Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Electronic System Assembly	
Program Type:	Job Preparatory	
Occupational Area:	Industrial Education	
Components:	N/A	
	Secondary	PSAV
Program Numbers:	**8730300**	**I470129**
CIP Number	0647.019903	0647.019903
Grade Level	9-12, 30, 31	30, 31
Length	3 Credits	450 Hours
Certification	ELECTRONIC @7 G TEC ELEC @7 G	ELECTRONIC @7 G TEC ELEC @7 G
Facility Code	245	
CTSO	SkillsUSA-VICA	SkillsUSA-VICA
Coop Method	Yes	Yes
Apprenticeship	Yes	Yes
Basic Skills		
Math		9
Language		9
Reading		9

I. **PURPOSE:** The purpose of this program is to prepare students for employment as an electrical, electronic assembler (93114670).

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, blueprint reading, selection and use of tools/materials, wire preparation for soldering, soldering skills, types of circuit boards, types of terminals, types of solder cups, component assembly, and solderless connections.

Listed below are the courses that comprise this program when offered at the secondary level:

8730310 - Electronic System Assembly 1
8730320 - Electronic System Assembly 2
8730330 - Electronic System Assembly 3

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Electronic System industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

II. **LABORATORY ACTIVITIES**: Shop or laboratory activities are an integral part of this program and provide instruction in electronic chassis assembly. The tools, materials and processes used in the laboratory should be similar to those used in industry.

III. **SPECIAL NOTE: SkillsUSA**-VICA, Inc. is the appropriate Career and Technical Student Organization (CTSO) for providing leadership training and for reinforcing specific career and technical skills. Career and Technical Student Organizations, when provided, shall

be an integral part of the career and technical instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, FAC.

Planned and supervised instructional activities must be provided through one or more of the following: (1) directed laboratory experience (2) student projects (3) placement for experience (4) cooperative experience.

Whenever cooperative training - OJT is offered, the following are required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a workstation that reflects equipment, skills and tasks that are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Rule 6A-10.040, FAC, the minimum basic-skills grade levels required for adult vocational students to complete this program are: Mathematics 9.0, Language 9.0, Reading 9.0. These grade-level numbers correspond to grade-equivalent scores obtained on one of the state-designated basic-skills examinations. If a student does not meet the basic-skills level required for completion of the program, remediation should be provided concurrently through Vocational Preparatory Instruction (VPI). Please refer to the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards, which the student must master to earn credit, must be specified on an individual basis. The job or jobs for which the student is being trained should be reflected in the student's desired postschool outcome statement on the Transition Individual Educational Plan (Transition IEP).

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific program or course articulation agreements with each other.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

SCANS Competencies: Instructional strategies for this program must include methods that require students to identify, organize and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.
The standard length of this program is 450 hours.

IV. **INTENDED OUTCOMES:** After successfully completing the program, the student will be able to:

OCCUPATIONAL COMPLETION POINT - DATA CODE - A

ELECTRICAL, ELECTRONIC ASSEMBLER - OES Code 93114670

01.0 Demonstrate proficiency in interpreting written, graphic and/or oral instruction.
02.0 Demonstrate proficiency in developing basic electronic assembly skills.
03.0 Demonstrate proficiency in preparing wire for soldering and/or assembly.
04.0 Demonstrate proficiency in applying soldering techniques.
05.0 Demonstrate proficiency in connecting component and lead wires.
06.0 Demonstrate proficiency in installing electronic component assembly.
07.0 Demonstrate proficiency in preparing material for solderless connections.
08.0 Demonstrate proficiency in appropriate communication skills.
09.0 Demonstrate proficiency in appropriate math skills.
10.0 Demonstrate proficiency in appropriate understanding of basic science.
11.0 Demonstrate proficiency in employability skills.
12.0 Demonstrate proficiency in understanding of entrepreneurship.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Electronic System Assembly
Secondary Number: 8730300
Postsecondary Number: I470129

OCCUPATIONAL COMPLETION POINT - DATA CODE - A
ELECTRICAL, ELECTRONIC ASSEMBLER - OES Code 93114670

01.0 DEMONSTRATE PROFICIENCY IN INTERPRETING WRITTEN, GRAPHIC AND/OR ORAL INSTRUCTION--The student will be able to:

01.01 Read and interpret written and oral instructions.
01.02 Read and interpret graphic instructions.
01.03 Follow accepted safety rules.
01.04 Read and interpret electronic chassis assembly.
01.05 Read and interpret color coding.

