TRADES AND APPRENTICESHIP CAREER CLASS CURRICULUM

IMPORTANT INFORMATION FOR INSTRUCTORS AND PROGRAM DIRECTORS

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Acknowledgements

This curriculum is an update of the materials and activities that are part of Oregon Tradeswomen Inc.'s successful Trades and Apprenticeship Career Class (TACC). Most of the content is based on the existing TACC content. These updated materials were developed by George Reese Instructional Design & Training, LLC.

The following individuals contributed valuable expertise, ideas, and guidance for this project:

- From Oregon Tradeswomen, Inc.
    - Abby Bandurraga, Pathways Program Manager and TACC Instructor
    - Amy James Neel, Construction Manager / Job Developer and TACC Instructor
    - Leigh McIlvaine, WANTO Project Manager
- TACC graduates, employers, and construction apprenticeship training coordinators also provided helpful input and guidance regarding the curriculum.

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How Will This Document Help Instructors and Program Directors?

This document provides an overview of, and important information about this curriculum. It will help you determine which parts of the curriculum will be most helpful to your students and how it can support the goals of your program. It answers these questions:

- What is important to know about the students this curriculum is designed for?
- What is important to know about the instructors this curriculum is designed for?
- What is important to know about this curriculum?
- What can this curriculum help students learn to do? (the Outcomes and Objectives)
- How is this curriculum organized? (the Modules)
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- What is important to know about using the materials?
- How can this curriculum contribute to a safe and motivating learning environment for students?
- What facilities and equipment are required for this curriculum?

What Is Important to Know About the Students This Curriculum is Designed for?

This curriculum is designed for students similar to those who enroll in Oregon Tradeswomen Inc.'s Trades and Apprenticeship Career Class: women from diverse backgrounds with a variety of education and experience, including some work experience in construction or related industries. Entrance requirements for TACC include the following:

- A GED or HS Diploma
- A driver's license
- A stable living situation
- Stable health
- Six months or longer of sobriety
- Good physical condition (able to do physical labor all day)
- Ability to pass a drug test
- Basic English communication skills
- Commitment to a career in the trades
- Readiness to go to work

By the first week of class, all students must take the Accuplacer or COMPASS tests at their local community college. Oregon Tradeswomen, Inc. arranges for tutors to work with students who need additional help in math as indicated by their test scores or performance in the math modules.

What Is Important to Know About the Instructors This Curriculum is Designed for?

To successfully teach this curriculum you should be an experienced tradeswoman who is knowledgeable about all aspects of the curriculum content. In addition to being the instructor, you will serve as a role model. Students will be particularly interested to learn about your experience in the field. You should be able to share stories, from your own experience and observations, about construction culture, job search strategies, local apprenticeships and employers, dealing with harassment or discrimination, and other issues related to a career in the trades. You should also be able to provide "survival" tips on topics such as what to wear and bring to the job site, where to purchase quality clothing and tools, etc.

What Is Important to Know About This Curriculum?

This curriculum is an updated version of the classroom portion of Oregon Tradeswomen, Inc.'s (OTI) successful Trades and Apprenticeship Careers (TACC). TACC is a seven-week, registered pre-apprenticeship program that helps women of diverse backgrounds prepare for high skill, high wage careers in the building, construction, mechanical and utility trades.

Some elements of OTI's TACC program are not included in this curriculum. They include: student and instructor introductions and icebreakers, physical fitness, hands-on use of tools, construction culture, framing, and OSHA 10 (provided by a local construction union). OTI also provides students with job shadows, hands-on work experiences, and field trips to apprenticeship training centers and active construction sites. Those program elements are also not addressed in this curriculum.

This curriculum does not attempt to address all of the knowledge and skills that would be helpful for women entering the trades. The content was selected and developed based on input from TACC instructors (experienced tradeswomen), employers, apprenticeship training coordinators, and former students. Programs that are considering using these materials should consult with their local employers and apprenticeships to learn how to tailor the curriculum to meet the needs of their own community.

