

# → Mechatronics Programs



**LJ CREATE™**  
Learning for life

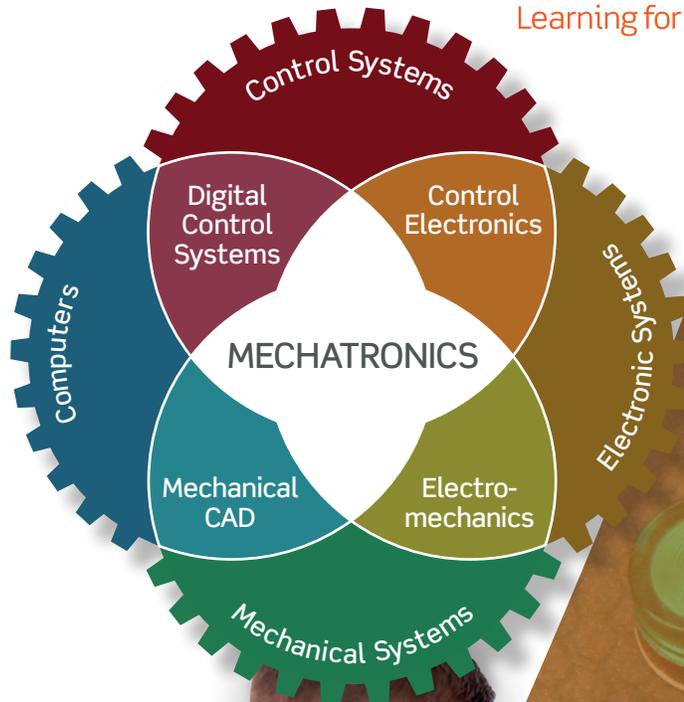
From LJ Create

## Prepare your students for success in Mechatronics

LJ Create Mechatronics is a set of courses at **three levels**, designed to provide students with a strong **foundation in mechatronic principles** and applications.

The courses will provide students with the expertise they need to succeed in **industrial skills programs** and industry certification courses.

-  Suitable for students of all abilities and aptitudes
-  Cost effective and sustainable



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## Foundation Mechatronics

Short project-based courses that explore basic mechatronic principles. Investigate the application of mechatronics in a wide range of different career clusters:

### Engineering Design

Students explore the engineering design process as a methodology for solving problems, and use the design process to develop an automated railroad crossing.

### Mechatronic Systems

This course explores basic mechanical principles and the principles of fluid power. Students design a fairground ride.

### Computer Science

Students explore techniques for algorithm development, including problem-solving methods, flowchart design, and pseudo code.

### Electrical Technology

Students explore basic electrical concepts and components.

### Capstone Robotics Project

Students design algorithms and then develop and test programs to control a range of robotic systems. Students design and program a robotic control system.



#### HARDWARE

- 220-01 Engineering Construction Kit
- 250-01 Educational Robotics Invention Kit
- 278-01 Fluid Power Student Resource Pack



## Mechatronics Systems

Courses teaching the basic principles of the technologies used in mechatronic systems:

### Engineering Principles

Students explore basic engineering science principles including materials, drawing skills and control theory.

### Mechanical Systems

Students explore mechanical systems including gears, levers, belts, and bearings.

### Fluid Power

Students explore the principles and components of pneumatic and hydraulic systems.

### Electrical and Electronics

This course explores DC and AC, digital electronics principles, electromagnetic concepts, transformers, and motors.

### Introduction to PLCs

Students are introduced to PLC technology and ladder logic programming concepts.

### Introduction to Process Control

Students are introduced to process control concepts.



#### HARDWARE

- 320-00 Electronics Study Trainer
- 320-14 Electromagnetism Card
- 320-41 Combinational Logic Card
- 208-01 Process Control Technology Flow Module
- 290-01 Industrial Control Trainer
- 260-01 Mechanisms Trainer
- 270-01 Pneumatics Trainer
- 280-01 Hydraulics Trainer



Can be purchased as a complete program or customized for specific pathways

## Advanced Mechatronics

Advanced mechatronics courses that allow students to specialize, and lead towards preparation for an industry certification:

### Advanced Mechatronics Core

All students explore advanced mechatronic principles including robotics, production and business concepts - before progressing onto the following optional courses:

### Industrial PLC Systems (Opt. 1)

Students explore industrial PLC programming using Siemens or Allen Bradley PLCs (includes SCADA and HMI).

### Control and Instrumentation (Opt. 2)

Students explore instrumentation and transducer technology, and motor control concepts.

### Process Control (Opt. 3)

Students explore process control concepts including: flow, pressure, temperature, and level control.

