Providence Career & Technical Academy
"Maritime Welding and Pipefitting Program - Years 1-4" Syllabi

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Year 3 - "Level II"

Instructor Name: Nate Hoffman **Time Frame:** 2021-2022
Email: nathan.hoffman@ppsd.org

Course Description:

The Maritime Welding Program's, "Level II" course, is the third year of instruction received in the four year Maritime Welding Program. Meeting five periods per day, for five days, every other week, this course will serve as an introduction into the principles and fundamentals of maritime welding, and it will continue a more in-depth look into the electric arc welding processes continuing with advanced instruction and practical application in the Shielded Metal Arc Welding (SMAW) process, as well as introductions to welding symbols, welding and mechanical drawings, physical/mechanical characteristics of metals, pre/post-heating of metals, and the Gas Metal Arc Welding (GMAW) and Flux Core Arc Welding (FCAW) processes. Emphasis will continue on safety in the workplace, construction math, employability skills, communication skills and material handling skills, as well as reinforcement of key scientific theories and principles that include electricity, metallurgy, physics, chemistry, and other fundamental concepts that surround cutting and metal joining technologies. **Prerequisite: "Maritime Welding Program - Level I."**

Students will obtain basic knowledge of the following, in no specific order:

- Shielded Metal Arc Welding (SMAW)
- Gas Metal Arc Welding (GMAW)
- Flux Core Arc Welding (FCAW)
- Welding Symbols
- Reading Welding Detail Drawings
- Physical Characteristics and Mechanical Properties of Metals
- Pre-Heating and Post-Heating Metals
- Shop Practices
- Employability Skills
- Safety, Tools & Equipment
- Electrical Safety
- Basic Employability Skills
- Basic Communication Skills
- Material Handling Skills
- Introduction to hand Tools
- Introduction to Construction Math

Common Core Standards Addressed:

- GMP 1.6: Connect mathematical ideas and representations to one another.
- GMP 2.2: Explain the meanings of the numbers, words, pictures, symbol, gestures, tables, graphs, and concrete objects you and others use.
- GMP 3.1: Explain both what to do and why it works.
- GMP 4.1: Apply mathematical ideas to real-world situations.
- GMP 5.3: Estimate and use what you know to check the answers you find using tools.
- GMP 6.1: Communicate your mathematical thinking clearly and precisely.
- GMP 8.3: Reflect on your thinking before, during, and after you solves a problem.
- W.9-10.2: Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

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- ➢ W.9-10.3: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.
- ➢ W.9-10.7: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Required Textbooks, Reading and Supplementary Materials

Textbook: *NCCER - "Core Curriculum: Introductory Craft Skills, Fifth Edition;" NCCER - "Introduction to the Maritime Industry;" NCCER – "Welding, Level - 1, Fifth Edition;" NCCER – "Welding, Level - 2, Fifth Edition;" along with a variety of online resources.*

Assignment and Examination Schedule:

LESSON NAME	MODULE #	BOOK	TIME
SMAW - BEADS AND FILLET WELDS (Refresher)		**WELDING LEVEL-1**	**20 HRS**
SMAW PREPARATIONS	29109-15	**WELDING LEVEL-1**	2 HRS
SMAW TECHNIQUES	29109-15	**WELDING LEVEL-1**	18 HRS
JOINT FIT-UP AND ALIGNMENT		**WELDING LEVEL-1**	**6 HRS**
JOINT FIT-UP AND ALIGNMENT TOOLS	29110-15	**WELDING LEVEL-1**	3 HRS
WELDMENT DISTORTION	29110-15	**WELDING LEVEL-1**	3 HRS
SMAW - GROOVE WELDS WITH BACKING		**WELDING LEVEL-1**	**60 HRS**
GROOVE WELDS	29111-15	**WELDING LEVEL-1**	5 HRS
V-GROOVE WELDS WITH BACKING	29111-15	**WELDING LEVEL-1**	55 HRS
SMAW - OPEN ROOT GROOVE WELDS - PLATE		**WELDING LEVEL-1**	**70 HRS**
OPEN GROOVE WELDS	29112-15	**WELDING LEVEL-1**	5 HRS
OPEN ROOT V-GROOVE WELDS	29112-15	**WELDING LEVEL-1**	65 HRS

