

Course Title:	Multi-Craft Core Curriculum (MC3)
Grade Level(s):	12
Length of Course:	Two semesters or equivalent term
Credit:	10 units
Prerequisite:	Completion of Junior year and/or 180 units (or consent of the instructor or YouthBuild Program Manager.)
Co-requisite:	None

Course Overview:

Multi-Craft Core Curriculum (MC3) is a training program offering a comprehensive overview of the construction industry and providing technical and job readiness skills to succeed in any trade. 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. Participants graduate with industry-standard certifications and are given opportunities to meet with industry experts, tour apprenticeship training centers, and network with Building Trades and contractors.

Schools Offering:	Livermore High School Granada High School Del Valle High School Vineyard High School YouthBuild Program
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Meets University of California Entrance Requirements:	No
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Board Approval:	<i>Pending Board Approval</i>
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Course Materials:	<u>Building Trades: Multi-Craft Core Curriculum</u> , AFL-CIO Building and Construction Trades Department, 2009, https://nabtu.personalearning.com/ Student binders
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Tools: Skill Saws, Reciprocal Saws, Impact Drills, Tape Measures, Hard Hats, 2x4 2x6 2x8 2x10 2x12 USB Plywood (depends on what is being constructed), 8” Sinkers, 16” Sinkers-Nails, Screws (depends on what is being constructed), Hammers, Speed Squares, Levels (small and large), T-squares (small and large), Steel-Toe Construction Boots, Safety Gloves, Chalk Lines or Boxes, Safety Glasses, Vests

Supplemental Materials:

Online resources, printed consumables, instructor-created materials.

Multi-Craft Core Curriculum (MC3)

COURSE CONTENT:

Unit 1: Orientation and Industry Awareness

Module 1: Introduction

Objective: At completion of the unit, students will discuss the interrelationship of craft skills, construction industry stakeholders, and craft workers to the construction process and explain the interconnectedness of work processes in the progress of a construction job.

Module 2: Overview of the Construction Industry

Objectives: At completion of the unit, students will be able to:

- a) Describe the scope of each major part of the construction industry, as well as the roles of occupations indirectly related to the construction industry.
- b) Discuss the roles of governmental agencies of interest to the building trades.
- c) Describe construction careers after apprenticeship, including careers as a journeyman in each craft, management leadership roles, and continuing education responsibilities.

Module 3: Introduction to Specific Trades

Objective: At completion of the unit, students will describe the roles of the principal occupations in the construction industry.

Module 4: Attitudes and Behaviors

Objective: At completion of the unit, students will explain the relationship between job productivity, employee welfare, and attitudes and behaviors on the job.

Module 5: An Overview

Objectives: At completion of the unit, students will be able to:

- a) Describe the demographics of the construction trade, and discuss industry projections of the future of the building trades.
- b) Identify the development of the apprenticeship from the fifth century B.C. to modern times.
- c) Explain the role of contractor organizations.
- d) Describe the National Building Trades Drug and Alcohol Program and its relationship to health and safety, productivity, and economic welfare of the principal stakeholders in construction work.
- e) Describe construction careers after apprenticeship, including careers as a journeyman in each craft, management leadership roles, and continuing education responsibilities.

Module 6: Apprentice Roles and Responsibilities

Objective: At completion of the unit, students will describe the apprentice's role in the building trades and the institutions and structures and facilities which support the apprenticeship program, including the obligations of the indenture, the apprenticeship trust and school, and sponsors

Module 7: Workers and Union Membership

Objectives: At completion of the unit, students will be able to:

- a) Describe the benefits and obligations of union membership.
- b) Describe the rights of workers: To be free from wrongful discrimination, sexual harassment, to earn fair wages, overtime requirements under law, to join a union and to organize, and to rights generally secured under a collective bargaining agreement, union constitutions, and labor law, and for an apprentice to be trained and educated; and describe the obligations of workers.
- c) Know the importance of the Helmets to Hardhats Program and veterans in the construction industry.

Module 8: Motivation and Codes of Conduct

Objectives: At completion of the unit, students will be able to:

- a) Describe and explain the codes of conduct for the crafts and the disciplinary process maintained by apprenticeship programs.
- b) Explain the relationship between job productivity, employee welfare, and attitudes and behaviors on the job.
- c) Explain the keys to success---motivation and leadership.

