

## ***Fresno Teachers Association proposal to Fresno Unified, November 2, 2016***

### ***New Article- Career Technical Education***

The Fresno Teachers Association is firmly committed to providing educational opportunities for our students that create a clear path to successful employment. We know that under the Career Technical Education (CTE) umbrella there exist several options. Currently, Fresno Unified is running programs in two of these options, Pathways and ROP. While Fresno Unified students are having exposure in Pathways and ROP programs, we recognize the importance of offering additional options that will address the needs of other students, and also lead to apprenticeships and jobs. One such option is Vocational Education. In 2018, Harvard University predicts only 33% of all jobs will require a 4-year degree or more, while the overwhelming majority will be middle-skilled jobs requiring technical skills and training at the credentialed or Associates Degree level. This makes our work on CTE imperative as we need to provide ALL of our students with more opportunities for success beyond a traditional 4-year degree program.

#### **I. FTA Career Technical Education (CTE)**

The Fresno Teachers Association supports CTE in FUSD that:

1. Builds interest at all ages and provides avenues to post-high school jobs at the 11<sup>th</sup> & 12<sup>th</sup> grade level.
2. Is taught by teachers that have relevant industry experience or appropriate additional training.
3. Provides a **direct path to a certification** either in high school or shortly after.
4. Ends the practice of utilizing regular A-G courses and naming them CTE by adding a few lessons.
5. Requires at least one CTE course for every student to graduate from an FUSD high school.
6. **Results in apprenticeship, internship, and employment opportunities for students.**

The true ratio of jobs in our economy is 1:2:7. This means that for every occupation requiring a master's degree or more, two professional jobs require a university degree, and there are over half a dozen jobs requiring a 1-year certificate or 2-year degree; and each of these technicians are in very high-skilled areas that are in great demand. This ratio is a fundamental to all industries. It was the same in 1950, the same in 1990, and will be the same in 2030. We must offer our students who will not enroll in a 4-year college another true avenue to success. Career Technical Education (CTE) has been envisioned as an avenue to allow these students to become interested in other opportunities beyond the traditional college track. This push toward CTE has been building in California for several years. In 2007, the California Department of Education published the ***Career Technical Education Framework for California Public Schools Grades Seven through Twelve***.<sup>1</sup> This is the only state curriculum framework developed under the authority of the California Legislature and guided in its design and development by a legislatively mandated advisory group; which included over 20 individuals from k-12 education, community college, labor, and industry. Anytime one discusses the way CTE is being implemented in California public schools one must be aware of the legally adopted framework in 15 industry sectors:

