Florida Department of Education
Curriculum Framework

Program Title: **Machining Technologies**
Program Type: **Career Preparatory**
Career Cluster: **Manufacturing**

Career Certificate Program		
Program Number	J200100	
CIP Number	0648050305	
Grade Level	30, 31	
Program Length	1500 hours	
Teacher Certification	Refer to the **Program Structure** section	
CTSO	SkillsUSA	
SOC Codes (all applicable)	Please see the CIP to SOC Crosswalk located at the link below.	
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml	
Basic Skills Level	Computation (Mathematics): 9	Communications (Reading and Language Arts): 8

Purpose

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. This program offers a broad foundation of knowledge and skills to prepare students for employment in machining positions.

The content includes but is not limited to broad, transferable skills, stresses the understanding of all aspects of the machining industry, and demonstrates such elements of the industry as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of four occupational completion points.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length
A	PMT0020	Machinist Helper	MACH SHOP @7 7G METAL WORK 7G TOOL DIE %7G	300 hours
B	PMT0022	Machinist Operator		300 hours
C	PMT0024	Machinist Setup Operator		600 hours
D	PMT0025	Machinist		300 hours

National Standards

Programs identified as having Industry or National Standards corresponding to the standards and/or benchmarks for the Machining Technologies program can be found using the following link: https://www.nims-skills.org/web/nims/home

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.

2. Apply appropriate academic and technical skills.

3. Attend to personal health and financial well-being.

4. Communicate clearly, effectively and with reason.

5. Consider the environmental, social and economic impacts of decisions.

6. Demonstrate creativity and innovation.

7. Employ valid and reliable research strategies.

8. Utilize critical thinking to make sense of problems and persevere in solving them.

9. Model integrity, ethical leadership and effective management.

10. Plan education and career path aligned to personal goals.

11. Use technology to enhance productivity.

12. Work productively in teams while using cultural/global competence.

Standards

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

01.0 Demonstrate an understanding of workplace safety and workplace organization.
02.0 Solve basic job-related math problems**.**
03.0 Interpret basic blueprint information.
04.0 Perform basic measuring operations.
05.0 Perform benchwork skills.
06.0 Demonstrate basic knowledge of manufacturing history and primary manufacturing processes.
07.0 Demonstrate basic knowledge of secondary manufacturing processes and manufacturing systems.
08.0 Demonstrate an understanding of graphic design by generating and interpreting computer-aided drawings.
09.0 Perform basic precision measuring operations.
10.0 Sharpen machining tools.
11.0 Set up and operate power saws.
12.0 Set up and operate pedestal grinders.
13.0 Set up and operate drill presses.
14.0 Explain the importance of employability and entrepreneurship skills.
15.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
16.0 Solve problems using critical thinking skills, creativity and innovation.
17.0 Solve advanced job-related math problems.
18.0 Demonstrate inspection methods.
19.0 Plan lathe machining operations.
20.0 Interpret and apply blueprint for lathe machine operations.
21.0 Operate lathes.
22.0 Use computer-aided design/computer-aided manufacturing (CAD/CAM) processes for lathe operations.
23.0 Set up and operate a computerized-numerical-control (CNC) machine for lathe operations.
24.0 Plan milling machining operations.
25.0 Interpret and apply blueprint for milling machine operations.
26.0 Operate milling machines.
27.0 Use computer-aided design/computer-aided manufacturing (CAD/CAM) processes for milling operations.
28.0 Set up and operate a computerized-numerical-control (CNC) machine for milling operations.
29.0 Perform advanced milling operations.
30.0 Perform advanced lathe operations.
31.0 Use advance techniques to operate a computerized-numerical-control (CNC) machine.
32.0 Perform advanced set up and operation of a computerized-numerical-control (CNC) machine.
33.0 Operate grinding machines.
34.0 Operate and set up electrical discharge machine (EDM).
35.0 Set up and operate heat-treating furnaces.
36.0 Perform advanced grinding operations.

Florida Department of Education
Student Performance Standards

Program Title: Machining Technologies
Career Certificate Program Number: J200100

Course Description: The Machinist Helper course prepares students for entry into the machining industry. Students explore career opportunities and requirements of a professional machinist. Content emphasizes beginning skills key to the success of working in the machining industry. Students study workplace safety and organization, job-related mathematics, basic blueprint information, basic measuring operations, benchwork skills, the history of manufacturing, manufacturing processes and systems, generating and interpreting computer-aided design drawings, basic precision measurement, sharpening tools, operating power saws, pedestal grinders, drill presses, and understanding the importance of employability and entrepreneurship skills.

