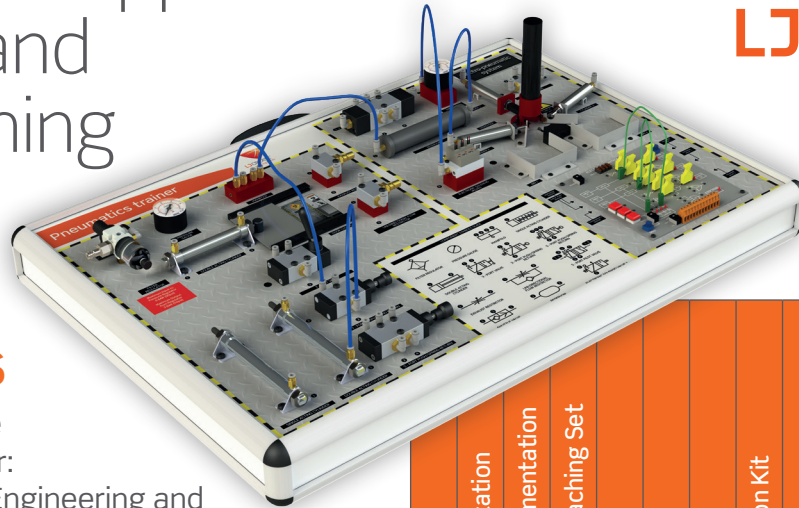


Engineering and Manufacturing

Products to support hands-on and online learning



LJ CREATE™
Learning for life



ENGINEERING CORE PRODUCTS

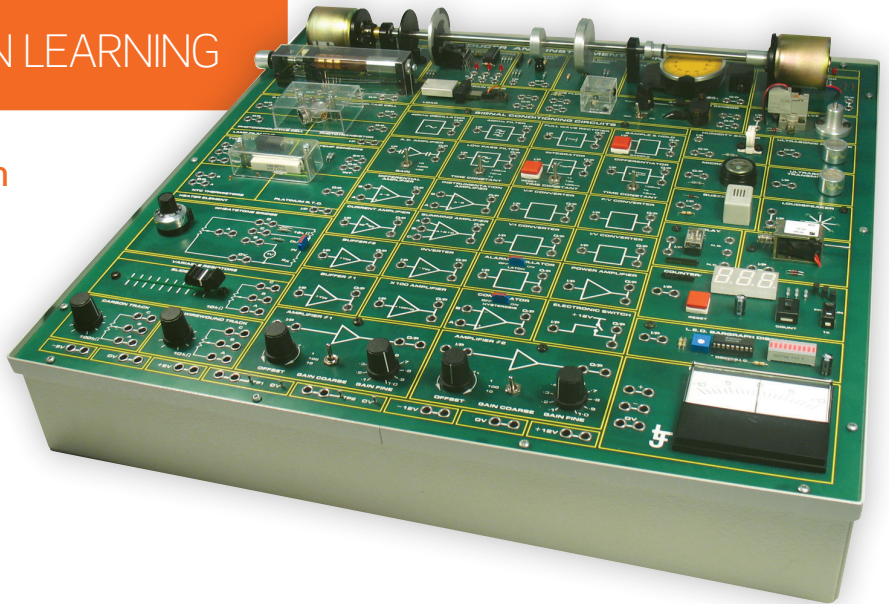
- Online Lessons Package
- Hands-on Equipment for:
 - Working within the Engineering and Manufacturing Sectors
 - Essential Science for Engineering and Manufacturing
 - Mechanical Principles
 - Electrical and Electronic Principles
 - Mechatronics
 - Engineering and Manufacturing Control Systems

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ENGINEERING AND MANUFACTURING CONTROL SYSTEMS EQUIPMENT FOR HANDS-ON LEARNING

Transducers and Instrumentation (24 Practical Activities)

- Types of sensors and actuators
- Purpose and function of sensors
- Measurement applications
- Electrical and pneumatic power sources
- Open and closed loop systems
- Overdamping and underdamped systems
- Three term control



ELECTRICAL AND ELECTRONIC PRINCIPLES EQUIPMENT FOR HANDS-ON LEARNING

Core Electronics Workstation (148 Practical Activities)

- Introduction to basic circuits
- DC circuits
- AC circuits and phasors
- Analog and digital signal conditioning
- Semiconductor devices
- Electromagnetic systems



WORKING WITHIN THE ENGINEERING AND MANUFACTURING SECTORS EQUIPMENT FOR HANDS-ON LEARNING

Engineering Construction Kit (112 Practical Activities)

- User requirements translated into engineering design
- Research and testing supporting effective design
- Relationship between manufacturing, processing and engineering design
- Engineering design in:
 - Manufacturing
 - Transportation
 - Mechatronics
 - Biomedical technology
 - Agriculture
 - Robotics



MECHATRONICS

EQUIPMENT FOR HANDS-ON LEARNING

Programmable Logic Controls (23 Practical Activities)

- Operation, use and application of programmable logic controllers

Pneumatics Trainer (8 Practical Activities)