*Arts, Media, and Entertainment*

*Agriculture and Natural Resources*

*Building and Construction Trades*

*Business and Finance*

*Education, Child Development, and Family Services*

*Energy, Environment, and Utilities*

*Engineering and Architecture*

*Fashion and Interior Design*

*Health Science and Medical Technology*

*Hospitality, Tourism, and Recreation*

*Information and Communication Technologies*

*Manufacturing and Product Development*

*Marketing Sales and Service*

*Public Services*

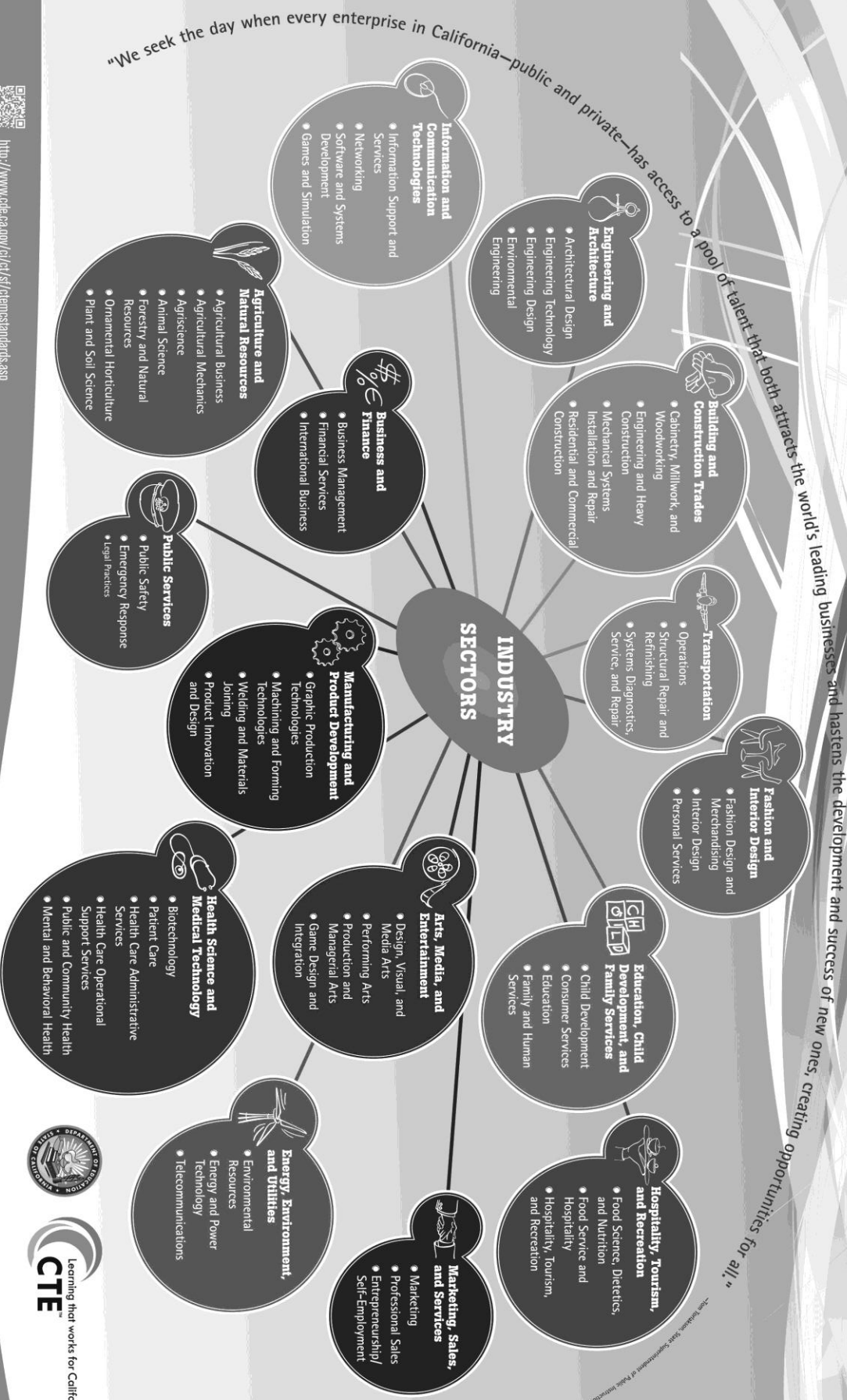
*Transportation*

---

<sup>1</sup> This 484 page CTE program description was adopted by the California State Board of Education and published by the California Department of Education in 2007.

# California's Career Technical Education:

## Preparing Students for the 21st Century and Beyond



<http://www.cde.ca.gov/ct/ct/sf/ctemstandards.asp>



The California CTE framework draws on 15 identified California's CTE industry sectors (defined by a broad diverse California committee in 2007) and was done to provide examples of practices and research-based guidance for implementing the CTE Model Curriculum Standards. As you can see each industry sector has two or more career pathways. Therefore, California's current CTE curriculum framework provides "pathways" to virtually every single occupation imaginable. It is a curricular planning document to provide structure to school districts that want to incorporate CTE pathways into their educational delivery models.

School districts are not obligated to provide all of the pathways; in fact, they are urged to work with their local communities to develop an overall CTE plan. We contend that FUSD's current CTE plan should be expanded to offer knowledge, skills and abilities needed for in-demand occupations. The Building and Construction industry is one such area where the need for highly-trained and skilled technicians is growing. Current Fresno area Building and Construction Trades labor organizations have facilities and expertise that we could tap into that would eliminate the need to build new facilities. This cost-savings approach will save the district millions of dollars and foster partnerships with leading industry experts.

