CUYAMACA
· COLLEGE ·

SUBSTANTIVE CHANGE PROPOSAL

Submitted to the Accrediting Commission for Community and Junior Colleges

Cuyamaca College
Grossmont-Cuyamaca Community College District
900 Rancho San Diego Parkway
El Cajon, CA 92019

September 16, 2016

New Educational Proposal:
Certificate of Achievement in Mechatronics

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A. Description of the Substantive Change

This Substantive Change Proposal is hereby submitted by Cuyamaca College to the Accrediting Commission for Community and Junior Colleges in support of the establishment of a new program: Certificate of Achievement (COA) in Mechatronics. Cuyamaca College has taken steps to identify the need for this new program, the specific courses that should be included in it, and the resources that exist to support it.

Relationship to the Institution's Mission

The Certificate of Achievement in Mechatronics support the mission, vision and values of Cuyamaca College as outlined in its Strategic Plan for 2010-2016. The mission of the College is to serve a diverse community of students who seek to benefit from the College's wide range of educational programs and services. Specifically, the Certificate promotes the College's mission to support student learning in Career Technical Education (CTE) and student success through effective practices in program development and implementation. One of the College's top priorities is "Economic and Community Development," and the COA in Mechatronics is fully in line with this priority, which states: *Develop strong and vibrant Career Technical Education partnerships with local business and industry to ensure that college programs meet economic needs of the community.*

B. Description of the Certificate Program

The primary educational purpose of this substantive change is to respond to the economic and workforce needs of the local community. Upon completion of this CTE program, students will be prepared to work in the burgeoning advanced manufacturing industry in the San Diego region. Graduates will be skilled in the programming, operation, and maintenance of microcontrollers; designing and prototyping mechanical components and devices; and integrating all of these skills to be applied in a manufacturing setting.

Catalog Description

Certificate of Achievement in Mechatronics

This certificate is designed for students interested in designing automatic electromechanical devices and systems. The curriculum is intended primarily for students interested in working in advanced manufacturing. It also provides the foundation for further studies in electrical and mechanical engineering.

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Write computer programs in high level languages such as C++ and, when appropriate, in assembly language, to control the operation of a microcontroller. In particular, students will be able to apply the following microcontroller capabilities: memory-mapped I/O (input/output), analog to digital (A/D) conversion, and volatile and non-volatile memory.
- Design automatic devices and control systems that can respond to inputs from sensors with appropriate outputs in the form of motion, light, and sound.
- Design mechanical components and devices, and create prototype versions of them.
- Combine the above capabilities to design integrated electro-mechanical devices of arbitrary complexity.

Catalog Descriptions for Each Course in the Certificate

ET 110: Exploratory course of study in the laws of physics as they relate to electricity and electronics. Topics include: the history of electrical science, atomic structure, basic electrical laws, DC and AC circuits, semiconductors, integrated circuits, amplifiers, wave forms, electrical test equipment, circuit construction, and electrical safety. Background in basic algebra and use of scientific calculators is highly desirable.

ENGR 100: Introduction to engineering as a way of perceiving the world. Overview of design and analytical techniques, problem solving and strategic thinking, disciplines, and ethics. Fundamentals of engineering graphics as a universal language and application to the visualization, representation, and documentation of designed artifacts, including orthographic projections, pictorial, section, and detail views; creation of basic to intermediate solid parts and assemblies; dimensioning and tolerancing practices; thread notation per ASME Y14.5M-1994. This course covers the

principles of engineering drawings in visually communicating engineering designs, and an introduction to solid modeling and computer-aided design (CAD). Assignments develop technical sketching and 2-D and 3-D CAD skills. The use of solid modeling CAD software (SolidWorks and Pro/Engineer) is an integral part of the course, as is the production of physical prototypes using 3D printing and other techniques. This course focuses on the design process and on spatial reasoning and visualization.

ENGR 175: Mechatronics is the combination of mechanical, electronic, and computer engineering to create automatic "intelligent" devices. Microcontrollers offer an easy and flexible way to do this. This course introduces the use of microcontrollers to operate motors, lights, and other electromechanical devices in response to inputs from sensors. Application of these ideas through the development of an autonomous robot.

ENGR 176: This course focuses on electromechanical product development. Control of single chip microcontrollers including memory-mapped I/O (Input/Output), direct access to registers, and fine control of timing. Development of custom circuits including manufacture of printed circuits. Control of DC and AC motors and stepper motors. Development of mechanisms and transmissions. Introduction to manufacturing techniques. This course includes a capstone design project.

ENGR 125: Advanced graphic communication using solid modeling techniques and software (SolidWorks). Techniques include feature based part construction using extrudes, cuts and revolves; advanced surface shaping using lofts and sweeps; and assembly construction and constraining in an engineering design environment. Students will continue to develop 2D drafting skills including proper organization and layout of component drawing views, dimensioning and tolerancing, sectioning and detailing, detail descriptive geometry, and introduction to manufacturing processes of mechanical parts such as sheet metal process and molding.

ENGR 182: Students who are employed in the engineering technology industry full-time or part-time (paid or unpaid) and able to work the minimum required hours during the semester are eligible to enroll in this course. Assessment of student will be performed by instructor in discussion with appropriate supervisor at place of employment. Students will further develop skills attained in the classroom setting. *Preregistration counseling with the instructor is required*. *May be taken up to 5 times for a maximum of 15 units.*

Certificate Requirements

Courses	*Title*	*Units*	*Sequence*
ET 110	Introduction to Basic Electronics	4	Fall
ENGR 100	Introduction to Engineering and Design	4	Fall

ENGR 175		Mechatronics Introduction to Microcontrollers and Robotics	3	Fall
ENGR 176		Mechatronics: Electromechanical Prototyping	3	Spring
ENGR 125		3D Solid Modeling	3	Spring
	or			
ENGR 129		Engineering Solid Modeling	3	Spring
ENGR 182		Work Experience in Engineering Technology	1 - 3	Spring
	Total Required		18-20	

This Certificate of Achievement is designed to be completed in one academic year with the first three courses (ET 100, ENGR 100, and ENGR 175) to be offered each fall and the remaining two courses (ENGR 176 and ENGR 125) to be offered in the spring semester along with the cooperative work experience course, ENGR 182.

Certificate of Achievement in Mechatronics
Recommended Course Sequence

Requirements	**Course**	**Name**	**Units**		**Local GE Area**	**Sequence**
Required Core	ET 100	Introduction to Basic Electronics	4		C	Year 1, Fall
Required Core	ENGR 100	Introduction to Engineering & Design	4		N/A	Year 1, Fall
Required Core	ENGR 175	Mechatronics: Introduction to Microcontrollers & Robotics	3		N/A	Year 1, Fall
Required Core	ENGR 176	Mechatronics: Electromechanical Prototyping	3		N/A	Year 1, Spring
Required Core	ENGR 125 Or ENGR 129	3D Solid Modeling Or Engineering Solid Modeling	3		N/A	Year 1, Spring
Required Core	ENGR 182	Work Experience in Engineering Technology	1-3			Year 1, Spring
			18-20			

There are no programmatic admission requirements for the proposed Certificate of Achievement in Mechatronics. As per course prerequisites, ET 110, ENGR 100 and ENGR 175 do not have prerequisites. ENGR 100 and 175 serve as the prerequisite for ENGR 176, and the work experience course requires a minimum of 10 units in an engineering technology program.

The COA in Mechatronics will broaden the depth and breadth of the program offerings at Cuyamaca College, adding significantly to the diversity of offerings. All of the courses included in the program, with the exception of the work experience course, are in existence; the work experience course is the only course specifically designed for the new certificate. In essence, the Certificate of Achievement in Mechatronics is a packaging of existing courses into a focused, meaningful program of study. Upon ACCJC approval, the program will be added to the College catalog, and the College will begin awarding the certificate.

Learning outcomes will be assessed annually. Faculty members engage in an annual Program Review and Planning process, empowering them to evaluate the state of their discipline. Through this review, faculty members collect and analyze data to accomplish effective planning, continuous quality improvement, and resource allocation. The evaluation is conducted through an assessment of course-level SLOs, which are mapped to Program Learning Outcomes that directly link with Institutional Learning Outcomes. Additionally, the process calls for a combination of self-evaluation and reflection on past accomplishments and future goals, which is followed with peer evaluation by external reviewers to the program or discipline.

The Program Review process is outcomes based, and student learning assessment results are used to arrive at planning and budgeting decisions. In addition, the process provides a structure to foster continuous program improvement, aligned with the discipline, department, unit, and College wide goals. The Program Review process requires disciplines to define or refine student and program-level outcomes, develop interventions to improve retention and graduation rates, while implementing action plans for improvements and linking results to the College's broader quality

assurance efforts. All units in the College complete the annual planning process in which results lead to College wide decision making, planning and budgeting, and institutional improvements.