Course Number: PMT0020 **Occupational Completion Point: A** **Machinist Helper – 300 Hours**	
01.0	Demonstrate an understanding of workplace safety and workplace organization. The student will be able to:
01.01	Identify safety requirements for manual, electrical-powered and pneumatic tools.
01.02	Demonstrate, apply, and provide evidence of safely using manual, electrical-powered and pneumatic tools.
01.03	Identify safety requirements for operation of automated machines and equipment.
01.04	Demonstrate, apply, and provide evidence of safely operating automated machines and equipment.
01.05	Demonstrate, apply, and provide evidence of properly storing equipment and tools.
01.06	Demonstrate, apply, and provide evidence of properly storing precision measuring tools.
01.07	Identify, demonstrate, apply, and provide evidence of understanding of shop safety rules on an ongoing basis.
01.08	Research and characterize class A, B and C type fires.
01.09	Demonstrate and apply the proper procedures for extinguishing class A, B and C type fires.
01.10	Identify various workplace injuries related to the machining industry.
01.11	Demonstrate and practice knowledge of first aid and first response procedures appropriate for this course.
01.12	Identify and apply safety procedures in case of smoke or chemical inhalation.
01.13	Demonstrate and apply material handling techniques to safely move materials.
01.14	Demonstrate and apply proper techniques for lifting loads.
01.15	Research Occupational Safety Health Administration (OSHA) safety standards.

01.16	Demonstrate, apply, and provide evidence of understanding Occupational Safety Health Administration (OSHA) safety standards.
01.17	Locate Safety Data Sheets (SDS).
01.18	Demonstrate understanding and knowledge of using and applying the information located on Safety Data Sheets (SDS).
01.19	Proactively respond to a safety concern and then document occurrences.
01.20	Demonstrate knowledge of emergency exits and signage.
01.21	Develop safety checklists.
01.22	Identify and report unsafe conditions.
01.23	Determine the appropriate corrective action after an unsafe condition is identified.
01.24	Demonstrate knowledge of various emergency alarms and procedures.
01.25	Perform emergency drills and participate in emergency teams.
01.26	Demonstrate knowledge and apply clean-up procedures for spills.
01.27	Explain Lock Out/Tag Out requirements and procedures.
01.28	Demonstrate knowledge of machinery and equipment safety functions to determine if all safeguards are operational.
01.29	Identify and apply procedures for handling hazardous material.
01.30	Perform safety and environmental inspections.
01.31	Perform leak checks to determine if toxic or hazardous material is escaping from a piece of equipment.
01.32	Demonstrate knowledge of proper and safe installation techniques as described in manuals, checklists, and regulations.
01.33	Demonstrate and apply proper equipment shutdown procedures.
01.34	Identify safety related maintenance procedures.
01.35	Select lubricants for machining operations.
01.36	Lubricate equipment parts.
01.37	Inspect and maintain machine cutting fluids.
01.38	Inspect drive pulleys and belts; perform necessary action.
01.39	Properly dispose of scrap-metal chips, shavings, trash and waste.
01.40	Identify, select and use personal protective equipment (PPE).
01.41	Explain the safety benefits of 6S work environment.
01.42	Identify, demonstrate and apply ergonomic work techniques.