Career technical education and vocational education and are supposed to provide links between public schools and industry. This is not a new concept. These ideas have been present in our California Education Code for many years.

- CA ED 1228 states that "districts are encouraged to provide all pupils with a rigorous academic curriculum that integrates academic and career skills, incorporates applied learning in all disciplines, and prepares all pupils for high school graduation and career entry."
- CA ED 51224 mandates that school district boards "Prescribe separate courses of study, including, but not limited to, a course of study to prepare prospective pupils for admission to state colleges and universities and a course of study for career technical training."
- CA ED 51228 also specifies that the last item, career technical training, should be "A course of study that provides an opportunity for those pupils to attain entry-level employment skills in business or industry upon graduation from high school."
- CA Ed Code 52343 mandates that school districts utilize this local advisory committee composed of 11 members, at least seven from business, industry, labor, and the general public. " Although these separate provisions sometimes specify all or part of a committee's makeup, it is generally accepted as good practice to include members from business and industry, education, state employment and workforce agencies, public and private agencies, and the community. Parents and students should also be included."<sup>2</sup>

## II. A New CTE approach for FUSD

The Fresno Teachers Association has had extensive discussion over the last 2 years with teachers, community leaders, business leaders, construction trades professionals, and FUSD school board members on how to best provide vocational education as an additional CTE option to our students in Fresno. The result of this work has led to one main conclusion—we need to focus on rapidly expanding the number of students that leave high school with a license or certification that can lead directly to employment. To this end we are proposing the adoption of the ***North America's Building Trades Unions Apprenticeship Readiness Program/MC3 Training***.

---

<sup>2</sup>*Career Technical Education Framework for California Public Schools Grades Seven Through Twelve, 103.*

**a. Index of courses & Elected Topics**

MC3 ARP Beginners Guide

Instructions for Section 1a: Orientation and Industry Awareness

Instructions for Section 1b: Construction Trade Awareness

Instructions for Section 2: Tools and Materials Hands on Training

Instructions for Section 3: Construction Health and Safety

Instructions for Section 4: Blueprint Reading

Instructions for Section 5: Basic Math for Construction

Instructions for Section 6: Heritage of the American Worker

Instructions for Section 7: Diversity in the Construction Industry

Instructions for Section 8: Green Construction

Instructions for Section 9: Financial Literacy

**b. The Multi-Core Curriculum: Required and Elected Topics**

Required Chapters	Elective Chapters- Select to complete the 120 hour requirement
Orientation and Industry Awareness- 8 hours	Construction Health and Safety- 22 hours (CPR and First Aid- 8 hours/Osha-10- 10 hours/Women's Health and Safety- 4 hours)
Construction Trade Awareness- 8 hours	Blueprint Reading- 20 hours
Tools and Materials Hands on Training- 8 hours	Green Construction- 4-8 hours
Basic Math for Construction- 40 hours	Financial Responsibility- 4-8 hours
Heritage of the American Worker- 8 hours	
Diversity in the Construction Industry- 12 hours (Diversity Awareness- 4 hours/Sexual Harassment- 8 hours)	
Total 84 Hours	Total 54 Hours (Choose 36 out of 50)

Apprenticeship Readiness Program

https://nabtuadrena.com

**NORTH AMERICA'S BUILDING TRADES UNIONS**  
Apprenticeship Readiness Program

HOME BUILDING TRADES WEBSITE

North America's Building Trades Unions are now sponsoring comprehensive apprenticeship-readiness training programs throughout the United States. These programs provide a gateway for local residents, particularly those from underserved communities, including women, people of color and transitioning veterans, to gain access to Building Trades registered apprenticeship programs. Apprenticeship Readiness Programs are administered by state and local Building Trades Councils, and they feature the Building Trades' nationally recognized Multi-Craft Core Curriculum (MC3).

The Multi-Craft Core Curriculum (MC3) is a comprehensive pre-apprenticeship curriculum. It was developed and approved by the Building Trades National Apprenticeship and Training Committee. In 2012, the U.S. Department of Labor awarded the Building Trades the Department's Registered Apprenticeship Innovator and Trailblazer Award for the MC3 at its 75<sup>th</sup> Anniversary celebration.