The COA in Mechatronics falls under the jurisdiction of the Career and Technical dean. Revising and monitoring curriculum for the program will be done by the Engineering and CADD Departments in consultation with the CTE dean. Any changes made in the future will be done in consultation with other full-time and part-time faculty members in the department, Mechatronics Advisory Committee recommendations, and the dean that oversees the department.

The Curriculum Committee reviews course outlines and programs to validate that the College complies with Title 5 and District policies and procedures. The Curriculum Committee reviews each proposal for breadth, depth and rigor, carefully examining the content, objectives and student learning outcomes. Specific criteria include the requirements for assignments, critical thinking activities, required reading, writing, and outside assignments. The course content provides a good indication of the breadth and depth of each course. Students are also required to study and engage in learning activities outside of class time in order to meet the requirements of course rigor. Bloom's Taxonomy is offered as a guide to develop curriculum. Appropriate breadth of programs is assured through the inclusion of general education requirements, including social and behavioral sciences, arts and humanities, language and rationality, and natural sciences. Synthesis of learning is assured through the inclusion of critical thinking in general education and degree requirements, a core set of major requirements and capstone classes.

All courses at Cuyamaca College undergo periodic curriculum review. The Office of Instruction maintains an official *Course Master List* that indicates when courses were originally approved by the Curriculum Committee, the date they were last reviewed by the Curriculum Committee, and the date they were last offered. Courses are reviewed by the Curriculum Committee every time they undergo a modification. Courses must be reviewed on a regular, five-year cycle.

As described more fully in sections F and G below, the Certificate of Achievement in Mechatronics meets all ACCJC Eligibility Requirements, Accreditation Standards, and Commission policies related to student learning programs, services, and resources. Cuyamaca College has always remained in good standing with ACCJC, with its last full review occurring in October 2013.

C. Planning Process for the Certificate Program

The goals and objectives of the COA in Mechatronics are directly aligned with Cuyamaca College's vision of "Learning for the Future," as the skill set attained in this career technical program will prepare students for jobs currently in high-demand in the region and imbue in them critical and creative thinking skills to carry them forward through a lifetime of learning and gainful employment. The program is intentionally designed with a low number of units to ensure that students have the opportunity to earn the certificate in one academic year, which includes participation in work-based learning through the required cooperative work experience (internship) component.

The COA in Mechatronics was planned in collaboration with regional industry advisors, analyzing labor market research, consulting with the East County Economic Development Council (ECEDC), and evaluating student participation in related programs conducted by the College's Engineering Club. With the growing interest in, and need for, robotics, a certificate has been envisioned for many years. The interest in the certificate has been extremely strong, as evidenced by requests made by students and community members to faculty members and counselors alike.

The Engineering and Computer Aided Drafting and Design (CADD) instructors at Cuyamaca College began taking initial steps towards converting an existing Certificate of Specialization (less than 18 units) into a Certificate of Achievement in 2013-2014, when the idea was first proposed in the annual Engineering Program Review and Planning Report. The concept was wholeheartedly supported. It was determined that a state-approved Certificate of Achievement was justified and would meet student needs, and a new cooperative work experience course that would be part of the

certificate was developed and approved by Curriculum Committee. In addition, the existing courses were reviewed and updated as appropriate. The planning process also ensured that human, physical, technology and financial resources were available, and that there would be negligible impact on college operations (See E below).

An analysis of awards data on the CCCCO DataMart showed that over the five-year period from 2009-2010 to 2013-2014, six different colleges awarded a total of 99 degrees and certificates in the 0935.00 TOP code. A search of the CCCCO Curriculum inventory cross-referenced by the colleges in the DataMart list revealed that none of those colleges has a certificate in the "mechatronics" field specifically.

An internet search was conducted for mechatronics training in California Community Colleges, and Sierra College was the only result. It does not appear in the DataMart at this time, as it is a new program at Sierra College.

Based on these data points it is estimated that when the Mechatronics Certificate of Achievement program is fully established at Cuyamaca College there will be at least 10 completers each year with a goal to exceed that number significantly.

The Mechatronics Certificate of Achievement builds on the existing Computer Aided Drafting and Design (CADD) program at Cuyamaca College while simultaneously aligning with coursework in the Engineering Department. All of the courses in the Certificate, with the exception of the Cooperative Work Experience (ENGR 182), are existing courses, although ENGR 175 and 176 have not been offered with regularity. Three of the engineering courses, ENGR 100, ENGR 175 and ENGR 176, in the certificate have been revised recently to better meet industry needs. Furthermore, the ENGR 100 course revisions have been reviewed by faculty at San Diego State University with enthusiastic support for the new content and hands-on laboratory components.

Cuyamaca College is part of the Grossmont-Cuyamaca Community College District (GCCCD), which serves the East County region of San Diego County. There are currently no other programs in the immediate service area. However, in evaluating the broader economic region of San Diego and Imperial counties, several slightly similar programs exist. The table below lists those programs and the ways in which the proposed Mechatronics Certificate of Achievement complements and/or does not

negatively impact those offerings. None of these programs are in the "Electro-Mechanical Technology" (0935.00) TOP code where the proposed program is coded.

College	***Program Title***	***TOP Code***	***Comments***
Imperial Valley College	Electronics & Electric Technology	0934.00	Electrical, not electronic, technology
Palomar College	Electro-Mechanical Drafting & Design	0953.30	Focused on design and drafting with no 3D modeling; no short-term certificate available
San Diego City College	Electronics & Electrical Technology	0934.00; 0953.30	Emphasis on electronic design; no 3D modeling
San Diego City College	Manufacturing Engineering Technology	0956.00; 0956.30	Emphasis on subtractive technologies v additive; no short-term certificate available
Southwestern College	Electronics	0953.30	Focused on computer electronics; not in manufacturing; no design components

The primary features that make the proposed Mechatronics Certificate of Achievement at Cuyamaca College unique in the region are:

1. Courses are sequenced to be completed in one year.
2. It is focused on designing electromechanical devices and systems using 3D design technology and software.
3. It is focused on additive versus subtractive design

Internal and external approvals were obtained. The Curriculum Committee, Academic Senate, GCCCD Governing Board and the California Community Colleges approved the COA in Mechatronics in 2015.

The planning process included a presentation to the Mechatronics Industry Advisory Board at Cuyamaca College on February 4, 2015 (See Minutes, Appendix). Engineering and CADD instructors Duncan McGehee and Cyrus Saghafi gave an overview of the classes proposed for the Mechatronics program. It was noted that while Cuyamaca has an Automotive Technology program, there are no other heavy industry programs. They consider Mechatronics to be classified as smart manufacturing or advanced manufacturing; that is where the College hopes to make a contribution and an impact on the local economy.

The planning process also consisted of an agenda item discussion at the San Diego Imperial Counties Community College Workforce Development Council on March 26, 2015 (See Appendix). Cuyamaca College's Dean Kate Alder reported to the Workforce Development Council that the Mechatronics program had been approved by the Cuyamaca College Curriculum Committee and the GCCCD Governing Board. The WDC unanimously approved the initiation of a certificate in Mechatronics at Cuyamaca College. Supporting documents including Mechatronics Certificate Program Proposal Narrative Summary and Labor Market Gap Analysis can be found at the Regional Consortium website, http://myworkforceconnection.org/march-2015-sdic-wdc-meeting/.

E. Evidence of Analysis of Human, Physical, Technology and Financial Resource Needs

There are sufficient fiscal and physical resources to support and sustain the proposed Certificate of Achievement in Mechatronics. All of the courses with the exception of the work experience course are existing. The certificate packages existing curriculum into a coherent, focused program. Additional sections of the course offerings are not planned; thus, human resources (faculty and staff needs) are also deemed adequate.

In the development of this certificate, the library has certified that additional resources (materials, books, periodicals) are not necessary. Facilities are satisfactory, as well. Since no new sections are planned, current facilities are suitable for supporting and sustaining the proposed program. In sum, the proposed COA in

Mechatronics will not impact the institution's budget since it consists of current curriculum and new sections and not planned.

Cuyamaca College assures the quality and integrity of its programs and services by hiring appropriate full-time and part-time personnel sufficiently qualified by education and experience to meet programmatic needs. Minimum qualifications are stated for all faculty and administrators, in keeping with the Minimum Qualifications for Faculty and Administrators in California Community Colleges Handbook.

Instructors avail themselves of the many opportunities for professional development throughout the year. Full-time instructors have the ability to participate in sabbatical leave projects; these contribute to maintenance of high-quality programs and services. Moreover, evaluation of faculty plays an important role in maintaining high quality programs, and the College conducts regular faculty evaluations through a process that includes management, peer, and student components.