02.0 DEMONSTRATE PROFICIENCY IN DEVELOPING BASIC ELECTRONIC ASSEMBLY SKILLS--The student will be able to:

02.01 Use hand tools.
02.02 Use mechanical and other strippers.
02.03 Use soldering irons.
02.04 Select soldering materials.
02.05 Select types of wire.
02.06 Identify and select electronic component parts.
02.07 Select types of terminals.
02.08 Select types of cleaning tools and materials.
02.09 Use desoldering tools.

03.0 DEMONSTRATE PROFICIENCY IN PREPARING WIRE FOR SOLDERING AND/OR ASSEMBLY--The student will be able to:

03.01 Strip wires for soldering.
03.02 Tin by hand and/or solder pot.

04.0 DEMONSTRATE PROFICIENCY IN APPLYING SOLDERING TECHNIQUES--The student will be able to:

04.01 Apply heat applications.
04.02 Apply solder applications.
04.03 Rework unsatisfactory connectors.
04.04 Maintain solder connection appearance.

05.0 DEMONSTRATE PROFICIENCY IN CONNECTING COMPONENT AND LEAD WIRES--The student will be able to:

05.01 Solder component leads to printed circuit boards.
05.02 Solder component lead wires to turret terminals.
05.03 Solder lead wires to bifurcated terminals.
05.04 Solder lead wires to hook and perforated terminals.
05.05 Solder lead wires into connector solder cups.

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING ELECTRONIC COMPONENT ASSEMBLY--The student will be able to:

06.01 Mount components onto a chassis.
06.02 Mount components onto a panel.
06.03 Mount components onto a circuit board.

07.0 DEMONSTRATE PROFICIENCY IN PREPARING MATERIALS FOR SOLDERLESS CONNECTIONS--The student will be able to:

07.01 Prepare wire for cables.
07.02 Strip, terminalize, lay and lace harness.
07.03 Use heat shrinkable tubing.
07.04 Strip wires for wrapping.
07.05 Route and wrap for pin connections.

08.0 DEMONSTRATE PROFICIENCY IN APPROPRIATE COMMUNICATION SKILLS--The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE PROFICIENCY IN APPROPRIATE MATH SKILLS--The student will be able to:

09.01 Read and interpret measuring devices (rules and tapes).
09.02 Add 100 addition combinations.
09.03 Add two-digit numbers.
09.04 Add three-digit numbers.
09.05 Subtract 100 subtraction combinations.
09.06 Subtract two-, three- and four-digit numbers.
09.07 Solve one-digit divisor problems.
09.08 Solve two-digit divisor problems.
09.09 Solve two- and three-digit divisor problems.
09.10 Solve multiplication facts.
09.11 Multiply by a one-digit factor.
09.12 Multiply by a two-digit factor.
09.13 Identify the parts of a fraction.
09.14 Solve fractional word problems.
09.15 Classify types of fractions.
09.16 Illustrate equivalent fractions.
09.17 Convert fractions.
09.18 Reduce fractions.
09.19 Solve decimal notations.
09.20 Solve number word problems.
09.21 Round to the nearest whole number.
09.22 Add decimals.
09.23 Subtract decimals.
09.24 Multiply decimals.
09.25 Divide a decimal by a decimal.
09.26 Divide a whole number by a decimal.

09.27 Write fractions as decimals and percents.
09.28 Write percents as fractions and decimals.
09.29 Solve percent problems.
09.30 Find the percent of a number.
09.31 Operate a calculator.
09.32 Understand and use the metric system.
09.33 Convert inches to millimeters and millimeters to inches.
09.34 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.35 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.36 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.37 Determine the correct purchase price, including sales tax for a materials list containing a minimum of six items.
09.38 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE PROFICIENCY IN APPROPRIATE UNDERSTANDING OF BASIC SCIENCE--The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health-related problems, which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury, and K.P.A.

11.0 DEMONSTRATE PROFICIENCY IN EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents, which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
11.10 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 DEMONSTRATE PROFICIENCY IN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

12.01 Define entrepreneurship.
12.02 Describe the importance of entrepreneurship to the American economy.
12.03 List the advantages and disadvantages of business ownership.
12.04 Identify the risks involved in ownership of a business.
12.05 Identify the necessary personal characteristics of a successful entrepreneur.