	01.43 Train other students to use and apply safety skills outlined in this standard.
02.0	Solve basic job-related math problems. The student will be able to:
	02.01 Solve job-related problems by adding, subtracting, multiplying, and dividing whole numbers, decimals and common fractions.
	02.02 Calculate the amount of material that should be removed to obtain correct limits for secondary operations.
	02.03 Solve job-related problems using mathematical handbooks, charts and tables.
	02.04 Calculate machine speed and feed by using appropriate formulas.
	02.05 Calculate chip load per tooth on milling operations.
03.0	Interpret basic blueprint information. The student will be able to:
	03.01 Interpret view concepts.
	03.02 Interpret lines.
	03.03 Read and interpret title blocks.
	03.04 Read and interpret change orders on working and assembly prints.
	03.05 Read and interpret abbreviations.
	03.06 Identify basic geometrical dimensioning & tolerancing (GD&T) terminology.
04.0	Perform basic measuring operations. The student will be able to:
	04.01 Comply with safe and efficient work practices.
	04.02 Measure a workpiece and compare measurements with blueprint specifications, including tolerances.
	04.03 Read and measure with rules and calipers.
	04.04 Read and measure with micrometers.
	04.05 Read and measure with vernier tools.
	04.06 Use surface-plate techniques.
05.0	Perform benchwork skills. The student will be able to:
	05.01 Comply with safe and efficient work practices.
	05.02 Cut materials by using appropriate hand saws.
	05.03 Cut threads by using hand taps.
	05.04 Cut threads by using dies.
	05.05 Deburr workpiece.

	05.06 Demonstrate or identify filing techniques.
06.0	Demonstrate basic knowledge of manufacturing history and primary manufacturing processes. The student will be able to:
	06.01 Demonstrate knowledge of how manufacturing processes have evolved throughout history.
	06.02 Demonstrate knowledge of obtaining raw materials through harvesting and extracting.
	06.03 Explain the difference between primary and secondary manufacturing processes.
	06.04 Demonstrate knowledge of primary processes (e.g., thermal, chemical, mechanical, etc.)
07.0	Demonstrate basic knowledge of secondary manufacturing processes and manufacturing systems. The student will be able to:
	07.01 Demonstrate knowledge of secondary processes. (e.g., casting and molding, separating, forming, conditioning, assembling and finishing)
	07.02 Demonstrate knowledge of the various materials used in manufacturing. (e.g., metallic, polymeric, ceramic, composite)
	07.03 Demonstrate knowledge of the various material properties. (e.g., physical, mechanical, chemical, thermal, acoustic, optical, electrical and magnetic)
	07.04 Demonstrate knowledge of the technological or universal systems model. (inputs, process, outputs, feedback)
	07.05 Demonstrate knowledge of the various manufacturing/production systems. (e.g., custom, intermittent, continuous, flexible, automated)
	07.06 Demonstrate knowledge of the use of current manufacturing processes.
	07.07 Demonstrate knowledge of quality assurance.
08.0	Demonstrate an understanding of graphic design by generating and interpreting computer-aided drawings. The student will be able to:
	08.01 Create a sketch of an object.
	08.02 Select the front view of an object.
	08.03 Use a CAD System to open and change the views of CAD drawings.
	08.04 Use standard CAD commands (such as Grid, Snap, Array, Erase, Trim Break) in the editing of a drawing.
	08.05 Use CAD software to create a single view drawing.
	08.06 Use CAD software to create a multi-view drawing.
	08.07 Use CAD software to dimension a drawing.
	08.08 Use the UCS command to create a custom 3D coordinate system orientation.
	08.09 Create a 3D object using 3D drawing commands.
	08.10 Open and change the view of a solid model.
09.0	Perform basic precision measuring operations. The student will be able to:

	09.01 Use appropriate measurement tools. (e.g., machinist's rule, tape measure, calipers, micrometers, vernier and dial indicator.
	09.02 Convert between common fraction inches and decimal inches.
	09.03 Calibrate a dial caliper.
	09.04 Master a dial indicator.
	09.05 Read and interpret gage blocks and adjustable gages.
	09.06 Implement appropriate testing regimes.
	09.07 Use appropriate safety monitoring and testing equipment.
	09.08 Use multi-gauging to inspect, verify, and document whether product dimensions meet customer requirements.
	09.09 Research measurement tools for non-mechanical systems and products. (i.e., pH, °Brix)
10.0	Sharpen machining tools. The student will be able to:
	10.01 Comply with safe and efficient work practices.
	10.02 Hand sharpens cutting tools by using abrasive stones.
	10.03 Grind lathe tools to required angles.
	10.04 Sharpen drills.
11.0	Set up and operate power saws. The student will be able to:
	11.01 Comply with safe and efficient work practices.
	11.02 Remove and replace saw blades.
	11.03 Select appropriate blades to perform given sawing operations.
	11.04 Select and set speeds and feeds for given sawing operations.
	11.05 Measure and cut material using a power saw.
	11.06 Saw to scribed lines by using a metal band saw.
	11.07 Cut and weld band-saw blades for contour sawing. (Optional)
	11.08 Set up and operate saws for angular cutting.
12.0	Set up and operate pedestal grinders. The student will be able to:
	12.01 Comply with safe and efficient work practices.
	12.02 Identify the parts of the machine and explain their uses.
	12.03 Set up support rests.

