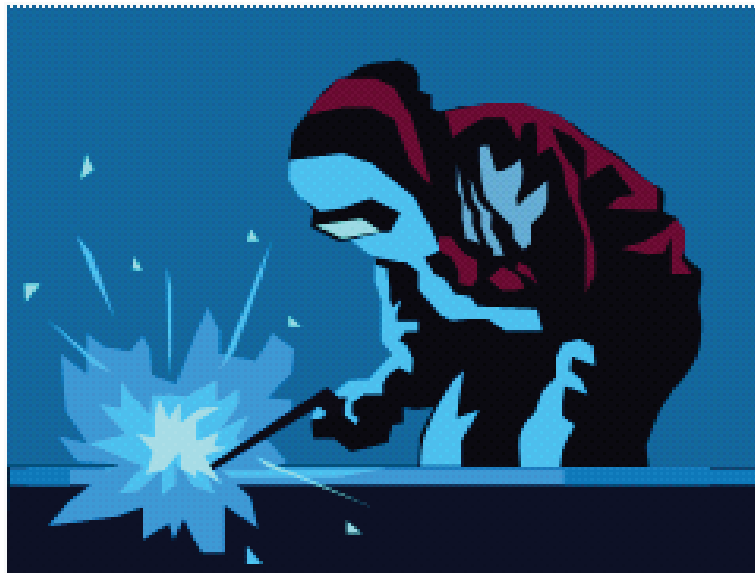




Lake Technical College

2015 - 2016
Master Plan of Instruction
Welding Technologies

John Dahler & Robert Sherwood, Instructors



The mission of Lake Technical College is to be an integral component of the economic growth and development in our community by offering a variety of high quality career-training opportunities.

Lake Technical College prohibits discrimination in admission to, or access to, or employment in its programs and activities on the basis of race, color, national origin, sex or sexual orientation, marital status, age, religion, disability, genetic information, gender identity or expression, or any other characteristic prohibited by law. The district provides equal access to district facilities to the Boy Scouts and other patriotic youth groups, as required by the Boy Scouts of America Equal Access Act.

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LAKE TECHNICAL COLLEGE WELDING TECHNOLOGIES

INTRODUCTION

Welding Technologies is an open-entry, open-exit, competency-based welding program with program entry four times each year.

In the program orientation, students learn shop safety regulations, tool crib procedures, record keeping, and the history of welding. After students have seen a demonstration of each unit, they practice all units in basic, advanced, oxyacetylene, heli arc, and micro wire welding. Upon completion of each block of work, students review all units until they can demonstrate at least 77% proficiency in the welding of all standard joints and in all standard positions. The display board in the welding shop is the standard.

Students will be evaluated by the instructor as to their skills, their ability to work safely, and their work habits (e.g., appearance, dress, attendance and compliance with school and program policies and procedures).

After completion of all program competencies, students may elect to test for code certification on plate and pipe welding.

PROGRAM MISSION

The mission of the Welding program is to prepare students for employment or advanced training in the welding industry. This program also provides supplemental training for persons previously or currently employed in these occupations.

WELDING TECHNOLOGIES PHILOSOPHY

We believe in assisting the student in the development of his/her ability to get along with others, show integrity, develop safe work habits both on and off the job, evidence personal and job cleanliness and demonstrate the ability to become a better adjusted, more productive citizen.

ADMISSION REQUIREMENTS

Applicants must be at least 16 years of age and should be academically, physically, and emotionally capable of meeting the demands of the chosen program. Applicants make initial application through the Admissions Office. A minimum skills evaluation is part of the admission process.

The Welding Technologies program has the following minimum admissions requirements:

1. Complete an LTC online application
2. Take the TABE
3. Meet with a career advisor
4. Confer with the program instructor prior to actual enrollment

TEST OF ADULT BASIC EDUCATION (TABE)

All applicants for Career and Technical Education programs 450 hours or more, with the exception of Florida Law Enforcement Academy, take a state mandated TABE prior to enrollment. Applicants who have earned a standard State of Florida high school diploma, 2007 or later, or possess a documented A.A., A.S., A.A.S., B.A., or B.S. degree are exempt from this requirement. Documented successful completion of college-level remedial coursework and accepted standardized tests such as Postsecondary Education Readiness Test (PERT) or ACT may be used to meet TABE requirements.

