Skill Sets – Electromechanical Technology

Automated Systems			
Dept.		**Course Title**	**Sem. Hrs.**
ELM	120	**Fundamentals of Fluid Power***	3
ELM	210	**PLC Fundamentals***	3
WTT	150	**Industrial Motor Controls**	4

**NOTE*: *Course may require Pre/Co-requisite courses.*

Upon successful completion of the skill set, students will be able to:

- Explain the concepts, construction and function of fundamental machine and process control circuitry.
- Design a "ladder-logic" control schematic.
- Explain the construction, function and application of hydraulic devices and circuitry.
- Explain the construction, function and application of pneumatic devices and circuitry.
- Discuss the design, operation and application of a programmable logic controller (PLC).
- Program a programmable logic controller (PLC).
- Explain discrete vs. continuous and open-loop vs. closed-loop control methods.
- Describe the design, function and characteristics of industrial robots.

Electronic Communications			
Dept.		**Course Title**	**Sem. Hrs.**
ELM	210	**PLC Fundamentals***	3
WTT	230	**Supervisory Control and Data Acquisition**	4

**NOTE*: *Course may require Pre/Co-requisite courses.*

Upon successful completion of the skill set, students will be able to:

- Describe the function and application of analog and digital components and circuitry used in electronic communications.
- Analyze and troubleshoot electronic communication systems.
- Explain the various methods of transmitting communications signals.
- Discuss fiber optic and laser communication methods.

Industrial Maintenance			
Dept.		**Course Title**	**Sem. Hrs.**
ELM	217	**Industrial Maintenance Fundamentals**	3
ELM	218	**Maintenance Applications***	3
WTT	110	**Wind Safety and OSHA**	4

**NOTE*: *Course may require Pre/Co-requisite courses.*

Upon successful completion of the skill set, students will be able to:

- Discuss OSHA standards as they apply to safety and health issues in an industrial environment
- Apply safe and approved practices in the workplace
- Demonstrate knowledge of working with industrial mechanical and power transmission systems
- Apply proper techniques and practices when using hand and power tools and in the repair of industrial equipment and systems
- Apply proper techniques in troubleshooting and maintaining industrial systems and components
- Develop knowledge of mechanical, fluid power, and electrical industrial systems and their interrelationships

Technical Electricity			
Dept.		**Course Title**	**Sem. Hrs.**
WTT	120	**DC/AC Circuits***	4
WTT	150	**Industrial Motor Controls***	4

**NOTE*: *Course may require Pre/Co-requisite courses.*

Upon successful completion of the skill set, students will be able to:

- Discuss the properties, devices and circuitry for direct-current (DC) electricity.
- Analyze series, parallel, series-parallel DC electrical circuits.
- Discuss the properties, devices and circuitry for alternating-current (AC) electricity.
- Analyze series, parallel, series-parallel AC electrical circuits.

Technical Electronics			
Dept.		**Course Title**	**Sem. Hrs.**
ELM	205	**Fundamentals of Analog Electronics***	4
ELM	207	**Fundamentals of Digital Electronics***	4
ELM	208	**Microprocessor Fundamentals***	4
WTT	120	**DC/AC Circuits***	4
WTT	160	**Power Generation and Transmission***	4
WTT	230	**Supervisory Control and Data Acquisition***	4

**NOTE*: *Course may require Pre/Co-requisite courses.*

Upon successful completion of the skill set, students will be able to:

- Explain the operation and application of semi-conductor devices.
- Analyze and troubleshoot solid-state electronic circuits.
- Explain the application and logic concepts of digital electronic circuits.
- Design various digital logic circuits.
- Explain the theory, operation and application of microprocessors.
- Program a microprocessor using basic assembly language.

Technical Foundations			
Dept.		**Course Title**	**Sem. Hrs.**
MTH Elective		Mathematics Elective (MTH 115 or higher)	3
PHS	115	**Applied Physics***	3
WTT	110	**Wind Safety and OSHA**	4

**NOTE*: *Course may require Pre/Co-requisite courses.*

Upon successful completion of the skill set, students will be able to:

- Discuss OSHA standards as they apply to safety and health issues in an industrial environment
- Apply safe and approved practices in the workplace
- Apply proper techniques in solving algebraic problems
- Explain concepts and principles of physics and mechanics
- Solve problems involving physical and mechanical properties