The curriculum consists of:

- student and instructor materials for 14 modules, which are listed in the section entitled How Is This Curriculum Organized? below
- three, 5 – 6 problem math quizzes
- a math practice test
- a math final test

You can choose to use some or all of the modules in your own training program. The math and measurement modules should be offered in the sequence identified in the section entitled How Is This Curriculum Organized? because the content in each module builds on content in the previous module. All of the modules are designed to be delivered face-to-face, by experienced tradeswomen. The curriculum should not be offered on-line or in a self-paced format.

The only formal classroom assessments included in this curriculum are the math quizzes and tests. However, Oregon Tradeswomen, Inc. expects their students to apply all of their learning in the job shadow and work experiences that are part of their program. OTI uses a formal process to assess and provide feedback to students based on their performance in those settings.

This curriculum does not specify homework assignments. OTI requires students to create their resumes as a homework assignment. Homework is kept to a minimum because most students have many responsibilities outside the class, including work and family, and because some students do not have ready access to computers or other resources.

What Can This Curriculum Help Students Learn to Do? (The Outcomes and Objectives)

Following are the intended outcomes and supporting objectives for the curriculum. The intended outcomes are the things students should be able to do out in the real world, after the class. Objectives are the things students should be able to *during* the class that will prepare them to achieve the outcomes.

Outcome 1: Persist through difficulty and frustration to achieve your goals – Module 1

- Explain what grit is
- Explain how grit contributes to success
- Recognize grit
- Identify ways to be gritty
- Demonstrate grit
- Explain what a growth mindset is
- Explain how a growth mindset contributes to success
- Explain how failure contributes to success
- Recognize a growth mindset
- Identify ways to build or strengthen your growth mindset
- Demonstrate a growth mindset
- Identify strategies to reduce math anxiety
- Apply strategies to reduce math anxiety

Outcome 2: Measure spaces and materials to successfully complete construction projects – Module 3

- Explain what a fraction is
- Determine which of two fractions is the largest
- Identify parts of a tape measure
- Read a tape measure to 1/16”
- Measure length using a tape measure

Outcome 3: Calculate the amount of material needed to successfully complete construction projects

- Identify polygons that are common in construction – Module 2
- Calculate the perimeter of polygons that are common in construction – Module 2
- Calculate the area of polygons that are common in construction – Module 2
- Multiply fractions – Module 4
- Simplify fractions – Module 4
- Convert between improper fractions and mixed numbers – Module 4
- Divide fractions – Module 5
- Explain what a common denominator is – Module 6
- Find common denominators – Module 6
- Add fractions – Module 6
- Add mixed numbers – Module 6
- Subtract fractions – Module 7
- Subtract mixed numbers – Module 7
- Convert between inches and feet – Module 8
- Explain what a decimal is – Module 9
- Convert between measurements in fractions and decimals – Module 9

Outcome 4: Ensure your safety and the safety of everyone on the job site – Module 10

- Eliminate common hazards on the job site
- Lift objects safely
- Use a hammer safely
- Identify personal protective equipment common to the trades
- Identify the parts of a cordless drill

- Use a cordless drill safely
- Use and put cords away safely

Outcome 8: Select the correct tool for the task you are working on – Module 11

- Identify common construction tools

Outcome 4: Obtain a job or apprenticeship in your desired trade – Module 12

- Explain the three typical pathways to a construction career
- Explain the basic aspects of registered apprenticeships
- Describe the typical construction apprenticeship career path
- Explain the differences between union and open shop apprenticeships
- Identify resources and strategies for finding openings for apprenticeships or other jobs in construction
- Conduct an informational interview
- Identify the main components of a resume for apprenticeships or other jobs in construction
- Identify the characteristics of a strong resume for apprenticeships or other jobs in construction
- Create a resume that will encourage construction apprenticeships or employers to interview you

Outcome 5: Develop and maintain habits of successful apprentices and construction workers – Module 13

- Identify what to wear and take to work
- Explain what “on time” means in the construction industry

Outcome 6: Respond appropriately to sexual harassment and discrimination – Module 14

- Define sexual harassment
- Identify types of sexual harassment
- Distinguish sexual harassment from other behaviors
- Identify examples of sexual harassment
- Identify individuals playing each of the four roles that are often involved in a sexual harassment scenario
- Describe a variety of responses to sexual harassment
- Define gender discrimination
- Identify resources that provide more information about gender discrimination

How Is This Curriculum Organized? (The Modules)

This curriculum is divided into 14 modules. You can choose to use some or all of the modules in your own training program. Whichever you choose, you are strongly encouraged to begin with Module 1 – Grit, Growth Mindset, and Math Anxiety – and reinforce those concepts throughout the program with the goal of strengthening students' confidence and sense of themselves as capable tradeswomen.

