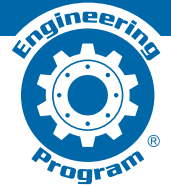


# Engineering Hydraulics

## ENGINEERING PROGRAM



**Engineering Hydraulics** introduces students to the principles of hydraulics and the use of fluid power in automated manufacturing environments.

This course engages students by means of compelling online curriculum with relevant projects that include:

- an overview of hydraulics concepts related to engineering
- activities using software to create, modify and operate simulated hydraulic and electro-hydraulic devices and circuits
- a capstone project using the hydraulics training panel with industrial-grade hydraulic components
- applied science experiments demonstrating the physical principles of fluid power

For students on an engineering pathway, Engineering Hydraulics adds enough exposure for a broad understanding of hydraulics principles.

**Engineering Hydraulics** includes everything you need for successful blended learning.

Through LearnMate®, essential resources are provided for both students and teachers.

- Students are always one click away from help files and audio available on each page.
- Teachers have instant access to handouts, tips and detailed activity instructions.

Engineering Hydraulics is ideal for foundations, engineering, mechatronics, industrial maintenance or automated manufacturing programs, providing a thorough and engaging element of STEM (science, technology, engineering and mathematics) education.



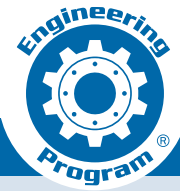
POWERED BY  
**LearnMate®**

Engineering Hydraulics is powered by LearnMate®- intelitek's innovative e-learning platform. Self-paced interactive LearnMate® content may be deployed stand-alone or through the robust learning management system (LMS). LearnMate® provides everything needed for the ultimate blended learning experience.

- SCORM-compliant interactive content
- Anytime, anywhere accessibility
- Student and class management
- Grade tracking
- Skill/competency reporting mapped to national skill standards

**intelitek**  <sup>®</sup>  
[www.intelitek.com](http://www.intelitek.com)

# Engineering Hydraulics Specifications



## Order # 16-HYDR

- LearnMate® E-Learning Content: Engineering Hydraulics
- Hydraulics Training Panel
  - Size: (WxDxH) 32" x 26" x 24" (813mm x 660mm x 610mm)
  - Weight (approximate): 100 lbs (45 kg)
  - Construction: Anodized aluminum U-shaped frame with environmentally stabilized, non-conductive polymer back and side panels. All components are permanently mounted to the back and side panels
  - Power Requirements: 110V AC 15A single-phase
  - Hydraulic Components
    - Hydraulic Power Unit
    - Hydraulic Fluid
    - Funnel
    - (2) Pressure Gauge
    - Hydraulic Cylinder
    - 4/3 Hydraulic Valve
    - Assorted Hoses all with quick disconnects

## ENGINEERING PROGRAM

Engineering Hydraulics features the Hydraulics Training panel, which enables students to build basic hydraulic circuits with industrial-grade equipment.

The trainer is driven by the rear-mounted hydraulic power unit. Connections are easily made with supplied quick-disconnect hoses to the front-mounted hardware including pressure gauges, hydraulic cylinder and 4/3 hydraulic valve.

**Hydraulic Trainer: front view**



**Hydraulics Trainer: rear view**



## Course Outline

- Activity 1: Getting Started
- Activity 2: Pressure and Force
- Activity 3: Pressure Gauges
- Activity 4: Hydraulic Power Transmission - Part 1
- Activity 5: Hydraulic Power Transmission - Part 2
- Activity 6: Hydraulic Power Source
- Activity 7: Determining Component Characteristics
- Activity 8: Controlling the Flow Rate
- Activity 9: Flow Control Valves
- Activity 10: 4/3 Closed-Center Valve – Construction and Function
- Activity 11: 4/3 Closed-Center Valve – Characteristics
- Activity 12: Power Transformation Using a Double-Acting Cylinder
- Activity 13: Loading a Piston
- Activity 14: Controlling the Piston Location
- Activity 15: Conclusion

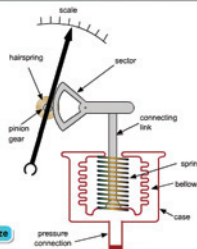
### Pressure Gauges

#### Bellevue Pressure Gauge

A simple cut-view of a Bellevue pressure gauge is shown in the figure to the right. The bellows is built such that it expands axially with pressure but not appreciably in any other direction.

Click the **Pressurize** button to admit pressure into the gauge.

When pressure is admitted into the bellows chamber through the input port at the bottom, it produces a force that acts in all directions. This force causes an axial displacement at the upper end of the bellows.



Affiliated with:



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