

360-hour Mechatronics Non-Credit Syllabus

Class hours Monday, Wednesday and Friday 9 am – 2:30 pm

Instructor: Ervin Martindale emartindale@ccac.edu

Lab phone number: (412) 788-7522

Project Manager: Sylvia Elsayed selsayed@ccac.edu (412) 788-7534

Career Coach: Michael Cunningham mcunningham@ccac.edu (412) 788-7396

Project Coordinator: Sarah Hansen shansen@ccac.edu (412) 788-7384

Required Textbook & Supplies

1. Access to a Windows-based computer system—home, workplace, or CCAC's Computer Lab.
2. Instructor-supplied textbooks, assessment packets, and reference materials. Please be sure to always have the appropriate textbook and assessment packet with you for lab work and hands-on testing!

Course Description

Mechatronics is the combination of computer science, electronics, and mechanics (engineering) and is applied to most industries through automation enhancements. This hands-on 360-hour course will allow the student to experience realistic applications of automation control. Topics will include: basic electricity and controller devices, sensors, and actuators, controlling motion and motors, using and troubleshooting hydraulics and pneumatics, application of measurement techniques, remote control applications, and mechanical systems.

Course Objectives

By the end of this course, you should be able to:

1. Demonstrate an understanding of fundamental Mechatronics characteristics, systems, and concepts.
2. Apply basic mathematical, critical reading, electronic, and engineering concepts to design and evaluate Mechatronics systems pertaining to electrical systems (AC/DC, motors, and industrial wiring), mechanical systems (hydraulics, pneumatics, piping, electro-fluid power, and chain drives), and programmable logic controllers.
3. Work effectively, both individually and interactively, to perform hands-on applications in the laboratory.

Grades

Successful completion of each course unit is dependent upon two forms of assessment:

1. Quizzes to test student knowledge in each Learning Activity Packet (LAP) (25%)
2. Hands-on assessment for each LAP given by the instructor. (75%)
 - a. Combined with your hands-on assessments will be a hands-on final for each section which has a scheduled date. You must take the final on the schedule date or you may be dismissed from the program.

These assessments are averaged for a final LAP grade. The minimum passing overall grade for each LAP is 70%.

Students will be eligible to earn up to 17 credits towards an Associate's degree in Advanced Manufacturing/ Integrated Systems Technology from CCAC. The Mechatronics units and their credit course equivalents are as follows:

Mechatronics Unit	CCAC Course Equivalent	Credit Hours
Electrical Control Circuits 1 & 2	EET 103 – Intro to Electronics	3
Electrical Motor Control 1 & 2	EET 245 – Electric Motor Control	3
Industrial Wiring & Power Distribution	EET 179 – Electric Power Distribution	3
Hydraulics & Pneumatics (all units)	MET 170 – Fluid Power Systems	4
Programmable Controllers (all units)	RBT 245 – Programmable Logic Controls	4

To achieve credit, students must complete each Mechatronics unit with an overall grade of 80% or higher.

Support Services

This course is supported through a Blackboard website available at: <http://courses.ccac.edu>

Students are expected to log on regularly to check for course announcements, to complete supplemental assignments, and to access career services.

Student Supportive Services: CCAC is committed to providing accessible facilities, appropriate accommodations, and assistive technology to students with documented disabilities. It is the responsibility of the student to contact the Supportive Services staff to initiate accommodations. For West Hills Center, please contact Della Pappas at dpappas@ccac.edu or (412) 369-3686.

Student Career Services: We are hoping to host some workshops that focus on Career Planning elements, such as resume writing and interviewing. Dates and times for these workshops, as well as any Career Fairs we host, will be posted as Announcements on Blackboard. For specific questions or resume assistance, students may also contact Emma Hartle from CCAC's Career Services at ehartle@ccac.edu.

Classroom Policies

Attendance Policy: You are expected to attend classes regularly and on time. Excessive absences result in poor classroom performance, low grades and possible failure. Instructors will check attendance daily. You will be permitted to miss 10% of the class over the entire course which equates to 7 classes that you may miss for illness or emergency. In the event that you miss class you must notify the instructor, Sylvia, and Michael via email or phone call. After you miss 3 classes you will have a meeting with your instructor to discuss your attendance and to develop a plan for making up the time you missed. It is critical to attend classes to be able to complete the course.

If you do not attend for an extended period of time (approximately three weeks), you will be dropped from the class.

Please see **Extenuating Circumstances** to review our policy regarding absence due to illness or other uncontrollable circumstances.

