

**MECHATRONICS ADVISORY COMMITTEE - MEETING MINUTES**

**Tuesday, April 24, 2018 \* 6:00 – 8:00 p.m.**

**Columbia Tech Center, Room 202**

**Members Present:** Zeb Hallmark, Committee Chair, Analog Devices; Silviu Spiridon, Analog Devices; Dan Wahlstrom Simonds International

**Members Absent**: Chris Taylor, Vice Chair, Daimler Trucks North America

**Guests:** Steven Park, Analog Devices; Jacob Paso, Delta; Brad Smith, Delta

**Clark College:** Chris Lewis, Department Head/Mechatronics Professor; Instructors Roger Godsil, Ken Luchini , Anne Koering; Genevieve Howard, Dean of WPTE; Wende Fisher, Educational Planner – Advising; Cathy Sherick, Assoc. Dir. of Instructional Planning & Innovation; SueAnn McWatters, Program Specialist – Advisory Coordinator

Committee Chair Zeb Hallmark called the meeting to order at 6.10pm and introductions were made, including new committee member Dan Wahlstrom.

**MINUTES OF PREVIOUS MEETING**

*The minutes of October 10, 2017 were presented: Zeb made a motion to approve, which was seconded by Silviu and passed by all members present.*

**NEXT MEETING DATE**

The committee will next meet on **Tuesday, October 16th, 2018 at 6:00pm.**

**OFFICE OF INSTRUCTION ANNOUNCEMENTS**

Cathy Sherick made the following announcements:

**Welcome SueAnn McWatters,** for those who may not have met SueAnn, she is the new Advisory Coordinator. The position was formerly held by Nicola Farron, and she started in January of this year providing meeting coordination and support to the twenty-seven Career and Technical Education Advisory Committees in addition to administrative support in the Office of Instruction. Sue Ann comes to us most recently from WSU Vancouver where she worked in the College of Business, Finance and Operations, and Development and Alumni. She is a former Clark student and graduate of WSUV, attaining a Bachelor’s in Business Administration.

**Career and Technical Education Insert** was sent in February, unfortunately we were not able to produce the insert as a focus on the high school partnerships as we had originally envisioned. It is however, a very nice look at our professional technical education programs and the students they serve.

**Healthy Penguin Walkabout** Saturday June 2, 2018, registration opens at 9:00 with the event beginning at 10. Community members and anyone interested in good health are invited to participate in this FREE event to stroll the beautiful campus and receive free health assessments.

**Spring Recognition event** planned for Wednesday, June 13th the event will be held at Clark College in PUB 161. This is our opportunity to share some refreshments and acknowledge and thank each of our community advisory members for their service to the college. Watch for a save the date, coming to your email soon.

**Need for new Advisory Members** we are asking our advisory members to think about others in the community that you know that might be interested in being a part of building student success at the college. Our committees are shrinking and we are in need of folks to provide that employee as well as employer perspective.

**PPI Exercise and handout:** Academic plan Goal 6: *Infuse the study of* ***Power, Privilege and Inequity*** *throughout the curriculum.* Last year advisory members asked why this was happening at Clark. To answer that question, we have been working with the Office of Diversity and Equity to put together some basic information to share with everyone. Experiences with different people that just didn’t feel right but nothing is really wrong. How do you feel in those instances?

Zeb made a motion to vote off Rob from SEH and add on Steven Park. Dan motioned first, with Silvia seconding and was unanimously approved.

**MECHATRONICS 2.0**

Chris spoke about what the program is offering currently: two degrees. The program can’t support two fully separate degrees so students will eventually have to choose a path. The future of the industry is changing and advancing so an upgrade to the curriculum was necessary. There were significant considerations in preparing this:

* Courses offered (technological areas)
* Certain limits the college deals with
	+ Can’t provide every course (two degrees = 116 credits, baseline is 94 credits)
	+ No financial aid if not on a career path
	+ Can’t take certain classes the same time as another
	+ Summers off aren’t going to occur

The program is currently two years in length (eight consecutive) quarters; 117 credits.

