July 2010

Florida Department of Education
Curriculum Framework

Program Title: **Electronics Aide**
Career Cluster: **Manufacturing**

CCC	
CIP Number	0615030313
Program Type	College Credit Certificate (CCC)
Program Length	12 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	17-3023
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Engineering Technology AS/AAS degree program 0615000001).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the manufacturing career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the manufacturing career cluster.

The content includes but is not limited to maintenance techniques, computer aided drafting/design skills, technical communications, maintenance and operation of various industrial components, quality control and testing, material handling protocols, and proper usage of tools and instrumentation.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

SkillsUSA is the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in basic D.C. circuits.
02.0 Demonstrate proficiency in A.C. circuits.
03.0 Demonstrate proficiency in solid state devices.
04.0 Demonstrate proficiency in digital circuits.

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Florida Department of Education
Student Performance Standards

Program Title: **Electronics Aide**
CIP Number: **0615030313**
Program Length: **12 Credit Hours**
SOC Code(s): **17-3023**

This certificate program is part of the Engineering Technology AS/AAS degree program (0615000001). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in basic direct current (DC) circuits--The student will be able to:

- 01.01 Define the characteristics of basic D.C. circuits.
- 01.02 Solve problems in electronic units utilizing metric prefixes.
- 01.03 Identify sources of electricity.
- 01.04 Define and describe voltage, current, resistance, power and energy.
- 01.05 Apply Ohm's law and power formulas.
- 01.06 Read and interpret color codes and symbols to identify electrical components and values.
- 01.07 Measure properties of circuits using a digital multimeter meter (DMM) and oscilloscopes.
- 01.08 Set up and operate power supplies for DC circuits.
- 01.09 Compute conductance and measure resistance of conductors and insulators.
- 01.10 Apply Ohm's law to series circuits.
- 01.11 Construct and verify the operation of series circuits.
- 01.12 Analyze and troubleshoot series circuits.
- 01.13 Apply Ohm's law to parallel circuits.
- 01.14 Construct and verify the operation of parallel circuits.
- 01.15 Analyze and troubleshoot parallel circuits.
- 01.16 Measure values of resistors, capacitors and inductors.
- 01.17 Construct and verify the operation of capacitors and inductors.
- 01.18 Analyze and troubleshoot circuits containing capacitors and inductors.
- 01.19 Apply various network theorems to D.C. circuits.

02.0 Demonstrate proficiency in A.C. circuits--The student will be able to:

- 02.01 Solve basic trigonometric problems as applicable to A.C. circuits.
- 02.02 Define the characteristics of AC capacitive circuits.
- 02.03 Construct and verify the operation of AC capacitive circuits.
- 02.04 Analyze and troubleshoot AC capacitive circuits.
- 02.05 Define the characteristics of AC inductive circuits.
- 02.06 Construct and verify the operation of AC inductive circuits.
- 02.07 Analyze and troubleshoot AC inductive circuits.
- 02.08 Define and apply the principles of transformers to AC circuits.
- 02.09 Construct and verify the operation of AC circuits utilizing transformers.
- 02.10 Analyze and troubleshoot AC circuits utilizing transformers.
- 02.11 Construct and verify the operation of differentiators and integrators to determine R-C and R-L time constraints.

02.12 Analyze and troubleshoot differentiator and integrator circuits.
02.13 Define the characteristics of resistive, Inductive, and Capacitive (RLC) circuits (series, parallel and complex).
02.14 Construct and verify the operation of series and parallel resonant circuits.
02.15 Define the characteristics of series and parallel resonant circuits.
02.16 Construct and verify the operation of series and parallel resonant circuits.
02.17 Analyze and troubleshoot R-C, R-L, and RLC circuits.
02.18 Define the characteristics of frequency selective filter circuits.
02.19 Construct and verify the operation of frequency selective filter circuits.
02.20 Analyze and troubleshoot frequency selective filter circuits.
02.21 Define the characteristics of polyphase circuits.
02.22 Define basic motor theory and operation.
02.23 Define basic generator theory and operation.
02.24 Set up and operate power supplies for AC circuits.
02.25 Analyze and measure power in AC circuits.
02.26 Set up and operate capacitor and inductor analyzers for AC circuits.
02.27 Apply various network theorems to A.C. circuits.