**The Multi-Craft Core Curriculum**

- Construction Industry Orientation
- Tools and Materials
- Construction Health and Safety
- Blueprint Reading
- Basic Math for Construction
- Heritage of the American Worker
- Diversity in the Construction Industry
- Green Construction
- Financial Responsibility

**Construct Your Future**

Watch this video before logging in

Username:   
Password (case-sensitive):   
Login

I forgot my password.

You are not logged in.

**Step 1:**

- Access the MC3 from [www.bctd.org](http://www.bctd.org) or [www.apprenticeshipreadinessprogram.com](http://www.apprenticeshipreadinessprogram.com)
- Then log in using user name and password provided by the Building Trades

**Make sure you and your students watch the "Construct Your Future" introductory video**

**List of MC3 Sections (Chapters)**

"As a veteran, this class gives me another opportunity to learn and grow. They will be leaps and bounds ahead of their peers."

Davin Benitez, Augusta Building Trades Apprenticeship Readiness Program Graduation Speech, February 2, 2015

**NORTH AMERICA'S BUILDING TRADES UNIONS**  
Apprenticeship Readiness Program

HOME COURSE CATALOG **MY ACCOUNT** REPORT CARD BUILDING TRADES WEBSITE

My Account

**My Account**

Calendar

SEPTEMBER 2015

Sun Mon Tue Wed Thu Fri Sat

30 31 1 2 3 4 5

6 7 8 9 10 11 12

13 14 15 16 17 18 19

20 21 22 23 24 25 26

27 28 29 30 1 2 3

**My Profile**

**My Transcript**

**LEARNING ACTIVITIES**

ENROLLED (58) OVERDUE (0) COMPLETED (1) EXPIRED (0)

Course	Due Date	Expires	Details	View
1-1a-1 Instructor Materials For Introduction	Sep 2, 2019	Sep 2, 2020		
1-1a-2 Instructor Materials For Overview of the Construction Industry	Sep 2, 2019	Sep 2, 2020		
1-1a-3 Instructor Materials For Introduction to the Specific Trades	Sep 2, 2019	Sep 2, 2020		
1-1a-4 Instructor Materials For Attitudes and Behaviors	Sep 2, 2019	Sep 2, 2020		
1-1b-1 Instructor Materials For The Construction Industry: An Overview	Sep 2, 2019	Sep 2, 2020		
1-1b-2 Instructor Materials For Apprentice Roles and Responsibilities	Sep 2, 2019	Sep 2, 2020		
1-1b-3 Instructor Materials For Workers and Union Membership	Sep 2, 2019	Sep 2, 2020		
1-1b-4 Instructor Materials For Motivation and Codes of Conduct	Sep 2, 2019	Sep 2, 2020		

**Step 2:**

- Once you log in, the site will go to your "My Account" Page
- Each Section or Chapter (or sub-section) of the MC3 curriculum will be listed as a separate "Course" on this page

**Here you can update your personal information (demographics, contact info) – My Profile**

**These "Courses" represent each section of the MC3 curriculum**

My Account Logged in as: Thomas Kriger / Logout

Calendar

SEPTEMBER 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3

Menu

My Profile My Transcript

LEARNING ACTIVITIES

ENROLLED (58) OVERDUE (0) COMPLETED (1) EXPIRED (0)

Course	Due Date	Expires	Details	View
I-1a-1 Instructor Materials For Introduction	Sep 2, 2019	Sep 2, 2020		
I-1a-2 Instructor Materials For Overview of the Construction Industry	Sep 2, 2019	Sep 2, 2020		
I-1a-3 Instructor Materials For Introduction to the Specific Trades	Sep 2, 2019	Sep 2, 2020		
I-1a-4 Instructor Materials For Attitudes and Behaviors	Sep 2, 2019	Sep 2, 2020		
I-1b-1 Instructor Materials For The Construction Industry As a Career	Sep 2, 2019	Sep 2, 2020		
I-1b-2 Instructor Materials For The Construction Industry As a Career	Sep 2, 2019	Sep 2, 2020		
I-1b-3 Instructor Materials For The Construction Industry As a Career	Sep 2, 2019	Sep 2, 2020		
I-1b-4 Instructor Materials For The Construction Industry As a Career	Sep 2, 2019	Sep 2, 2020		
I-3c Instructor Materials For Health and Safety Issues for Women	Sep 2, 2019	Sep 2, 2020		
I-4a Instructor Materials for Module One- Basic Blueprint Reading Principles	Sep 2, 2019	Sep 2, 2020		
I-4b Instructor Materials For Module Two- Plans and Drawings	Sep 2, 2019	Sep 2, 2020		

