

ENGINEERING TEACHING EQUIPMENT

2025 SHORT FORM

Aerospace
Biomedical
Civil & Environmental
Chemical
Electrical
Mechanical
Mechatronics & Robotics
Physics
3D & Additive Manufacturing
Test & Measurement

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AEROSPACE ENGINEERING

TOPICS COVERED

- Wind Tunnel Systems
- Jet Engines & Turboshafts
- Flight Control & Dynamics
- Aircraft Structures
- Unmanned Aerial Vehicles
- Avionics & EFIS



JET ENGINE TEST CELL

Brayton Cycle, Compressor & Turbine Performance, Emissions



STRAIN ANALYSIS LAB

Bending, Shear, Torsion and Combined loads



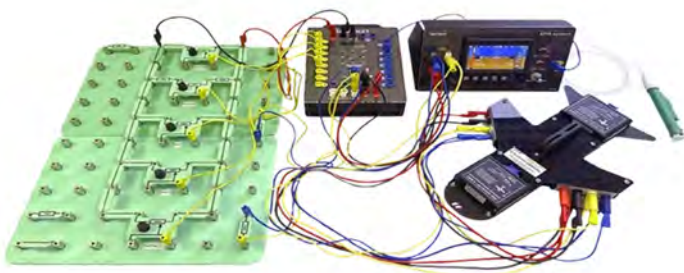
FLIGHT CONTROL & UNMANNED AIR VEHICLES

AERO2 and QDrone 2 Quad-Rotor Drone



WIND TUNNEL SYSTEMS

Subsonic & Supersonic. Variable Sizes & Air Speeds



EFIS AND AVIONICS

Electronic Flight Information Systems

MANUFACTURING

SPECIALISTS

- Armfield - www.armfield.com
- Quanser - www.quanser.com
- Matrix - www.matrixsl.com
- Turbine Technologies - www.turbine technologies.com

BIOMEDICAL ENGINEERING

TOPICS COVERED

- Biomedical & Mechatronics System Designs
- Bioinstrumentation (EEG, EMG, SpO₂, Respiration)
- Materials Testing
- Wireless Data Acquisition



ULTRASOUND & COMPUTED TOMOGRAPHY (CT)

Ultrasonic Computer Tomography (CT) and Scan Methods



BIORADIO

Wireless, Programmable, Physiological Logging System



STRENGTH OF MATERIALS

Universal Materials Tester, Fundamentals of Mechanics



X-RAY APPARATUS AND CT

X-ray Apparatus & Computed Tomography Module

MANUFACTURING

SPECIALISTS

- Greatlakes Neurotechnologies - www.glneurotech.com
- Gampt - www.gampt.de

CIVIL & ENVIRONMENTAL ENGINEERING

TOPICS COVERED

- Fluid Mechanics & Hydraulics
- Hydrology
- Water Treatment
- Irrigation Water Management
- Structural Analysis & Design
- Strength of Materials



ENVIRONMENTAL HYDROLOGY

Fluvial Mechanics, Hydrographs, Permeability, Groundwater



STRUCTURAL ENGINEERING

Forces & Moments, Forces in a Truss, Strength of Materials



PUMPS AND TURBINES

Series & Parallel Pumps, Pelton & Francis Turbines



OPEN CHANNEL & CLOSED CHANNEL FLOW

Flumes & Fluid Mechanics Demonstrators



WATER TREATMENT

Aerobic & Anaerobic Digesters, Aeration, Permeability

MANUFACTURING

SPECIALISTS

- Armfield - www.armfield.com

CHEMICAL ENGINEERING

TOPICS COVERED

- Reaction Engineering
- Heat & Mass Transfer
- Biochemical Engineering
- Process Control
- Water Treatment
- Membrane Science
- Separation Processes
- Unit Operations



CHEMICAL REACTION ENGINEERING

CSTR (single & in series), Tubular, Batch, Laminar, and Plug flow



FLUIDISED BEDS

Fixed and Fluidised Bed Apparatus



DISTILLATION

Continuous or Batch Distillation Columns



ABSORPTION & ADSORPTION

Gas Absorption Column & Fixed Bed Adsorption



PROCESS CONTROL

Level, Flow, Temperature, Pressure. Single Loop & Cascade

MANUFACTURING

SPECIALISTS

- Armfield - www.armfield.com
- Quanser - www.quanser.com
- DarbyTech - www.darbytech.ca