According to Florida Department of Education rules, students who fail all or parts of the TABE may only retest using a different TABE version after 60 documented hours of remediation in the Applied Academics for Adult Education (AAAE) lab or three months if not attending AAAE. Students may not retake the same test version for six months. We, therefore, strongly recommend that students test early, especially for licensure programs, in order to allow time for remediation and retesting should the need arise.

Students who do not meet the minimum TABE scores set by the Florida Department of Education for their program must begin attending remediation classes in the AAAE lab prior to or at the time of enrollment in a Career and Technical Education class for at least one block a day and make acceptable progress as determined by the AAAE instructor. It is highly recommended students meet state mandated TABE requirements by the time they have completed 50% of their program. Students who do not meet state mandated TABE scores may not receive a certificate of completion as per Florida Department of Education rules.

Applicants transferring appropriately leveled TABE, PERT or other accepted standardized test scores from other testing centers must do so by having an official score report sent directly to the Admissions Office prior to enrollment in the program. Scores brought by hand will be accepted only if document provided by the outside testing center is in a sealed envelope. Standardized tests scores are valid for two years.

TABE scores are good for two years and must be valid at the time of enrollment. TABE scores that expire during continuous enrollment remain valid until the end of such enrollment. Under continuous enrollment, students must be enrolled at least 50% of each semester per school year. Continuous enrollment applies to attendance in a single program.

The required TABE exit scores for this program are: Reading, 9; Math, 9; and Language, 9.

ESSENTIAL TRAINING TASKS

Physical Requirements

Ability to:

1. Reach.
2. Exhibit a high degree of manual dexterity.
3. Stoop.
4. Crouch and/or bend.
5. Exhibit a high degree of finger dexterity.
6. See (near acuity).
7. Lift 50 pounds or less.
8. Communicate.

Mental and Emotional Requirements

Ability to:

1. Work with others.
2. Make decisions.
3. Cope with anger/hostility of others in a calm manner.
4. Cope with moderate to high levels of stress.
5. Cope with confrontation.
6. Cope with frustration.
7. Assist with problem resolution.
8. Demonstrate a high degree of patience.
9. Plan and organize daily activities.
10. Apply common sense understanding to carry out instructions furnished in both written and oral form.
11. Tolerate moderate noise level.
12. Measure accurately.
13. Work without close, direct supervision.
14. Work on multiple tasks and priorities.
15. Perform and complete tasks of relative complexity.
16. Perform basic mathematical operations.
17. Demonstrate mechanical skills.

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 to ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary provider.

Students desiring accommodations or updates to their accommodations are encouraged to self-identify as early in the program as possible. In order to receive disability accommodations, students must self-disclose the disability to the Students with Disabilities Coordinator and provide documentation that clearly shows evidence of a disability and applicable accommodations. The Students with Disabilities Coordinator will schedule a meeting with the student and instructor to discuss the documented disability and applicable accommodations.

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, assessments, time demands, schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodation requested and provided is maintained in a confidential file.

MATERIALS

Students are required to purchase the following equipment, supplies, and textbooks:

- Welding helmet
- Jacket, leather sleeves with bib
- Wire brush
- Burning goggles
- Grinding goggles
- Chipping hammer
- Tape
- Gloves
- Tip cleaner
- Flint lighter
- Pocket welding guide
- 100% cotton long-sleeved shirt
- 100% cotton pants

TUITION

Tuition is charged for adult students at a rate established by the State legislature. Current fee information is available in the Admissions Office. Tuition is waived for eligible high school dual-enrolled students. Tuition is due prior to the first day of each semester based on the Lake Technical College payment calendar. Failure to pay all fees due at the time class begins will result in not being able to attend class and/or clinical if applicable.

CLASS SCHEDULE

Full-time students attend class from 8:00 AM to 2:30 PM Monday through Friday with a 30 minute lunch period. This schedule provides 6 hours of instruction each day for a total of 30 hours per five-day week, excluding holidays and school breaks as outlined in the current school calendar.

ATTENDANCE POLICY

In an effort to develop appropriate work ethics, Lake Tech students are expected to attend all class sessions. As is expected in the workplace, when it is necessary to be absent due to illness or emergency situations, all students are to notify the instructor on or before the date of absence. The student attendance policy for each postsecondary program is consistent with industry standards.

