MECHATRONICS

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Course Objective:
Students will be able to demonstrate proficiency through performance and theoretical testing relating to Mechatronics Technology.

Course Description:
This three-year course focuses on all aspects of industrial and commercial machines and robotics and is designed to prepare students for work in industry or continued education in engineering-related fields. The program includes design activities and instruction in operation, set-up, maintenance, troubleshooting, and repair of machines and systems found in commercial, packaging, medical, and food production facilities where high tech equipment is used. Curriculum and instruction include the areas of Electricity, Electronics, Sensor Technology, Machine Operations and Maintenance, Industrial Electronics, Computer Machine Controls, Machine Repair, Motors and Control Applied Physics, Fluid Power, Mechanical Components, Schematic Interpretation and Quality Control. Students are trained on a wide variety of tools for preventative maintenance and construction of equipment. Individuals entering this career should possess good mechanical aptitude, eye-hand coordination, math skills, manual dexterity, critical thinking skills, and the ability to work as a team member.

Course Topics:
- Electricity
- Electronics
- Sensor Technology
- Machine Operations & Maintenance
- Robotics
- Mechanical Drive Systems
- Applied Physics
- Pneumatics
- Hydraulics
- Programmable Logic
- Controllers
- Computer Machine Controls
- Schematic Interpretation
- Control Systems

Required Supplies:
- Safety Glasses
- Uniform
- Work Boots
- Scientific Calculator

Textbooks:
To Be Determined

Cooperating Companies:
- Ferro Chemical
- Weld Tooling Corporation
- Ross Mould, Inc.
- All-Clad Metal Crafters

Specialized Shop Equipment:
- Hydraulics Systems Trainer
- Allen Bradley SLC500 Programmable Logic Trainer
- Mechanical Drive Systems Trainer

DRAFT: 5/1/2012
Certifications:
Advanced Manufacturing/ Integrated Systems Technology (Level 1)*
OSHA (General Industry Safety)
International Siemens Mechatronics (Assistant Level)**
International Fluid Power Society (Fluid Power Certified Mechanic)
National Institute for Metalworking Skills (Machine Operator 1)
*Pending IMTC of PA Approval
**Pending Siemens Approval

Articulation Agreements:
California University of Pennsylvania – Robotics Engineering Technology
Community College of Allegheny County – Mechatronics Technology
Reading Area Community College – Mechatronics Engineering Technology
Pennsylvania College of Technology – Automated Manufacturing & Machining

Post-Secondary Training Options:
Numerous Engineering Programs – (Mechatronics, Industrial, Mechanical, Electrical)
California University of Pennsylvania – Robotics Engineering Technology
Community College of Allegheny County – Mechatronics Technology
Pennsylvania College of Technology – Automated Manufacturing
Reading Area Community College – Mechatronics Engineering Technology

Potential Careers:
Automated Manufacturing Tech Machine Set-Up Operator Repair Technician
Electrical Engineer Maintenance Technician Power Generation Plant
Industrial Engineer Packaging/ PLA Technician Technician
Mechanical Engineer Parts Repair and Sales Robotics Technician
Mechatronics Engineer Preventative Maintenance
Machine Operator Mechanic

Mechatronics Skills:
Operation and Control — Controlling operations of equipment or systems.
Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.
Mathematics — Using mathematics to solve problems.
Equipment Selection — Determining the kind of tools and equipment needed to do a job.
Troubleshooting — Determining causes of operating errors and deciding what to do about it.
Reading Comprehension — Understanding written sentences and paragraphs in work-related documents.
Quality Control Analysis — Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
Equipment Maintenance — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making.
Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

Wages and Employment Trends:
Median Wages (2010) $21.84 Hourly, $45,420 Annually
Employment (2008) 288,000 Employees
Projected Growth (2008-2018) Average (7% to 13%)
Projected Need (2008-2018) 16,400 Additional Employees