ELECTRICAL ENGINEERING

TOPICS COVERED

- AC & DC Power Supplies
- Electrical Machines and Drives
- Electronics Labs
- Test & Measurement
- Telecommunications
- Signals & Systems
- High Voltage Testing
- Power System Simulation
- High Voltage Testing



SMART GRIDS & POWER SYSTEMS

Generation, Energy Flow, Storage, Consumption, SCADA



FUNDAMENTALS OF ELECTRICAL ENGINEERING

Breadboards, Electronics, Photovoltaics, Telecoms, Control



HIGH VOLTAGE LABORATORY

AC, DC, Impulse—Up to 500kV



ELECTRICAL MACHINES AND DRIVES

1kW and 3kW Motors, Loads, Meters



Oscilloscopes—50 MHz to 13GHz Bandwidth

Spectrum Analysers - 1.5GHz to 26.5GHz



Generators - Function, RF & Arbitrary 20MHz to 20GHz



DC & AC Power Supplies

TEST AND MEASURING INSTRUMENTS

Oscilloscopes, Generators, Spec Analysers, DC & AC Power

MANUFACTURING

SPECIALISTS

- Matrix - www.matrixtsl.com
- Leybold - www.leybold-shop.com
- Terco - www.tercosweden.com
- Emona - www.emona.com.au
- Emona TIMS - www.emona-tims.com

FOOD & BEVERAGE TECHNOLOGY

TOPICS COVERED

- Food Technology
- Beverages
- Liquid Foods
- Edible & Essential Oils
- Pharmaceuticals
- Flavours & Fragrances
- Membranes/RO



UHT / HTST / PASTEURISATION

Modular HTST/UHT Systems—From 1L to 300L/hr



CARBONATION, CAPPING, FILLING

Cans, Glass & PET. Can Seaming, Screw & Crown Capping



SPRAY DRYER

Bench & Tall Form Spray Dryer Systems



STERILE FILLING SYSTEM

FT83XA Sterile Filling System

MANUFACTURING

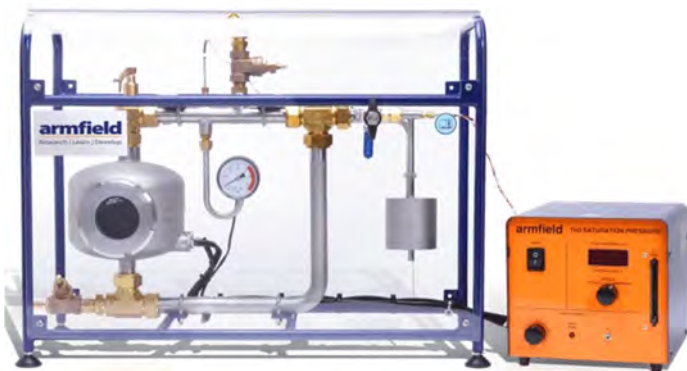
SPECIALISTS

- Armfield - www.armfield.com

MECHANICAL ENGINEERING

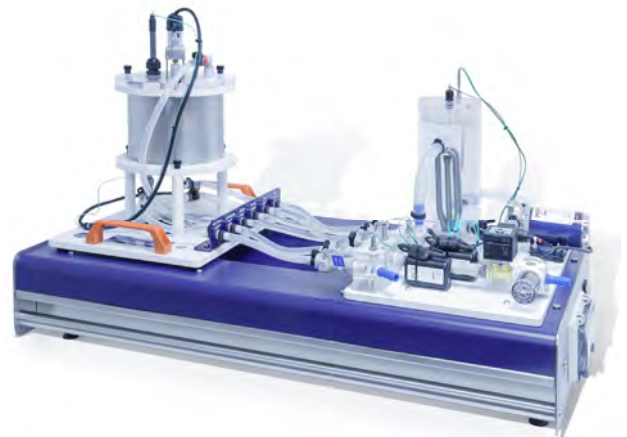
TOPICS COVERED

- Thermodynamics
- Refrigeration & Air Conditioning
- Combustion Engines
- Kinematics & Dynamics
- Statics & Mechanisms
- Structural Behaviour
- Vibration
- Machine Dynamics & Balancing
- Fluid Mechanics



