Florida Department of Education
CURRICULUM FRAMEWORK

Program Title: Precision Metal Fabrication
Occupational Area: Industrial Education

	PSAV	Secondary
Program Numbers	**I480504**	**8754300**
CIP Number	0648.050400	0648.050400
Grade Level	30, 31	9-12, 30, 31
Length	1600 Hours	11 credits
Certification	SHEETMETAL @7 G	SHEETMETAL @7 G
	METAL WORK @7 G	METAL WORK @7 G
	WELDING @7 G	WELDING @7 G

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as structural metal fabricators (91714801), metal fabricators-assemblers (809.381-010).

The course content will include the following; measurement and layout, planning and design, sheetmetal work, structural steel, welding, mechanical fasteners, metal properties, heat treating and metalworking tools. The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

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

8754310 - Metal Fabrication 1 – (150)
8754320 - Metal Fabrication 2 – (150)
8754330 - Metal Fabrication 3 – (150) [450] OCP A
8754340 - Metal Fabrication 4 - (150) [150] OCP B
8754350 - Metal Fabrication 5 – (150)
8754360 - Metal Fabrication 6 – (150)
8754370 - Metal Fabrication 7 – (150)
8754380 - Metal Fabrication 8 – (150)
8754390 - Metal Fabrication 9 – (150) [700] OCP C
8754391 - Metal Fabrication 10 – (150)
8754392 - Metal Fabrication 11 – (150) [350] OCP D

Secondary programs may complete an OCP in the middle of a course. Align your secondary program curriculum with the outcomes necessary to complete an OCP. This will allow transfer of students to PSAV programs if they need additional instruction to complete the program.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Metal 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. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: measuring and layout

tools, bench metal operations, electric metal bonding operations, gas welding and cutting operations, sheetmetal operations, grinding and sharpening tools and metalworking machines.

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.

Cooperative training - OJT is appropriate for this program. 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).

SCANS Competencies: To accomplish the Secretary's Commission on Achieving Necessary Skills (SCANS) competencies, instructional strategies for this cluster 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 methods to improve students' personal qualities and higher-order thinking skills.

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.

The standard length of this program is 1600 hours.

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

OCCUPATIONAL COMPLETION POINT - DATA CODE - A (400 Hours)
METAL/FABRICATOR HELPER DOT 619.685-066

01.0 Demonstrate basic metal fabrication skills.
02.0 Demonstrate ability to read plans and drawings.
03.0 Describe metals and their properties.
04.0 Demonstrate appropriate math skills.
05.0 Demonstrate appropriate understanding of basic science.
06.0 Demonstrate and practice employability skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE - B (150 Hours)
METAL FABRICATOR DOT 619.361-014