### System-Based Electronics (ETA) (Opt. 4)

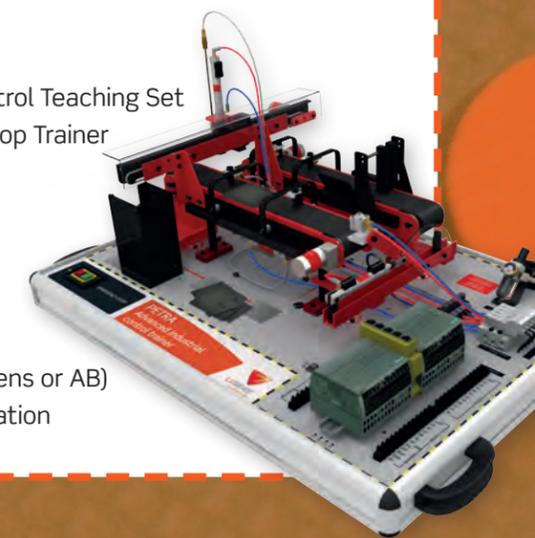
This electronics course prepares students for ETA certification.

### MSSC CPT Preparation (Opt. 5)

Designed to prepare students to take the MSSC CPT certification tests.

#### HARDWARE

- 207-00 Analog and Digital Motor Control Teaching Set
- 208-10 Process Control Tech. Benchtop Trainer
- 217-00 Transducers, Instrumentation and Control Teaching Set
- 240-01 Robotics Trainer
- 290-00/AB (or /SI) Industrial Control Teaching Set (Siemens or AB)
- 292-00/AB (or /SI) PETRA Advanced Industrial Control Teaching Set (Siemens or AB)
- 320-10 Complete Electronics Workstation



# Aligned to educational standards and industry certification standards

Knowledge Skills	Mechatronics	Foundation Mechatronics				Mechatronic Systems				Advanced Mechatronics								
		Engineering Design	Mechatronic Systems	Computer Science	Electrical Technology	Capstone Robotics Project	Engineering Principles	Mechanical Systems	Fluid Power	Electrical and Electronics	Introduction to PLCs	Introduction to Process Control	Advanced Mechatronics Core	Industrial PLC Systems	Control and Instrumentation	Process Control	System-Based Electronics (ETA)	MSSC CPT Preparation
I	ACADEMIC FOUNDATIONS																	
A	English Language Arts	●	●	●	●													●
B	Math		●	●	●	●	●	●	●			●		●	●			●
C	Science	●	●	●	●			●										●
D	Measurement		●				●	●				●						●
II	COMMUNICATIONS SKILLS																	●
III	PROBLEM-SOLVING AND CRITICAL THINKING	●	●	●	●	●		●	●	●	●		●				●	●
IV	INFORMATION TECHNOLOGY APPLICATIONS	●	●	●	●	●						●	●		●	●		●
V	SYSTEMS																	
A	Describe the nature and types of business organizations...											●						●
B	Implement quality control systems...											●						●
C	Electrical components and systems				●	●				●	●	●	●	●	●	●	●	
D	Mechanical components and systems		●			●		●				●						
E	Hydraulic and pneumatic components and systems		●					●			●		●					
F	Computer and control systems	●	●	●		●				●	●	●	●	●	●	●	●	
VI	SAFETY, HEALTH AND ENVIRONMENTAL	●	●	●		●					●	●	●		●			●
VII	LEADERSHIP AND TEAMWORK	●	●	●		●												
VIII	ETHICS AND LEGAL RESPONSIBILITIES		●	●								●						
IX	EMPLOYABILITY AND CAREER DEVELOPMENT		●	●			●											
X	TECHNICAL SKILLS																	
A	Employ information management techniques and strategies...								●									
B	Employ planning and time management skills and tools to...	●	●	●		●												
C	Apply concepts and processes for the application of...	●	●	●		●				●	●	●	●	●	●	●	●	●
D	Mechatronic concepts and principles	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
E	Instrumentation and measurement				●	●			●		●			●	●			●
F	Digital fundamentals and programmable logic controllers (PLCs)									●			●					
G	Equipment controls and sensors	●	●	●		●					●	●	●	●	●	●	●	
H	Blueprint reading/schematics/CAD						●					●						
I	Computer aided design						●					●						
J	Robotics					●						●						
K	Basic machining											●						
L	NC/CNC equipment											●						
XI	ENGINEERING & TECHNOLOGY PATHWAY																	
A	Know the elements of the design process	●	●	●		●												
B	Develop processes and concepts to apply the design process	●	●	●		●												

If you'd like a call or visit:

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