THERMODYNAMICS

Saturation Pressure & Calorimeter, Expansion of a Perfect Gas



HEAT EXCHANGERS

Plate, Tubular, Shell & Tube, Jacketed, and Cross Flow Exchangers



STEAM TURBINE POWER SYSTEM

Rankine Cycle, Boiler, Steam Turbine, Cooling Tower



FLUID MECHANICS & DYNAMICS

Fluid & Pipe Friction, Pumps, Turbines



PUMPS, FANS & TURBINES

Series & Parallel Pumps, Wind Power

MANUFACTURING SPECIALISTS

- Armfield - www.armfield.com
- Turbine Technologies - www.turbine technologies.com

ADVANCED MANUFACTURING

TOPICS COVERED

- Industry 4.0 / Smart Factories
- Collaborative Robotics
- Industrial Process Control
- PLC Programming
- Hydraulics & Fluid Power
- System Integration & Networking
- Predictive Maintenance
- Digital Twins & Augmented Reality



INDUSTRY 4.0 & SMART FACTORY SYSTEMS

Training System for Industry 4.0, Industrial Process Control



HYDRAULICS & PNEUMATICS

Fluid Power, Pneumatic Actuation



ROBOTICS & AUTONOMOUS SYSTEMS

Collaborative & Industrial Robots, Robotics Training System



PLCS & ADVANCED CONTROL SYSTEMS

Programmable Logic Controllers, Embedded Systems

MANUFACTURING SPECIALISTS

- SMC - www.smctraining.com
- Quanser - www.quanser.com
- Amatrol - www.amatrol.com
- Kinova - www.kinovarobotics.com

MECHATRONICS & AI

TOPICS COVERED

- Control Systems
- Industrial Applications & Process Control
- Autonomous Systems
- Haptic Feedback Systems
- Open Architecture Robotics
- Smart Sensors
- Applied AI



ULTRA-LIGHTWEIGHT ROBOTIC ARMS

Robotics (portable, programmable), Smart sensors



FLEXIBLE INTEGRATED ASSEMBLY SYSTEM

Industrial Applications, Integrate Automation, Manufacturing



AUTONOMOUS GROUND ROBOTS

Mobile Robotics, SLAM & Warehouse Automation



SELF-DRIVING CARS

Self-driving Concepts, Research & Project-based Learning



QUBE-SERVO 3

Servo Motor, Rotary Control & Digital Twins

MANUFACTURING

SPECIALISTS

- SMC - www.smctraining.com
- Quanser - www.quanser.com
- Kinova Robotics - www.kinovarobotics.com

RENEWABLE ENERGY & HYDROGEN

TOPICS COVERED

- Solar PV
- Wind Turbines
- Hydro Electric Power
- Hydrogen Fuel Cells
- Electrolysers & H₂ Storage
- Concentrated Solar
- Geothermal Energy
- Energy Management
- Hybridisation & Grid Integration



RENEWABLE ENERGY SYSTEMS

Hybrid Renewable Energy Trainer

New Energy Lab (PV, Wind, Fuel Cells, Electrolyser, Batteries)



HYDROGEN & FUEL CELL TECHNOLOGY

Fuel Cells (12W-30kW), Electrolysers, Metal Hydride



HYDRO-ELECTRIC POWER TRAINING SYSTEMS

Hydro-Electric Power Training System



SOLAR ENERGY CONCENTRATOR

Solar Energy Concentrator Training System

MANUFACTURING

SPECIALISTS

- Heliocentris - www.heliocentris.com
- BEDO - www.bedoeng.com
- Amatrol - www.amatrol.com

PHYSICS EXPERIMENTS & LABS

TOPICS COVERED

- Mechanics
- Heat
- Optics & Photonics
- Atomic & Nuclear Physics
- Solid-State Physics
- Electricity & Electronics
- Desktop Quantum Computers