07.0 Perform gas welding and cutting operations.

OCCUPATIONAL COMPLETION POINT - DATA CODE - C (700 Hours)
METAL FABRICATOR ASSEMBLER DOT 809.381-010

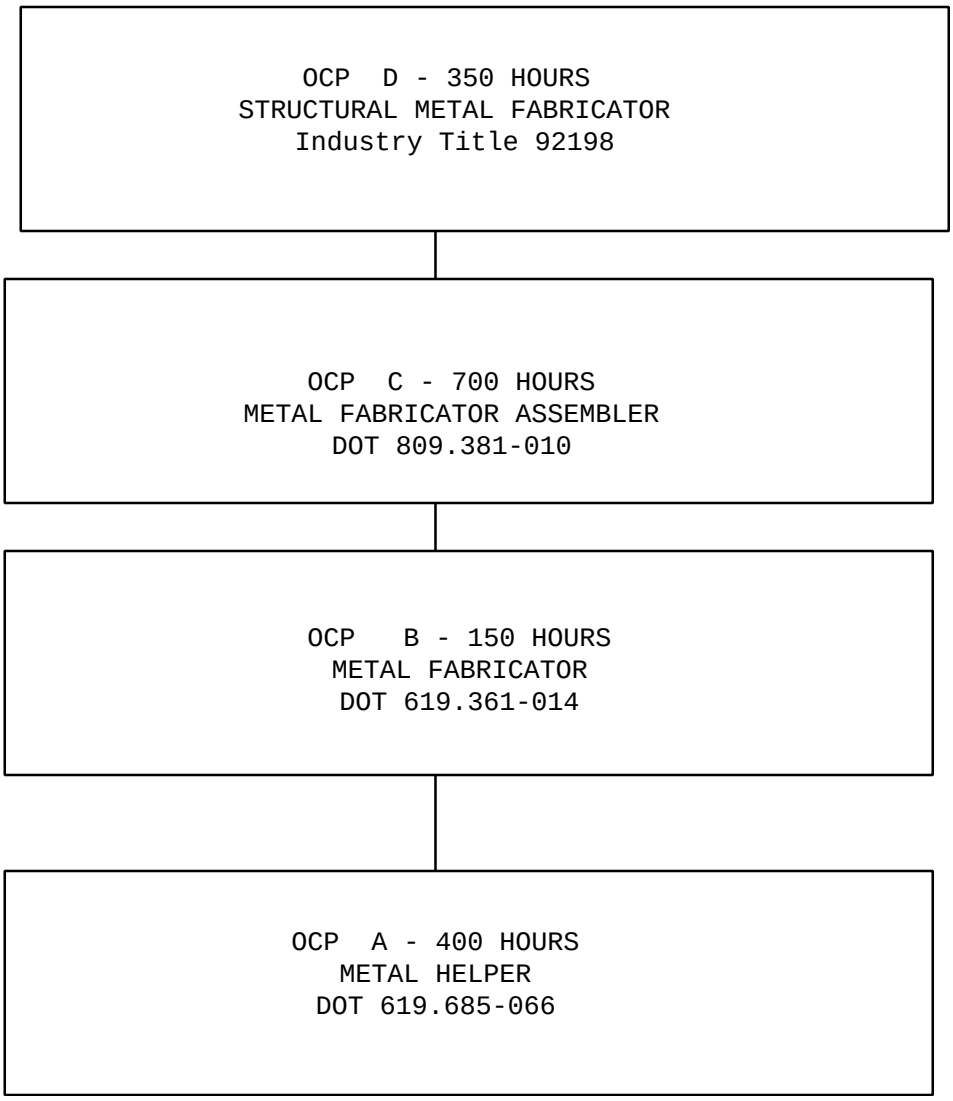
08.0 Perform measuring and layout operations.
09.0 Operate metalworking machines.
10.0 Perform metal fabrication operations.
11.0 Perform electric metal-bonding operations.
12.0 Perform assembly operation.

OCCUPATIONAL COMPLETION POINT - DATA CODE - D (350 Hours)
STRUCTURAL METAL FABRICATOR - OES 92198

13.0 Demonstrate ability to apply geometric form and position control.
14.0 Organize and plan work.
15.0 Demonstrate appropriate communication skills.
16.0 Demonstrate an understanding of entrepreneurship.

The following diagram illustrates the program structure:

PRECISION METAL FABRICATION



Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Precision Metal Fabrication
Secondary Number:
Postsecondary Number: I480504

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

01.01 Comply with safety and operating rules and practices.
01.02 Maintain a clean and orderly shop.
01.03 Make job-related decimal and fraction calculations.
01.04 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
01.05 Solve job-related problems operating a hand-held calculator.
01.06 Solve job-related problems using mathematical handbooks, charts and tables.
01.07 Compute feet, inches and yards.
01.08 Use the protractor to measure angles to nearest degree.
01.09 Use the protractor and triangles to draw angles.
01.10 Demonstrate proper use of material handling techniques.
01.11 Solve job-related problems using basic formulas.
01.12 Solve job-related problems using basic geometry.
01.13 Solve job-related problems using basic trigonometry.
01.14 Calculate the amount of material that is required to fabricate project.
01.15 Calculate machine feed and speed by using formulas.
01.16 Calculate set back and bend allowance.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/detail views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint abbreviations.
02.06 Identify dimensioning of radii, round holes, fillets and chamfers.
02.07 Identify screw threads and bolt types.
02.08 Apply dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.
02.10 Read and interpret title block information.
02.11 Identify and interpret rivet call outs.
02.12 Identify and interpret weld call outs.
02.13 Identify and interpret general and local notes.
02.14 Describe the use of assembly blueprints and detail blueprints.