	12.04 Dress grinding wheels.
13.0	Set up and operate drill presses. The student will be able to:
	13.01 Identify the parts of a drill press and explain their uses.
	13.02 Identify and set the machine controls.
	13.03 Comply with safe and efficient work practices.
	13.04 Select the proper tooling.
	13.05 Set up and operate drill press for hole work, center drill, drill, ream, countersink and counterbore.
	13.06 Set drill presses for proper feed and speed for specified operations.
14.0	Explain the importance of employability and entrepreneurship skills. The students will be able to:
	14.01 Identify and demonstrate positive work behaviors needed to be employable.
	14.02 Develop personal career plan that includes goals, objectives and strategies.
	14.03 Examine licensing, certification, and industry credentialing requirements.
	14.04 Maintain a career portfolio to document knowledge, skills and experience.
	14.05 Evaluate and compare employment opportunities that match career goals.
	14.06 Identify and exhibit traits for retaining employment.
	14.07 Identify opportunities and research requirements for career advancement.
	14.08 Research the benefits of ongoing professional development.
	14.09 Examine and describe entrepreneurship opportunities as a career planning option.

Course Description: The Machining Operator course is designed to build on the skills and knowledge students learned in the Machinist Helper course for entry into the machining industry. Students explore career opportunities and requirements of a professional machinist. Content emphasizes knowledge of working in the machining industry. Students study the skills necessary to work in teams, using critical thinking skill to solve complex problems, advance mathematics, quality control and inspection methods, plan machining operations using a lathe and mill, use CAD/CAM processes for lathe and milling operations, and set-up and program a CNC machine for lathe and milling operations.

Course Number: PMT0022 Occupational Completion Point: B Machinist Operator – 300 Hours	
15.0	Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. The students will be able to:
	15.01 Employ leadership skills to accomplish organizational goals and objectives.

	15.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks.
	15.03 Conduct and participate in meetings to accomplish work tasks.
	15.04 Employ mentoring skills to inspire and teach others.
16.0	Solve problems using critical thinking skills, creativity and innovation. The students will be able to:
	16.01 Employ critical thinking skills independently and in teams to solve problems and make decisions.
	16.02 Employ critical thinking and interpersonal skills to resolve conflicts.
	16.03 Identify and document workplace performance goals and monitor progress toward those goal.
	16.04 Conduct technical research to gather information necessary for decision-making.
17.0	Solve advanced job-related math problems. The student will be able to:
	17.01 Solve job-related problems using basic formulas, geometry and trigonometry.
	17.02 Convert measurements from English to metric and from metric to English units.
18.0	Demonstrate inspection methods. The student will be able to:
	18.01 Comply with safe and efficient work practices.
	18.02 Measure with sine bars.
	18.03 Take readings with hardness testers.
	18.04 Explain the purpose of statistical process control (SPC).
19.0	Plan lathe machining operations. The student will be able to:
	19.01 Comply with safe and efficient work practices.
	19.02 Perform layout for precision machine work by using layout instruments.
	19.03 Describe the importance of quality assurance.
20.0	Interpret and apply blueprint for lathe machine operations. The student will be able to:
	20.01 Create shop sketches.
	20.02 Read and interpret blueprints that include geometric tolerances.
	20.03 Determine and interpret reference information used in performing machine work.
	20.04 Comply with safe and efficient work practices.
	20.05 Inspect, remove, and replace manufactured parts that need repair or machine work.
	20.06 Select the most productive tool and tooling for a given operation.

