Certificate Form

***Certificates of Achievement (if* applicable):**

A. An Annual Update must be completed for each Certificate of Achievement program.
B. Programs with stackable certificates fill out the following form, which is included in the related degree program review.
C. Stand-alone certificates fill out the entire Annual Update.

Name of Program: Electronics Technology

Certificate Name	JSC	CA	Is the certificate stackable?	Is the certificate a stand alone program?
Electronics Technology		X	No	No
Industrial Automation	X		No	No
Industrial Communication	X		No	No
Industrial Maintenance	X		No	No
Manufacturing Automation	X		No	No

Please discuss the following questions regarding all area Certificates of Achievement (CA):

1. List certificates that are proposed for *addition*.
   Manufacturing Automation CA
   Industrial Electronics CA
   Electronic Communications CA
   Industrial Maintenance CA

2. List certificates that are proposed for *deletion*.
   Industrial Automation JSC
   Manufacturing Automation JSC
   Industrial Communications JSC
   Industrial Maintenance JSC

3. For this CA, what are the SOC codes (Occupational Titles and codes) that students who complete the CA will be able to obtain entry-level employment in, and what are the projected annual openings and median salary for each occupational title? You can use your latest Program Review data for your response.

   For the SOC codes below:
   5,012 Jobs (2018) **+2.57% Change** (2018-2023) – Nation = 2.3%
   $24.44 Median Hourly Earnings (Nation = $20.66)
   Total Annual Openings for all SOC Codes Listed: **465**

SOC Code	Occupation	2018 Jobs	Annual Openings	Median Hourly Earnings	Growth (2018 - 2023)
49-9041	Industrial Machinery Mechanics	1,241	108	$27.73	0.64%

49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	808	90	$20.47	2.97%
49-9099	Installation, Maintenance, and Repair Workers, All Other	737	76	$16.84	3.80%
49-9098	Helpers--Installation, Maintenance, and Repair Workers	571	75	$13.65	2.80%
49-9043	Maintenance Workers, Machinery	356	38	$21.54	2.81%
17-3023	Electrical and Electronics Engineering Technicians	760	25	$38.64	6.60%
49-9052	Telecommunications Line Installers and Repairers	218	21	$26.67	(7.80%)
49-9022	Electrical and Electronics Repairers, Commercial and Industrial Equipment	184	16	$31.61	1.09%
51-2022	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	98	13	$15.09	5.10%
49-9069	Precision Instrument and Equipment Repairers, All Other	39	4	$30.01	5.13%
	Totals for Occupational Titles	5,012	465	$24.44	2.57%

Source: EMSI (Economic Modeling Specialists, Inc) and California State Employment Development Department (EDD) for 17-3023 data. Note: SOC's from EMSI report that were irrelevant to our program was deleted from spreadsheet, and totals were recalculated based on the SOC codes that were used.

4. For this CA, what process was followed to ensure the required and possible elective courses were adequate for entry level employment (such as advisory committee input, surveys, industry feedback, licensing or accreditation agencies)? How often do/will you re-examine the effectiveness of certificate requirements?

Process

We used the following information and feedback sources: Advisory committee meetings/members, local employers (particularly from their technical management), our local International Society for Automation (ISA) membership – including published national data and occupational information. We additionally had input from former students now employed in technical positions. We also looked at similar programs at other Community Colleges, mainly in California.

We were able to draw from surveys and feedback from TWO advisory committees: our Electronics Technology (lower-division, A.S. degree) advisory committee, and our Industrial Automation (B.S. degree) advisory committee.

Re-examination/Evaluation:

We will evaluate and re-examine the certificate requirements as we do with course content mainly through advisory committee meetings. We will continue to solicit feedback from employer representatives, former students, and will continue to use skills sets lists, such as those found on O-Net.

5. What is your annual completion target (number of certificates awarded) for this CA? What was the number of awards in this CA for each of the past three years? Based on your results, what changes could you make in your program to meet or continue to exceed your target (such as course content, scheduling/sequence, outreach, instructional strategies)?

   We would like to triple the number of certificates of achievement awarded by the end of the next school year (or whenever we are able to convert the Job Skills certificates to CA's. This would equal a minimum of 30 CA's per year. If you look at the ever-increasing number of total certificates (CA's and JSC's) and AS degrees, this seems easily attainable.

   Electronics Technology CA

2015-16	2016-17	2017-18	3-yr Total	Average
10	9	12	31	10
Including JSC's and CA:				
61	53	81	195	65

   One other factor that has been changing over the past several years is the number of our students that actually earn an AS degree. Traditionally, that number had been only 3-6 students per year (out of close to 200 individual students taking classes in our program each semester.

   However, now that we have a baccalaureate program with a steadily-increasing enrollment, we have seen a significant increase in the number of our students who are taking the general education coursework for a degree.