Campus attendance is kept via a computerized system. It is the responsibility of the student to **log in and out** in order to receive credit for class time. This allows the school to keep accurate attendance records for the actual number of hours and minutes attended.

Absences

A student who is absent for six (6) consecutive class sessions will be withdrawn from enrollment in his/her program. A student withdrawn for absenteeism must petition administration to return. Students exhibiting a pattern of consecutive absences less than six days will be subject to dismissal as determined by a School Intervention Team.

Students in non-licensure programs must have achieved a minimum of 80% attendance at the end of each quarter. Students not having met this requirement will sign an acknowledgement that they have been notified that continued absences will pose a threat to grades and program enrollment. School Intervention Team meetings will be held as necessary to attempt to alleviate issues resulting in excessive absences and to counsel the student of possible alternatives and consequences. Students who miss more than 20% of their program will not be allowed to re-enroll the next semester and must wait until the following enrollment period to re-register unless the student's appeal to the Director has been approved. Only regularly scheduled class hours will be reported for attendance.

Tardiness

As in the workplace, students are expected to be in their seats promptly in the morning, after break, and after lunch. Students are expected to notify the instructor before the start of class of any anticipated tardies.

Leaving Campus During School Hours

For safety reasons, students will notify their instructor when leaving campus early. Students may leave campus for lunch provided this is done within the allotted time.

PLAN OF INSTRUCTIONAL PRACTICES

Methods of Teaching

Material used is self-paced and competency based. Students proceed at their own pace with written, audio-visual, and hands-on training. They are tested periodically with written and practical testing. Practical shop experiences are designed to enhance and reinforce the theories involved as well as to develop manipulative skill and good work and safety practices.

Methods of instruction include: associated activities; demonstrations; manipulative operations; group instruction; related technology; shop talk; safety and motivation; individual instruction; and remedial work.

Teaching Aids

- DVDs
- Charts

Online Access

Technology is an integral part of our daily lives. From smart phones to electronic tablets, these devices are becoming items that many cannot function without. In addition, the Internet is changing the way education is delivered. Lake Technical College strives to ensure that our students are able to compete in this technology driven world. With this in mind, it is recommended that students have an online presence and access to the internet. LTC campus computer labs are available to those without this access. Please let your instructor know if you need to use the campus computer labs, and scheduling information will be provided to you.

It is also important that students have an email address that they check on a regular basis. A lot of information may come to you through your email, so it is important that you check it regularly. If you do not have an email address, there are numerous services that provide FREE email addresses. Please make sure your instructor(s) have a current, working email address for you. See your instructor for more information.

Social Media

The advent of social media has created a world-wide communication medium for persons of all ages. While extremely popular, these websites have also created their own set of “not-so-popular” problems such as cyber-stalking, identity theft, cyber-bullying, cyber-cheating (posting of exam, or other course material), and a host of other nebulous challenges that users may face. Another reality associated with social media is its far-reaching consequences for those who share posts that may be seen by others as inappropriate.

Potential employers, current employers, civic, or educational organizations you may be associated with, and many others are looking at social media sites for information that may tell them things about you. You should also be cautioned on how private your social media content really is – despite the settings on your account. All social media sites are potentially vulnerable. A simple search of how to view pages that are set as “private” for a popular social media website yielded numerous responses for ways to view the content. Everything from blogs to online videos offer to explain how to accomplish this task.

Students in all programs need to be cognizant of the fact that the most professions rely on great moral character. It is recommended that when using social media, assume that your posts will be seen/read by everyone with access to the Internet.

Laboratory Activities

Shop or laboratory activities are an integral part of this program and provide instruction in various processes and techniques of welding and fabrication skills, including thermal cutting, Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Flux Cored Arc Welding (FCAW), Gas Tungsten Arc Welding (GTAW), Certification Test Preparation, and use of current industry standards, practices and techniques.

Work Based Activities

Work-based learning activities play an integral part of the curriculum of Lake Technical College’s (LTC) career-technical training programs. These activities are planned with two objectives in mind. First, the activity provides students with the opportunity to develop and apply a “real world” experience using the knowledge and skills attained in the program. Second, the activity provides the instructor with objective input from potential employers or customers of program graduates. Each work-based activity has a written instructional plan outlining objectives, experiences, competencies and evaluation required during the activity.