The math and measurement modules (Modules 2 – 9) should be offered in the sequence shown below because the content in each module builds on content in previous modules. For example, the first math module, Perimeter and Area of Polygons (with whole numbers only), shows students why the ability to use a tape measure is an important skill in the trades. Subsequent modules require students to calculate perimeter with fractions. Multiplying Fractions is offered before the other operations because it is the easiest. Success in multiplying fractions can help students build confidence in their ability to do math before moving on to more challenging operations. Also, students learn to simplify fractions and convert between improper fractions and mixed numbers in the Multiplying Fractions module, so it should

precede dividing, adding, and subtracting fractions. Students learn to find common denominators in Adding Fractions so it must precede Subtracting Fractions.

Of course it is essential to ensure that students learn how to properly use tools and keep themselves and others safe. The Safety and Tools modules, along with additional training on safety and tools, should be offered before students begin any activity that might pose a hazard. The remaining modules in the curriculum can be offered in any order.

The timing suggested for modules 1 – 9 is only an estimate. Your students might need less or more examples and practice than is provided in each module. The actual amount of time you spend on each module will depend on your students, the amount of classroom time scheduled for your program, and other factors.

These Modules Should Be Offered in This Sequence

Module 1 - Grit, Growth Mindset, and Math Anxiety (1 hour 35 minutes)

Module 2 - Perimeter and Area of Polygons (2 hours)

Module 3 - Fractions and Measurement (4 hours)

Module 4 - Multiplying Fractions – includes simplifying fractions, and converting between improper fractions and mixed numbers (5 hours and 45 minutes)

Module 5 - Dividing Fractions (3 hours and 30 minutes)

Module 6 - Adding Fractions (3 hours)

Module 7 - Subtracting Fractions (2 hours)

Module 8 - Converting Between Inches and Feet (3 hours 30 minutes)

Module 9 - Converting Between Fractions and Decimals (3 hours 30 minutes)

These Modules, and Additional Training on Safety and Tools, Should Be Offered Before Students Begin Any Activity That Might Pose a Hazard (no timing is suggested for these modules)

Module 10 - Safety

Module 11 - Tools

These Modules Can Be Offered in Any Sequence and Interspersed with the Modules Listed Above (no timing is suggested for these modules)

Module 12 - Obtaining a Job or Apprenticeship

Module 13 - Preparing for Work

Module 14 - Harassment and Discrimination

What Materials Are Provided in This Curriculum?

The materials for this curriculum consist of 14 modules and a set of math quizzes and tests. Module 1 (Grit, Growth Mindset, and Math Anxiety) and Modules 2 – 9 (math and measurement) differ from the remaining modules in some significant ways.

Module 1 (Grit, Growth Mindset, and Math Anxiety) and Modules 2 – 9 (math and measurement) include:

- A logic model, which identifies the:
    - prerequisite modules
    - intended outcome
    - objectives
    - content (knowledge, skills, and attitudes) that students need to achieve the objectives and outcomes
    - ways in which students demonstrate their leaning
- An instructor's guide which includes:
    - the module objective(s)
    - suggested timing for each part of the module
    - the required equipment and materials
    - set up instructions
    - notes to the instructor

    - step by step instructions for facilitating the module, including key points and questions to ask students

- PowerPoint slides

- Handouts for students, which include the PowerPoint slides and practice problems. The handouts do not include every slide from the PowerPoint presentation. For example, some slides present practice problems for students to complete. Slides with the correct answers to those problems are included in the instructor's PowerPoint file, but are not included in the handouts.

- A link to Math-Aids.com http://www.math-aids.com where you can create and print a wide variety of practice problem sets (and answer keys) for students who want or need additional practice. You can also create problem sets that offer a higher degree of challenge for students who want an additional challenge. Be sure to confirm that your use of the Math-Aids resources complies with its usage guidelines.

