

# MECHATRONICS (MEC)

---

## **MEC 100 Materials and Processes (3 Credits)**

45 lecture, 15 lab, 3 total contact hours

In this course, students receive an introduction to basic terms, mechanical and physical properties, and characteristics and structures of materials. Heat treatment of ferrous and non-ferrous metals and the effect on tensile, torsion, and impact will be investigated. The study of common consumer products will identify material types and processes used in manufacturing. In a capstone project, students will associate two different materials to a product identifying the advantages and disadvantages for both. Mechanical and physical properties, characteristics, ease of manufacturing, cost, environmental impact, and life cycle will be compared. This course was previously AMS 103. Level I  
Prerequisite: Academic Reading and Writing Levels of 6

## **MEC 101 Blueprint Reading for Manufacturing (2 Credits)**

15 lecture, 30 lab, 2 total contact hours

In this course, students will develop the skills to read and understand blueprints and schematics used in manufacturing. Topics such as terms of the trade, identification of line types, dimensioning systems, tolerancing, first and third angle projections and associated views and symbols used in manufacturing will be covered. Students will also be introduced to basic electrical and fluid power diagrams. The knowledge and skills gained in this course will be used throughout the Mechatronics and Advanced Manufacturing CNC programs. Level I Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 2

## **MEC 105 Pneumatics and Hydraulics in Fluid Power (4 Credits)**

45 lecture, 45 lab, 4 total contact hours

In this course, students are introduced to the fundamental principles of fluid power used in both pneumatics and hydraulics. By applying Pascal's Law, students will understand prime mover requirements, the principles and operation of fluid power fixed displacement pumps and compressors, pressure and flow control valves and actuators. Failure modes and troubleshooting concepts are also covered. Level I  
Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 3

## **MEC 201 Mechanisms and Introduction to Mechatronics (2 Credits)**

60 lab, 2 total contact hours

In this course, students will gain theoretical knowledge and hands-on skills for shaft, belt, gear and chain drives using real-world motor drive components. Students will learn and apply these skills in mechanical drives training systems and interactive online mechanical drives curriculum. They will also build skills in hands-on mechanical drives including mechanical drive systems, power transmission systems, v-belt drives, chain drives, spur gear drives, and multiple shaft drives. Students will be introduced to Lock-out/Tag-out safety procedures and 5S workplace organization. This course is the foundation for mechatronics programs. The title of this course was previously Mechanisms. Level I  
Prerequisite: Academic Reading and Writing Levels of 6; Academic Math Level 3

## **MEC 224 Mechatronics Capstone (4 Credits)**

30 lecture, 60 lab, 4 total contact hours

In this course, students will demonstrate the knowledge accumulated from the entire Mechatronics program. Students will be working around industrial equipment safely and integrating automated systems. Students will integrate industrial automated systems as well as design and document a simple robotic workcell. The title of this course was previously Robotics IV. Level I Prerequisite: Academic Reading and Writing Levels of 6; ELE 224, NCT 120 and ROB 221, minimum grade "C"