

Bay College
Course Cover Sheet



M-CAM Training Area:

CNC/Machining **Multi-Skilled/Mechatronics** Production Operation Welding/Fabrications

Program(s): Mechatronics and Robotics Systems, AAS

Course: ELEC 295 Mechatronics

Course Description: A further study of fluid power principles, covering air and gas pressure principles. Electrical controls of pneumatic equipment in industry will also be covered. This lecture/laboratory course covers sequencing controls, pressure controls, monitoring controls, and computer applications. Prerequisites: ELEC-285, and ELEC 290

Date Modified: November 2015

Faculty Developer(s)/Instructional Designers(s): Mark Highum

Employer/Industry Partner: Engineered Machine Products (EMP), Stewart Manufacturing, Cal Grinding

College Contact: Mark Highum

Phone: 906.217.4083

Email: highumm@baycollege.edu

Additional Information/Comments:

Textbook used: Mechatronics by Festo Didactic

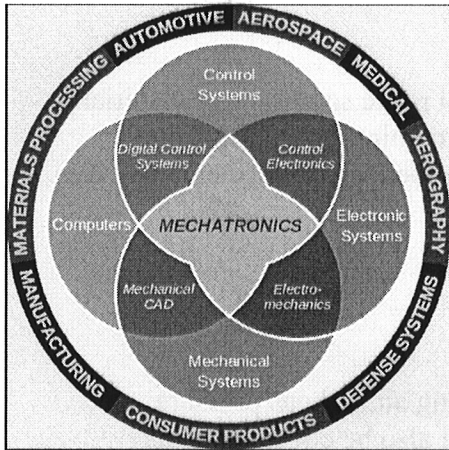
Labs used: Festo Learnline Hydraulics and Pneumatics trainers and associated lab materials as well as Festo Modular Production Systems stations and associated documentation

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COURSE SYLLABUS **Winter 2017**

ELEC 295 Mechatronics

Mechatronics
Bay College

LEAD INSTRUCTOR: MARK HIGHUM

I. For important college policies and other information you need to know, visit <https://www.baycollege.edu/collegepolicies>

II. COURSE INFORMATION:

Title:..... *Mechatronics*
Number:.....ELEC 295 01 10
Credit/contact hours:.....4/4
Prerequisites:.....ELEC 285, ELEC 290
Classroom number:.....402E/972
Class Hours:.....TR 2 – 3:50 PM

III. INSTRUCTOR INFORMATION:

Name:.....Mark Highum
Office location:.....RM 402D
Office Hours:.....Wed –9AM - Noon
Tues & Thurs– 11AM-Noon
E-Mail:..... highumm@baycollege.edu
Office Phone:.....906-217-4083

IV. COURSE MATERIALS:

Required Text: None

Additional Materials Required for the course:

- A. Notebook
- B. USB storage device (optional)
- C. Scientific Calculator

V. ONLINE COURSE COMPONENT

There is no required online component to this class. The instructor will make some course materials available through the MyBay portal. Additionally, the student may be required to submit some classwork and lab reports via the MyBay portal. The instructor will use the Bay College email system for any needed communication to students.

VI. COURSE OBJECTIVES:

Catalog Description: A further study of fluid power principles, covering air and gas pressure principles. Electrical controls of pneumatic equipment in industry will also be covered. This lecture/laboratory course covers sequencing controls, pressure controls, monitoring controls, and computer applications.

VII. STUDENT LEARNING OUTCOMES:

Course Objectives	Course Outcomes	Assessment Method
Demonstrate an understanding of Mechatronic systems	Demonstrate proper use of automation terminology.	Homework, Lab, Exam
Demonstrate an understanding of Mechatronic systems	Operate a programmable logic controller (PLC).	Homework, Lab, Exam
Demonstrate a basic knowledge of basic hand tool use	Build a mechatronics system in accordance to a print	Homework, Lab, Exam
Demonstrate the ability to analyze Mechatronic Systems	Analyze, connect, and troubleshoot Fluid Power circuits.	Homework, Lab, Exam
Demonstrate the ability to analyze Mechatronic Systems	Analyze, connect, and troubleshoot AC/DC motor control circuits.	Homework, Lab, Exam
Demonstrate the ability to analyze Mechatronic Systems	Analyze, connect, and troubleshoot electrical motor drive circuits.	Homework, Lab, Exam

VIII. INSTRUCTORS STATEMENT ON ACADEMIC INTEGRITY

As stated in the Bay College Integrity Policy: Students are expected to pursue their education at Bay College with honor and integrity. In line with this college policy, any student found cheating, copying, or otherwise misrepresenting his/her performance, or any way gaining an unfair advantage over other students will be subject to disciplinary actions according to the Bay College Academic Integrity Procedures.