Module 9: Getting Along at Work

Objectives: At completion of this unit, students will be able to:

- a) Recognize the importance of effective communication and different forms of communication and how to avoid the barriers of communication.
- b) Recognize the importance of teamwork in construction.
- c) Understand discrimination and harassment on the job site and how to avoid conflict.

Module 10: Interview Skills

Objectives: At completion of this unit, students will be able to:

- a) Explain the importance of interviews in the application and hiring process, as well as elements of the interview process and expectations.
- b) Interview and respond to interview questions.
- c) Demonstrate positive body language and non-verbal behavior, as well as effective interviewing skills.

Unit 2: Tools

Objective: At the completion of this unit, students will be familiar with tools and materials used on construction sites.

Unit 3: Occupational Safety and Health Administration (OSHA), Cardiopulmonary Resuscitation (CPR) and First Aid, Health and Safety Issues

OSHA Module: Introduction to Specific Trades

Objective: At completion of the unit, students will describe key elements of construction health and safety.

CPR & First Aid Module:

Objectives: At the completion of this unit, students will be able to:

- a) Recognize a life-threatening emergency and act.
- b) Recognize breathing and cardiac emergencies that call for CPR.
- c) Perform CPR on adults, and provide rescue breathing when needed.

- d) Use an Automated External Defibrillation unit, (AED), by the guidelines of The American Red Cross, and use the Emergency Medical Services (EMS) system effectively.
- e) Recognize when 911 should be activated and support the most common situations until further help arrives.
- f) Treat sudden illness, including poisonings and heat and cold emergencies.
- g) Determine the best response to medical emergencies such as: Heart Attacks, Strokes, Allergic Reactions, Cardiac Arrest, and Seizures.

Safety Issues:

Objectives: At the completion of this unit, students will be able to:

- a) Demonstrate what individuals can do to protect themselves and their co-workers.
- b) Promote equitable health and safety practices and policies in the workplace.

Unit 4: Blueprint Reading

Objectives: At the completion of this unit, students will be able to:

- a) Identify the various views of a drawing that are included in a set of plans and their relationship to each other.
- b) Identify and define the various parts of a set of plans, such as details, etc.
- c) Identify and define material symbols, abbreviations, and lines used in drawings.
- d) Demonstrate proper handling procedures for a printed set of plans and drawings.
- e) Define the meaning of "scale," and use a fractional ruler to calculate measurements.

Unit 5: Math

Module 1: Introduction to Mathematics

Objectives: At the completion of this unit, students will be able to:

- a) Describe the basic history of mathematics.
- b) Identify two basic systems of measurement used by Bricklayers and Allied Craftworkers (BAC).
- c) Select a calculator, and use the Student Manual to learn mathematics for BAC.

Module 2: Whole Numbers

Objectives: At the completion of this unit, students will be able to:

- a) Add and subtract whole numbers.
- b) Multiply and divide whole numbers.
- c) Perform combined operations with whole numbers.

Module 3: Common Fractions

Objectives: At the completion of this unit, students will be able to:

- a) Describe the fundamentals of common fractions.
- b) Add and subtract common fractions.
- c) Multiply and divide common fractions.
- d) Perform combined operations with common fractions.

Module 4: Decimal Fractions

Objectives: At the completion of this unit, students will be able to:

- a) Use a calculator to add, subtract, multiply, and divide whole numbers and fractions.

- b) Describe the fundamentals of decimal fractions.
- c) Add and subtract decimal fractions.
- d) Multiply and divide decimal fractions.
- e) Perform combined operations with decimal fractions.

Module 5: Measurement

Objectives: At the completion of this unit, students will be able to:

- a) Solve linear measurement problems.
- b) Solve area measurement problems.
- c) Solve circular measurement problems.
- d) Solve volume measurement problems.