Appendix A: GenEd Course Descriptions

There are 34 different classes in the program (includes both degrees). One of the first suggestions was to combine RDC and RAC into one course, however the feedback from students was to keep the skills separate, which we did.

Appendix B: Program Degree Requirement Courses

The two original Mechatronics degree programs (instrumental control and mechanical operation) was 88 credits each, not including general education requirements, which is another 15 credits.

No Changes:

* MTX&100: Industrial Safety - there is online access to the program and can get an OSHA certification. It isn’t a requirement, but it is another option for students.
* MTX&101: DC Fundamentals – basic measurement tools and soldering
* HDEV&120: Practical Reasoning & Decision Making – students have to critically think through paper, system, and other aspects of problem solving. This course does not count on the AAT list of excepted courses in HDEV; it hasn’t yet been identified.
* MTX&102: AC Fundamentals
* MTX&216: Mechatronics 2
* MTX&230: Laser Alignment – the bulk of the curriculum is vibration analysis.
* PTCS&110: Trade Math – computational skills class. All math is required in the trade; everyday mathematics.
* PTWR&135: Technical Writing – students have to create reports related to the job or equipment/maintenance.
* COLL&101: College Essentials – dual beneficial. This course helps students, provides resources, and gives them good information.

Changes:

* All GenEd will be taken at the beginning as a full load to make sure students do not take extra courses they do not need.
* MTX&106: Fluid Power Systems – a combination of courses in hydraulics and pneumatics; 2 hours of lecture, 4 hours of lab.
* MTX&180: Mechanical Systems – a combination of courses MTX&120, MTX&153 and MTX&227.
* MTX&121: Semiconductor Fundamentals
* MTX&128: Robotic Systems – another combination of courses.
* MTX&200: Process Control Systems – was originally two separate courses at 5 credits each. Decided to combine them as a 6 credit course. It will be very intensive (systematically and understandably).
* MTX&202: Motor Drive Systems
* MTX&292: Manufacturing System Principles – another combination of courses MTX&220 and MTX&223. This course focuses on workplace organization, product design, and project management; more of an organizational/entrepreneurial course. The final exam includes working as a team. Anne explained that oral presentations and public speaking are going to be a part of the mid-term or final. The goal is to get students as comfortable for their capstone to be able to do a huge presentation in front of a lot of people.
* MTX&201: Advanced Fluid Power Systems: another combination of courses that include electrical control, hydraulics, vacuum, and advanced pneumatics.
* Capstone – course number and title.

New Courses:

* MTX&208: Semiconductors 2 – industry feedback suggested another level for semiconductors. This course directly relates to analog implementation; being able to see the circuits and then being able to build them. Zeb stated that interns were missing these skills so it’s important to make sure they have them.
* MTX&256: Digital Electronics – Ken discussed that the program currently doesn’t have a course in this subject. The idea is to give students the basic understanding of numbering systems, learning how to convert between binary coded decimals, how it’s read into a system, and then being able to read how the output is displayed. Chris stated that there is also some important overlap. The numbering system and sequencer data is all introduced in MTX&130 (Programmable Logic Controllers 1), however this course allows students to see it from a different perspective. This course is also an important Segway into a Bachelor’s in Technology.
* MTX&202: Motor Drive Systems

The total number of credits for the program would come out to 97 credits, which also includes the 15 credits of GenEd. This new program takes the two degree track from 34 classes and turns it into 26 total courses; 22 mechatronics, 4 GenEd. 10 of these courses remain unchanged, 2 are brand new, and 10 are combined or reworked courses.

**PATHWAY THROUGH THE PROGRAM (Appendix C)**

The industry wants to see a list of skills and be able to equate it to a certificate that is recognized. The program can show students a path to a degree, but it is also a stepping stone process. There are identified certificates that have been created that the industry would like to see.

*RAMP (Rural Access Mechatronics Program) Certificate*

This certificate was originally given after the first 7 courses; it can now be earned after the first 6. This enables students to be able to take other courses.

*Electronics Certification (Industry Recognized)*

Ken stated that the Electronics Technician Association and the International Society of Certified Electronics Technicians have tests available to take. There is a test fee and a specific test center.