Cuyamaca College has a sufficient number of qualified instructors to support the proposed Certificate of Achievement in Mechatronics. Cuyamaca College can draw from its surrounding community of which there are sufficient and qualified individuals. In addition, as stated, the program is a packaging of courses currently offered at the College. No new sections are planned; thus, it will not be necessary to conduct a search for additional instructors. The development of future curriculum will be determined by full-time and part-time instructors of the Engineering courses and administrational oversight.

Cuyamaca College meets the varied educational needs of its students through student support services. New students are encouraged to complete an assessment and orientation process to identify their level of Mathematics, English, or English as a Second Language preparedness. Following the process, students receive a recommendation on placement level and then meet with counselors and peer advisors who assist them with registration, course selection, and the development of an educational plan.

Cuyamaca College offers support services on campus and online. Student Services are open during regular business hours with early evening hours in major

service areas in the "One Stop Center." The One Stop Center houses key programs such as Admissions & Records, Assessment, Borderless Spaces, CalWORKs, Career Services, Counseling, Disabled Students Programs & Services (DSPS), Extended Opportunity Programs & Services (EOPS), Cooperative Agencies Resources for Education (CARE), Financial Aid, First Year Experience (FYE), Transfer Center and Veterans Affairs. Housing these services in one location provides easy access for students, and allows the various programs to collaborate to achieve exemplary, quality services. The Cuyamaca College Student Center houses Student Affairs, the Associate Student Government, High School and Community Relations, and the Student Health Center. Centrally located, these services are adjacent to the College bookstore and student dining services.

Enrollment Data

Average annual enrollment figures and sections for the core required courses from Fall 2013 through Spring 2015 appear in the table below:

		FY 2013-2014		FY 2014-2015	
Course #	Course Title	Annual # Sections	Annual Enrollment Total	Annual # Sections	Annual Enrollment Total
ET 100	Introduction to Basic Electronics	2	54	2	58
ENGR 100	Introduction to Engineering & Design	4	120	5	143
ENGR 175*	Mechatronics: Introduction to Microcontrollers & Robotics	0	0	0	0
ENGR 176*	Mechatronics: Electromechanical Prototyping	0	0	0	0
ENGR 125 or ENGR 129	3D Solid Modeling or Engineering Solid Modeling	1 1	30 21	1 1	26 28
ENGR 182	Work Experience in Engineering Technology	0	0	0	0

*Due to the downturn in the economy, these courses have not been offered in the years indicated above.

Plan for Monitoring Achievement of Outcomes

Upon ACCJC approval and activation of the Certificate of Achievement in Mechatronics at Cuyamaca College, learning outcomes will be assessed annually. At Cuyamaca College, each discipline undergoes an annual program review and planning process, empowering instructional faculty members to evaluate the state of their discipline. Through this review, faculty members collect and analyze data to accomplish effective planning, continuous quality improvement, and resource allocation. The evaluation is conducted by through an assessment of course-level Student Learning Outcomes (SLOs), which are mapped to Program Learning Outcomes that directly link with the Institutional Learning Outcomes. Additionally, the program review and planning process calls for a combination of self-evaluation and reflection on past accomplishments and future goals, which is followed with peer evaluation by external reviewers (members of the Instructional Program Review & Planning Committee).

The Program Review and Planning process is outcomes-based, and results are used to arrive at planning and budgeting decisions. In addition, the process provides a structure to foster continuous program improvement, aligned with the discipline, department, unit, and College wide goals. The process requires disciplines to define or refine student and program-level outcomes, develop interventions to improve retention and graduation rates, while implementing action plans for improvements and linking results to the College's broader quality assurance efforts. All units in the College complete the annual program review and planning process, which leads to College wide decision making, planning and budgeting, and institutional improvements.

All all programs, the Cerficiate of Achievement in Mechatronics will undergo the annual outcomes assessment and program review process already in place at Cuyamaca College. The process uses TracDat to enter course and program outcomes assessment and improvement plans. The program is structures to allow students to

achieve their COA degree in one year, by taking three courses in the fall semester, and three courses in the spring.

E. Evidence of Necessary Internal and External Approvals

All necessary internal and external approvals have been obtained. The Cuyamaca College Curriculum Committee approved the COA in Mechatronics on February 17, 2015. Following that, the Cuyamaca College Academic Senate approved the addition of the COA on February 26, 2015. Then, the Governing Board of the Grossmont-Cuyamaca Community College District approved the addition of a certificate of achievement in Mechatronics on March 17, 2015. A link to the official Minutes http://www.gcccd.edu/governing-board/documents/minutes/2015/March%2017,%202015,%20Regular%20Meeting.pdf provides evidence of official approval.

The Mechatronics Advisory Committee supported the addition of a COA in Mechatronics at Cuyamaca College on February 4, 2015, and the San Diego and Imperial Counties Workforce Development Committee (SDICWDC) unanimously approved the addition of a COA in Mechatronics at Cuyamaca College on March 26, 2015. Finally, the Chancellor's Office approved the COA in Mechatronics on November 8, 2015.

F. Evidence that Eligibility Requirements and Standards Are Met by the Changes

Cuyamaca College affirms that, with the addition of the COA in Mechatronics, the institution will remain in continued compliance with the Accrediting Commission for Community and Junior Colleges' prescribed eligibility requirements as set forth below:

1. Authority

Cuyamaca College is a public, two-year community college authorized to operate as a degree-granting institution by the State of California, the Board of Governors of the California Community Colleges, and the Governing Board of

the Grossmont-Cuyamaca Community College District. Cuyamaca College is accredited by the Accrediting Commission for Community and Junior Colleges of the Western Association of Schools and Colleges (WASC). There will be no change with the addition of a Certificate of Achievement in Mechatronics.

2. Mission

The Cuyamaca College Mission defines the institution's broad educational purposes, its intended student population and its commitment to student learning. The College's Mission Statement was most recently revised by the College in Spring 2012 and adopted by the Governing Board in July 2012. The proposed COA in Mechatronics are in alignment with the mission of Cuyamaca College.

3. Governing Board

A five-member Governing Board elected by the citizens of San Diego's East County region sets policy and direction and provides leadership for the Grossmont-Cuyamaca Community College District. Each Governing Board member serves a term of four years and terms are staggered to allow for continuity. The Governing Board is an independent policy-making body that approves and oversees the educational mission of the District and the two Colleges. The Governing Board has two non-voting student members, each representing one of the two Colleges in the District. Meetings are held once per month, alternating between Cuyamaca College and Grossmont College. The Certificate of Achievement in Mechatronics will have no impact on the composition or role of the GCCCD Governing Board.

4. Chief Executive Officer

Dr. Julianna Barnes serves as the President and Chief Executive Officer (CEO) of Cuyamaca College. Dr. Barnes was hired for this position in September 2015. It is her full-time responsibility to lead and administer the institution, and she

reports directly to the Chancellor of the Grossmont-Cuyamaca Community College District, Dr. Cindy L. Miles. She is supportive of the program and acknowledges the value of the program for Cuyamaca College and its surrounding community.

5. Administrative Capacity

The institution's administrative capacity can support this change. The administration at Cuyamaca College consists of:

President
Vice President of Instruction
Vice President of Student Services
Vice President of Administrative Services
Three instructional deans (Divisions I, II and III)
Dean of Counseling
Dean of Learning and Technology Resources
Assistant Dean, EOPS/CARE
Associate Dean, Athletics
Associate Dean, Student Affairs
Associate Dean, Special Funded Programs
Director, Financial Aid
Manager, College Bookstore
Manager, College Food Services

6. Operational Status

Cuyamaca College has been in continuous operation since its founding in 1978. Students actively pursue degree and certificate programs, career and technical education training, basic skills education, and noncredit course offerings. Courses are offered in the traditional classroom setting and distance education modality. Cuyamaca College serves approximately 9,000 students each semester. The addition of the Certificate of Achievement in Mechatronics degree program will likely result in a slight increase in the number of certificates awarded at Cuyamaca College.

7. Degrees

Cuyamaca College offers 85 Associate Degree programs, 49 Certificates of Achievement, and 18 Certificates of Specialization (less than 18 units). The College prepares students for transfer to public and private colleges and universities through its academic programs. Students are also better equipped for employment opportunities through its wide variety of vocational training programs. A significant proportion of students are enrolled in programs leading to degrees and certificates. The COA in Mechatronics adds one certificate to the current offerings.

8. Educational Programs

All educational programs offered by Cuyamaca College reflect the mission of the institution. They are based on recognized higher education fields of study, are of sufficient content and length, are conducted at levels of quality and rigor appropriate to the degrees offered, and culminate in identified student outcomes. Distance education courses follow the same approval and evaluation processes as "face-to-face" courses. The COA in Mechatronics adds an academic opportunity for students and, upon approval, will be included in the College catalog along with the other degrees and certificates.