Work-based activities are program specific and may include:

- Unpaid in-school shop/lab activities to provide customer service opportunities under the direct supervision of the program instructor(s).
- Unpaid job shadowing experiences that may include in-school or off-campus employer-based experiences under the supervision of a qualified employer representative who is working closely with the program instructor(s).

- Paid or unpaid cooperative training experiences conducted at the employer's work location under the supervision of a qualified employer representative and under the direction of the program instructor.

Co-operative Education

Co-operative training is available for students and coordinated by the program instructor. Co-operative training is for students who have shown competence in program training, which indicates readiness for placement in an on-the-job program. High school students participating in the co-operative job placement program must be in at least the 12th grade.

Students who do not function satisfactorily on the job may be returned to the program for additional training or when the co-operative agreement is terminated at the request of the student, the parent, the employer, or the program instructor.

Additional information regarding co-op opportunities may be obtained from the program instructor.

Veterans will be accepted into the program in accordance with the Department of Veterans Affairs policies.

Job Shadowing

Job shadowing experiences or volunteer experiences are available to students who may benefit from the experience. These experiences are designed to give the student actual hands-on experience doing a variety of welding related tasks. Length and type of experiences will vary. The program instructor determines appropriateness of the experience. Additional information regarding job-shadowing experiences may be obtained from the program instructor.

Student Job System

1. Tool Room Foreman
 - a. Checks out tools
 - b. Issues welding supplies
2. Safety Foreman
 - a. Checks fire extinguishers
 - b. Keeps safety lanes painted
3. Shop Foreman
 - a. In charge of cleanup and break time
 - b. Helps with student problems

Program Enrollment for High School Students

All students enrolled in Lake Technical College are expected to function as adults. High school students will be held to the same behavioral and performance standards as adult students.

GRADING PROCEDURE

Grading Scale

The grading policy for this program is as follows:

90-100	Excellent
80- 89	Passing
< 80	Failing

Lake Technical College is a postsecondary institution designed to provide trained individuals to industry. The grading scale for this program reflects industry standards. The approved postsecondary program grading requirements must be met if the student is to receive a certificate.

In order to successfully complete the Welding Program, the student must achieve a minimum 80% passing rate.

Grades will be based on three areas:

1. Skills - production (counts for 33 1/3% of the grade)
2. Knowledge - exams, quizzes, class participation (counts for 33 1/3% of the grade)
3. Work Habits – listed below (counts for 33 1/3% of the grade)

Work Habits

Effective work habits are the cornerstone to successful employment. Students are expected to demonstrate productive work habits during all phases of enrollment. Instructors will work with students who need assistance in this area to improve the overall possibility for successful employment.

Attendance: Attends class for all scheduled hours assigned, arrives/leaves on time, contribute to class discussion and is actively involved in all activities.

Character: Displays academic integrity (inclusive of not committing plagiarism), trustworthiness, dependability, reliability, self-discipline, and self-responsibility.

Teamwork: Respects the rights of others; is a team worker; is cooperative; ensures confidentiality in all classroom, clinical and other matters; demonstrates professional behavior in interactions with peers, preceptors, and instructors.

Appearance: Displays appropriate dress, grooming, hygiene, and wears full regulation uniform of the day.

Attitude: Displays a willingness to cooperate and accept constructive criticism; sets realistic expectations; approaches assignments with interest and initiative.

Productivity: Follows safety practices; conserves materials and supplies; maintains equipment; stays on task and utilizes time constructively; demonstrates proactive learning through involvement in activities and contributions to class discussions.

Organization: Manifests skill in prioritizing and management of time and stress; demonstrates flexibility in handling change; completes assignments on time; uses work time appropriately.

Communication: Contacts instructor to report concerns; notifies instructor of tardy/absence one hour before start of class; seeks clarification and understanding through appropriate, pertinent questions.

Leadership: Displays leadership skills; appropriately handles conflict and concerns; demonstrates problem-solving capability; maintains appropriate relationships with supervisors/instructors and peers; follows the chain of command.

Respect: Deals appropriately with cultural/racial diversity; does not engage in harassment of any kind to include but not limited to verbal, nonverbal, and written; addresses instructors and peers in appropriate tone and with appropriate language to include but not limited to electronic (email, text, etc.) communications.