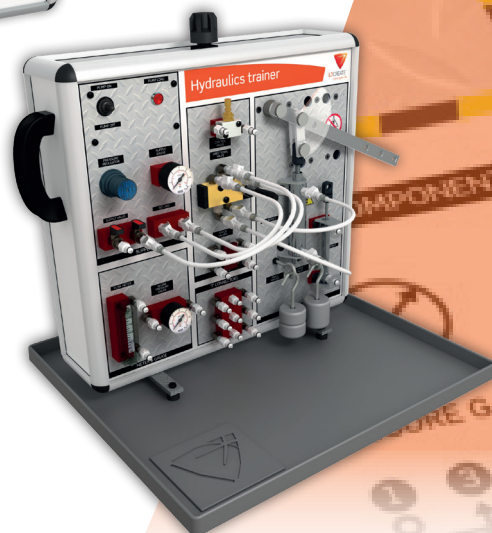
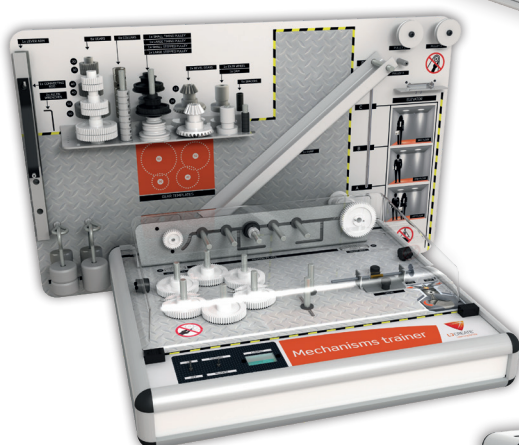
- Operation of electronic devices and circuits in mechatronics contexts

Hydraulics Systems Trainer (7 Practical Activities)

- Basic principles and applications of hydraulics in relevant contexts

Mechanisms Trainer (5 Practical Activities)

- Basic principles and applications of mechanisms in relevant contexts



ESSENTIAL SCIENCE FOR ENGINEERING AND MANUFACTURING

EQUIPMENT FOR HANDS-ON LEARNING

Measurement Kit (5 Practical Activities)

- Techniques for making accurate measurements along with use of a range of measurement instruments
- Density

Chemistry Apparatus Kit (39 Practical Activities)

- The structure of mixtures and solutions
- Chemical reactions such as acidity and alkalinity

Force and Energy Kit (3 Practical Activities)

- Force, displacement and cause in work
- Calculating the amount of work

Motion Kit (4 Practical Activities)

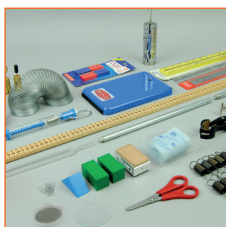
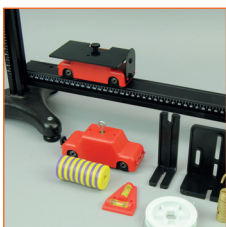
- Speed, velocity, acceleration, force and mass
- Linear momentum and impulse

Physics Apparatus Kit (18 Practical Activities)

- Friction
- Conservation of energy

Datalogging Kit (22 Practical Activities)

- Measurement
- Forces
- Motion



Engineering and Manufacturing - Online Lessons Pack

Course 1: Working within the Engineering and Manufacturing Sectors

- Engineering and manufacturing design
- Maintenance, installation and repair practices
- Manufacturing, processing and control practices

Course 2: Engineering and Manufacturing Past, Present and Future

- Innovation and emerging trends
- Impact of technological advances

Course 3: Engineering Representations

- Graphical information
- Drawing, dimensions and sizing

Course 4: Essential Mathematics for Engineering and Manufacturing

- Basic arithmetic
- Algebra
- Geometry
- Area and volume
- Graphs and charts
- Trigonometry
- Vectors and moments

Course 5: Essential Science for Engineering and Manufacturing

- Scientific method
- Measurement
- Chemical composition and behaviors
- Physical forces and behaviors
- Thermal dynamics
- Fluid dynamics

Course 6: Materials and their Properties

- Material structures
- Metals
- Plastics
- Polymers
- Disposal of materials
- Material processing
- Heat treatments
- Material testing

Course 7: Mechanical Principles

- Motion and mechanics
- Newton's laws
- Beams
- Gravity
- Friction
- Power sources

Course 8: Electrical and Electronic Principles

- Atomic theory
- Voltage, current, and resistance
- Ohm's law
- DC and AC circuits
- Phasors
- Semiconductor devices
- Magnetism and electromagnetism

Course 9: Mechatronics

- Electronic control of mechanical devices
- Programmable logic controllers
- Hydraulics
- Pneumatics

Course 10: Engineering and Manufacturing Control Systems

- Open and closed loop systems
- Feedback
- Summing points
- PID control
- Transfer functions
- Overdamping and underdamping
- Industrial network systems
- Types of sensors and measurement applications

Course 11: Quality Management

- BS and ISO standards
- Effects of standards on quality and safety

Course 12: Health and Safety Principles and Coverage

- Health and safety in the workplace
- Fire Safety
- Chemical hazards
- Risk and hazard identification
- Control measures

Course 13: Business, Commercial and Financial Awareness

- Commercial priorities
- Markets and customers
- Business models
- Profits and cash flow
- Budgets and recording financial transactions

Course 14: Professional Responsibilities, Attitudes, and Behaviors

- Organizational structure
- Relationship to others
- Equality and inclusion
- Performance and error reduction
- Reputation and ethics

Course 15: Stock and Asset Management

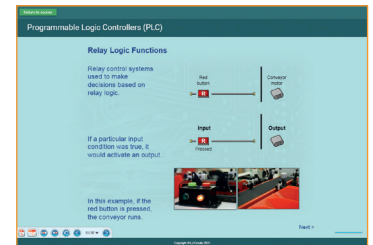
- Stock and inventory control
- Product life cycles
- Supply chain issues
- Warehousing
- Asset management

Course 16: Continuous Improvement

- Principles of continuous improvement
- Planning, monitoring and implementing
- Lean principles and practices

Course 17: Project and Program Management

- Project planning, control and practices
- Collaborative project working practices



If you'd like a call or a visit: **tel: 1-800-237-3482 | email: info@ljcreate.com**