IX. Guidelines for Success

Attendance: Students are expected to attend all class sessions. Should a student not be able to attend a class session, he/she is expected to talk to the instructor about material that was missed. Absences that are expected by the student should be discussed with the instructor prior to missing the class.

Missed Assignments: Assignments (and exams) are not normally accepted late. If the instructor allows a missed assignment (or exam) to be made up, it will be due within one week of the original due date. Any late assignment after one week will be counted as half credit.

Participation: Students are expected to participate in class discussions. Taking notes is not required, but is encouraged. Students are expected to read the assigned text prior to the class session. The instructor retains the right to use the book, handed out material and lecture notes for the exams.

Acceptable Use Policies: apply to all workstations and servers in CNSS classrooms and labs. Any student found to be violating acceptable use policies will be referred to the Dean of Business and Technology for discipline.

Incomplete: An incomplete grade is given only in extenuating circumstances, and only with prior arrangement with the instructor.

X. STUDENT EVALUATION/GRADING: % of Grade

<u>Unit Exams:</u>	30%
<u>Quizzes/Chapter Review Questions:</u>	20%
<u>Labs</u>	30%
<u>Final exam :</u>	20%
<u>Total:</u>	100%

Grade Scale

≥90%	=	A
80-90%	=	B
70-80%	=	C
60-70%	=	D
<60%	=	F

XI. STUDENT ASSESSMENT

All Bay College students will be expected to participate in assessment activities during their course of study at the college. These activities will include participating in assessment of General Education Outcomes, classroom assessment for specific course lessons, or assessment of skills needed for a specific program. These assessments will help instructors and the college make decisions to improve instruction and student learning.

XII. COURSE WITHDRAWAL

It is your responsibility to withdraw/drop from the class if you choose to do so. You may drop this class within the first two weeks (**January 20**) with reimbursement for the tuition. You may withdraw within the third through tenth week (**March 24**) and receive a WP (if passing at the time of the withdrawal request) or WF (if failing at the time of the withdrawal request). After the tenth week you are required to request an Administrative Appeal. All students who do not follow the drop/withdrawal procedure will receive an "F" for the class.

XIII. CLASS CANCELLATION/ COLLEGE CLOSING/NOTIFICATION OF EMERGENCY SITUATIONS

Weather concerns: As stated in Bay College's Student Handbook, a reasonable effort to be present is expected. Therefore, students may exercise their own judgment as to whether or not travel to campus is warranted during adverse weather. If you decide not to travel to campus, or determine that you need to leave campus because of threatening weather, you will be expected to contact your instructor via phone or email as soon as possible to let him/her know why you will be absent and to discuss options for completing the missed work. Students are reminded of the opportunity to receive weather related and other emergency messages from Bay College. Bay College has subscribed to e2Campus to send time-sensitive emergency communication to students, faculty and staff who opt-in to BayAlert Campus Emergency Text and Voice Messaging.

Visit <http://baycollege.edu/Around-Campus/Campus-Safety/Bay-Alert.aspx> for more information and to sign up for BayAlert.

Should the instructor need to cancel a class session, every effort will be made to provide at least a one week notice of this cancellation. In the event of illness or other unforeseen conditions, the instructor will contact the students via the college email system as early as possible.