Program Progress

Students are expected to complete the program of training within the hours allotted by the State of Florida for completion. The student's rate of progress will be closely monitored by the instructor to ensure program completion in a timely manner.

Requirements for a Certificate

All competencies specified in the State of Florida Curriculum Framework for the program must be successfully completed with at least an 80 percent in the areas of skills, knowledge, and work habits. Students must also meet minimum TABE requirements prior to graduation.

STUDENT DRESS CODE

Students who attend Lake Tech shall dress in a manner appropriate for the job in which they are receiving training, including any special protective gear and professional uniforms. All clothing must be clean, neat, modest, in good repair, appropriately sized, and be neither distracting nor offensive. Jewelry and makeup, if worn, must be in accordance with the program Master Plan of Instruction. Please refer to the Master Plans of Instruction for individual program dress code policies.

The Director or designee has the final authority for determining whether or not a student's apparel conforms to the dress code. If it is determined that it does not, students will be required to change into clothing which will conform to this code or leave campus. Students may return to campus when they have changed into appropriate clothing.

Minimum Program Dress Code

1. Pants shall be worn fastened and at the waist. Pants should be dark colored, straight legged or boot cut (jeans are acceptable). Baggy pants are not permitted in any program area. Baggy pants are considered to be more than one size larger than the individual's waist. Shorts are not permitted.
2. Shoes must meet safety/industry standards. Sandals are not permitted
3. Program logo school T-shirts are to be worn.
4. Clothing should be clean and in good repair.
5. For safety reasons, shorts, loose clothing, jewelry, and loose hair below the collar are not allowed.
6. Hats are only permitted in shop areas and must meet the instructor's specifications for safety and appropriateness.

GENERAL SCHOOL INFORMATION

Campus Safety

Lake Technical College makes every effort to provide a safe environment for all students, visitors, faculty and staff. Basic safety standards, which will include fire drills, weather drills, equipment usage, and traffic regulations, will be covered in the program orientation. These basic safety standards will be reinforced throughout the program enrollment. See the current school catalog for additional campus safety information.

Competency-based Instruction

Any student who enters a LTC program with previous experience or educational background that would enable the student to successfully complete a test of competence in any area may, with the permission of the instructor, complete a test to measure that competence.

Follow Up

Lake Technical College is proud of its graduates and celebrates the next step graduates take whether it is employment, military or further education. Prior to completing, students may visit the Career Success Center for assistance with employability skills such as resume writing. In addition, instructors may provide students with employment leads. However, it is up to the individual student to actively pursue employment opportunities. We like to hear how our graduates are doing and want to celebrate your successes so be sure to communicate with your instructor any employment, military, or further education you enter.

Food and Drink in Program Areas

To protect equipment and furnishings in the classroom and laboratory areas, only water, in closed, covered containers, is permitted. No other food or drinks are allowed, unless specific permission is granted by the instructor. However, under no circumstance may food or drinks be in the laboratory areas.

Lunch

Food services are provided on the main campus by the Culinary Institute and are available during breaks and lunch. Adult students may leave the LTC campus during the scheduled 30-minute lunch break as long as they return to the program on time.

Parking Regulations

Students may park only in the south parking lot in spaces not designated as staff or customer service parking. For safety, loitering in or around vehicles once the vehicle is parked is not allowed, and a 10 mph speed limit is enforced. In consideration of the neighbors and classes in session, loud music in vehicles on campus is prohibited.

Smoking

Lake Tech is a tobacco free institution. The use of tobacco products of any kind, including e-cigarettes, is not permitted at any Lake Tech location.

FINANCIAL AID

Policies and guidelines for the administration of all financial aid are established according to federal and state law. Applicants complete an information form, Free Application for Federal Student Aid, and furnish documentation needed to verify eligibility. More information on the application process may be obtained in the Financial Aid Office.

The Financial Aid Office will assist students, where possible, with access to financial support offered by federal agencies (U.S. Department of Education – Pell Grants, Department of Veterans' Affairs), other state and local agencies and local organizations (scholarships).

JOB DESCRIPTION

The welder constructs, erects, installs, and repairs all types of metal fabrication, machine frames, pipe lines, and pressure tanks. He/she used oxyacetylene, electric and, heli arc, micro wire, plasma arc cutter, and plasma arc welding machines.