03.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

03.01 Describe the steelmaking process.
03.02 Describe the differences between ferrous and nonferrous metals.
03.03 Describe casting, alloys and forging.
03.04 Identify metals such as galvanized iron and steel, aluminum stainless steel, sheetmetal, copper and brass.
03.05 Identify properties of the most common metals.
03.06 Identify and describe common gages, shapes and dimensions of purchased materials.

04.0 DEMONSTRATE APPROPRIATE MATH SKILLS--The student will be able to:

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

05.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE--The student will be able to:

05.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
05.02 Draw conclusions or make inferences from data.
05.03 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.
05.04 Understand pressure measurement in terms of P.S.I., inches of mercury, and K.P.A.

06.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

06.01 Conduct a job search.
06.02 Secure information about a job.
06.03 Identify documents that may be required when applying for job.
06.04 Complete a job application form correctly.
06.05 Demonstrate competence in job interview techniques.
06.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
06.07 Identify acceptable work habits.
06.08 Demonstrate knowledge of how to make job changes appropriately.
06.09 Demonstrate acceptable employee health habits.
06.10 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

07.01 Identify welding cylinders, regulators, hoses, pressure gages and torches.
07.02 Describe welding equipment safety procedures.
07.03 Demonstrate proper flame settings.
07.04 Demonstrate basic gas welding skills.
07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
07.06 Demonstrate freehand and guide cutting of various metal thickness'.
07.07 Set up and operate a plasma arc cutting machine.

08.0 PERFORM MEASURING AND LAYOUT OPERATIONS--The student will be able to:

08.01 Perform basic geometric construction.
08.02 Use marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surfaceplates, depth gates and circumference rules.
08.03 Develop patterns using parallel line, radial line and triangulation.
08.04 Make metal fabrication sketches.
08.05 Read and measure with steel rules.
08.06 Read and measure with micrometers.
08.07 Read and measure with vernier height gages.
08.08 Read and measure with dial calipers.
08.09 Read and measure with universal bevel protractor.
08.10 Measure with sine bars.
08.11 Read and measure with dial indicators.
08.12 Apply parallel bars, angle plates and surface gages to precision measurement operations.
08.13 Apply "V" blocks to precision measurement operations.
08.14 Use gage blocks in establishing measurement.
08.15 Layout work piece using marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surface plates, depth gages and circumference rules.
08.16 Perform flat pattern bracket layouts.
08.17 Perform cone development, construct radial line and use triangulation.

09.0 OPERATE METALWORKING MACHINES--The student will be able to:

09.01 Identify the purpose of various types of machine shop equipment.
09.02 Identify types of a drill press.
09.03 Operate a drill press utilizing the correct drilling speed.
09.04 Operate a band saw utilizing the correct cutting speed.
09.05 Demonstrate clamping devices for securing stock for drilling.
09.06 Identify types and sizes of drill bits.
09.07 Use portable power saw equipment.
09.08 Use a cutoff or power hacksaw.
09.09 Use electric and air utility grinders.
09.10 Sharpen drill bits.
09.11 Select proper type of abrasive wheels for grinding machines.
09.12 Operate large belt sander.
09.13 Operate power press brake.
09.14 Operate power metal shear.
09.15 Operate various manual brakes.
09.16 Operate power jitterbug shear.
09.17 Operate bench grinders.
09.18 Operate beverly shear.
09.19 Operate unishear.

10.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

10.01 Fabricate metal, edges and seams.
10.02 Use hand tools to cut, punch and shear metal.
10.03 Form sheetmetal using a brake, a folder, rolls and a turning machine.
10.04 Join metals using solder, rivets and mechanical fasteners.
10.05 Make fixtures as required (Micarta and Mild Steel).
10.06 Arrange proper setup in vise using safety devices.
10.07 Demonstrate ability to cut various shapes of metal stock.

