MECHATRONICS
PATHWAY COURSE SEQUENCE:

1

Level 1: Principles of Manufacturing

Exposes you to various occupations and pathways in Advanced Manufacturing.

You will develop an understanding of:

- General steps involved in the manufacturing process
- Essential skills needed to be an effective manufacturing team member
- Basic quality principles and processes, blueprints and schematics, and systems

2

Level 2: Digital Electronics

An introduction to the basic workings of digital electronic systems, where you will use these elements to design complex digital systems.

You will learn:

- Functions of digital pieces such as gates, flip flops, counters and other devices.
- Use of digital pieces to design complex circuits using programmable tools
- How to design a complex digital system and communicate the product through a variety of media
- Technical writing skills when operating and troubleshooting circuits

3

Level 3: Mechatronics I

An applied course highlighting technician careers in mechatronics, maintenance, electromechanical or a career as a manufacturing engineer.

You will learn the basics/functions of:

- Electrical and mechanical parts of mechatronics systems and their uses with instrument controls and embedded software designs
- Physical and electrical properties within a mechatronic system and how to trace the flow of its energy
- Technical documentation such as data sheets, schematics, timing diagrams, and system specifications to troubleshoot basic problems with equipment
- Strategies to identify, localize and correct malfunctioning parts and equipment

4

Level 4: Mechatronics II and Manufacturing Practicum

Mechatronics II—you will learn:

- Basics of pneumatic, electro pneumatic, and hydraulic control circuits
- Differences and scientific principles between hydraulic and pneumatic fluid power
- Roles of programmable logic controllers (PLC) in mechatronic systems and how to write, debug and run basic ladder logic
- Technical writing to troubleshoot and resolve malfunctioning parts and circuits

Manufacturing Practicum— apply your skills and knowledge of manufacturing to:

- Work in teams and plan the production of an advanced product
- Develop troubleshooting and problem solving methods to ensure products run smoothly, and analyze products to compile professional reports
- Connect your experiences with future career and post-high school opportunities

E

Pathway Elective: Work Based Learning (WBL) Career Practicum:

Helps you connect your classroom knowledge to high-demand, high-skill careers in Tennessee. You will develop employability skills preparing you for post-high school education and future careers. As a junior or senior (16 years or older), you may earn high school credit for Capstone WBL through internships, apprenticeships, and paid work experiences.

**Course sequence is identified by Tennessee Department of Education. Each school district determines courses offered in each pathway.*

CERTIFICATE TCAT**	**ASSOCIATE** COMM. COLLEGE	**BACHELOR'S** UNIVERSITY
$23,000 - 32,000*	**$31,000 - 61,000***	**$56,000 - 85,000***
• Technician • Robotic Welding Machine Operator	• Technical Operator • CNC Operator	• Senior Project Engineer • Design Engineer
TCAT Athens TCAT Chattanooga	Chattanooga State Cleveland State	UTC - University of Tennessee at Chattanooga

**Median wage ranges based on Tennessee Department of Labor & Workforce Development Labor Market Information- June 2014. Job standards, descriptions, and wages vary by company.*

***TCAT - Tennessee College of Applied Technology*