Unit 6: Labor Heritage

Module 1: From Artisans to Wage-earners to Local and National Organizations

Objectives: At the completion of this unit, students will be able to:

- a) Describe the “artisan system” of work and skills training in the early years of the American republic, and be able to describe the different roles in this system performed by master craftsmen, journeymen and apprentices.
- b) Understand how social, technological and political change began to transform the “artisan system” in the mid-19th century and the effects these changes had on workers in the Building and Construction Trades.
- c) Describe why Building and Construction Tradesmen joined forces in the late 19th Century.
- d) Be familiar with the impact of high-rise building construction (“skyscrapers”) on the Building Trades and the construction industry.
- e) Understand the Building Trades’ role in World War I and the response to the increasing power in the Trades known as the “American Plan.”

Module 2: Government Matters

Objectives: At the end of this unit, students will be able to

- a) Describe the effects of the Great Depression on the American economy in general and on the Building Trades and construction in particular.
- b) Understand why Building Trades leaders came to the realization that “government matters” to them and their organizations, as well as the purpose of the Fitzgerald Act and the federal government’s role in the U.S. apprenticeship system.
- c) Understand the Building Trades’ role during World War II, and why powerful business interests and their allies in Congress pushed back against the new-found power of the Building Trades with policies such as the Taft-Hartley Act in 1947.

Module 3: The Best of Times, The Worst of Times

Objectives: At the end of this unit, students will be able to:

- a) Describe why many Building Trades’ locals limited access to their training programs and their membership, and the detrimental impact this had on the reputation of the Building Trades around the country.
- b) Be familiar with the steps that policy makers and Building Trades leaders took to address the lack of diversity in the trades, and why these changes were slow in coming at the local level.

- c) Describe the series of attacks by powerful business interests in the 1970's that was similar to the "American Plan" in the 1920's, which was designed to increase opportunities for "open shop," or non-union, workers and contractors.

Module 4: Back to the Future

Objective: At the end of this unit, students will be able to:

- a) Understand how a new generation of Building Trades leaders (such as those whose interviews are included in this chapter) have committed their unions to recruiting new members and increasing diversity among apprentices and in the general membership, through programs such as the Multi-Craft Core Curriculum, Helmets to Hardhats, the North American's Building Trades Union (NABTU) Tradeswomen Committee and others.

Unit 7: Diversity Awareness and Sexual Harassment

Module 1: Diversity Awareness

Objectives: At the completion of this unit, students will be able to:

- a) Explain the importance of a diverse workforce in the construction industry, identify the importance of the construction industry to diverse populations.
- b) Identify the historical and social roots of under-representation of women and minorities in the trades, explain the barriers and challenges to building a diverse construction workforce and an equitable worksite.
- c) Explain what it means to be a culturally competent person and organization.
- d) Identify equal employment opportunity and non-discrimination rights in the workplace and classroom.

Module 2: Sexual Harassment

Objectives: At the completion of this unit, students will be able to:

- a) Define the legal definition of sexual harassment and identify the evolution of laws pertaining to sexual harassment, recognize and define different forms of sexual harassment, explain why sexual harassment is a problem in the construction workplace.
- b) Identify who is harmed by sexual harassment, describe the role of employers, and workers in preventing and addressing sexual harassment.
- c) Demonstrate action steps to take in response to witnessing or experiencing sexual harassment.

Unit 8: Green Construction

Module 1: Sustainability

Objective: At the completion of this unit, students will be able to:

- a) Recognize green awareness on construction projects, including sustainable site development, efficient use of water resources, energy conservation, the use of sustainable building materials, reducing and recycling construction waste and protecting indoor and outdoor environmental quality.

Module 2: Green Building

Objective: At the completion of this unit, students will be able to:

- a) Describe the basic elements of green construction and green buildings and the part they will play as a construction worker on green job sites.

Unit 9: Financial Responsibility

Objective: At the completion of this unit, students will be able to:

- a) Identify the rationale for understanding financial literacy, construct a budget, devise a strategy for savings and debt management, and define financial services and products for financial security.

Assignments

Assessments will be administered in the form of quizzes and unit tests. Multi-Craft Core Curriculum requires a passing grade on unit assessments to receive an MC3 certification, which is a transferable, industry-recognized certificate. In addition, students who pass assessments will also receive certifications in OSHA 10 and First Aid/CPR.