**Step 3:**

- To launch a "Course" (MC3 Section or Sub-section), click on the green "Go" button

**Tips:**

- There are separate "Courses" for students and instructors. The students see only the common materials – instructors have access to all the instructional materials as well
- If you can't find a "Course" you're looking for, it may be listed under the "Completed" tab – once you view a course is it moved to the Completed Tab

### c. UC Course Submission Form (Example)

#### UC Course Submission Form

**Course Title: Multi-Craft Core Curriculum: Building Scaled Structures**

**Academic Subject and Discipline (Building & Trades with English & Math)**

**CTE Sector and Pathway: ("g")**

#### Course Overview

*A brief summary of the purpose of the course and the topics and skills learned overall.*

This course has been developed to integrate skills and concepts from the Building and Construction Trades with applied mathematics and English. As a natural progression, students will apply the craft skills required to design and build a variety of scaled structures that meet current code requirements. In addition, students will make real world connections between construction, math, and English using written projects, construction documents that include creating blueprints, project packets, and student centered construction projects. This course provides students the opportunity to apply academic knowledge and technical skills through a hands on curriculum that meets pre-apprenticeship requirements for the National Building Trades Council.

#### Course Content:

**For each unit please provide the following information:**

1) **Unit Overview:** describe the topics and skills students learn in the unit. Focus on describing the actual work of the course and not the content standards the course aligns with.

2) **Assignment summaries:** Describe each major assignment that makes up the “identity” of the unit: What do students produce to demonstrate learning? What are the major parameters of that work and what purpose does it serve?

## **Unit One:**

### **Orientation and Safety:**

Students receive instruction and extended practice in the orientation and Industry awareness of the construction industry. Learners will receive instruction in measurement and marking/layout, the fundamental skills which will be needed to complete all of the applied mathematics, English, and Construction units and assignments that follow in this course. These concepts are also a launching platform for this integrated course as they are, by themselves, common to both applied mathematics and the construction sector. Students practice the key concepts of General shop safety: Students learn the specific safety rules for the tooling that is applicable to the task at hand and acquire the knowledge and skills required to work in a safe environment. Within this section, the students will also receive OSHA 10 Hour training and certification.

Students understand and use the vocabulary of the construction trades, as well as the vocabulary of various math concepts as they apply to the construction industry.

They study math and building sequences related to measurements, geometry, and practical building applications.

### **Major Topics:**

- Review of fractions and decimals: converting fractions to higher or lower terms, improper fractions and mixed numbers, common denominators, and adding, subtracting, multiplying, and dividing with decimals and fractions.
- Reading a ruler and a tape measure while incorporating fractional measurements to 1/16 of an inch in a building project. Reading a fractional caliper to measure material to desired thicknesses.
- Shop safety procedures, transporting sharp woodworking tools to prevent injury, and shop etiquette as it applies to cleanliness and safety.
- Safe and appropriate use of basic, non-powered hand tools including cross-cut saws, rip saws, pull saws, coping saws, hammers and chisels, hand planes, sand paper of various grits, etc.

### **Key Assignments:**

**Students use the vocabulary of geometry and other mathematical concepts as it relates to the construction industries. They will integrate the study of math and building sequences related to measurements, geometry, and practical building applications.** Students use specific geometric tools such as a ruler, protractor, and compass as well as various measuring and marking tools specific to all unit projects, such as tape measures, squares and other tools of the trade. They will produce an orthographic projection of simple objects using measurement and layout components of basic dimensional shapes.