The remaining modules include:

- An instructor's guide which includes:
    - the module objective(s)
    - notes to the instructor
    - a list of materials and activities
    - suggestions for facilitating the module
- Some of the remaining modules also include PowerPoint slides

Note that these remaining modules do not include a detailed instructor's guide like that provided for Modules 1 – 9. As you review these modules, consider how much time they might require based on what you know about your students' interest, their prior knowledge, and any adaptations and additions you make to the materials and activities.

The math and measurement assessments include:

- Three short quizzes:
    - perimeter and area of polygons
    - adding and subtracting fractions
    - multiplying and dividing fractions

- A practice test
- A final test

All of the student handouts are at or below an 8th grade reading level (based on the Flesch-Kincaid analytics in Microsoft Word).

What is Important to Know About Using the Materials?

Within each module, the files are numbered to recommend the order in which you review them. For example, Modules 1 – 9 include a logic model, which provides the objectives, critical content, and ways in which students will demonstrate their learning. The logic model is listed first because it provides a high-level overview of the module. The instructor's guide is listed second (or first for modules that do not include a logic model), followed by student materials and other instructor support materials, such as the PowerPoint slides.

In Module 1 (Grit, Growth Mindset, and Math Anxiety) and Modules 2 – 9 (math and measurement), the instructor's guide includes directions, questions to ask students, and key points about each slide. Do not try to read the key points and questions word-for-word like a script. Instead, use them as suggestions to help you focus on the most important points for each part of the module. Explain the concepts using your own words and state them in ways that are comfortable and authentic for you. You might want to elaborate on some of the key points and provide some of your own examples. Examples from your own experience will be especially valuable to students.

The instructor's guides do not identify specific places for you to invite questions or check for understanding. You should do so regularly and review the content and/or provide additional practice where necessary.

Before presenting each module, review all of the materials, and practice presenting the PowerPoint slides and explaining the content and activities several times until you feel comfortable using the materials and facilitating the module. It is fine to let students know that the materials are new to you and that you might pause to refer to them from time to time.

The "thumbnail" images of the PowerPoint slides in the instructor's guide are only intended to give you a sense of where you are in the presentation, not to be read from the document. Some

of the slides include animation and require you to “click” the wireless presenter or press enter on the keyboard to reveal additional information on the slide. Revealing the information in that way will help you guide students’ attention to the information you are addressing. In other cases, it engages students by giving them a chance to think through their own answer or strategy for solving a problem before the answer is revealed on the slide.

In the math modules, the slides are designed to demonstrate each step in solving the math operations. Oregon Tradeswomen, Inc. has found it helpful for instructors to demonstrate one or two sample problems on the board, and then invite one or more students to do so. You can do the same, using problems from the PowerPoint slides rather than demonstrating the operations via the slides. You and student volunteers could also solve some of the problems from the practice handouts on the board.

You will notice that the terms “numerator” and “denominator” are not used in the modules on fractions. Oregon Tradeswomen, Inc. has found that students are more successful when “top number” and “bottom number” are used instead.

Where appropriate, students are asked to give their answers in feet + inches and inches only, or as both fractions and decimals. Doing so gives students additional practice in making those conversions.

Guest speakers can enhance the curriculum by providing additional insights and perspectives. The Trades and Apprenticeship Career Class is intended to serve a diverse population of students, so it is important to develop a diverse pool of tradeswomen who can visit the class to share their own experiences and advice for students. Doing so is especially valuable for Module 14 (Harassment and Discrimination).

How Can This Curriculum Contribute to an Emotionally Safe and Motivating Learning Environment?

Emotions significantly impact learning, and the classroom environment will have a big impact on students’ emotions. Students are more likely to be successful when they feel safe, welcome, and comfortable; when the learning is meaningful to them; and when they recognize and are acknowledged for their progress. An environment and a culture will develop during the class, either intentionally or unintentionally. The table below identifies aspects of the curriculum and things you

can do to intentionally create a safe and meaningful environment. It is based on a framework created by Professor Raymond Wlodkowski at the University of Washington.