Foundation Standards***California Career Technical Education Model Curriculum Standards:*****Building and Construction Trades Knowledge and Performance Anchor Standards****1.0 Academics**

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment.

California Common Core Standard Standards**English Language Arts Standards*****Reading: Informational Text***

- (RI.9-10.2) Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.
- (RI.9-10.4) Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).
- (RI.9-10.7) Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.

Writing

- (WHST.9-10.2.A) Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
- (WHST.9-10.2.B) Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

(WHST.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.

Mathematics Standards

(HSG.CO.A.1) Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

(7.G.B.4) Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

(7.G.B.6) Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

(6.G.A.1) Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

(6.NS.B.3) Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

2.0 Communications

Acquire and accurately use Building and Construction Trades sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

2.3 Interpret verbal and nonverbal communications and respond appropriately.

2.4 Demonstrate elements of written and electronic communication such as accurate spelling, grammar, and format.

3.0 Career Planning and Management

Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.

3.1 Identify personal interests, aptitudes, information, and skills necessary for informed career decision making.

3.2 Evaluate personal character traits such as trust, respect, and responsibility and understand the impact they can have on career success.

3.4 Research the scope of career opportunities available and the requirements for education, training, certification, and licensure.

3.6 Recognize the role and function of professional organizations, industry associations, and organized labor in a productive society

3.9 Develop a career plan that reflects career interests, pathways, and postsecondary options

4.0 Technology

Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Building and Construction Trades sector workplace environment.

- 4.1 Use electronic reference materials to gather information and produce products and services.
- 4.2 Employ Web-based communications responsibly and effectively to explore complex systems and issues.

5.0 Problem Solving and Critical Thinking

Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Building and Construction Trades sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

- 5.1 Identify and ask significant questions that clarify various points of view to solve problems.
- 5.2 Solve predictable and unpredictable work-related problems using various types of reasoning (inductive, deductive) as appropriate.
- 5.3 Use systems thinking to analyze how various components interact with each other to produce outcomes in a complex work environment.
- 5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.

6.0 Health and Safety

Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Building and Construction Trades sector workplace environment.

- 6.1 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
- 6.3 Set up a work area, or shop, to avoid potential health concerns and safety hazards, including but not limited to electrical (shock), wires (tripping), fumes (lung health), noise (hearing loss), fire (burns), and so forth, incorporating ergonomics.
- 6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.
- 6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.
- 6.6 Maintain a safe and healthful working environment.
- 6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).
- 6.8 Report hazards found on the job site to supervisor/teacher.
- 6.10 Maintain proper use of safety apparel at all times, including but not limited to, eye protection, hearing protection, skin protection, head protection, footwear and protection from airborne particulate matter.
- 6.12 Demonstrate the proper care and safe use of hand, portable and stationary power tools.

7.0 Responsibility and Flexibility

Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Building and Construction Trades sector workplace environment and community settings

- 7.1 Recognize how financial management impacts the economy, workforce, and community.
- 7.2 Explain the importance of accountability and responsibility in fulfilling personal, community, and workplace roles.
- 7.3 Understand the need to adapt to changing and varied roles and responsibilities.
- 7.4 Practice time management and efficiency to fulfill responsibilities.
- 7.6 Demonstrate knowledge and practice of responsible financial management.

8.0 Ethics and Legal Responsibilities

Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.

- 8.1 Access, analyze, and implement quality assurance standards of practice.
- 8.2 Identify local, district, state, and federal regulatory agencies, entities, laws, and regulations related to the Building and Construction Trades industry sector.
- 8.3 Demonstrate ethical and legal practices consistent with Building and Construction Trades sector workplace standards.
- 8.4 Explain the importance of personal integrity, confidentiality, and ethical behavior in the workplace.

9.0 Leadership and Teamwork

Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution as practiced in the SkillsUSA career technical student organization.

- 9.1 Define leadership and identify the responsibilities, competencies, and behaviors of successful leaders.
- 9.2 Identify the characteristics of successful teams, including leadership, cooperation, collaboration, and effective decision-making skills as applied in groups, teams, and career technical student organization activities.
- 9.3 Understand the characteristics and benefits of teamwork, leadership, and citizenship in the school, community, and workplace setting.
- 9.4 Explain how professional associations and organizations and associated leadership development and competitive career development activities enhance academic preparation, promote career choices, and contribute to employment opportunities.
- 9.6 Respect individual and cultural differences and recognize the importance of diversity in the workplace.