ELECTRON SPIN RESONANCE

Quantum Spin Mechanics, Zeeman Splitting, Resonance



NUCLEAR MAGNETIC RESONANCE

Nuclear Spin, Magnetic Moments, Relaxation Times



ATOMIC & NUCLEAR PHYSICS

Rutherford Scattering



Normal Zeeman Effect



QUANTUM COMPUTING

Desktop, Room Temperature Quantum Computers

MANUFACTURING

SPECIALISTS

- Leybold - www.leybold-shop.com
- SPINQ - www.spinquanta.com

RESEARCH

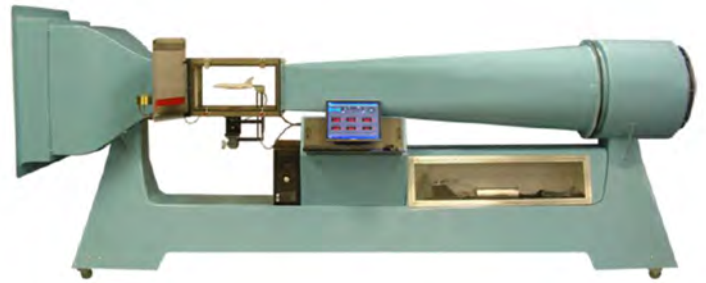
TOPICS COVERED

- Wind Tunnels
- Research Flumes & Wave Channels
- Hydrogen Fuel Cells
- Biofuels & Biodiesel
- Fire Testing/Reaction to Fire
- Earthquake Simulators/Structural Dynamics
- Food, Beverage & Pharmaceuticals R & D



SHAKE TABLES

Earthquake Simulation, Structural Testing, Vibration Analysis



WIND TUNNELS

Aerodynamics, Fluid Dynamics & Airflow (Lift, Drag, Pressure)



TEACHING & RESEARCH FLUMES

Fixed/Tilting Bed, Glass Sided, Wind & Wave Generators



FOOD TECHNOLOGY & PHARMACEUTICALS

Dairy & Food Processing, Lab & Mini Pilot Scale



FIRE TESTING TECHNOLOGY

Reaction to Fire Testing, Cone Calorimetry

MANUFACTURING SPECIALISTS

- Armfield - www.armfield.com
- Quanser - www.quanser.com
- Aerolab - www.aerolab.com
- Fire Testing Technology - www.fire-testing.com

3D PRINTERS & ADDITIVE

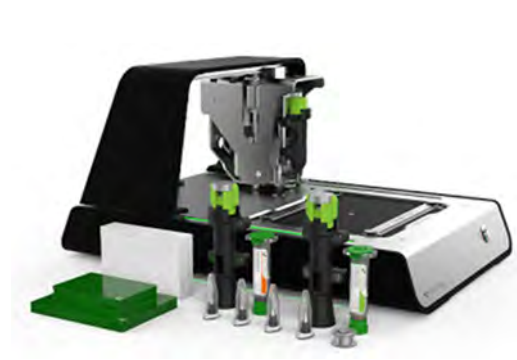
TOPICS COVERED

- SLA & SLS Printing
- Thermoplastics – PLA, TPU, Nylon, ONYX
- Composite Carbon Fibre Reinforcement
- Metals—Stainless Steel, Copper, Tool Steel, Inconel
- Resins—Engineering & Biocompatible
- Electronics & PCB Printing



FORMLABS

Professional SLA & SLS 3D Printing Solutions



ELECTRONICS & PCB PRINTING

Multilayer PCBs with Conductive & Insulating Inks



BAMBU LAB

Thermoplastics with Laser Module



MARKFORGED

Industrial Composite & Metal 3D Printers

MANUFACTURING

SPECIALISTS

- Marforged—www.markforged.com
- Bambu Lab — www.bambulab.com
- Formlabs— www.formlabs.com
- Voltera—www.voltera.io
- Nano Dimension— www.nano-di.com
- EOS—www.eos.info

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Installation Testing: www.instaltest.com.au

TIMS Telecoms Trainer: www.tims.com.au