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WELDING SYMBOLS		**WELDING LEVEL-2**	**5 HRS**
WELDING SYMBOLS	29201-15	**WELDING LEVEL-2**	5 HRS
READING WELDING DETAIL DRAWINGS		**WELDING LEVEL-2**	**12 HRS**
BASIC WELDING DETAIL DRAWINGS	29202-15	**WELDING LEVEL-2**	7 HRS
DIMENSION, NOTES AND MATERIALS	29202-15	**WELDING LEVEL-2**	5 HRS
PHYSICAL CHARACTERISTICS AND MECHANICAL PROPERTIES OF METAL		**WELDING LEVEL-2**	**8 HRS**
METAL COMPOSITION AND CLASSIFICATION	29203-15	**WELDING LEVEL-2**	3 HRS
METAL CHARACTERISTICS	29203-15	**WELDING LEVEL-2**	3 HRS
COMMON STRUCTURAL STEEL SHAPES	29203-15	**WELDING LEVEL-2**	2 HRS
PREHEATING AND POST-HEATING OF METALS		**WELDING LEVEL-2**	**6 HRS**
PREHEATING AND POST-HEATING OF METALS	29204-15	**WELDING LEVEL-2**	3 HRS
TEMPERATURE MAINTENANCE AND POST-HEATING PROCESSES	29204-15	**WELDING LEVEL-2**	3 HRS
GMAW AND FCAW EQUIPMENT AND FILLER METALS		**WELDING LEVEL-2**	**12 HRS**
GMAW AND FCAW WELDING	29205-15	**WELDING LEVEL-2**	4 HRS
GMAW AND FCAW EQUIPMENT	29205-15	**WELDING LEVEL-2**	4 HRS
FILLER METALS	29205-15	**WELDING LEVEL-2**	4 HRS
GMAW - PLATE		**WELDING LEVEL-2**	**70 HRS**
GMAW WELDING	29206-15	**WELDING LEVEL-2**	5 HRS
WELDING PROCEDURES AND BASIC BEADS	29206-15	**WELDING LEVEL-2**	15 HRS
GMAW FILLET AND V-GROOVE WELDS	29206-15	**WELDING LEVEL-2**	50 HRS

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FCAW - PLATE		**WELDING LEVEL-2**	**70 HRS**
FCAW WELDING	29207-15	**WELDING LEVEL-2**	5 HRS
WELDING PROCEDURES AND BASIC BEADS	29207-15	**WELDING LEVEL-2**	15 HRS
FCAW FILLET AND V-GROOVE WELDS	29207-15	**WELDING LEVEL-2**	50 HRS

Grading Policy:
We encourage all students to come to class prepared, do their homework and participate in all class activities. In an effort to measure students' true knowledge of the course content and their employability skills, assessments, tests, quizzes, attendance, class/shop conduct will all be factored in the grades of all students.

Student's final grades will be broken down as follows:

1. Summative Assessments{ 45%
2. Formative Assessments: 35%
3. Employability Skills: 20%

Total: 100%

Any student who obtains a score of less than 70% in any classroom summative assessment will be qualified to retake the assessment only after he/she completes all necessary preparatory assignments. Tests that are re-taken can receive a maximum score of 90%.

EXPECTATIONS:

Safety
The electric arc and oxy-fuel welding and cutting processes are inherently dangerous processes that require strict safety practices to ensure the safety of everyone. The dangers of welding include, but are not limited to: electric shock; burns; exposure to arc rays; exposure to fumes; and other general construction safety hazards. Therefore, to ensure student safety, we expect that all students will thoroughly understand and adhere to the safety procedures established. Due to the inherent and associated risks, safety training will take place at the beginning of each school year. Horseplay and not adhering to proper safety will affect not only the "Employability Skills" portion of the grade, but will also limit the amount of in-shop, hands-on work a student is able to perform and may result in students not being allowed to perform certain assessments.

*****Students who are found to pose a persistent danger to themselves or others, will be removed from the Maritime Welding program.** ***

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*****We strongly caution students from performing any work outside of school that is learned in this course, without the proper supervision of a qualified professional, until they are deemed professionally upon successful completion of this course.*****

Effort
We expect all students to give 100% and always try their hardest. Our responsibility is to make sure this effort is rewarded with learning.

Conduct
We expect all students to adhere to the school's handbook regarding classroom conduct. It is important for student learning and student safety that the learning environment be safe and free from physical and emotional dangers. **Teasing, bullying, hurtful, disrespectful and unsafe behaviors will NOT be tolerated.**

PCTA Maritime Welding Program
Prior to RTI (Response to intervention)

1. The Welding Department shall identify on a monthly basis any student who has frequent absences, several missed assignments, and lack of productivity in the lab area.

2. Upon identifying a student with needs, a meeting shall be made with the student, guidance and the director of CTE to evaluate the student's lack of performance when attending Maritime Welding classes. This meeting will allow the student and instructor to produce a comprehensive plan with the help of a guidance counselor and the CTE director to get the student to the appropriate performance level. This gives the student the opportunity to be a part of his or her education and redirection of their Career and Technical Education Training.

3. If the student does not comply with the agreement within 2 weeks, a representative from the Welding Department will contact the guidance department to make an appointment for a second conference including the parent to discuss any issues or concerns about their child.

4. If student performance continues to decline the student will be referred to RTI (see below for RTI plan)

RTI Plan

1. The welding department will review student performance and identify any potential students who are in the "at risk" category. The "at risk" category is defined as any freshmen or sophomore student missing more than 22 days in one quarter, also any student who fails one full module from the curriculum. The above will also apply to juniors and seniors, with the more stringent requirement that the student not miss more than 11 days per quarter.

2. Once "at risk" students have been identified, a spreadsheet shall be forwarded to guidance and special

education. The spreadsheet will be filed permanently in the welding department.

3. A meeting shall be scheduled with the RTI team to discuss further actions to create a comprehensive plan for the students to succeed.

4. Upon the student's completion of RTI, the Welding Department shall contact the RTI team to discuss whether the student shall be referred to special education, or if they can be dismissed from the Response to Intervention (RTI) plan.