9. Academic Credit

Cuyamaca College awards credit based on the traditional Carnegie unit, which is the generally accepted standard for degree-granting institutions of higher education. The traditional classroom lecture class requires the equivalent of one hour per week for each semester unit awarded. Laboratory classes require three hours per week for each semester unit awarded. The traditional semester is 16 weeks in length. Cuyamaca College also offers short-term classes throughout the year, including during intersession, as well as during the summer, when four, six, or eight week sessions are offered.

10. Student Learning and Achievement

Cuyamaca College identifies student learning outcomes (SLOs) for courses, programs, certificates, and degrees, assesses student achievement of those outcomes, and uses assessment results to make improvements. The same SLOs exist, regardless of the mode of instruction. Student learning outcomes are evaluated each year in either annual program review updates or the comprehensive program review. The description of the COA in Mechatronics including program outcomes will be published in the College catalog, pending ACCJC approval. The chair of the Engineering Department will monitor achievement of outcomes through the established processes.

11. General Education

Cuyamaca College incorporates into all of its degree programs a substantial component of general education designed to ensure breadth of knowledge and promote intellectual inquiry. A minimum of 22 semester units in general education is required for all degrees except Transfer degrees. The GE component includes demonstrated competence in writing and computational skills, an introduction to some major areas of knowledge, and several additional competencies. Courses submitted for GE are closely scrutinized by the Curriculum Committee, and are consistent with levels of quality and rigor appropriate to higher education. All general education courses have identified student learning outcomes, which are assessed.

12. Academic Freedom

The Grossmont-Cuyamaca Community College District Board Policy 4030 on Academic Freedom states, "The Board shall promote public understanding and support of academic freedom for the implementation of the educational philosophy of Grossmont-Cuyamaca Community College District. Academic freedom is fundamental for the protection of the rights of the instructor in teaching, and of the student in freedom in learning. It carries with it duties correlative with rights." The College maintains an atmosphere in which

intellectual freedom and independence exist. The Board Policy on academic freedom will not change in any way due to the addition of the COA in Mechatronics. Program faculty and students will be afforded the same protection under this policy as all others.

13. Faculty

Cuyamaca College has a substantial core of qualified faculty with full-time responsibility to the institution. The core is sufficient in size and experience to support all of the institution's educational programs. Full-time faculty are represented in comparable numbers in all modes of instruction. Faculty responsibilities include the development and review of curriculum as stated in the American Federation of Teachers contract, the Academic Senate's roles and responsibilities, and faculty job descriptions. The Curriculum Committee is under the purview of the Academic Senate and its co-chair is a faculty member. A faculty member also serves as the Student Learning Outcomes Coordinator. Faculty are responsible for curriculum development and are responsible for defining and assessing SLOs.

14. Student Services

Cuyamaca College provides a wide array of programs and services that support student learning and development within the context of the institutional mission. These include Admissions & Records, Counseling, Financial Aid, CalWORKs, Extended Opportunity Programs and Services (EOPS), Cooperative Resources for Education (CARE), and Disabled Students Programs and Services (DSPS). A Tutoring Center, Reading and Writing Center, High Tech Center for the Disabled, and STEM Achievement Center provide for support for student learning. The entire student pathway through the institutional experience is characterized by a concern for student access, progress, learning, and success.

15. Admissions

In keeping with Title 5 and District policies, Cuyamaca College admission policies and practices are consistent with its mission. These guidelines are stated on the College website as well as in the College catalog. The new COA in Mechatronics will reflect admission policies.

16. Information and Learning Resources

Cuyamaca College provides access to information and resources to support student learning and enhance the mission and instructional programs. Learning resources include a library collection, computer laboratories, Instructional Media Services, Tutoring/Learning Centers, and a variety of library services. The same information and resources are available to students, regardless of the format or location of the program.

17. Financial Resources

In conjunction with the Grossmont-Cuyamaca Community College District, Cuyamaca College has a funding base, financial resources, and plans for financial development adequate to support student learning programs and services. Cuyamaca College has a set of well-defined guidelines and processes for financial planning and budget development based on the mission, values, and goals of the College. Budget goals and priorities are developed and updated annually through a shared governance process. Cuyamaca College has remained fiscally stable throughout the last few years of budget reductions in the California Community College system, with adequate resources to support a comprehensive offering of programs and services, including the proposed COA in Mechatronics.

18. Financial Accountability

Cuyamaca College undergoes an annual external financial audit by a certified public accountant as part of the District audit. Annually, Cuyamaca College submits with its ACCJC eligibility application a copy of the budget and

institutional financial audits and management letters prepared by an outside certified public accountant that has no other relationship to the institution. Every year, the District receives unqualified audits on its financial statements and federal and state compliance audits. All audits are available to the public on the District Website.

19. Institutional Planning and Evaluation

Cuyamaca College has a clearly defined and systematic cycle of evaluation, integrated Program Review and Planning, resource allocation, implementation, and re-evaluation. The Program Review and Planning process is integrated with the College and District Strategic Plans, and it provides substantial data upon which annual budget decisions are based. The College develops goals and annually assesses progress toward these goals through the measurement of Key Performance Indicators (KPIs). Based on these assessments, decisions regarding improvements are made to achieve continuous quality improvement. The COA in Mechatronics will be included in established planning and evaluation processes.

20. Integrity in Communication with the Public

Cuyamaca College provides a catalog, both printed and electronic, and strives to ensure the information is precise, accurate, and current. The Cuyamaca College catalog is updated and published on an annual basis. The catalog includes the College mission, academic calendar, College and District administration and faculty, including their degrees, names of the Governing Board members, College history and vision, academic policies, Associate Degree and certificate programs, individual course descriptions, and General Education, degree, and transfer information. In addition the College publishes its schedule of course offerings in electronic form every semester.. Upon approval by the ACCJAC, the COA in Mechatronics will be included in the

catalog and contain all the pertinent information the public and prospective students need to learn about it.

21. Integrity in Relations with the Accrediting Commission

Cuyamaca College adheres to the eligibility requirements, standards, and policies of the Accrediting Commission for Community and Junior Colleges (ACCJC). Cuyamaca College describes itself in identical terms to all its accrediting agencies, communicates any changes in its accredited status, and agrees to disclose information required by the Commission to carry out its accrediting responsibilities. A statement of Accreditation for Cuyamaca College appears in its catalog and on the College website. The Commission is being notified of the proposed COA in Mechatronics through this substantive change proposal, as directed by the commission staff.

G. Evidence that Accreditation Standards Will be Fulfilled

Standard I. Institutional Mission and Effectiveness

A. Mission

Cuyamaca College's Mission Statement defines the College's educational purposes, intended student population, and commitment to student learning. The mission is the foundation for institutional planning and decision making, and drives high expectations about student learning at the College. The proposed COA in Mechatronics clearly fall within the scope of the mission, and is in direct response to the needs of students.

B. Improving Institutional Effectiveness

The Cuyamaca College Council is responsible for the ongoing and systematic cycle of evaluation, integrated planning, resource allocation, implementation and re-evaluation. Key processes and allocation of resources to effectively support student learning are well-organized. The model integrates effective approaches to ensure proficiency in achieving a continuous improvement cycle of evaluation, integrated planning, resource allocation, implementation and re-evaluation.

Assessment and improvement plans are recorded in TracDat and utilized in program reviews, as well as in department dialogue on quality and improvement. Data is evaluated to identify annual and long term priorities and goals. The COA in Mechatronics will undergo the same processes.

Standard II. Student Learning Programs and Services

A. Instructional Programs

Cuyamaca College offers high quality instructional programs, consistent with its mission, vision, and shared values, that meet the needs of a diverse community. All programs have established procedures that assure ongoing and systematic review of their relevance, appropriateness, achievement of the learning outcomes, currency, and future needs. Faculty expertise is relied on to identify and measure student learning through outcomes assessment. The College provides clear and accurate information in its catalog and website about educational course, programs, certificates, and degrees that includes student learning outcomes. The College adheres to and makes public all board policies that assure the integrity of the teaching and learning process. The COA in Mechatronics meet this standard by complying with all quality assurance requirements. Program outcomes have been identified, and the assessment cycle will begin upon ACCJC approval.

B. Student Support Services

Cuyamaca College recruits and admits diverse students who are able to benefit from its programs, consistent with its mission. Student support services address the identified needs of students and enhance a supportive learning environment. The entire student pathway through the institutional experience is characterized by a concern for student access, progress, learning and success. All student services programs have defined outcomes that are regularly and systematically evaluated for improvement using Student Learning Outcomes, faculty and staff input, and other appropriate measures.

C. Library and Learning Support Services

Cuyamaca College supports the quality of its instructional programs by providing a variety of learning support services to its students. These services are housed in the Learning and Technology Resource Center (LTRC), online, and in other learning centers on campus. Library and learning support services are sufficient to support the College's instructional programs and other activities. Library and learning support services have defined outcomes that are regularly evaluated for improvement.