Elements of a Safe and Motivating Learning Environment	Strategies for Providing an Emotionally Safe and Motivating Learning Environment
Inclusion - Students feel respected and connected to one another	• **Develop "Community Agreements"** – In the first class meeting, provide an opportunity for students to express what they need from each other, and themselves, in order to have a positive, effective, learning experience. Be sure to tell students what you need from them in order to provide the best possible experience for them. • **Check in** from time to time to ask students how they are doing as a class at upholding the community agreements, and whether additions or changes are necessary. • **Encourage the class to create a Facebook page or other social media forum** as a way to connect with one another outside of class. • **Emphasize the need for students to support and empower one another** - in class and on the job site. Oregon Tradeswomen, Inc. has found it helpful to have students develop a hand signal that a student can use to signal when she needs support from her peers**.** • **Maintain an (emotionally) safe environment** so students feel free to share their stories, perspectives, questions, and concerns, knowing that they will be respected by you and their classmates. • **The curriculum suggests that students work on activities and problem sets in pairs or small groups.** Randomly assign students to groups so they have the opportunity to work with, and get to know all of their classmates.

Elements of a Safe and Motivating Learning Environment	Strategies for Providing an Emotionally Safe and Motivating Learning Environment
Attitude - Learners feel that the learning is relevant to them	• **Many of the examples, activities, and problems in the curriculum reflect those that students might encounter on the job.** • **Encourage students to share how they have used, or have observed others using** the knowledge, skills, and attitudes they are learning. Classroom activities, and job shadow and work experiences provide opportunities to make such observations. • **Use examples from your own experience** to show students how you have used the knowledge, skills, and attitudes they are learning, and why they are important to success in the trades. • **The curriculum encourages students to reflect** on their learning at the end of every module and identify how it will be useful to them on the job.
Meaning - Learners feel engaged and challenged by the learning	• **Activities and practice problems in the curriculum** are designed to engage students. • **Students will experience different levels of challenge** with the curriculum because they come to the class with different experiences and education. The math modules include a link to Math-Aids.com, where you can create and print math practice problem sets for students who want or need additional practice or are ready for more of a challenge.

Elements of a Safe and Motivating Learning Environment	Strategies for Providing an Emotionally Safe and Motivating Learning Environment
Competence - Learners feel they are learning	• **Recognize and celebrate students' learning,** and encourage them to celebrate their own learning and that of their peers. • **Remind students about the importance of Grit and a Growth Mindset** as presented in the Grit, Growth Mindset, and Math Anxiety module. • **Give students more time if they need it to complete problems, quizzes, and tests**. Refer to the *What Is Math Anxiety and What Can I do about It as an Instructor* in the Grit, Growth Mindset, and Math Anxiety module for additional ways to support students who are struggling with math.

What Facilities and Equipment Are Required for this Curriculum?

The following are the facilities and equipment requirements for this curriculum. **The <u>materials</u> required for each module, such as handouts, measuring tapes, etc. are listed in the instructor's guide for each module.** Elements of the Trades Apprenticeship and Career Class that are not included as part of this curriculum, such as hands on instruction with power tools, will require facilities and equipment that are in addition to those listed below.

- A standard classroom or training space that is accessible to students with enough room to arrange tables in "pods" with 3 – 4 students at each pod
- High speed internet access
- A cart or table with an LCD projector and a Windows computer or laptop. The computer should have high speed internet access, a recent version of PowerPoint, an updated

Internet browser (specify if there is a browser you are most familiar with or prefer) and speakers

- Cords for connecting the LCD projector to the computer
- A way to cover the computer and LCD cords so they will not create a trip hazard
- A screen visible to all in the room
- A wireless PowerPoint presenter
- Computer speakers
- A flip chart easel
- A white board, preferably not located behind the screen
- Four sets of fraction strips per student (see the Fraction Strip document in Module 3 - Fractions and Measurement). The strips should be printed on heavy cardstock then cut. For example, each set of fraction strips should consist of sixteen 1/16ths separated from one another, not a single row of connected 1/16ths. The set would also include eight 1/8ths, four 1/4ths, two 1/2s, and one "whole."
- Provide, or have students purchase a small, rugged notebook or journal in which they can record key points and things they want to remember. Doing so helps build the practice of taking notes, which is a success strategy for apprentices and others new to the construction trades.