10.08 Demonstrate ability to bend various shapes of metal stock.
10.09 Inspect fabricated parts.

11.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

11.01 Describe and demonstrate the spot and arc welding process.
11.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, striking and maintaining an arc, welding in various positions and clamping.
11.03 Setup and operate a spot welder.
11.04 Explain and demonstrate the MIG welding process.
11.05 Apply basic procedures for safely adjusting, operating, cleaning and maintaining MIG welding equipment.
11.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various positions, selecting proper tips and choosing filler metal.

12.0 PERFORM ASSEMBLY OPERATION--The student will be able to:

12.01 Identify weld symbols.
12.02 Perform required weld preparation.
12.03 Assist welder in weld operation.
12.04 Identify rivet symbol.
12.05 Install proper diameter holes and prepare metal surfaces for riveting.
12.06 Determine whether rivet is to be "shot" or squeezed.
12.07 Perform proper setup and upset rivets.
12.08 Set up and install blind rivets.

13.0 DEMONSTRATE ABILITY TO APPLY GEOMETRIC FORM AND POSITION CONTROL--The student will be able to:

13.01 Identify material condition and perfect form.
13.02 Identify the eleven form characteristics.
13.03 Identify the two position characteristics.
13.04 Identify the seven different tolerance zones.
13.05 Identify datum symbols.
13.06 Identify datum planes.
13.07 Identify datum axis.
13.08 Identify datum centerplane.
13.09 Identify the three plan datum system and multiple datums.
13.10 Identify material condition modifiers.
13.11 Solve bonus tolerance applications.
13.12 Solve datum zone applications.
13.13 Identify tolerance value indicator.
13.14 Identify American National Standards Institute.
13.15 Identify International Standards Institute.

14.0 ORGANIZE AND PLAN WORK--The student will be able to:

14.01 Interpret blueprints and drawings to acquire proper amount of material.
14.02 Requisition proper tools and equipment to fabricate parts.
14.03 Develop and project plan.

15.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS--The student will be able to:

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

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754310
Course Title: Metal Fabrication 1
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to familiarize the student with facilities, safety and housekeeping rules. The student will also become familiar with materials and specifications, skilled in using measuring and layout tools.

01.0 DEMONSTRATE BASIC METAL FABRICATION SKILLS--The student will be able to:

- 01.01 Comply with safety and operating rules and practices.
- 01.02 Maintain a clean and orderly shop.
- 01.03 Make job-related decimal and fraction calculations.
- 01.04 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
- 01.05 Solve job-related problems operating a hand-held calculator.
- 01.06 Solve job-related problems using mathematical handbooks, charts and tables.
- 01.07 Compute feet, inches and yards.
- 01.08 Use the protractor to measure angles to nearest degree.
- 01.09 Use the protractor and triangles to draw angles.
- 01.10 Demonstrate proper use of material handling techniques.
- 01.11 Solve job-related problems using basic formulas.
- 01.12 Solve job-related problems using basic geometry.
- 01.13 Solve job-related problems using basic trigonometry.
- 01.14 Calculate the amount of material that is required to fabricate project.
- 01.15 Calculate machine feed and speed by using formulas.
- 01.16 Calculate set back and bend allowance.

13.0 DEMONSTRATE APPROPRIATE MATH SKILLS--The student will be able to:

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

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754320
Course Title: Metal Fabrication 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to familiarize the students with plans and drawings. The student will be familar with basic science as it applies to metal fabrication.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

02.01 Identify dimensions.
02.02 Identify lists of materials and specifications.
02.03 Identify section views/detail views.
02.04 Disassemble and assemble parts using an exploded view drawing.
02.05 Interpret blueprint abbreviations.
02.06 Identify dimensioning of radii, round holes, fillets and chamfers.
02.07 Identify screw threads and bolt types.
02.08 Apply dimensional tolerances.
02.09 Identify metal fabrication symbols used in blueprints.
02.10 Read and interpret title block information.
02.11 Identify and interpret rivet call outs.
02.12 Identify and interpret weld call outs.
02.13 Identify and interpret general and local notes.
02.14 Describe the use of assembly blueprints and detail blueprints.

14.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE--The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 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.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury, and K.P.A.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754330
Course Title: Metal Fabrication 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop basic skills in metals and their properties.