Standard III. Resources

A. Human Resources

Cuyamaca College employs qualified faculty, staff and administrators to support student learning and services and improve institutional effectiveness. The College uses recruiting and hiring processes for all faculty and staff to ensure that employees meet minimum qualifications for education and experience. College employees are regularly evaluated to ensure effectiveness and nurture improvement. Employees involved in the COA in Mechatronics will be held to the same standards, regulations and processes in place to ensure quality, professional ethics, and integrity.

B. Physical Resources

Cuyamaca College provides sufficient and safe physical resources to support and assure the quality of its programs. The COA in Mechatronics will utilize existing space on campus. Additional physical resources, i.e. classroom or laboratory space, will not be necessary, as there are no new courses or sections being added. All courses, with the exception of the work experience course, are existing.

C. Technology Resources

Technology resources at Cuyamaca College are used to support student learning programs and services and to improve institutional effectiveness. Technology planning is integrated with institutional planning. Cuyamaca College is committed to providing students, faculty, and staff with the latest and most effective technology through a comprehensive process of planning, implementation, and support. Technology processes and procedures are designed to enhance and support the College's mission, operation, and effectiveness. Responsibility for these processes lies with shared governance committees. Additional technology will not be necessary to implement the COA in Mechatronics at Cuyamaca College.

D. Financial Resources

Financial resources are sufficient to support student learning programs and services and to improve institutional effectiveness at Cuyamaca College. Cuyamaca College maintains financial solvency through its planning processes and Strategic Plan that initially concentrates on fixed expenses, setting aside a 5% contingency reserve. Within the planning context, additional funds are used to increase the number of faculty and classified positions to support instruction, student services, infrastructure technology needs, and adequate facilities. Financial planning at Cuyamaca College is fully integrated with institutional planning. The College takes a conservative approach to budget allocation, relying on sources from general and categorical funds. Following comprehensive dialogue and strategic planning through a realistic needs analysis, priorities are identified and decisions reached. A baseline approach forecasts future projections, and all new requests must support the College mission, with approval from Program Review committees. The distribution of resources supports the development, maintenance, and enhancement of programs and services. The budget of the COA in Mechatronics will be monitored through established processes.

Standard IV. Leadership and Governance

A. Decision Making Roles and Process

Cuyamaca College fully embraces the concept of shared governance, comprised of staff, faculty, administrators, and students in the decision-making process. The shared governance process allows the institution to effectively identify its values and establish goals in a cycle of continuous quality improvement. The faculty, in particular, have a leadership role in developing recommendations about student learning programs and services. Cuyamaca College strives to maintain the highest standards of honesty and integrity. College programs and departments regularly undergo financial audits, compliance reviews, and accreditations. Federal and state agencies regularly conduct compliance reviews of academic and student services programs and departments. The role of leadership and the institution's governance and decision-making structures and processes are regularly evaluated to assure their integrity and effectiveness. The institution widely communicates the results of these evaluations and uses them as the basis for improvement. The COA in Mechatronics have been approved at all levels, including the Curriculum Committee, Academic Senate, GCCCD Governing Board, SDIC Workforce Development Committee and the California Community College Chancellor's Office.

B. Board and Administrative Organization

The Governing Board of the GCCCD is an elected body that advocates for and supports Cuyamaca College in its policy decision making. The Governing Board engages in ongoing discussion to act as a whole in reaching any decision. A majority vote of its five members will designate approval, except when two-thirds vote is required under special circumstances. The Governing Board President speaks to the media on behalf of the Governing Board. Individual Governing Board members are involved with community service clubs, Chambers of Commerce, and other community groups and forums. The

Governing Board works closely with the GCCCD Chancellor in carrying out the district and college mission, ensuring educational quality, and maintaining financial integrity. The Board holds public meetings once a month, with special meetings held as needed. The Board participates in self-evaluation annually, as well as annual evaluation of top leadership positions. The COA in Mechatronics will comply with all established Board policies and procedures.

Relevant Commission Policies

Cuyamaca College remains compliant with all ACCJC Commission Policies as listed in the Accreditation Reference Handbook. The addition of the COA and COA in Mechatronics relates only to the ACCJC Policy on Substantive Change, as it adds a new program that is a significant departure from existing offerings when the institution was last evaluated in 2013.

APPENDIX

1. Catalog Information

CUYAMACA COLLEGE

MECHATRONICS

This certificate is designed for students interested in designing automatic electromechanical devices and systems. The curriculum is intended primarily for students interested in working in advanced manufacturing. It also provides the foundation for further studies in electrical and mechanical engineering.

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Write computer programs in high-level languages such as C++ and, when appropriate, in assembly language to control the operation of a microcontroller. In particular, students will be able to apply the following microcontroller capabilities: memory-mapped I/O (input/output), analog-to-digital (A/D) conversion, and volatile and non-volatile memory.
- Design automatic devices and control systems which can respond to inputs from sensors with appropriate outputs in the form of motion, light, and sound.
- Design mechanical components and devices, and create prototype versions of them.
- Combine the above capabilities to design integrated electro-mechanical devices of arbitrary complexity.

Certificate Requirements:

Course	*Title*	*Units*
ENGR 100	Introduction to Engineering and Design	4
ENGR 125	3D Solid Modeling	3
or		
ENGR 129	Engineering Solid Modeling	3
ENGR 175	Mechatronics: Introduction to Microcontrollers and Robotics	3
ENGR 176	Mechatronics: Electromechanical Prototyping	3
ENGR 182	Work Experience in Engineering Technology	1-3
ET 110	Introduction to Basic Electronics	4
	Total Required	18-20

Certificate of Achievement

Students who complete the requirements above qualify for a Certificate in Mechatronics. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

2. Minutes, Mechanics Industry Advisory Board Meeting

Cuyamaca College Mechatronics Industry Advisory Board
Meeting Minutes

February 4, 2015; 8:00 a.m. to 10:00 a.m.

I. Welcome and Introductions

Present: Kate Alder, Cuyamaca College; Joshua Benz, Parker Hannifin; Jerry Fregoe, Solar Turbines, Inc.; Duncan McGehee, Cuyamaca College; Cyrus Saghafi, Cuyamaca College; James Sly, East County Development Council; Kathryn Worley, West Hills High School;

Recorder: Kate Miller, Cuyamaca College CTE Support Specialist

Kate Alder welcomed everyone to the meeting and thanked them for participating in this inaugural meeting of the Mechatronics Industry Advisory Board.

II. Meeting Purpose

Kate Alder explained that career and technical education programs at community colleges are required to have Industry Advisory Boards. The purpose of the Industry Advisory Meeting is to help us make sure that the programs we are offering in Career-Technical Education meet the needs of area industry, and that we are creating a pipeline to move students from high school, where students are beginning to learn things, through the community college and into the workforce or to the university.

She assured the participants that although there was not a representative from a four-year college present for this meeting, Duncan McGehee has been consulting with SDSU so we have their voice in the conversation as well.

III. Overview of Proposed Mechatronics Certificate

Duncan McGehee and Cyrus Saghafi gave an overview of the classes that have been proposed for the Mechatronics program. While Cuyamaca does have an Automotive Technology program, there are no other heavy industry programs here. They consider Mechatronics to be classified as smart manufacturing or advanced manufacturing; that is where we hope to make a contribution.

The six courses currently offered that would be included in this new certificate would include:

- Electrical Technology 110 – a basic electronics class.
- Engineering 100- an introduction to engineering that was traditionally a 3-unit lecture. We included hand sketching so that they would be able to think in 3-D and present ideas. We've added a 3-unit lab that is going to be a solid modeling lab that will include Solid Works and Creo Parametric. The addition of the lab will also help our transfer students, because SDSU has said it will help qualify them for acceptance into their courses. Most of the math in the

program will be in this program. Includes unit analysis.