	20.07 Identify the costs involved in product production.
21.0	Operate lathes. The student will be able to:
	21.01 Identify the parts of a lathe and explain their uses.
	21.02 Comply with safe and efficient work practices.
	21.03 Inspect tooling prior to operations.
	21.04 Set up an engine lathe.
	21.05 Secure tools, tool holders, and fixtures or attachments.
	21.06 Select and set feeds and speeds.
	21.07 Set up lathes and face workpieces held in chucks.
	21.08 Rough cut and finish cut with lathes.
	21.09 Perform lathe filing to deburr parts.
	21.10 Drill holes with lathes.
	21.11 Countersink holes with lathes.
	21.12 Ream holes with lathes.
	21.13 Tap threads with lathes.
	21.14 Die cut threads with lathes.
	21.15 Counterbore holes with lathes.
	21.16 Align lathe centers using accurate methods.
	21.17 Bore holes with lathes.
	21.18 Knurl parts with lathes.
	21.19 Cut external threads with lathes.
	21.20 Perform contour, angular or radii cuts with lathes.
	21.21 Set up the faceplate and dog.
22.0	Use computer-aided design/computer-aided manufacturing (CAD/CAM) processes for lathe operations. The student will be able to:
	22.01 Identify parts of the machine and explain their uses.
	22.02 Identify CAD/CAM processes.
	22.03 Comply with safe and efficient work practices.

	22.04 Create a multidimensional geometry of parts.
	22.05 Create a CNC code from parts geometry.
	22.06 Identify the basic classification of CNC tooling.
	22.07 Set up and manufacture parts.
23.0	Set up and operate a computerized-numerical-control (CNC) machine for lathe operations. The student will be able to:
	23.01 Comply with safe and efficient work practices.
	23.02 Set up work holding devices.
	23.03 Select proper cutting tools.
	23.04 Write a basic program and apply basic programming skills.
	23.05 Adjust appropriate cutting tools and tool offsets.
	23.06 Machine and create parts to blueprint tolerances.
24.0	Plan milling machining operations. The student will be able to:
	24.01 Comply with safe and efficient work practices.
	24.02 Perform layout for precision machine work by using layout instruments.
	24.03 Describe the importance of quality assurance.
25.0	Interpret and apply blueprint for milling machine operations. The student will be able to:
	25.01 Create shop sketches.
	25.02 Read and interpret blueprints that include geometric tolerances.
	25.03 Determine and interpret reference information used in performing machine work.
	25.04 Comply with safe and efficient work practices.
	25.05 Lay out radial and bolt hole circles.
	25.06 Inspect, remove, and replace manufactured parts that need repair or machine work.
	25.07 Select the most productive tool and tooling for a given operation.
	25.08 Identify the costs involved in product production.
26.0	Operate milling machines. The student will be able to:
	26.01 Identify the parts of a vertical milling machine and explain their uses.
	26.02 Comply with safe and efficient work practices.

	26.03 Inspect tooling prior to operations.
	26.04 True up the head and align milling fixtures.
	26.05 Select and set feeds and speeds for milling work.
	26.06 Square up workpieces with a table vise.
	26.07 Perform end milling.
	26.08 Perform fly-cutting operations.
	26.09 Drill holes with milling machines.
	26.10 Perform reaming operations.
	26.11 Perform form milling.
	26.12 Mill an external radius.
	26.13 Mill an angle.
	26.14 Use an edge finder and wiggler.
	26.15 Identify the parts of vertical and horizontal milling machines and explain their uses.
	26.16 Select the correct set up and operation for different milling machines.
	26.17 Cut external keyways.
	26.18 Bore holes with boring head.
	26.19 Mill cylindrical work.
	26.20 Set up and perform slab mill operations.
	26.21 Use digital readouts.
	26.22 Set up and operate power tapping head.
27.0	Use computer-aided design/computer-aided manufacturing (CAD/CAM) processes for milling operations. The student will be able to:
	27.01 Identify parts of the machine and explain their uses.
	27.02 Identify CAD/CAM processes.
	27.03 Comply with safe and efficient work practices.
	27.04 Create a multidimensional geometry of parts.
	27.05 Create a CNC code from parts geometry.
	27.06 Identify the basic classification of CNC tooling.

	27.07 Set up and manufacture parts.
28.0	Set up and operate a computerized-numerical-control (CNC) machine for milling operations. The student will be able to:
	28.01 Comply with safe and efficient work practices.
	28.02 Set up work holding devices.
	28.03 Select proper cutting tools.
	28.04 Write a basic program and apply basic programming skills.
	28.05 Adjust appropriate cutting tools and tool offsets.
	28.06 Machine and create parts to blueprint tolerances.