04.0 DESCRIBE METALS AND THEIR PROPERTIES--The student will be able to:

- 04.01 Describe the steelmaking process.
- 04.02 Describe the differences between ferrous and nonferrous metals.
- 04.03 Describe casting, alloys and forging.
- 04.04 Identify metals such as galvanized iron and steel, aluminum stainless steel, sheetmetal, copper and brass.
- 04.05 Identify properties of the most common metals.
- 04.06 Identify and describe common gages, shapes and dimensions of purchased materials.

15.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

- 15.01 Conduct a job search.
- 15.02 Secure information about a job.
- 15.03 Identify documents that may be required when applying for job.
- 15.04 Complete a job application form correctly.
- 15.05 Demonstrate competence in job interview techniques.
- 15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
- 15.07 Identify acceptable work habits.
- 15.08 Demonstrate knowledge of how to make job changes appropriately.
- 15.09 Demonstrate acceptable employee health habits.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754340
Course Title: Metal Fabrication 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop skills in the safe use of gas welding and cutting equipment.

07.0 PERFORM GAS WELDING AND CUTTING OPERATIONS--The student will be able to:

07.01 Identify welding cylinders, regulators, hoses, pressure gages and torches.
07.02 Describe welding equipment safety procedures.
07.03 Demonstrate proper flame settings.
07.04 Demonstrate basic gas welding skills.
07.05 Demonstrate procedures for adjusting and operating the oxyacetylene cutting torch.
07.06 Demonstrate freehand and guide cutting of various metal thickness'.
07.07 Set up and operate a plasma arc cutting machine.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754350
Course Title: Metal Fabrication 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop skills in measuring and layout operations, the operation of metal working machines and metal fabrication.

03.0 PERFORM MEASURING AND LAYOUT OPERATIONS--The student will be able to:

03.01 Perform basic geometric construction.
03.02 Use marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surfaceplates, depth gates and circumference rules.
03.03 Develop patterns using parallel line, radial line and triangulation.
03.04 Make metal fabrication sketches.
03.05 Read and measure with steel rules.
03.06 Read and measure with micrometers.
03.07 Read and measure with vernier height gages.
03.08 Read and measure with dial calipers.
03.09 Read and measure with universal bevel protractor.
03.10 Measure with sine bars.
03.11 Read and measure with dial indicators.
03.12 Apply parallel bars, angle plates and surface gages to precision measurement operations.
03.13 Apply "V" blocks to precision measurement operations.
03.14 Use gage blocks in establishing measurement.
03.15 Layout work piece using marking gages, center punches, scribes, surface gages, squares, dividers, dial indicators, protractors, surface plates, depth gages and circumference rules.
03.16 Perform flat pattern bracket layouts.
03.17 Perform cone development, construct radial line and use triangulation.

05.0 OPERATE METALWORKING MACHINES--The student will be able to:

05.01 Identify the purpose of various types of machine shop equipment.
05.02 Identify types of a drill press.
05.03 Operate a drill press utilizing the correct drilling speed.
05.04 Operate a band saw utilizing the correct cutting speed.
05.05 Demonstrate clamping devices for securing stock for drilling.
05.06 Identify types and sizes of drill bits.
05.07 Use portable power saw equipment.
05.08 Use a cutoff or power hacksaw.
05.09 Use electric and air utility grinders.
05.10 Sharpen drill bits.
05.11 Select proper type of abrasive wheels for grinding machines.
05.12 Operate large belt sander.
05.13 Operate power press brake.
05.14 Operate power metal shear.
05.15 Operate various manual brakes.
05.16 Operate power jitterbug shear.
05.17 Operate bench grinders.

05.18 Operate beverly shear.
05.19 Operate unishear.

06.0 PERFORM METAL FABRICATION OPERATIONS--The student will be able to:

06.01 Fabricate metal, edges and seams.
06.02 Use hand tools to cut, punch and shear metal.
06.03 Form sheetmetal using a brake, a folder, rolls and a turning machine.
06.04 Join metals using solder, rivets and mechanical fasteners.
06.05 Make fixtures as required (Micarta and Mild Steel).
06.06 Arrange proper setup in vise using safety devices.
06.07 Demonstrate ability to cut various shapes of metal stock.
06.08 Demonstrate ability to bend various shapes of metal stock.
06.09 Inspect fabricated parts.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754360
Course Title: Metal Fabrication 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to help the students demonstrate the ability to peform metal bonding operations and assembly operations.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

- 08.01 Describe and demonstrate the spot and arc welding process.
- 08.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, striking and maintaining an arc, welding in various positions and clamping.
- 08.03 Setup and operate a spot welder.
- 08.04 Explain and demonstrate the MIG welding process.
- 08.05 Apply basic procedures for safely adjusting, operating, cleaning and maintaining MIG welding equipment.
- 08.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various positions, selecting proper tips and choosing filler metal.