- Engineering 175 (and 176) -- Mechatronics -- were developed to hook students with an introduction to micro-controllers and introduction to robotics. It didn't transfer anywhere, so in the cutbacks that followed 2008, it was cut. Includes elements of design so that students can try designing something before their junior year. Also includes some robotics. These two classes will be moved over to CTE.
- Engineering 176 – formerly Electrical- Mechanical Prototyping – has been dramatically changed. Pre-requisites are ENG100 and ENG175. Students start developing their own micro-controller circuits – they make their own circuit board. The other part of it is DC motors, and steppers. They then design something that would have intelligent control.— like a robot, in a capstone project.
- Engineering 125 – Advanced Manufacturing and Artificial Intelligence. Engineering 100 is a prerequisite – so students will have been exposed to creating, drawing and conveying on paper what they have in their minds. In Engineering 125, they will be able to convey those ideas through 3-D. This would include sketching, creating the model, scaling it down and then use the 3-D technology to produce it on a smaller scale. This course introduces machining; sheet metal cutting; forming and design; sand casting; and sand molding. A student would be ready for enrolling in 182 (internship/cooperative work experience). Then they will be able to tell the difference between class work and real life experience. We also have the simulation technology available for students to analyze of the finished product and work through solutions to any problems that may be revealed.
- Engineering 182 – Cooperative Work Experience

Kate explained that all of the classes, except ENG182, which is the cooperative work experience class, already exist. A critical quality of this program is that it can be completed in one year. The first three classes will be offered in the fall and the remaining three classes will be offered in the spring. As long as we are able to get internships set up for the spring, they would have this certificate and the skill set within one year's time. The hope is that they would then be able to find employment in the field, and perhaps be inspired to go on to take more engineering classes and pursue a degree.

The 3-D printers that we are being able to add to the CADD lab and that will support the Mechatronics program are being funded through a state grant from AB39 that is supposed to focus on energy and utility efficiencies. So that grant views the 3-D printer as helping with efficiencies in manufacturing processes. It is possible that the grant will allow both Cyrus and Duncan to participate in some professional development to help them bring those efficiencies into their lectures.

IV. Discussion

A. Kathy asked if programmable logic controllers are included in any of the course work that would fit with the controllers she has in her program. The answer was no, not here. Duncan believes they have them at City College. It would be most closely connected with the micro-controller. It has its place, but we don't have that technology. Kathy said they are also looking at getting more C and C machines for the wood shop. This would help her expand the design program at

West Hills. Duncan said this is also not in our program.

James mentioned that he might have a contact that will be helping bring many CNC machines into some programs in the near future. City College only has a couple of CNC machines, whereas Workforce Warriors has 15. It makes quite a difference in the training students receive.

Kate explained that while we want to create a robust program at Cuyamaca, we need to avoid direct competition with programs offered at other community colleges in our region. However, with Prop V and soon with Prop R, we will be seeing some building programs here at Cuyamaca that will allow us to revisit these options as facilities to house them comes into being.

James said there is potential for a larger conversation about this in a few months, after California Career Pathways infuses significant money into equipment purchases and building construction. He said that everyone recognizes the gap between the workforce that employers need and the workforce that exists right now. And the state is starting to do something about it. His office has been tasked with building that pipeline to bring the workers and the employers together. According to Kate, that task is central to California Career Pathways.

B. Joshua asked if 182 and 176 are offered at the same time, since it seems that students might be able to use the tools at the employer's site to help complete the project – if the two classes could be coordinated. The consensus was that this might be a good thing and that if students would like to propose their own capstone project in ENGR 176 (for example something from their workplace), and if the proposed project meets the class requirements, the instructor could allow it in place of the classroom assigned project. The basic outline of 182 is usually designed together by the employer and instructor, so that the program learning outcomes are achieved.

C. The question was raised of what students do after they complete the courses. The two options offered are employment or further study toward a two- or four-year degree in engineering. The consensus was that 182 Cooperative Work Experience and the coursework toward the Certificate will give students an idea of whether they want to pursue Mechatronics as a career.

D. Jerry shared one of the job descriptions from his company and said that he can see several different paths within his organization that would be met by the proposed Certificate in Mechatronics: the whole design process, a technician's job, the machining job. He said pointed out that when a student comes through this program, he or she would understand how and why things happen and would not need to be sent to observe the process at one of their suppliers' shops to gain that information. This could save his company hundreds of dollars per employee, and would make those employees more valuable overall.

E. The question was raised about how studying for the Certificate compares to real-world experience that is often requested by employers in their job descriptions. (Students were mentioning this as a drawback to being able to find employment.) Cyrus shared that when he spoke with one company and suggested that the training our students receive while they are

studying is equivalent to real world experience. When one employer reluctantly gave one of our students a chance, they called back in six months asking for another student. Why? They had promoted the first student because he did so well.

F. Flexibility in what aspects receive classroom focus was addressed from several angles, with Cyrus and Duncan both agreeing that the classroom focus can be shifted to meet the needs of industry as those needs become clear, and that attention is and will be given to specific industry standards such as ASTM, so that it would be an industry recognized certification.

G. It was pointed out that math might be something that needs to be strengthened in the program. It was agreed that the faculty would further explore the idea of a math requirement for the mechatronics program, based on the success of students in the early classes (i.e., ET110 and ENGR100), including what level of math is needed, and whether to require it or merely recommend it. This will be discussed further at future IAB meetings.

H. It was agreed that adding Engineering 129 (which teaches the use of Inventor) as an option to Engineering 125 (which teaches the use of Solid Works) would allow students to choose which system they would prefer to learn, based on individual research about which system is being used in industry.

I. Kate added that it is possible for classes to have directed learning activities (DLA) through the Tutoring Center imbedded in their course outline so that when students hit certain subjects that require more study, they can be sent to the Tutoring Center to gain that information.

V. Approval of Mechatronics Certificate of Achievement Proposal
   A. After thorough discussion, the program was approved
   B. Special consideration of the factors underlined in Items C, H, and I above should be given in implementing the courses.
   C. All four advisors agreed to continue as members of the Mechatronics IAB.

3. Minutes, Curriculum Committee, Cuyamaca College, February 17, 2015

CURRICULUM, GENERAL EDUCATION AND ACADEMIC POLICIES AND PROCEDURES COMMITTEE

Minutes of February 17, 2015

CO-CHAIRS: Chuck Charter, Wei Zhou
MEMBERS: Guillermo Colls, Bryan Elliott, Mary Graham, Laurie LeBlanc, Teresa McNeil, Pat Setzer, Kari Wergeland, Kristin Zink
EX-OFFICIO: Kate Alder, Scott Herrin, Jennifer Lewis, Marsha Gable
RECORDER: Joan Burak
GUESTS: Duncan McGehee, Jodi Reed, Patricia Santana

APPROVAL OF MINUTES of February 3, 2015: *Graham/LeBlanc* to approve: 9 Yes, 0 No, 0 Abstentions.

ACTION ITEMS: Adoption of the Consent Calendar:

- BOT: **Account Clerk; Front Office Receptionist**: Additions
- **COUN 130**: Modification
- **ENGR 100, 175, 176, 210**: Modifications **ENGR 170, 171, 172, 173**: Deletions **ENGR 182**: Addition, Assign to Discipline
  ENGR 200, 260: SLO, Out-of-Class Assignments

  Civil Engineering; Electrical and Computer Engineering;

  Mechanical and Aerospace Engineering; Mechatronics: Modifications
- **OH 255**: Modification
  Arboriculture; Irrigation Technology; Landscape Technology; Nursery Technology; Sustainable Urban Landscapes: Modifications

Mechatronics was pulled for discussion. *Graham/Elliott* to approve the Consent Calendar: 10 Yes, 0 No, 0 Abstentions.

Mechatronics: Duncan McGehee discussed the additional revision to the certificate based on a recommendation from the department's advisory committee. *Zink/Elliott* to approve: 10 Yes, 0 No, 0 Abstentions.

INFORMATION ITEMS

- **Arabic Studies**: Addition

Patricia Santana discussed the new program which was developed in response to community and student interest.

- **ENGR 270**: SLO, Out-of-Class Assignments

Duncan McGehee stated that the outline has been updated as part of the regular review cycle.

- **Graphic Design, Web Graphics**: Modifications

Jodi Reed discussed the program modifications in response to CIS 211 replacing CIS 212. The department will submit paperwork to delete CIS 212 which is no longer offered.

- **Basic Ornamental Horticulture**: Addition

Kate Alder discussed the new certificate of specialization. Committee members discussed the "Additional Associate Degree" requirements and asked if the requirements are being applied to students completing multiple certificates. Kate will look into how the policy is being applied including any financial aid implications and will report back to the committee.

In order to allow sufficient time for new courses/programs and substantive course modifications to be approved by the State Chancellor's office (and ACCJC as applicable) in time to appear in next year's catalog, committee members want to submit a curriculum packet to the Board in March. *Graham/Setzer* to suspend regular information/action cycle for the above Information items: 9 Yes, 1 No, 0 Abstentions. *Graham/Setzer* to approve: 9 Yes, 0 No, 1 Abstention.