10.0 Technical Knowledge and Skills

Apply essential technical knowledge and skills common to all pathways in the Building and Construction Trades sector, following procedures when carrying out experiments or performing technical tasks.

- 10.1 Interpret and explain terminology and practices specific to the Building and Construction Trades sector.
- 10.2 Comply with the rules, regulations, and expectations of all aspects of the Building and Construction Trades sector.
- 10.3 Construct projects and products specific to the Building and Construction Trades sector requirements and expectations.

- 10.4 Collaborate with industry experts for specific technical knowledge and skills.
- 10.5 Demonstrate the basic care, proper maintenance, and use of hand, portable, and stationary tools related to the Building and Construction trades.

11.0 Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the Building and Construction Trades anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through the SkillsUSA career technical student organizations

- 11.1 Utilize work-based/workplace learning experiences to demonstrate and expand upon knowledge and skills gained during classroom instruction and laboratory practices specific to the Building and Construction Trades sector program of study.
- 11.2 Demonstrate proficiency in a career technical pathway that leads to certification, licensure, and/or continued learning at the postsecondary level.

Building and Construction Trades Pathway Standards

D. Residential and Commercial Construction Pathway

The Residential and Commercial Construction pathway provides learning opportunities for students interested in preparing for careers in construction and building design, performance, and sustainability. The standards focus on the manner in which residential and commercial structures are designed and built. The pathway includes instruction in the way in which these structures are built (Class B California License).

- D1.0 Recognize the impact of financial, technical, environmental, and labor trends on the past and future of the construction industry.
 - D1.1 Understand significant historical trends in the construction industry.
 - D1.2 Understand the environmental regulations that influence residential and commercial design.
- D2.0 Apply the appropriate mathematical calculations used in the construction trades.
 - D2.1 Apply formulas to determine area, volume, lineal, board, and square feet.
 - D2.2 Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.
 - D2.3 Estimate the materials needed to complete a specific task.
- D3.0 Interpret and apply information from technical drawings, schedules, and specifications used in the construction trades.
 - D3.1 Identify the elements used in technical drawings, including types of lines, symbols, details, and views.
 - D3.2 Identify and interpret the elements of technical drawings, including plan, elevation, section, and detail views.
 - D3.3 Interpret technical drawings specifications.
 - D3.4 Identify plumbing, electrical, and mechanical symbols and other abbreviations used in construction drawings.
 - D3.5 Interpret and scale dimensions from a set of plans using an architect's scale.
 - D3.7 Understand the sequencing and phases of residential and commercial construction projects.

- D6.0 Demonstrate carpentry techniques for the construction of a single-family residence.
- D6.1 Properly place a moisture barrier and pest control guard on a foundation.
 - D6.2 Attach a sill plate at top of concrete foundation.
 - D6.3 Lay out, cut, and install joist supports, rim joists, and floor joists as specified on construction plans.
 - D6.5 Demonstrate wall and plate layout, including rough openings.
 - D6.6 Measure, cut, and assemble wall components using appropriate tools and fasteners.
 - D6.7 Demonstrate the ability to square wall systems and install wall bracing and shear panels according to code.
 - D6.8 Stand, square, plumb, and brace walls.
- D9.0 Understand, integrate, and employ sustainable construction practices in the building trades.
- D9.1 Identify design and energy solutions for improving building energy efficiency.
 - D9.2 Identify materials used in building construction to increase energy efficiency and sustainability.
 - D9.3 Calculate energy requirements and loads for buildings and structures.
 - D9.4 Demonstrate the application of constructing materials intended to improve building efficiency and sustainability.

Instructional Methods and/or Strategies

- Direct instruction through lectures
- Group and class discussion
- Cooperative learning groups
- Hands-on experience and practice
- Field work
- Project-based learning
- Online and video instruction

Assessment Methods and/or Tools

- Quizzes and unit tests
- Group projects
- On-going application assignments
- Self and peer evaluations
- In-class participation and attendance