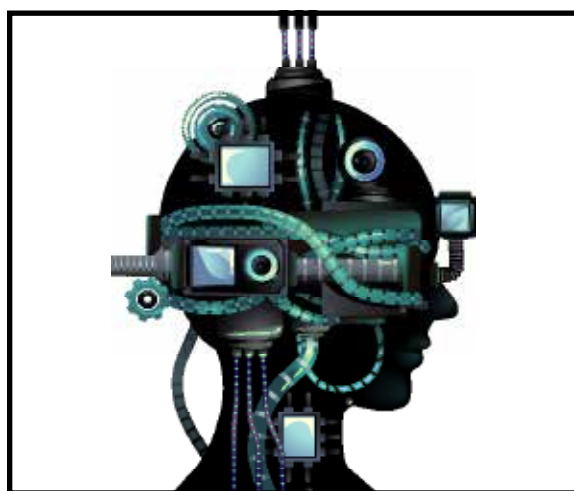


CHIPPEWA VALLEY SCHOOLS

Career and Technical Education



MECHATRONICS AND ROBOTICS

Mechatronics integrates principles from four engineering disciplines: electrical, mechanical, computer, and industrial. Thus, students will learn about robots, machines, electronics, hydraulics & pneumatics, electrical motor controls, sensors, computer-aided design (CAD), programming, programmable logic controls (PLC), diagnostics, computer numeric control (CNC), and other topics that together form the basis of “smart” devices used in robotics and advanced automated systems. This important knowledge is needed not only by highly skilled technicians who help install, program, trouble-shoot and fix problems, but also by engineers who plan, design, develop, or otherwise work with complex mechatronic systems.

Examples of Careers:

- Automation Engineer
- Big Data Analyst
- Control System Design
- Control System Troubleshooting
- Data Scientist
- Electro-mechanical Systems
- Electronics Design Engineer
- Instrumentation Engineer
- Machine Assembly
- Mechanical Design Engineer
- Mechanical Drafting
- Mechanical Engineering

Examples of Degrees, Certificates

- Process Engineering Technology
- Robotics
- Robotics Engineer
- Software Engineer
- Technician

and/or Certifications

- Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- Mechatronics
- Robotics

STEM

Successful completers of this STEM (Science, Technology, Engineering and Math) based, 2-year program will gain foundational knowledge and skills in the high-demand, multidisciplinary area of mechatronics.

“Mechatronics” comes from combining the words mechanical and electronics, though it actually also includes computer controls.



As a result of the strong demand for mechatronics professionals, the State of Michigan offers a program called MAT2 (Michigan Advanced Technician Training) that provides FREE tuition and paid employment to qualified applicants accepted into the post high school training program. Students successfully completing CVS's Mechatronics & Robotics program will be ideal candidates for this opportunity.

Classes can meet the following graduation requirements:

Visual and Performing Arts Credit

World Language Credit

Senior Math-Related Credit

Articulation — Earn College Credits

Students successfully completing the CTE State-approved program may be eligible for tuition free credit.

Instructor:

Mr. Jomo Walker

jwalker01@cvs.k12.mi.us

Phone: 586.723.2731



NOTICE OF NONDISCRIMINATION It is the policy of Chippewa Valley Schools not to discriminate on the basis of race, color, religion, national origin or ancestry, gender, age, disability, height, weight or marital status in its programs, services, activities, or employment. Inquiries related to nondiscrimination policies should be directed to: Civil Rights Coordinator, Assistant Superintendent of Human Resources, Chippewa Valley Schools Administration, 19120 Cass Avenue, Clinton Township, MI 48038 Phone: 586-723-2090 / Nondiscrimination inquiries related to disability should be directed to: Section 504 Coordinator, Director of Special Services, (same address) Phone: 586-723-2180

EXAMPLES OF DEGREES, CERTIFICATES AND/OR CERTIFICATIONS

- Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- Mechatronics
- Robotics



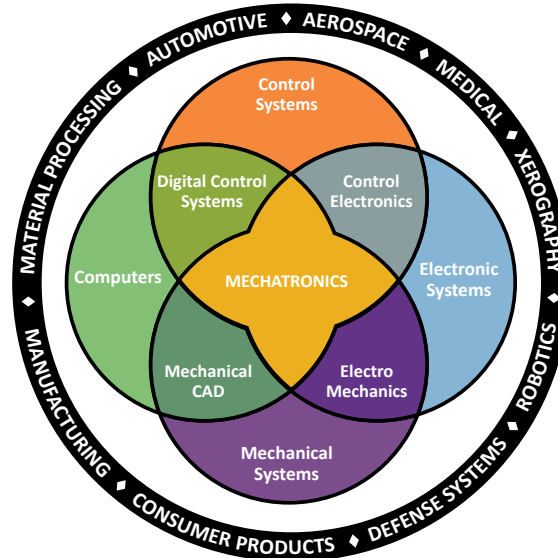
EXAMPLES OF CAREERS:

- Automation Engineer
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- Mechanical Engineering
- Process Engineering Technology
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- Robotics Engineer
- Software Engineer
- Technician