4. Minutes, Academic Senate, February 26, 2015
http://www.cuyamaca.edu/faculty-staff/academic-senate/files/minutes/2015/2015-02-26-as-minutes.pdf

5. Minutes, San Diego Imperial Counties Regional Consortium, Workforce Development Council Meeting, March 26, 2015

SDIC COMMUNITY COLLEGE WORKFORCE DEVELOPMENT COUNCIL MEETING

Thursday, March 26, 2015
10:15am – 12 noon
Holiday Inn Golden Gateway – Oregon Room

1. Welcome / Introductions

Andrea Rayos, Program Specialist, GCCCD Auxiliary, Grossmont College **Ann Durham**, Director, Health Workforce Initiative, DSN – Health, Grossmont College
Catherine Shafer, Professor/Simulation Lab Coordinator, Nursing Department, SD City College
Charlene Atkins, VTEA Coordinator, SD City College
Gloria Bañuelos, Deputy Sector Navigator, Life Sciences/Biotech, SD Miramar College
Jennifer Lewis, Dean of Continuing Education & Workforce Training, Cuyamaca College
Jennifer Nelson, CTE Transitions Coordinator, Palomar College
Jim Custeau, Interim Dean, CTE/Workforce Development, Grossmont College
Joe Molina, Deputy Sector Navigator, Small Business, MiraCosta College
Jonathan Kropp, Interim Director, Center for Innovation, Cuyamaca College **Kate Alder,** Dean, Career and Technical Education, Cuyamaca College
Laurie Vasallo-Dusa, Work Experience Coordinator, SD Miramar College
Leroy Brady, Faculty, Business Studies, SD City College
Lynne Ornelas, Dean, Business, Technical Careers & Workforce Initiatives, SD Miramar College
Margie Fritch, Chair, SDIC WDC; Dean, Health Science and Public Service, SD Mesa College
Mary Wylie, Chair, SDIC Regional Consortium
Michelle Fischthal, Dean, Business and Information Technology, SD Continuing Education
Robin Carvajal, Dean, Allied Health and Community Education, SD Continuing Education
Sally Cox, Executive Director, GCCCD Auxiliary, Grossmont College
Steve Wright, Sector Navigator, ICT/Digital Media, Doing What Matters
Teri Sprecco, Assistant Director, CTE, Grossmont Union High School District
Theresa Saverese, Faculty, Information Technology-Computer Business Technology, SD City College
Trudy Gerald, Dean, Arts, Humanities, Communications & Telecommunications, SD

City College
Victor Castillo, Deputy Sector Navigator, Global Trade/Logistics, Southwestern College
Wheeler North, Academic Senate for California Community Colleges
Zhenya Lindstrom, Director, Regional Center of Excellence, Chaffey College

2. Approval of Minutes from February 6, 2015 Meeting

Motion to approve the February 6th minutes made by: Kate Alder. Seconded by: Jim Custeau. Voted on and approved unanimously.

3. Program Approvals

New Options/Certificate of Achievement

Cuyamaca College

Mechatronics (Certificate of Achievement) – Action

Kate Alder reported to the WDC that the Mechatronics program has been reviewed through the GCCCD Governing Board and Curriculum Committee prior to requesting approval by the WDC. Motion to approve the Mechatronics (Certificate of Achievement) made by: Jim Custeau. Seconded by: Lynn Ornelas. Voted on and approved unanimously.

Supporting documents including Mechatronics Certificate Program Proposal Narrative Summary and Labor Market Gap Analysis can be found at the Regional Consortium website, http://myworkforceconnection.org/march-2015-sdic-wdc-meeting/.

4. CCCCO Update

No report provided by CCCCO at this meeting.

5. CCCAOE Update

Jonathan Kropp provided the following documents:

- Data Sharing & Accountability: Recommendations for Workforce & Jobs Taskforce
- BOG Task Force: CCCAOE Recommendations Phase 5
- Education Initiatives in California (Matrix)

Jonathan Kropp distributed three documents: Data Sharing & Accountability: Recommendations for Workforce & Jobs Taskforce, which is a summary of the recommendations to the BOG Workforce, Job Creation and a Strong Economy Taskforce from the Vocational Education Research, Accountability and Technical Assistance Committee (VERATAC). The BOG Task Force: CCCAOE Recommendations Phase 5 document, which summarizes all the recommendations made at the Regional Conversations, Faculty Conversations and Town Hall Meetings across the state. The Education Initiatives in California matrix, which summarizes workforce development funding initiatives that are in need of common metrics.

Jonathan informed WDC that CCCAOE is requesting each region to review the listed recommendations in the CCCAOE Phase 5 document and create a regional prioritized summary of the most important themes. Other local experts within the region are

also encouraged to weigh in.

Mary Wylie indicated this item will be placed on the WDC agenda for April 17. If WDC members have any concerns about the data sharing and accountability recommendation, CCCAOE must receive your email (on data only) by Thursday, April 2nd.

6. Regional Consortium Chair Update

a) CTE EF Update

1. Regional Share 40% Application Review and Approval -

1st Reading Mary Wylie presented the Regional Share

Application for review by the WDC.

The following draft documents were provided:

- CTE Enhancement Fund Regional (40%) Application Regional Share Budget Sheet
- Regional Share Budget Summary Breakdown Sheet
- Regional Share – Cuyamaca College Budget Breakdown
- Sample Career Development Services Budget Sheet – SD Miramar College
- CTE Student Employment Outcome Survey Workplan
- Industry Certification Center Workplan
- Work Keys: CTE Soft Skills Workplan Career Development Services Workplan

Mary informed WDC that the plan for implementation of the Regional Share project is 12 months (may be June 1, 2015 – May 31, 2016) with an expected fiscal regional consortium close out date of December, 2016. All CTE EF regional funds must be spent by that date. WDC, at our April meeting, will begin drafting ideas for reallocation of any unspent CTE EF funds, so that we will have an agreed upon plan to spend any remaining unspent funds.

Mary noted the Work Keys: Soft Skills component will be a three year license and that Work Keys has agreed to provide partnership assistance. WDC discussed the need for the creation of an informational flyer as well as posting a mini-tutorial about how to get students to complete the CTE Employment Outcome Survey.

Mary requested for WDC to review the CTE EF Regional Share (40%) application, Regional Share budget breakdowns and workplans and to submit any questions/feedback in the next two weeks. The CTE EF Regional Share 40% application will either be on the WDC agenda for approval at the April 17th meeting or earlier by electronic email vote.

Peggy Miller will be emailing a Budget Change Request Form to all CTE EF college

contacts. The form is also posted on the Regional Consortium website under the CTE Enhancement Fund page. This form may be used for both the 60% local share and the 40% regional share contracts.

b) Regional Consortium/DSNs/TAPs Grant Renewals for 2015-2016

Mary Wylie informed WDC that the Regional Consortium, DSN and TAP grant renewal applications have been sent out by CCCCO and are due April 24. The Regional Consortium and DSNs met this month in order to review and discuss the combined goals for 2015-2016. Mary is currently collecting feedback from the DSNs about the regional themes for completion of the workplans and is planning to provide a draft of the Regional Consortium workplan at the April WDC meeting.

c) CTE Program Regional Analysis – An example using Launchboard

Zhenya Lindstrom and Gloria Bañuelos presented a mini-workshop on how to complete a program regional analysis via Launchboard. This workshop meets one of the Regional Consortium's workplan objectives for review of CTE programs at the regional level to enhance decision-making

An adhoc committee of Mary Wylie, Zhenya Lindstrom, Sally Cox and Gloria Bañuelos selected the program, Computer Information Systems (CIS) for the demo presentation. A copy of the PowerPoint presentation can be found on the Regional Consortium website at http://myworkforceconnection.org/march-2015-sdic-wdc-meeting/.

The Regional Consortium budgeted funds to continue this kind of regional CTE program analysis if WDC saw value in doing so. WDC agreed regional discussion was beneficial and selected the Biotech/Life Sciences sector (macro level) and the Automotives Program (6 digit TOP) for regional data analysis with mini-workshops planned for the May and June WDC meetings.

d) Skill Builder Discussion (Continued from prior CCCAOE Session)

Due to time constraints, Zhenya Lindstrom was unable to facilitate the Skills Builder Discussion item. It was agreed to place the Skill Builder Discussion on the April 17th WDC meeting agenda.

SDIC - Regional Contacts

Next meeting:

April 17, 2015 at SD Mesa College, Allied Health S-100, Room 305

6. Minutes, Governing Board Meeting, Grossmont-Cuyamaca Community College District, March 17, 2015
http://www.gcccd.edu/governing-board/documents/minutes/2015/March%2017,%202015,%20Regular%20Meeting.pdf

7. Supporting Documentation: Labor Market Gap Analysis (see following page)

Cuyamaca College Mechatronics Certificate of Achievement

Cuyamaca College, 900 Rancho San Diego Parkway, El Cajon CA 92019

Other Supporting Documentation: Labor Market Gap Analysis

According the California EDD website there are 16 job openings projected each year for the period from 2012-22 in San Diego County. The only other college in the region with a program in this TOP code is Palomar College which is more than 40 miles from Cuyamaca College. The areas served by the two colleges each have a unique employer base that can be separately served by the colleges.