He/she studies blueprints and sketches to determine the type of electrodes and metals to use in construction and measurements required.

He/she prepares layouts using tapes, square, and straight edge and marks cutting and assembly lines on material using pencil, soapstone, and metal markers.

The work of the welder is active and sometimes strenuous, but exceptional physical strength is not required. Prolonged standing as well as climbing and squatting is often necessary. Good physical condition, eyesight, and the ability to communicate are important.

The welder works both inside and outside in heat and cold and is subject to extreme temperature changes. The work may be performed under wet or humid conditions. Job conditions may be noisy.

Welders risk injury from slips and falls, contact with sharp metal, burns, spark radiation from the arc fumes, electric shock, and grinding machines. Welders should always have good ventilation and stay as dry as possible.

TEXTBOOKS

- Welding Technology Fundamentals
- Welding Technology Fundamentals Lab Manual

PROGRAM OBJECTIVES

See the attached Florida State Department of Education curriculum framework for program objectives and desired competencies.

Florida Department of Education
Curriculum Framework

Program Title: Welding Technology
Program Type: Career Preparatory
Career Cluster: Manufacturing

PSAV – Career Preparatory	
Program Number	J400400
CIP Number	0648050805
Grade Level	30, 31
Standard Length	1050 hours
Teacher Certification	WELDING @7 7G METAL WORK 7G
CTSO	SkillsUSA
SOC Codes (all applicable)	51-9198 – Helpers-Production Workers 51-4121 – Welders, Cutters, Solderers, and Brazers
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml
Basic Skills Level	Mathematics: 9 Language: 9 Reading: 9

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 the welding industry.

The content includes but is not limited to planning, management, technical and product 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 three 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.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	PMT0070	Welder Assistant 1	150 hours	51-9198
	PMT0071	Welder Assistant 2	150 hours	51-9198
B	PMT0072	Welder, SMAW 1	150 hours	51-4121
	PMT0073	Welder, SMAW 2	150 hours	51-4121
C	PMT0074	Welder	450 hours	51-4121

National Standards

Programs identified as having Industry or National Standards corresponding to the standards and/or benchmarks for the Welding Technology program can be found using the following link:

<http://www.aws.org/w/a/certification/CW/>

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 and apply workplace safety and workplace organization skills.
- 02.0 Demonstrate basic knowledge of industrial and manufacturing processes.
- 03.0 Describe and identify metals and their properties accurately.
- 04.0 Demonstrate basic knowledge of drawing and interpreting welding symbols.
- 05.0 Apply basic oxyfuel gas cutting principles and practices.
- 06.0 Create a product using basic oxyfuel gas cutting principles and practices.
- 07.0 Apply knowledge of drawing and interpreting welding symbols
- 08.0 Apply intermediate oxyfuel gas cutting principles and practices.
- 09.0 Demonstrate plasma arc cutting principles and practices.
- 10.0 Demonstrate a basic understanding of shielded metal arc welding (SMAW).
- 11.0 Create a product using basic shielded metal arc welding (SMAW) principles and practices.
- 12.0 Apply basic shielded metal arc welding (SMAW) skills.
- 13.0 Demonstrate and apply Carbon Arc Gouging (GAC) principles and practices.
- 14.0 Apply visual examination skills.
- 15.0 Create a product using Carbon Arc Gouging and basic shielded metal arc welding (SMAW) principles and practices.
- 16.0 Demonstrate an understanding of employability skills and career opportunities related to the welding industry.
- 17.0 Apply intermediate shielded metal arc welding (SMAW) skills.
- 18.0 Create a product using intermediate shielded metal arc welding (SMAW) principles and practices
- 19.0 Apply basic gas metal arc welding (GMAW) skills.
- 20.0 Apply intermediate gas metal arc welding (GMAW) skills.
- 21.0 Apply basic flux-cored arc welding (FCAW) skills.
- 22.0 Apply intermediate flux-cored arc welding (FCAW) skills.
- 23.0 Apply basic gas tungsten arc welding (GTAW) skills.
- 24.0 Apply intermediate gas tungsten arc welding (GTAW) skills.
- 25.0 Demonstrate and apply basic pipe welding principles and practices.