   Unfortunately, there is no difference in pay between students who have just a CA and who have the AS degree, as they enter the technical workforce. But the Industrial Automation Bachelor of Science degree (or a similar technical baccalaureate degree) is the defining factor in moving up to a management position or one with a higher pay grade. Students who follow the recommended educational plan for the lower-division preparation for the baccalaureate are very close (if not completely there) to getting our AS degree while they are on the path for the baccalaureate. Therefore, the baccalaureate has the additional benefit of encouraging completion of the AS degree requirements.

6. Based on what you know about your area, what emerging/potential institutional factors (internal) and industry factors (external) will impact this certificate? How are you planning to incorporate these factors in your planning and evaluation of this certificate?

   Internal (Institutional) Factors

A major concern we have is that other entities (administration, department-level, management-level) are making commitments to expand or support an initiative, and some are adding certificates/degrees through Strong Workforce and Rural Initiatives that utilize some of our courses, but consultation and "buy-in" with our program faculty has been lacking. Our program is being committed to expansion efforts in dual enrollment, but we have concerns about the standards of those classes (along with student achievement and expectations) not being at the level of our on-campus courses. We are also concerned with the increasing rate of commitments being made by administration that do not include faculty input and collaboration. Examples are provided below.

Administrative commitments and expansions: Recent commitments and potential commitments that include some of our courses to a large corporate organization that is implementing charter schools in rural areas will impact our program and faculty, but no discussion was initiated that included our program faculty. Additionally, our college's rural initiatives expanded our program to operate at a rural center. Despite many requests to promote the program and recruit students using the strong infrastructure for outreach and recruitment, there is little evidence of our request being fulfilled. The result for that rural expansion was rural offerings cancelled and program planning being impacted negatively due to the unpredictable enrollment for those rural sections that feed the enrollment of the next courses in the pathway sequence.

"Push" to expand dual enrollment: Our program is heavily lab-dependent, and the equipment needed to implement EACH of our classes ranges from $118,000 to $325,000 PER COURSE, not including the needed facilities needs (workbenches, special electrical power, compressed air connections, floor space, and storage). Again, our concern is that because of our college "push," dual enrollment sections in our program will be offered at school sites lacking the resources to replicate the student lab experience that we rely on to meet CSLO's and PLO's.

Added pathways and degrees: Several certificates and degrees were either proposed or added this past year that utilize some of our courses (or are planning to do so). In order to make this a positive and not a negative impact, the following needs to occur: 1) serious discussion on curriculum additions or changes to the effected classes, 2) realistic projections of enrollment increases that will occur in those classes in the near future, e.g. one semester, one year, two years, etc. 3) discussion on scheduling, location of sections, facilities use, and other planning issues that have an impact on our program.

Changing J.S.C.'s to C.A.'s: One of the administrative changes that we support is the conversion of our Job Skills Certificates (that are not reflected on student transcripts and do not count as a "completion" according to state standards) to Certificates of Achievement (that do). This is a very beneficial change to our program in terms of outcomes, and to our students who stand to receive multiple certificates and at least one Associates degree if they can put in the full 60 units worth of coursework. We want to be confident that the

certificates have enough coursework to ensure entry-level employment. We also have the natural overlap of several courses between certificates, which will encourage students to continue taking a few more courses to earn another certificate or two, rather than just taking enough classes to be a "skill builder" but not a recognized "completer."

External (Industry) Factors

A big advantage of our CTE program over similar ones at other community colleges is that our students with the Electronics Technology C.A. and the companion A.S. degree are prepared not for a single industry sector, but for the multiple industry sectors of: Value-Added Agriculture, Transportation, Logistics and Manufacturing, Energy and Natural Resources, and to a certain extent, Aerospace. They represent 95% of the companies associated with the Kern Economic Development Corporation. With that diversity comes a greater challenge of providing the right course content and certificate/degree requirements, considering the diversity of needs that come from such a wide industry sector.

Changing technologies and job descriptions: Four changes that are evident: 1) job titles are changing due to the role that automation is playing in the companies and their industry in general, 2) job requirements/duties, rather than getting more specialized, are becoming more broad to include more skills and expectations, 3) the lifespan of installed technology is more difficult to predict, requiring workers to know not only state-of-the-art automation systems and equipment, but also to support older (legacy) equipment and technology as well, and 4) in software, networking, and computer applications, there is a variety of manufacturers being utilized. While some technology, such as programmable controllers have a broad installed base, other technologies like networking, control, and maintenance management software can vary between companies.

These four factors make it more challenging when we periodically review course content and certificate requirements. We only have a finite amount of class time for a reasonable number of units for each certificate.

Industry sector changes: The energy industry, particularly gas and oil, has experienced a sustained drop in revenues. This resulted in reconfiguring the business model and employees. The value-added agriculture companies have remained strong, and several ones have expanded locally, utilizing technology and automation to a greater extent. The area of greatest growth in the county among the companies we support, is with distribution centers. In recent years, almost a dozen new distribution centers were built and staffed, and just this month, two companies: L'oreal and Amazon announced new facilities being built In Kern County.