CA EDD Projections of Employment by Occupation, 2012 - 2022

Occupations Matched to Top Code(s):
093500 *Electro-Mechanical Technology*

Geography: San Diego County
Counties: San Diego County

Annual Job Openings by Occupation

SOC Code	Occupation Title (Link to Occupation Profile)	2012 Employment	Annual Job Openings[1]
173024	Electro-Mechanical Technicians	320	9
512023	Electromechanical Equipment Assemblers	610	7
	Total	930	16

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[1]Total Job Openings are the sum of new jobs from growth plus net replacements. Annual job openings are total job openings divided by the number of years in the projection period.

This low number of projected openings may not accurately reflect the labor market need in this emerging technology field. Recent research conducted by the CCCCO San Diego Imperial Counties Regional Consortium, San Diego Workforce Partnership, and the CCCCO Centers of Excellence projects a gap between the supply of skilled manufacturing technicians and the demand for those skills in the region. They project that from 2014 to 2018 there will be 47 openings with only 3 graduates prepared to work in those positions[1].

Awards data from the California Community Colleges Chancellor's Office Data Mart for the most recent five academic years show programs in six colleges; only one of those colleges, Palomar, is also located in the San Diego region.

[1] Advanced Manufacturing Labor Market Analysis, San Diego County, October 2014
http://workforce.org/sites/default/files/pdfs/reports/industry/advanced_manufacturing_sdwp_2014-10-02_0.pdf

California Community Colleges Chancellor's Office
Program Awards Summary Report
Statewide Data for TOP 0935.00

		2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
	TOTAL	**35**	**26**	**10**	**19**	**9**
	AVERAGE	**7**	**9**	**3**	**6**	**5**
	Contra Costa CCD Total	**10**	**20**	**6**	**12**	**8**
1.	Los Medanos Total	10	20	6	12	8
	Associate of Science (A.S.)	2				
	Certificate 30 to < 60 units	8	11	4	10	8
	Certificate 18 to < 30 units		9	2	2	
	Los Angeles CCD Total	**20**				
2.	LA Harbor Total	20				
	Associate of Science (A.S.)	5				
	Certificate 30 to < 60 units	15				
	Palomar CCD Total	**1**	**1**			
3.	Palomar Total	1	1			
	Certificate 18 to < 30 units	1	1			
	Riverside CCD Total		**5**	**2**		
4.	Norco College Total		5	2		
	Associate of Science (A.S.)		3	2		
	Certificate 18 to < 30 units		2			
	San Luis Obispo CCD Total	**1**		**1**	**5**	**1**
5.	Cuesta Total	1		1	5	1
	Associate of Science (A.S.)	1		1	5	1
	San Mateo CCD Total	**3**		**1**	**2**	
6.	Skyline Total	3		1	2	
	Associate of Science (A.S.)	2			2	
	Certificate 30 to < 60 units	1		1		

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8. Approval Letter, California Community Colleges, November 8, 2015

STATE OF CALIFORNIA

CALIFORNIA COMMUNITY COLLEGES
CHANCELLOR'S OFFICE

1102 Q Street

Sacramento, Ca 95811-6549

11/08/2015

Admin, CUYAMACA
College CIO CUYAMACA
Cuyamaca College 900 Rancho San Diego Parkway El Cajon, CA 92019

Dear Colleague:

In compliance with California Education Code section 70901 and California Code of Regulations, Title 5, Subchapter 2. Approval by the Chancellor, the California Community Colleges Chancellor's Office Academic Affairs Division has reviewed and approved the following instructional program:

CURRICULUM INVENTORY RECORD
College: 021
Credit Status: Credit
Program Title: Mechatronics
Program Award: Certificate of Achievement:18 or greater semester (or 27 or greater quarter) units
Program Control Number: 33742
TOP Code: 093500
Program Goal(s): Career Technical Education (CTE)
For a program to be recognized by the U.S. Department of Education, the Accrediting Commission for Community and Junior Colleges/Western Association of Schools and Colleges (ACCJC/WASC) must approve the program as a substantive change. Once a program is approved by the California Community Colleges Chancellor's Office (CCCCO), colleges must follow the steps outlined in the ACCJC Manual (www.accjc.org). Please note: colleges are not eligible to collect state apportionment or federal support for granting this award without first receiving approval from the Chancellor's Office and the ACCJC.

For questions regarding this review please submit your written inquiry to

curriculum@cccco.edu. Sincerely,

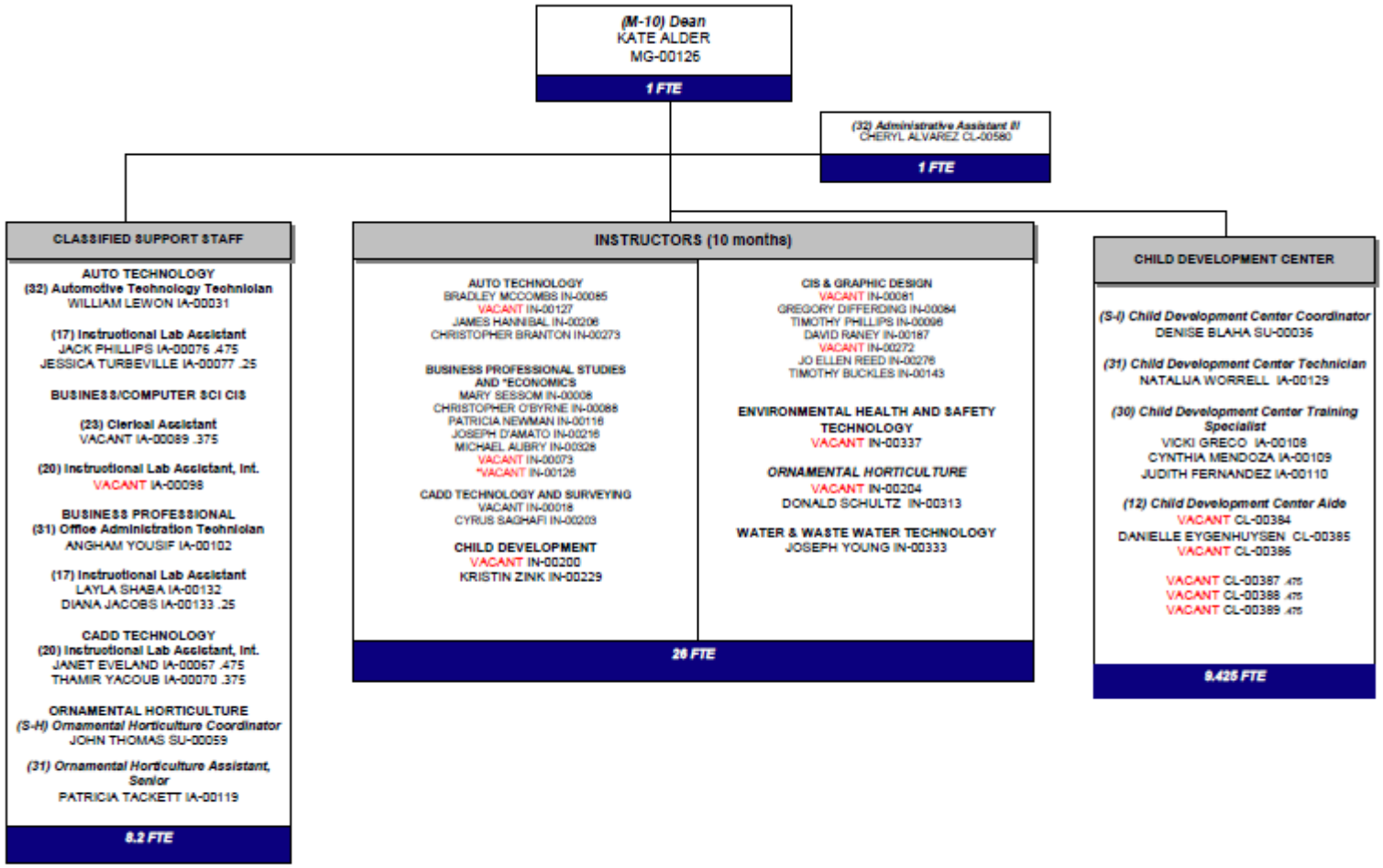
Academic Affairs Division
California Community Colleges Chancellor's Office

9. Program Review, Engineering (2013-2014); link below.

http://www.cuyamaca.edu/in/committees/iprpc/files/documents/PR%20reports/2013-2014/PR%20Reports/IPR-ENGR-2013.pdf

10. Organizational Chart, Career Technical Education; see following page.

CUYAMACA COLLEGE-DEAN, CAREER & TECHNICAL EDUCATION



FTE = Full-time Equivalent
ADJ FTE = Full-time Equivalent of Adjunct Faculty
* Categorically Funded

Last Update 10/20/2015