*Semi-Conductor Apprentice Certification*

*NIMS (National Incident Management System) Certification*

This is backed by the MSSC (Manufacturing Skills and Standards Council). This covers the common areas of interest going into technical fields.

*CPT (Certified Production Technician)*

Students have to earn this certificate before they do NIMS.

After the one year breakout point, the program can offer a certificate. This helps with the goals of the students and also the goals of the lenders. Students can go through the program and get out in a reasonable amount of time. One year certificate options are also still available.

*Appendix D: Course and Quarter Breakdown*

Track 1: Students can start the program in the summer, however they have to take the prerequisites in the spring prior. Class will be 24 hours a week, but only 8 weeks long. 7 quarters later, students are done.

Track 2: Students start in the summer taking all their prerequisites during this time. They start the regular program in the fall.

Track 3: Students start in the winter and take all prerequisites in the fall.

This creates a very streamlined program and also cuts out a quarter and some coursework. Dan noticed that even if a student misses a class along the way, they can still jump back in somewhere. Zeb stated that he discussed with recent graduates and interns what classes would be good, combined or expanded on. The committee has been working on this the last six months. Wende explained that students now have to pick and choose from both, which makes funding hard. The one pathway makes it a lot easier.

The committee discussed the capstone project and how flexible it can be. Students have to be able to demonstrate applications in one particular project. They have to be able to build on concepts. There are two purpose for this course: a demonstration to the industry and also to get students to realize the skill level that they have achieved. The experience the students get in front of the industry is very unique.

The industry members appreciated providing feedback and interacting with the faculty and being able to see how the whole process works.

Dan asked if students have a general sense of the industry when they first join the program. Chris stated that they try to get the students into tours and coursework to talk about jobs and careers. A suggestions was made to have some of the industry members come in and talk to the classes. Working with high schools is also another goal. It gets students exposed to the industry early.

Jacob from Delta mentioned that what’s required by technicians is much different now than before; they need a much broader depth of knowledge.

Zeb motioned to approve the new curriculum for Mechatronics 2.0. Silvia seconded and was passed unanimously.

**ADVANCED MANUFACTURING UPDATE**

Genevieve explained the timeline for the new advanced manufacturing building. As of now, we are in the design phase. The next phase will be funding for the actual construction of the building. There is a developed concept; potentially a bachelor’s program (4-5 years down the road). There is a vision of what the building will be, a request for qualifications will be sent out, and then companies/people will bid for the project. We will then pick a few that we like, have them do a full blown design and then make a final decision. This should all happen between October-January of the next academic year. Doors will open fall 2020.

Funding for a 70,000 square foot building is no easy task. The decision was made to make it one story to utilize space and efficiency. We want to make sure that the building will work for 5, 10, and 20 years. We are trying to be as creative and flexible as possible.

Zeb adjourned the meeting at 7:41pm

Prepared by SueAnn McWatters

**APPENDIX A**

**Professional Technical Computational Skills**

**PROFESSIONAL TECHNICAL COMPUTATIONAL SKILLS**

PTCS 110

5 Credits

55 hours of lecture

Intended for students enrolled in career technical education programs. It includes topics from algebra, geometry, statistics, inductive reasoning, and trigonometry with an emphasis on applications and measurement. This course will satisfy the computational requirement for the Certificate of Proficiency, Associate of Applied Science and the Associate of Applied Technology. Prerequisite: A grade of "C" or better in MATH 030 or CAP 042 or recommending score on placement test. [CP]

**Course Outcomes:**

* Demonstrate the ability to perform the manipulation of fractions, decimals, percents, and equivalent forms.
* Demonstrate the ability to perform unit conversions of numbers, volume, mass, angles, time, temperature, etc.
* Understand the limitations on precision and accuracy imposed by measurement processes.
* Solve equations and use equations to model and solve real world applications.
* Use trigonometry to solve a right triangle: given a side, an angle, or one trigonometric function.
* Make correct inferences based on inductive reasoning.