XIV. TENTATIVE COURSE SCHEDULE: (This schedule is provided as a guide and is not to be construed as a contract)(Assignment/grade section is for student record keeping)

DAY	DATE	SUBJECT/TOPIC
Tues	1/10/17	Class Introduction – Project Discussion
Thurs	1/12/17	Sequence Control
Tues	1/17/17	Sequence Control
Thurs	1/19/17	Sensors
Tues	1/24/17	Sensors
Thurs	1/26/17	Timers
Tues	1/31/17	Timers
Thurs	2/02/17	Counters
Tues	2/07/17	Emergency Stop
Thurs	2/09/17	EXAM ONE
Tues	2/14/17	Mec Lab practice
Thurs	2/16/17	Mec Lab practice
Tues	2/21/17	Mec Lab practice
Thurs	2/23/17	Mec Lab practice
Tues	2/28/17	Mec Lab practice – Project Definition
Thurs	3/02/17	EXAM TWO
Tues	3/07/17	Spring Break No Classes
Thurs	3/09/17	Spring Break No Classes
Tues	3/14/17	Project work
Thurs	3/16/17	Project work
Tues	3/21/17	Project work
Thurs	3/23/17	Project work
Tues	3/28/17	Project work
Thurs	3/30/17	Project work
Tues	4/04/17	Project work
Thurs	4/06/17	Project work
Tues	4/11/17	Project work
Thurs	4/13/17	Project work
Tues	4/18/17	Project work
Thurs	4/20/17	Project work
Tues	4/25/17	Project work
Thurs	4/27/17	Project work
	5/02/17	Finals Week - Final Exam



Subject Matter Expert (SME) Course Review Summary

College: Bay College

M-CAM Training Area: CNC/Machining Multi-Skilled/Mechatronics Production Operation Welding/Fabrication

Degree Program Name: Mechatronics

Title of Course: ELEC295 Mechatronics

Subject Matter Expert (SME) Reviewer Information

Name: Casey Calouette

Title: Engineer

Phone: 9062413582

Email: ccalouette@calvalves.com

Organization/Affiliation: Cal Grinding, Inc.

Attach Resume or provide credentials (showing years of experience and work experience that is relevant to course content):

AAS : Electrical Engineering Technology – Bay College, 2003

BS : Electrical Engineering Technology – Michigan Technological University, 2005

Ross’s Manufacturing – Design Engineer, Frozen Custard Machine Electrical&Controls Design 2006

Cal Grinding, Inc. – Electrical & Manufacturing Engineer, Automation and Manufacturing Environment, 2006-Present

Synopsis of Findings:

ELEC295 looks to make an excellent end to the coursework. A month plus final lab allows plenty of time for a challenging and rigorous end of term project that goes beyond what most class projects could offer. This is an opportunity for the program to really bring it all together.

Reviewers Signature _____

Date: 3/28/17

Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review

1. Course Overview and Objectives	Exceptional	Satisfactory	Ineffective
The goals and purpose of the course is clearly stated.		X	
Prerequisites and/or any required competencies are clearly stated.		X	
Learning objectives are specific and well-defined.		X	
Learning objectives describe outcomes that are measurable.	X		
Outcomes align to occupational focus (industry skills and standards).	X		
Comments or recommendations: Lengthy end of class lab fits in well with a true work environment.			
2. Material and Resources	Exceptional	Satisfactory	Ineffective
The instructional materials contribute to the achievement of the course learning objectives.		X	
The materials and resources meet/reflect current industry practices and standards.		X	
The instructional materials provide options for a variety of learning styles.		X	
Resources and materials are cited appropriately. If applicable, license information is provided.		X	
Comments or recommendations: No instructional textbooks noted on the syllabus.			
3. Learning Activities	Exceptional	Satisfactory	Ineffective
Provide opportunities for interaction and active learning.	X		
Help understand fundamental concepts, and build skills useful outside of the learning object.	X		
Activities are linked to current industry practices and standards.	X		
Comments or recommendations: Excellent use of lab times.			

**Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review**

4. Assessment Tools/Criteria for Evaluation	Exceptional	Satisfactory	Ineffective
The course evaluation criteria/course grading policy is stated clearly on syllabus.	X		
Measure stated learning objectives and link to industry standards.	X		
Align with course activities and resources.	X		
Include specific criteria for evaluation of student work and participation.		x	
Comments and recommendations:			
5. Equipment/Technology	Exceptional	Satisfactory	Ineffective
Meets industry standards and needs.	x		
Supports the course learning objectives.	X		
Provides students with easy access to the technologies required in the course/module.	x		
Comments and recommendations:			

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