

MECHATRONICS I

COURSE SYLLABUS

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Course Description

Mechatronics I is an applied course in the manufacturing cluster for students interested in learning more about careers as a mechatronics technician, maintenance technician, electromechanical technician, or a manufacturing engineer. This first of two courses covers basic electrical and mechanical components of mechatronics systems as well as their combined uses with instrument controls and embedded software designs. Standards in this course are aligned with Tennessee State Standards for English Language Arts & Literacy in Technical Subjects and Tennessee State Standards in Mathematics.

Dual Enrollment with TCAT

The Tennessee College of Applied Technology at Athens (TCAT) has partnered with your high school in a dual enrollment agreement. Because you are enrolled in the Mechatronics/Electro-Mechanical program of study at your high school you have also been enrolled in the Electro-Mechanical Technology program at the TCAT. This gives you the opportunity to earn college credit while being a high school student. Upon successful completion of the Mechatronics/Electro-Mechanical program of study at the high school level, you will then enroll and finish the remaining coursework needed to obtain an Electro-Mechanical Technology diploma at the TCAT. The Electro-Mechanical Technology program at the TCAT takes approximately 16 months to complete. However, if you graduate high school successfully completing the Mechatronics/Electro-mechanical program of study, you will be able to complete the program in approximately 12 months.

Attendance Policy

Students are expected to be present and on time for all scheduled classes. The purpose of this course is to better prepare you to enter the workforce, and in the workforce all employees are expected to be present, on time, and ready to work. Remember to follow the school's reporting policy if it is necessary for you to be absent from class

Course Outcomes

Upon successful completion of this course, you will be prepared to:

- Describe and explain basic functions of physical properties and electrical components within a mechatronic system.
- Logically trace the flow of energy through a mechatronic system and communicate this process to others.
- Effectively use technical documentation such as data sheets, schematics, timing diagrams, and systems specifications to troubleshoot basic problems with equipment.

Coursework

The following subjects will be covered during the course:

- Fundamental Safety Practices
- AC/DC Motors
- Circuits and Electrical Components
- Schematics
- Gears, Belts, and Drives
- Measurements
- Technical Documentation and Troubleshooting

Course Subjects will be delivered using a combination of electronic textbooks, written handouts, and practical application exercises using classroom trainers. Some subjects will be taught as a stand-alone topic. Others will be blended in with all subjects. For example, drawings and schematics are used in all technologies. Industrial safety is covered in general and included with each topic as a reinforcement.

Delivery methods are listed in the following matrix:

Subject	Learn Mate	NIDA	Handout	Lab
Fundamental Safety Practices		x	x	Trainers
AC/DC Motors		X		Drive trainer
Circuits and Electrical Components		X		Electrical Trainer
Schematics		X		All labs
Gears, Belts, and Drives	x	x	x	Drives trainer, hydraulics & pneumatics
Measurements			x	Hands on measurements
Technical Documentation and Troubleshooting	x	x	x	

Assignments:

1. Safety Practices
2. Measurements
3. Basic electrical
4. Basic mechanical / hydraulics & pneumatics
5. Basic mechanical / drives
6. Robotics
7. Drawings and schematics
8. Documentation and troubleshooting