09.0 PERFORM ASSEMBLY OPERATION--The student will be able to:

- 09.01 Identify weld symbols.
- 09.02 Perform required weld preparation.
- 09.03 Assist welder in weld operation.
- 09.04 Identify rivet symbol.
- 09.05 Install proper diameter holes and prepare metal surfaces for riveting.
- 09.06 Determine whether rivet is to be "shot" or squeezed.
- 09.07 Perform proper setup and upset rivets.
- 09.08 Set up and install blind rivets.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754370
Course Title: Metal Fabrication 7
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to help the students demonstrate the ability to perform electric metal bonding operations.

08.0 PERFORM ELECTRIC METAL-BONDING OPERATIONS--The student will be able to:

08.01 Describe and demonstrate the spot and arc welding process.
08.02 Demonstrate basic procedures for safely adjusting and operating an arc welder, selecting a rod, striking and maintaining an arc, welding in various positions and clamping.
08.03 Setup and operate a spot welder.
08.04 Explain and demonstrate the MIG welding process.
08.05 Apply basic procedures for safely adjusting, operating, cleaning and maintaining MIG welding equipment.
08.06 Apply basic procedures for safely adjusting and operating a TIG welder, welding in various positions, selecting proper tips and choosing filler metal.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754380
Course Title: Metal Fabrication 8
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to help the students demonstrate the ability to perform operations.

09.0 PERFORM ASSEMBLY OPERATION--The student will be able to:

09.01 Identify weld symbols.
09.02 Perform required weld preparation.
09.03 Assist welder in weld operation.
09.04 Identify rivet symbol.
09.05 Install proper diameter holes and prepare metal surfaces for riveting.
09.06 Determine whether rivet is to be "shot" or squeezed.
09.07 Perform proper setup and upset rivets.
09.08 Set up and install blind rivets.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754390
Course Title: Metal Fabrication 9
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to help the students demonstrate the ability to appply geometric form and position control.

10.0 DEMONSTRATE ABILITY TO APPLY GEOMETRIC FORM AND POSITION CONTROL--The student will be able to:

10.01 Identify material condition and perfect form.
10.02 Identify the eleven form characteristics.
10.03 Identify the two position characteristics.
10.04 Identify the seven different tolerance zones.
10.05 Identify datum symbols.
10.06 Identify datum planes.
10.07 Identify datum axis.
10.08 Identify datum centerplane.
10.09 Identify the three plan datum system and multiple datums.
10.10 Identify material condition modifiers.
10.11 Solve bonus tolerance applications.
10.12 Solve datum zone applications.
10.13 Identify tolerance value indicator.
10.14 Identify American National Standards Institute.
10.15 Identify International Standards Institute.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754391
Course Title: Metal Fabrication 10
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to help the students demonstrate the ability to organize and plan work

11.0 ORGANIZE AND PLAN WORK--The student will be able to:

11.01 Interpret blueprints and drawings to acquire proper amount of material.
11.02 Requisition proper tools and equipment to fabricate parts.
11.03 Develop and project plan.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8754392
Course Title: Metal Fabrication 11
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to help the students demonstrate the ability to demonstrate appropriate communications skills and understand entrepreneurship.

12.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS--The student will be able to:

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

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

16.01 Define entrepreneurship.
16.02 Describe the importance of entrepreneurship to the American economy.
16.03 List the advantages and disadvantages of business ownership.
16.04 Identify the risks involved in ownership of a business.
16.05 Identify the necessary personal characteristics of a successful entrepreneur.
16.06 Identify the business skills needed to operate a small business efficiently and effectively.