Mechatronics FAQ

Who is LJ Create?

LJ Create has been providing award-winning, world-class active learning solutions for technical education for over 35 years. Today we create complete systems combining digital cloud content and tailor-made hardware kits that deliver innovative, inspiring learning in science, technology, and engineering.

Our mission is to enable learners throughout the world to achieve their full potential in a wide range of science and engineering areas by providing teaching solutions for schools and further education.

What are the LJ Create Mechatronics Programs?

The LJ Create Mechatronics programs are a set of programs at three different levels, designed to give students a solid grounding in mechatronic systems and applications, getting them fully prepared to undertake higher level certification programs and college level courses.

The Mechatronics Programs:

- Provide students with the foundational skills of mechatronics applications in a wide range of career pathways
- Provide students with a solid grounding in the basic principles of mechatronic systems; mechanical, electrical and electronic, fluid power, and control
- Aimed at and suitable for students of all abilities and aptitudes
- Integrate academic subjects, careers, technical skills and knowledge, and 21st Century Skills.
- Aligned to educational standards and industry certification standards
- Can be customized and flexibly implemented to align with specific pathways.

What are the three levels of Mechatronic Programs?

Level One: Foundations of Mechatronics

This is a set of 15-20 hour project-based courses designed to give students an understanding of how mechatronic systems and concepts are applied in a wide range of different career clusters; manufacturing, energy, agriculture, health, transport and logistics. The projects help to make the students career-aware and will allow students to develop their interests and options as they move into later grades and make choices about careers and college courses.

Project	Project Description
Engineering Design	Students explore the engineering design process as a methodology for solving engineering problems. They use the design process to develop a system for an automated railroad crossing.
Mechatronic Systems	Students explore mechanical and fluid power principles and develop an automated fairground ride.

Project	Project Description
Computer Science	Students explore computer science concepts through the design of computer-controlled machines and develop an automated elevator system.
Electrical Technology	Students explore fundamental electrical concepts and components
Robotics Capstone Project	Students design, build, and program a robotic system.

Level Two: Mechatronic Systems

A set of six courses which take students through the basic principles of the technologies that are used in mechatronic systems. These course are designed to provide students with the fundamental theory and skills they need to succeed in further study and a career working with mechatronic systems.

Each course is designed to last around 35–40 hours.

We suggest the students study engineering principles first, but each course stands alone and there are no prerequisites.

Course	Course Description
Engineering Principles	This course covers fundamental engineering principles, including safety, units, electrical concepts, control theory, drawing, and materials.
Mechanical Systems	Students explore mechanical principle including gears, levers, pulleys, belts, cams, bearings, and lubrication.
Fluid Power	This course introduces students to pneumatic and hydraulic systems, component, and applications.
Electrical and Electronic Principles	This course explores fundamental DC, AC and digital electronic principles. Students also explore electromagnetic devices including relays, transformers, and motors.
Introduction to PLCs	Students are introduced to PLC technology and ladder logic programming.
Introduction to Process Control	This courses introduces students to process control concepts including PID control and measurement of temperature, level, pressure and flow.

Level Three: Advanced Mechatronics

A set of advanced courses that allow students to specialize in an area of mechatronics and lead to towards preparation for an industry certification:

- System-based Electronics leading to ETA certification
- PLC Technology (Siemens and Allen Bradley)
- Control and Instrumentation
- MSSC CPT certification preparation
- Robotics

How can the LJ Mechatronics Programs be used?

The Mechatronics programs are flexible programs and can be organized into 60-hour, 90-hour, 120-hour, 180-hour programs, and more. The Mechatronics programs can be used in a range of different scenarios:

- A foundational Career and Technical Education program.
- A college and career readiness program
- An introductory mechatronics program
- To prepare students for industry certification
- To provide students with a foundation in basic mechatronic principles
- To provide students with the skills they need to succeed in high-level mechatronics programs

What hardware do I need to run the Mechatronics Programs?

The hardware requirements for each course are listed below:

Course	Equipment
Foundations of Mechatronics	220-01 Engineering Construction Kit 278-01 Fluid Power Student Resource Pack 250-01 Education Robotics Invention Kit
Mechatronic Systems	260-01 Mechanisms Trainer 280-01 Hydraulics Trainer 270-01 Pneumatics Trainer 320-00 Electronics Study Trainer, 320-14 Electromagnetic Cards 320-41 Combinational Logic Card 290-01 Industrial Control Trainer 280 -01 Process Control Trainer
Mechatronics and Automation	320-11 Complete Electronics Workstation 290-XX Industrial Control Trainer with Siemens or AB PLC 292-01 Petra Advanced Industrial Control Trainer 207-00 Motor Control Teaching Set 217-00 Transducers instrumentation and Control Teaching Set 280-xx Process Control Trainers

Are the Mechatronics Programs suitable for a wide range of students?

The Mechatronics programs have been designed to be accessible to all types of students, not just those students that will go on to an engineering degree.

LJ Create takes a very inclusive approach to curriculum design. We have integrated the type of support and help that would traditionally be provided by the instructor or the teacher into an adaptive on-demand system. This support system provides students with relevant support, as and when they need it.

Examples of support include:

- Fundamental science principles
- Mathematics
- English Language Arts
- Practical skills and Programming support

Do teachers require training to run the Mechatronics Programs?

There are no mandatory training requirements to run the Mechatronics program, however to get the most out of running the program with your students we recommend opting for professional development. LJ Create offers professional development courses including a one-day training session or a full 3-day course.

In addition to training, the Mechatronics curriculum includes extensive teacher resources, including:

- A detailed Program Guide, which includes an outline of each course and some typical course sequences
- Detailed hardware support information
- Answer guides

How is the curriculum delivered and tracked?

The Mechatronic courses are delivered using the LJ Create Learning management system (LMS). The LMS is a cloud-based system that provides delivery of the curriculum, automatically tracks and records the progress of your students, and provides reporting of student progress.

You can access the cloud from anywhere that you have an Internet connection and a web browser. What's more, the learning content updates automatically whenever we make changes to keep it up to date.

Contact Us:

LJ Create Inc
2400 Lake Orange Drive, Suite 105
Orlando FL 32837

Tel: 1-800-237-3482

Email: info@ljcreate.com

Fax: 407-250-5891