### **Safety First**

Specific tool safety is covered for each tool being introduced. Safety is an ongoing practice throughout the course with specific instruction and reinforcement to complement each unit. In this particular unit, students are assessed on their knowledge of shop safety through a combination of written tests and teacher generated and supervised activities.

## **OSHA 10 Hour Safety Course**

After gaining an understanding of general shop and machine tool safety, the students will participate in an OSHA 10-Hour Safety Course. Through the successful completion of this course, the students will receive an OSHA 10 certification

### **Unit Two:**

#### **Intermediate/Advanced Construction Techniques:**

Students will explore numerous building and construction trades. They will discover their unique aptitudes and specific skill sets as they build wall sections using varied materials. IE: dimension lumber products, steel stud framing for use by various trades: Including but not limited to, plumbing, electrical, HVAC, finish carpentry, lath plaster and drywall, framing, glazing, veneers, waterproofing, roofing, sheet metal, concrete etc. Students will use these skills to complete the capstone project. Math skills used will include applied geometry related to the angles of roof pitches, wall angles, finish trim, etc. They will also understand the connection between fractions and decimals and how they relate to the construction process.

#### **Key Assignments:**

Using construction drawings, students will construct interior/exterior wall sections to practice various trade skills by installing necessary components of a structure including but not limited to: electrical circuits, simple plumbing system, typical 3-coat stucco system, roofing materials, finish carpentry, rough framing, glazing/windows, concrete, HVAC, drywall and paint.

#### **Key Assignments:**

Students will create their own design plan that includes a material list, cost estimate, and project schedule. Students will read, interpret and understand construction drawings, using these tools to create their plan. They will interpret lines, symbols and abbreviations from a set of construction documents required for the implementation of their personal/team projects.

#### **Key Assignments:**

Changes in architectural styles and engineering/structural requirements will be compared and contrasted using different sets of historical plans. In addition, students will perform a cost analysis regarding plans from different historical eras and submit revised estimates and opinions to explain why the costs have increased so significantly from one era to another. IE: increases in materials, labor, new building codes etc.

### **Unit Three:**

The students will design a structure and develop construction documents for a structure made to house one or multiple animals. Examples would include a birdhouse, doghouse, cat tree, chicken coop, or other structure, as long as it is designed for an animal. The design should include a variety of geometric shapes and should require applied mathematical skills and concepts in order to complete construction. To complete their design, students review specific geometric concepts including understanding the definitions of point, line, line segment, ray, plane, angle, vertex, diameter, radius, and circumference including circular shapes and where other circular shapes fit inside of them. Students apply the area formulas for circles and cylinders and use knowledge of precise measurement of angles using a protractor and angle bisectors using a compass to complete their construction project.

#### **Key Assignments:**

The documents should include a front view, side view, top view, materials list and cost, and a written proposal that identifies the advantages of their design. The drawings must have dimensions in both standard and metric, calculated angles, an accurate and labeled scale, and any other pertinent information. After the documents have been approved by the instructor, the structure will be built.



**English:**

The audience for the proposal should be a potential client. The students will be highlighting the advantages of their design and persuading the reader that their particular structure is going to meet the specific needs of their pet. The document should include justification for the types of materials used and estimate the amount of hours of labor required for assembly.

**Math:**

There should be a variety of geometric shapes in order to challenge the students' design and layout skills. Conversion between the standard and metric system should be done throughout. The project drawings should have detailed labels and dimensions, stressing the importance of accuracy in design and mathematical calculations.

**Unit Four:****American Labor History:**

Students will work collaboratively in teams and respond to a given prompt related to the political, economic, and social conditions that have influenced American labor history and current labor laws. Students will write a research essay, write blog posts and comment on those of peers, and make in class presentations. Students will learn research, organization, and presentation skills as those skills apply to students showcasing their knowledge of American labor history as well as current labor laws.

**Key Assignments:****Research Essay:**

In order to gain a deeper understanding of the historical situations and issues that have led to the creation of current labor laws, students will research a given era to identify key leaders and major movements and their influence throughout history. Topics include the significance of apprenticeships, heritage of craft unions and symbols, the progression of working conditions, collective bargaining and economic and social justice.