Course Description: The Machine Setup Operator course is designed to build on the skills and knowledge students learned in the Machinist Helper and Machine Operator courses for entry into the machining industry. Students explore career opportunities and requirements of a professional machinist. Content emphasizes knowledge of working in the machining industry. Students study the skills necessary to perform advanced lathe, milling, and CNC operations.

Course Number: PMT0024 Occupational Completion Point: C Machinist Setup Operator – 600 Hours	
29.0	Perform advanced milling operations. The student will be able to:
	29.01 Perform indexing operations using a dividing head.
	29.02 Set up and operate rotary tables.
	29.03 Design and use jigs and fixtures. (Optional)
30.0	Perform advanced lathe operations. The student will be able to:
	30.01 Rechase threads with lathes.
	30.02 Cut internal threads with lathes.
	30.03 Set up and perform taper turning with the compound rest.
	30.04 Cut internal tapered surfaces.
	30.05 Set up and use follower and steady rests.
31.0	Use advance techniques to operate a computerized-numerical-control (CNC) machine. The student will be able to:
	31.01 Identify parts of a CNC machine and explain their uses.
	31.02 Follow safe and efficient work practices, including procedures sheets.

	31.03 Identify unusual machine noises.
	31.04 Adjust machine speeds and feeds according to specifications.
	31.05 Inspect parts for correct dimensions.
32.0	Perform advanced set up and operation of a computerized-numerical-control (CNC) machine. The student will be able to:
	32.01 Comply with safe and efficient work practices.
	32.02 Set up work holding devices.
	32.03 Select proper cutting tools.
	32.04 Write an advanced program and apply basic programming skills.
	32.05 Adjust appropriate cutting tools and tool offsets.
	32.06 Machine and create parts to blueprint tolerances.

Course Description: The Machinist course is designed to build on the skills and knowledge students learned in the Machinist Helper, Machine Operator, and Machine Setup Operator courses for entry into the machining industry. Students explore career opportunities and requirements of a professional machinist. Content emphasizes knowledge of working in the machining industry. Students study the skills necessary to perform grinding operations, operating and setting up electrical discharge machines, and heat-treating furnaces.

Course Number: PMT0025 Occupational Completion Point: D Machinist – 300 Hours	
33.0	Operate grinding machines. The student will be able to:
	33.01 Identify the parts of a grinding machine and explain their uses.
	33.02 Comply with safe and efficient work practices.
	33.03 Set up and grind parallel flat surfaces.
	33.04 Select the proper wheel.
	33.05 Inspect, balance, dress, and true grinding wheels.
	33.06 Attach and align workpieces for grinding operations.
	33.07 Set up and grind four sides square.
	33.08 Select and set feeds and speeds of power-feed grinding machines.
	33.09 Cut or part workpieces with grinding machines.
	33.10 Set up and use angle plates.

	33.11 Grind to a shoulder.
	33.12 Grind a taper.
34.0	Operate and set up electrical discharge machine (EDM). The student will be able to:
	34.01 Identify parts of the machine and explain their uses.
	34.02 Comply with safe and efficient work practices.
	34.03 Follow procedure sheets.
	34.04 Set up and adjust machine controls according to specifications.
	34.05 Select and manufacture electrode.
	34.06 Select flushing techniques.
	34.07 Create part according to specifications. (Optional)
	34.08 Perform EDM programming.
35.0	Set up and operate heat-treating furnaces. The student will be able to:
	35.01 Identify the parts of the machine and explain their uses. (Optional)
	35.02 Identify and select proper machine controls. (Optional)
	35.03 Comply with safe and efficient work practices. (Optional)
	35.04 Select and identify proper heat-treatment processes. (Optional)
	35.05 Perform a basic heat-treatment process to blueprint specifications. (Optional)
36.0	Perform advanced grinding operations. The student will be able to:
	36.01 Explain up grinders to run workpieces between centers. (Optional)
	36.02 Explain up and use radius dressers. (Optional)
	36.03 Explain cylindrical grinders. (Optional)
	36.04 Explain operate inside diameter (ID) grinders. (Optional)

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools, and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate, and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the co-curricular career and technical student organization(s) 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.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In Career Certificate Programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Computation (Mathematics) and Communications (Reading and Language Arts). These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02, Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01, F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College System Institution must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91, F.S.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities 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 counselor and/or instructors. 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.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.