Email Policy: Please use courteous discretion when scheduling appointments with instructors and/or administrators. Generally, plan to give a minimum notice of 48-hours prior to an appointment. If there is a change in your schedule, please try to contact your instructor and/or administrator at least 24 hours in advance of the appointment. Instructors and administrators will likewise plan to respond to emails within 48 hours of receiving them.

Extenuating Circumstances: If you have extenuating circumstances that prevent you from completing quizzes, hands-on assessments, or participating in the class, please contact the instructor to make alternative arrangements. The possibility of alternative arrangements is at the discretion of the instructor. Active communication is the key to overcoming any hurdles you may encounter during the term. We have several avenues we may pursue to assist you, but we rely on your communication with us to make these resolutions happen.

Severe Weather Policy

In the event of Severe Weather or other emergencies, the campus may cancel classes. Please be aware of the following resources to check for delays or cancellations: The local news, CCAC homepage (www.ccac.edu), and North Campus Hotline: (412) 369-3675. You may also sign up for Twitter Alerts - Text "follow CCACAlerts" to 40404 or

follow @CCACAlerts.

CCAC Student Policies

The policies listed in this syllabus are taken directly from CCAC's *Student Handbook 2010-2011*. A copy of this handbook can be obtained upon request or from Admissions, or it can be found online at: <http://www.ccac.edu/default.aspx?id=137886>

Computer & Electronic Resources—Student Responsibilities

Computers for student use are available in some college centers and at each campus in the library, learning center, computer center and in computer classrooms. At the campus computer center, you can access word processing, email, the Internet and a variety of software packages for completing coursework. Hours for the computer labs at each campus may vary.

The college relies upon users to conduct themselves according to the basic principles of mutual respect. In this way, we attempt to promote the most effective and beneficial use of the college's computer equipment and facilities and protect the free exchange of information and ideas.

When using computer resources, students are expected to:

1. Use the computer resources primarily for scholarly purposes.
2. Use discretion when displaying and printing material that may be offensive to others.
3. Not use college computer resources to transmit or display obscene, illegal, violent, discriminatory or other information that may result in harassment or defamation.
4. Discourage inappropriate usage by others.
5. Avoid disruptive behavior when using computer resources.
6. Abide by all signs posted in the computer labs.
7. Respect the needs of other users to access limited computer resources.
8. Not use college computer resources to gain unauthorized access to any other computer system.
9. Respect the integrity of the system and related physical resources, and observe all relevant laws, regulations and contractual obligations.
10. Not download, post or install to college computers, or transport across college networks material which is illegal, proprietary, in violation of license agreements, copyrights, college contracts or which may be damaging to the college.
11. Not share your password. The responsibility for anything done under your account is totally yours.
12. Not use CCAC resources (email, computer hardware, software or supplies) or your account for personal financial gain and/or commercial purposes (whether for-profit or not-for-profit), or for supporting political campaigns, candidates, legislation or ballot issues.
13. Use the systems and individual accounts in a manner consistent with the instructional, research and administrative objectives of the college. Legally, the college electronic network is not an open forum (such as a free-speech park); thus, its use is limited to activities consistent with college objectives.
14. Not use the CCAC name or logo or likeness on your webpage without the consent of the Information Technology Services Department.
15. Not print large quantities of flyers, banners or other printed materials intended for multiple distribution. For print jobs of this nature, only one copy may be printed in the labs.
16. Take responsibility and report any problems with computer hardware or software.
17. Not smoke, drink or eat in any computing facility.
18. Not misrepresent your identity or affiliation in email communication.
19. Use email for purposes which do not violate federal or state laws.
20. Not send harassing, intimidating, abusive or offensive material to or about others.
21. Not intercept, disrupt or alter electronic communications packets.

22. Not cause congestion on the network by such things as “chain letters,” “broadcasting” inappropriate messages to lists or individuals or excessive use of the email system.
23. Not attach non-CCAC computer equipment to the CCAC network.

Any unauthorized attempt to modify computer hardware and software components is prohibited. This includes attempts to use and/or copy software in violation of federal copyright laws.

All instances of misuse of computer equipment and facilities constitute grounds for disciplinary action under the CCAC Student Behavioral Code of Conduct. Instances of abuse may also result in civil and/or criminal proceedings.

ITS ServiceDesk: 412.237.3275 • help@servicedesk.ccac.edu

The Student Code of Behavioral Conduct

The college is committed to the advancement of knowledge and learning and to the development of responsible individuals. The college has an obligation to provide a safe and secure environment for the college community. In meeting this commitment, the college has established Behavior Intervention Teams which respond to college situations involving dangerous, atypical, threatening or disruptive student behaviors. Behavioral Intervention Teams assess situations in the college community and intervene with regard to the health, safety and security of the college community and in accordance with college policies.