03.0 Demonstrate proficiency in solid state devices--The student will be able to:

03.01 Identify and define properties of semiconductor materials.
03.02 Identify and define operating characteristics and applications of junction diodes.
03.03 Identify and define operating characteristics and applications of special diodes.
03.04 Construct and verify the operation of diode circuits.
03.05 Analyze and troubleshoot diode circuits.
03.06 Identify and define operating characteristics and applications of bipolar transistors.
03.07 Identify and define operating characteristics and applications of field effect transistors.
03.08 Identify and define operating characteristics and applications of single-stage amplifiers.
03.09 Construct and verify the operation of single-stage amplifiers.
03.10 Analyze and troubleshoot single-stage amplifiers.
03.11 Construct and verify thyristor circuitry.
03.12 Analyze and troubleshoot thyristor circuitry.
03.13 Set up and operate DVM for solid-state devices.
03.14 Set up and operate power supplies for solid-state devices.
03.15 Set up and operate oscilloscopes for solid-state devices.
03.16 Set up and operate function generators for solid-state devices.
03.17 Set up and operate capacitor and inductor analyzers for solid-state devices.
03.18 Set up and operate curve tracers.
03.19 Set up and operate transistor testers.
03.20 Construct and analyze electronic circuits for all operating parameters.
03.21 Set up and operate measuring instruments for electronic circuit analysis.
03.22 Apply appropriate solid state circuitry for other systems such as electronic communications, telecommunications, wireless, and other electronic applications.

04.0 Demonstrate proficiency in digital circuits--The student will be able to:

04.01 Define and apply numbering systems to codes and arithmetic operations.
04.02 Analyze and minimize logic circuits using Boolean operations.
04.03 Set up and operate logic probes for digital circuits.
04.04 Set up and operate power supplies for digital circuits.
04.05 Set up and operate pulsers for digital circuits.
04.06 Set up and operate oscilloscopes for digital circuits.
04.07 Set up and operate logic analyzers for digital circuits.
04.08 Set up and operate pulse generators for digital circuits.
04.09 Identify types of logic gates and their truth tables.
04.10 Construct combinational logic circuits using integrated circuits.
04.11 Troubleshoot logic circuits.
04.12 Analyze types of flip-flops and their truth tables.
04.13 Construct flip-flops using integrated circuits.
04.14 Troubleshoot flip-flops.
04.15 Identify, define and measure characteristics of integrated circuit (IC) logic families.
04.16 Identify types of registers and counters.
04.17 Construct registers and counters using flip-flops and logic gates.
04.18 Troubleshoot registers and counters.
04.19 Analyze clock and timing circuits.
04.20 Construct clock and timing circuits.
04.21 Troubleshoot clock and timing circuits.
04.22 Identify types of arithmetic-logic circuits.
04.23 Construct arithmetic-logic circuits.
04.24 Troubleshoot arithmetic-logic circuits.
04.25 Identify types of encoding and decoding devices.
04.26 Construct encoders and decoders.
04.27 Troubleshoot encoders and decoders.
04.28 Identify types of multiplexer and demultiplexer circuits.
04.29 Construct multiplexer and demultiplexer circuits using integrated circuits.
04.30 Troubleshoot multiplexer and demultiplexer circuits.
04.31 Identify types of memory circuits.
04.32 Identify types of digital displays.
04.33 Set up and operate measuring instruments for digital circuit analysis.
04.34 Apply appropriate digital circuitry for other systems such as electronic communications, telecommunications, wireless, and other electronic Application.