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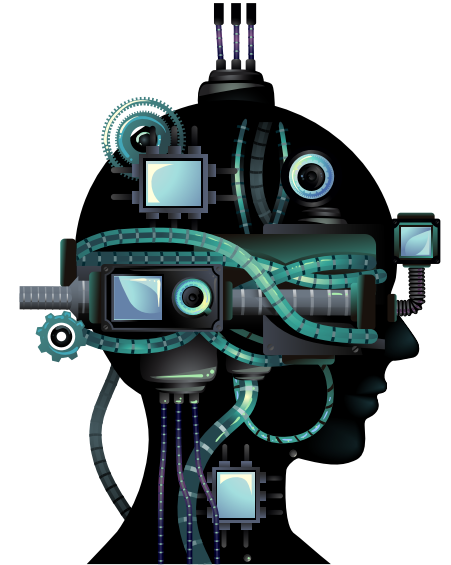


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MECHATRONICS AND ROBOTICS



INSTRUCTOR:
DAKOTA HIGH SCHOOL
Mr. Jomo Walker
jwalker01@cvs.k12.mi.us
Phone: 586.723.2855

DON'T JUST CHOOSE A CLASS ~ CHOOSE A CAREER

MECHATRONICS & ROBOTICS

Successful completers of this STEM*based, 2-year program will gain foundational knowledge and skills in the high-demand, multidisciplinary area of mechatronics. “Mechatronics” comes from combining the words mechanical and electronics, though it actually also includes computer-controls. Mechatronics integrates principles from four engineering disciplines: electrical, mechanical, computer, and industrial. Thus, students will learn about robots, machines, electronics, hydraulics & pneumatics, electrical motor controls, sensors, computer-aided design (CAD), programming, programmable logic controls (PLC), diagnostics, computer numeric control (CNC), and other topics that together form the basis of “smart” devices used in Mechatronics & Robotics and advanced automated systems. This important knowledge is needed not only by highly skilled technicians who help install, program, trouble-shoot and fix problems, but also by engineers who plan, design, develop, or otherwise work with complex mechatronic systems.



CLASSES CAN MEET THE FOLLOWING GRADUATION REQUIREMENTS:

- Visual and Performing Arts Credit
 - World Language Credit
- Articulation — Earn College Credits

Students successfully completing CTE state approved classes, may be eligible for tuition free credit.

9515/9516 MECHATRONICS & ROBOTICS 1A/1B

Gr 10–12

2 hour

1.0/1.0 credit

Prerequisites: *An interest in hands-on learning and the interface between humans, machines, and technology.*

Within a state-of-the-art lab, students will begin the journey into learning the various disciplines (see above overview) involved in mechatronics. Underlying theory and principles will gradually come together, and come to life, through a combination of learning strategies including hands-on learning, computer-based lessons, use of high-tech trainers and equipment, industry experts and site visits, and (perhaps most importantly), periodic, student-created projects that apply learning and allow students to develop novel solutions to challenges. Students can expect to improve their understanding of many physics principles that are naturally embedded in mechatronics. In addition to appropriate STEM* knowledge and skills, 21st century skills like critical thinking, collaboration, creative problem-solving and effective communication will be developed. Opportunities for student leadership, participation in competitions, and work-based learning experiences, will also be woven in throughout.

This course has been approved to meet the MMC senior year math-related credit requirement.

9517/9518 MECHATRONICS & ROBOTICS 2A BC/2B BC

Grades 11–12

2 hour

1.0/1.0 credit

Prerequisites/Recommendation: *Mechatronics & Robotics 1A/1B with a 2.0 or higher and teacher/administrative recommendation.*

In the second year, students will incorporate and build upon their knowledge of mechatronics learned in the first year through more complex, project-based application. Additional opportunity for work-based learning, student leadership, and competition will be incorporated. (See Mechatronics & Robotics overview at top of page and description for Mechatronics 1A for details about mechatronics content.) This is a seamless continuation of Mechatronics 1A/1B (see above) this course will incorporate a capstone experience or project which will be concluded and shared.

This course has been approved to meet the MMC senior year math-related credit requirement

9245/9246 MECHATRONICS & ROBOTICS INTERNSHIP 1/2

2 hour

9247/9248 MECHATRONICS & ROBOTICS INTERNSHIP 1A/1B

1 hour

Prerequisite: *Mechatronics 1A/1B and concurrently enrolled in Mechatronics 2A BC/2B BC course each semester.*

This course may be taken for one or two hours. An Individual Educational Training Plan and Training Agreement are developed for each student–trainee detailing his/her specific learning activities. Note: A student who chooses the Internship course for either one or two hours is expected to work 10 hours per week and provide their own transportation.

STEM

(Science, Technology, Engineering and Math)

In this course, students discover how the four disciplines connect as they explore the interaction between mechanics, electrical engineering, electronics, and computer engineering. They'll have the opportunity to design innovative solutions to real-world problems, challenges, and needs.

Students will be challenged to design an automated system by taking on the role of a mechatronics engineer. They must adhere to the specifications and constraints given and explore the interaction between mechanics, electrical engineering, electronics, and computer engineering disciplines to develop task-handling systems that help speed up time-consuming processes or processes that are unsafe for a human to perform.

Successful completers of this STEM (Science, Technology, Engineering and Math) based, 2-year program will gain foundational knowledge and skills in the high-demand, multidisciplinary area of mechatronics. “Mechatronics” comes from combining the words mechanical and electronics, though it actually also includes computer controls.