Students are expected to respect the rights and properties of others and to uphold appropriate standards of integrity and behavior. The college has a concern for student conduct, both on campus, at college centers and college-sponsored activities off campus. The college’s responsibility is to provide members of the college community a full and equal opportunity to pursue their educational objectives and to maintain acceptable rules for good conduct.

Each student is considered to be a responsible adult. Emphasis is placed on standards of mature conduct rather than upon restrictions. However, any student who demonstrates his/her inability to conform to acceptable social conduct by disruptive activities may lose his/her right to enjoy the educational, social and recreational opportunities of the college.

Should any criminal violations occur on campus, at college centers or college-sponsored events off campus, the college has a legal obligation to report those violations to the appropriate law enforcement agency. In addition to being subject to possible criminal liability, a student may be subject to sanctions of the Student Code of Behavioral Conduct. The college will not waive its right to restitution or reimbursement for damages to its property or equipment. Therefore, prompt action will be taken to prosecute any claim against any person damaging college property or equipment. Any student engaging in the following behavioral misconduct may be subject to disciplinary sanctions. Students enrolled in limited enrollment programs and/or in programs with more specific behavioral criteria are subject to both conduct identified here as well as the conduct as defined by their program.

Improper Behavioral Conduct:

- Disruptive physical behavior and/or verbal interference with normal activities of the college community including classrooms, offices and public areas—this includes disruptive or unauthorized use of cell phones, cameras and other electronic devices that interfere with classroom activities or other college business
- Threats (terroristic or other), physical and/or verbal abuse, obscene conduct, intimidation, harassment or any conduct which threatens or endangers the health or safety of another person
- Theft, defacement or destruction of college property or another’s personal property on the college premises
- Unauthorized use of computers for the purposes of engaging in any activity aimed at compromising computer systems or network security.
- Use of college computer resources to transmit or display obscene, illegal, violent, discriminatory or other information that may result in harassment or defamation
- Unauthorized entry to or use of college facilities, electronic resources or equipment
- Alteration or unauthorized use of college documents
- Intentionally supplying false information to the college

- Possession, sale, use or being under the influence of alcohol or illegal substances on campus, at college centers or college-sponsored activities off campus
- Possession of firearms, weapons or explosive devices on campus, at college centers or during college functions off campus
- Gambling in any form, including the use of playing cards and dice (subject to local statutes, activities such as raffles or drawings that benefit recognized campus organizations are permitted with the approval of the dean of Student Development)
- Use of all tobacco products, including cigarettes, pipes, cigars, chewing tobacco and snuff, except in designated outdoor locations
- Failure to respond to reasonable instructions or requests by identified college personnel or security officers
- Excessive violations of parking regulations

Sexual Harassment

The Community College of Allegheny County shall not tolerate any behavior by administrators, faculty, staff or students which constitutes sexual harassment of a student. For the purpose of this policy, sexual harassment is defined as follows:

- unwelcome sexual advances;
- request for sexual favors; or
- other verbal or physical conduct or written communications of an intimidating, hostile or offensive sexual nature where:
 - a. submission to such conduct is made either explicitly or implicitly a term or condition of the student's status in a course, program or activity;
 - b. submission to or rejection of such conduct by a student is used as a basis for academic or other decisions affecting such student; or
 - c. such conduct has the purpose or effect of substantially interfering with a student's educational experience or creating an intimidating, hostile or offensive academic environment.

All administrators, faculty, staff and/or students will be held accountable for compliance with this policy. Violations can lead to disciplinary action to include suspension or termination.

A student who feels he/she has been sexually harassed should report such incidents to the dean of Student Development office at the campus where the incident occurred. A complaint should include the name, address and telephone number of the person filing the complaint; a brief description of the complaint and/or alleged violation of policy, law or regulation; and the date(s) of the incident(s).

The dean of Student Development has responsibility for receipt and handling of student allegations of sexual harassment, in conjunction with the Equal Employment Opportunity officer. Complete copies of the CCAC Affirmative Action Policy can be obtained by contacting the dean of Student Development office or via the college website at www.ccac.edu.

Please review the Student Handbook for a full description of sanctions regarding disregard for these policies.

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites, and including, but not limited to accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability or ownership.



This work is licensed under a Creative Commons CC BY 3.0 Unported License. <http://creativecommons.org/licenses/by/3.0/>