with the site deans, counselors and outreach staff on those campuses and will actively work with those local experts on this issue. It is important to remember that NCC and TTC make up less than 10% of our total department enrollment and so, although important, enrollment issues at those campuses is not a major negative to the department overall.

4) **Resources: This category assesses the adequacy of current resources available to the program and describes and justifies the resources required to achieve planning goals by relating program needs to the assessments above.**

4a) Please describe the future direction and goals of your program for the next three years in terms of sustaining or improving program effectiveness, relevance, and currency. Please include any relevant analysis of student success, equity goals, and the development of Interest Areas and Guided Pathways. Please incorporate analysis of any relevant outcome or other data in this description, including any data from the dashboard.

We believe that the interest shown by local industry in hiring our graduates demonstrates that we are on the right track. The future direction and goals of our department for the next three years is to implement the curriculum changes described above and continue to evolve as we receive information from our Industry Advisory Committee.

We will also continue to implement cross-department partnerships within our Interest Area such as developing an interdisciplinary CTE certificate which combines courses from the Mechatronics, Drafting, Welding, Advanced Manufacturing and other departments.

4b) Please describe and justify any projected requests for additional staff, new or augmented technology/equipment, and additional or remodeled facilities necessary to support these goals. Please incorporate any relevant data related to SLOs, student success, and equity.

Equipment/Technology: Last year through the CTE Committee we were funded and purchased classroom sets of table-top multi-axis robotic arms. No other major equipment needs have been identified, but we will be listening to our Industry Advisory Committee for developing technologies and our associated need for new equipment.

Facilities: We recently had facilities install compressed air outlets in one of our classrooms. No other significant changes to our facilities are needed.

Staff: 2 years ago we were able to hire a replacement for a retired full-time faculty member. No additional full-time staff requests are planned. Due to the retirement of 3 part-time instructors in the last year, we have onboarded one new part-time faculty and are actively recruiting one or two more.

4e) Please check the appropriate boxes in the chart below indicating the general reasons for the resource requests described above (please check all that apply):

Function/Role	Maintenance	Development	Growth	Safety	Outcomes	Other success measures	No Requests
							X

5) <u>Summary/Closing</u>

5a) Based on the analysis above, briefly summarize your program's strengths, weaknesses, opportunities/future directions, and challenges.

Our program is strong. Our graduates have a proven track record of successfully competing for jobs and excelling in their jobs once they begin their careers. We have an excellent reputation within local industry as the preferred source for highly skilled mechatronic technicians. Our graduates are working at over 100 local, regional and national employers and have become solid contributing members of the local community.

We offer a world-class program that is rivaled by less than a dozen community colleges or private colleges in the United States. According to one of our industry partners, Cirque du Soleil (Las Vegas, which has hired two of our graduates), <u>we are one of only three programs in the United States that offer a program of this caliber.</u> Every year we host visits by other colleges from California and around the country to discuss how we can help them develop or improve a mechatronics program at their institution. The state of Texas has published a report recommending that Texas follow the Sierra College Mechatronics model in developing CTE programs across their entire state.

At the current time, our main weakness and opportunity is to produce more graduates since our courses are not all full. Like most CTE programs, a long economic growth period such as the US has been in for the last 9 years tends to produce lower or flat enrollment in our department. Although we have actually

grown 10% in the last 3 years, we will be working with our Sierra College outreach partners to promote our program to both high-school graduates as well as adults that may be looking for retraining or additional training to improve their career paths.

.

5b) How has this report integrated the views and perspectives of stakeholders in the program?

Before writing this report, the department chair has had numerous one-on-one discussions about the status and the future of our program with our other full-time and part-time faculty members, our classified employee, our student assistants, our dean and the deans of NCC and TT. As a full-time professor, I constantly receive feedback from students at both the Rocklin and NCC campuses. I have synthesized these diverse inputs to the best of my ability and this report has been read and approved by all of our department's full-time faculty.