**Professional Technical Writing**

**INTRODUCTION TO APPLIED TECHNICAL WRITING**

PTWR 135

5 Credits

55 hours of lecture

Introduction to principles of effective workplace communication: focus on methods of writing clear, concise documents for technical audiences and purposes; summarizing technical information; collaborating successfully in small groups. For students of all technical fields. Prerequisite: A grade of "C" or better in ENGL 098 taken at 5 credits or recommending score on the writing skills placement test for ENGL& 101. [CA,CT,GE]

**Course Outcomes:**

* Conduct effective and ethical research.
* Employ communication appropriate to a specific audience, purpose, and situation.
* Evaluate and accurately summarize technical/professional sources and texts.
* Create visuals and content with attention to accuracy, brevity, specificity, unity, and clarity.
* Collaborate successfully in the process of producing work-world documents.

**College Preparation**

**COLLEGE ESSENTIALS: INTRODUCTION TO CLARK**

COLL 101

2 Credits

22 hours of lecture

Introduction to Clark College for new students, focusing on making a successful transition to college life. Topics include goal setting, personal management skills, developing an academic plan, developing cultural competence and communication skills, financial literacy, and an introduction to student resources at the college. [GE, HR] [PNP]

**Course Outcomes:**

* Describe campus resources, including Career Services and Clark College Libraries, and their relationship to student success.
* Develop a two-quarter educational plan that works toward academic goals and increases understanding of the Academic Advising process.
* Define and discuss introductory concepts of power, privilege and inequity.
* Identify and apply personal learning styles and associated learning strategies.
* Apply introductory understanding of financial literacy to personal budgeting and college funding options.
* Utilize Clark College technology.

**PRACTICAL REASONING AND DECISION MAKING**

HDEV 120

3 Credits

33 hours of lecture

Develop, analyze, evaluate and apply critical thinking to academic, career and personal pursuits. College level reading and eligibility for ENGL& 101 are strongly recommended. [GE] [PNP]

**Course Outcomes:**

* Identify and utilize the Elements of Thought by applying them to discussions, concepts, text books, etc.
* Identify and apply Intellectual Standards to evaluate information.
* Identify essential Intellectual Traits and apply them to the decision making/problem solving process.
* Explore personal and cultural values and ethical concepts and apply them to "right versus right" ethical issues.

**APPENDIX B**

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|   |   | **Mechatronics 2.0** |   |
|   |  |  Two-Year Degree Program |   |
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| **Program Degree Requirement** |   |
| PTCS | 110 |  Trade Math | 5 |
| PTWR | 135 |  Technical Writing | 5 |
| COLL  | 101 |  College Essentials | 2 |
| MTX | 100 |  Industrial Safety | 1 |
| MTX | 101 | DC Fundamentals | 3 |
| MTX | 103 | Basic Measurement Tools | 2 |
| MTX | 106 | Fluid Power Systems | 4 |
| HDEV | 120 | Practical Reasoning & Decision Making | 3 |
| MTX | 102 | AC Fundamentals | 4 |
| MTX | 130 | Programmable Logic Controllers 1 | 4 |
| MTX | 180 | Mechanical Systems | 5 |
| MTX | 110 | Electric Motor Control 1 | 4 |
| MTX | 115 | Electrical Power and Distribution Systems | 4 |
| MTX | 119 | Mechatronics Concepts | 3 |
| MTX | 121 | Semiconductor Fundamentals | 3 |
| MTX | 128 | Robotic Systems | 4 |
| MTX  | 200 | Process Control Systems | 6 |
| MTX | 208 | Semiconductors 2 | 3 |
| MTX | 216 | Mechatronics 2 | 5 |
| MTX | 256 | Digital Electronics | 3 |
| MTX | 202 | Motor Drive Systems | 5 |
| MTX | 250 | Advanced Programmable Logic Controllers | 4 |
| MTX | 292 | Manufacturing System Principles | 4 |
| MTX | 296 | Capstone/Final Project | 4 |
| MTX | 230 | Laser Alignment | 2 |
| MTX | 201 | Advanced Fluid Power Systems | 5 |
|  |  | **Total Credits Required** | **97** |

**APPENDIX C**



**APPENDIX D**