**Blog:** Students will post their research papers on a blog and comment on each other's papers to enrich the discussion of current labor law and make contemporary application of relevant topics including work conditions, past practices, or social issues like women in the trades.

**Presentation:**

Students will present the key findings of their research essay in a 3-5 minute multi-media format (PowerPoints, Prezis, posters, videos, or other platform) and provide an overview of evidence collected including the identification of key leaders and their impact on major labor movements for the given era, a description of the political, economic and social implications of the leaders and movements, and labor law and contemporary application. Presentations are intended to demonstrate a deeper understanding of the labor history movement, demonstrate mastery of research, organizational, and presentation skills, and the effective use of academic language in the oral presentation. Students will present to classmates and a panel of advisors including teachers, peers, building trades, professionals and other community partners as appropriate.

**Unit Five****Capstone Project:**

Students will design and build a scaled sustainable structure that encompasses the multiple facets of the building and construction trades. Examples of a capstone project may include a "tiny" home, structure on a trailer, shed, or office space. The interior of the sustainable structure could be a work area or living habitat with finished walls, flooring system, and cabinetry. The sustainable capstone structure requires a broad variety of the trades to be represented and may include skills for rough framing, roofing, doors and windows, insulation, electrical systems, finish carpentry, plumbing systems, roofing, sheet metal, glazing, concrete, painting, solar power

system, and HVAC. Design parameters will meet current building code and Title 24 requirements per the local municipality. Students will follow a “Critical Path” schedule for completion of the project and will maintain daily logs and workplace documentation.

**Key Assignments:**

Students will create a packet of construction drawings for approval, similar to what may be submitted before construction can begin. The construction drawings will include a floor plan, framing plan, roof framing plan, elevations, an electrical plan, a plumbing plan, a window and door schedule, and a materials list. These may be produced either by hand or by Computer Aided Drawing (CAD).

**Math Skills:**

Applied Geometry will be used to determine square footages of buildings, rooms, lots, parcels, etc. Estimation skills would utilize multiplication, addition, subtraction, division, etc. Skills will be taught in determining quantities of cubic yards, square yards, cubic feet, volume, etc. Conversion techniques are utilized in the creation of a plan for a constructed project when using dimensional measurements and when transferring plans and calculations to a physical project. One must also be able to calculate the area of triangles and quadrilaterals. The Pythagorean Theorem must be used in theory and application through construction of woodworking projects, such as right triangle shelf supports. The students must also be able to use calculating concepts of measuring volume in woodworking and construction, such as when using the volumetric unit "board foot."

**Technical writing:**

Students will use their knowledge of OSHA requirements and labor law to create documents within a project package including a bill of materials, vendor list, estimates, purchase orders, and labor costs. They will also be responsible for researching and listing the components in a project package such as contract documents, payment schedules, scopes of work, material safety data sheets (MSDS) licensing documentation, proper insurance documents, workers' compensation, liability, job safety analysis worksheets etc.

**Course Materials**

***In the space below, list all course materials, including primary and secondary texts and supplemental materials.***

Building and Construction Trades Department, AFL-CIO. *Building Trades: Multi-Craft Core Curriculum*. Print. 2009

Uniform Building Code (UBC) current standard  
National Electrical Code (NEC) current standard  
Uniform Plumbing Code (UPC) current standard  
International Council of Building Officials (ICBO)  
American National Standards Institute (ANSI)

**Additional Agreement Components:**

- FUSD will be responsible for the salary and benefits of all instructors, on school sites and at non-school site facilities, including tuition for any and all CTE teaching credentials
- FUSD will be responsible for all insurance coverages, and ensure that all students and instructors are free from any liability due the use of equipment
- All students who successfully complete the CTE program will have the opportunity to be part of the Building & Construction Trades Council, AFL-CIO, and Apprenticeship program
- Only certificated and certified instructors with relevant industry experience and training will instruct students in any of the CTE courses and programs
- This shall be adopted & implemented by FUSD in the 2017-18 school year and remain in affect all subsequent years thereafter