12.06 Identify the business skills needed to operate a small business efficiently and effectively.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8730310
Course Title: Electronic System Assembly 1
Course Credit: 1

COURSE DESCRIPTION:

This course includes instruction in basic electronics and interpreting instructions.

01.0 DEMONSTRATE PROFICIENCY IN INTERPRETING WRITTEN, GRAPHIC AND/OR ORAL INSTRUCTION--The student will be able to:

01.01 Read and interpret written and oral instructions.
01.02 Read and interpret graphic instructions.
01.03 Follow accepted safety rules.
01.04 Read and interpret electronic chassis assembly.
01.05 Read and interpret color coding.

02.0 DEMONSTRATE PROFICIENCY IN DEVELOPING BASIC ELECTRONIC ASSEMBLY SKILLS--The student will be able to:

02.01 Use hand tools.
02.02 Use mechanical and other strippers.
02.03 Use soldering irons.
02.04 Select soldering materials.
02.05 Select types of wire.
02.06 Identify and select electronic component parts.
02.07 Select types of terminals.
02.08 Select types of cleaning tools and materials.
02.09 Use desoldering tools.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8730320
Course Title: Electronic System Assembly 2
Course Credit: 1

COURSE DESCRIPTION:

This course includes instruction in wire soldering, soldering techniques and connecting lead wires.

03.0 DEMONSTRATE PROFICIENCY IN PREPARING WIRE FOR SOLDERING AND/OR ASSEMBLY--The student will be able to:

03.01 Strip wires for soldering.
03.02 Tin by hand and/or solder pot.

04.0 DEMONSTRATE PROFICIENCY IN APPLYING SOLDERING TECHNIQUES--The student will be able to:

04.01 Apply heat applications.
04.02 Apply solder applications.
04.03 Rework unsatisfactory connectors.
04.04 Maintain solder connection appearance.

05.0 DEMONSTRATE PROFICIENCY IN CONNECTING COMPONENT AND LEAD WIRES--The student will be able to:

05.01 Solder component leads to printed circuit boards.
05.02 Solder component lead wires to turret terminals.
05.03 Solder lead wires to bifurcated terminals.
05.04 Solder lead wires to hook and perforated terminals.
05.05 Solder lead wires into connector solder cups.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8730330
Course Title: Electronic System Assembly 3
Course Credit: 1

COURSE DESCRIPTION:

This course includes instruction in installation of electronic components, and making solderless connections.

06.0 DEMONSTRATE PROFICIENCY IN INSTALLING ELECTRONIC COMPONENT ASSEMBLY--The student will be able to:

06.01 Mount components onto a chassis.
06.02 Mount components onto a panel.
06.03 Mount components onto a circuit board.

07.0 DEMONSTRATE PROFICIENCY IN PREPARING MATERIALS FOR SOLDERLESS CONNECTIONS--The student will be able to:

07.01 Prepare wire for cables.
07.02 Strip, terminalize, lay and lace harness.
07.03 Use heat shrinkable tubing.
07.04 Strip wires for wrapping.
07.05 Route and wrap for pin connections.

08.0 DEMONSTRATE PROFICIENCY IN APPROPRIATE COMMUNICATION SKILLS--The student will be able to:

08.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
08.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03 Read and follow written and oral instructions.
08.04 Answer and ask questions coherently and concisely.
08.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06 Demonstrate appropriate telephone/communication skills.

09.0 DEMONSTRATE PROFICIENCY IN APPROPRIATE MATH SKILLS--The student will be able to:

09.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
09.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
09.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
09.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
09.05 Demonstrate an understanding of federal, state and local taxes and their computation.

10.0 DEMONSTRATE PROFICIENCY IN APPROPRIATE UNDERSTANDING OF BASIC SCIENCE--The student will be able to:

10.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
10.02 Draw conclusions or make inferences from data.
10.03 Identify health-related problems, which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04 Understand pressure measurement in terms of P.S.I., inches of mercury, and K.P.A.

11.0 DEMONSTRATE PROFICIENCY IN EMPLOYABILITY SKILLS--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents, which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make appropriate job changes.
11.09 Demonstrate acceptable employee health habits.
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