Construction Technology Degree Curriculum

One of QVCC's goals is to develop partnerships with local educational institutes, businesses and government to better serve the community. This degree program is the outcome of a partnership with the Home Builders' Association of Connecticut. The intent of the partnership is to formalize skills training in the residential construction trades and preparation for employment.

Another one of QVCC's goals is to provide the skills and knowledge for personal achievement. To that end, the Construction Technology degree program instruction will include problem solving, decision making, teamwork as well as technological skills.

GENERAL EDUCATION CORE		**27 Credits**
Dept. & No.	**Title of Course**	**Credits**
ENG* 101	Composition	3
COM* 173	Public Communication	3
	Fine Arts Elective	3
	History Elective	3
PHL* 111	Ethics	3
	Psychology or Sociology Elective	3
ECN* 102	Principles of Microeconomics	3
	Geography, or Political Science, or History Elective	3
ENG* 202	Technical Writing	3
SCIENCE AND MATH CORE		**15 Credits**
MAT* 167	Statistics with Technology	3
MAT* 186	Precalculus	4
CHE* 121	General Chemistry I	4
PHY* 121	General Physics I	4
TECHNOLOGY/MANAGEMENT CORE		**10 Credits**
MFG* 126	Drafting	3
CAD* 117	Principles of Residential Design	3
CTC* 102	Introduction to Residential Housing	4
SPECIALIZATION ELECTIVE		**15 Credits**
EGR* 118	Material Science	3
CTC* 104	Residential Construction Safety	1
CTC* 200	Residential Site, Foundation & Floor Systems	3
CTC* 211	Advanced Wall Framing	3
CTC* 212	Advanced Roof Framing	3
CTC* 216	Advanced Residential Building Finishes	2
Total Certificate Credits		**67**

CTC* 102 Introduction to Residential Housing — 4 Credits

Students will be introduced to the American housing market by survey of architecture, markets and finance, community planning and civil regulations. Discussions are held on environmentally sustainable structures and careers in the construction workplace. Interpretive skills for construction documents such as contracts, drawings and specifications, as well as the International Residential Building Code will be developed. Students will gain familiarity with basic tools of the building trades during hands-on lab exercises.

The student will:

- Use the terminology and describe the functions associated with specified tools.
- Practice safe work habits.
- Prepare and use specified tools for an intended purpose.
- Identify and select the appropriate nails, screw, adhesives, gussets, nail plates, and joist hangers for specific applications.
- Use the language of framing terms in context to communicate design functions.
- Select common framing materials and explain why they are used.

CTC* 104 Residential Construction Safety — 1 Credit

This course will be offered by an OSHA authorized instructor. The learner will be eligible for a ten (10) hour OSHA construction safety certificate upon completion of this course. Topics will include the areas of highest hazard within the construction workplace, methods of accident prevention, and the rights and responsibilities of all personnel involved in hazardous occupations.

The student will:

- Understand the function and history of OSHA
- Demonstrate and understanding of general duty clause 5 (a) (1) and STD 3-1.1
- Describe the function of record keeping with regard to safety.
- Define a competent person as specified by OSHA standards.
- Complete two hours of OSHA electrical and fall protection training.
- Erect and dismantle scaffolding according to OSHA safety recommendations.
- Set up ladders at an incline that promotes safe work practices.
- Safely install/erect and use ladder jacks, pump jacks, and roof brackets.

CTC* 200 Residential Site, Foundation and Floor Systems 3 Credits

This course is designed to give students an understanding of the methods and processes used to assess and produce residential site topography, utilities installation, on-site waste water treatment, and basic structural foundation construction. Various types of main girder arrangements and integral floor systems will also be explored. Lectures will combine with hands-on lab exercises. Basic hand tools will be required.

The student will:

- Understand and operate a builder's transit and how to assess and control grade conditions.
- Develop awareness of different soils and the purposeful use of construction aggregates.
- Be conversant in basic on-site waste water treatment.
- Comprehend potable water supply and utilities installations necessary for typical residential housing.
- Estimate structural cast in place concrete foundation, pier, and floor systems.
- Develop an awareness of Concrete Masonry Unit and Permanent Wood Foundation systems.
- Demonstrate an understanding of drainage and below grade waterproofing.
- Explain conditions calling for steel and wood girders and columns, including basic sizing and placement.
- Recognize appropriate layout and assembly of common wood joist and engineered lumber flooring systems.
- Accurately estimate materials for common western platform floor-deck systems.

CTC* 201 Residential Building Exteriors 3 Credits

This course is designed to give students a thorough understanding of the methods and processes used to construct the exterior envelope of a common North American residential structure. Topics will include western platform structural framing techniques, various roof and cornice systems, and fenestration (windows and doors). Students will also develop skills in quantity take-off materials lists and job cost estimating. Assembly of these systems will be practiced in a lab environment. Basic hand tools will be required.

The student will:

- Layout and install wall plates, studs and openings as needed to build a wall system.
- Layout and install ceiling joists.
- Identify and describe the function of various parts of a wall or ceiling framing system.
- Describe four different types of walls used in residential construction.
- Layout and install corner and partition framing.
- Install wall blocking and bracing.
- Apply wall sheathing.
- Identify the components of steel wall framing.
- Develop a bill of materials for a wall system.
- Estimate the cost of a wall system.
- Identify and layout standard window and door rough openings.
- Be able to compare and contrast building wraps and vapor barriers including traditional felt paper and poly-olefin fabric.
- Explain the techniques and principles of exterior cornices and moldings.
- Be able to identify roof structures, such as: gable, hip, valley, shed, and dormer inclusive of solid rafter and truss construction.
- Layout and fabricate solid gable rafters and asphalt shingle roof system.
- Explain rain gutter and drainage issues.
- Recognize window and door styles, performance ratings, and installation techniques.

CTC* 202 Residential Building Finishes — 3 Credits

This course is designed to give students an understanding of the methods and processes used to complete residential construction buildings. Topics will include various siding materials, non-structural systems, energy conservation, noise reduction, drywall, and interior trim. Students will demonstrate the ability to describe the components and their interdependencies, and will practice assembly in a lab environment. Basic hand tools will be required.

The student will:

- Describe, compare, and contrast various styles of residential siding, including: clapboard, shingle, vertical masonry, EFIS, wood, and vinyl.
- Apply at least one type of siding.
- Explain the basic principles associated with non-structural residential systems such as: electrical, plumbing, HVAC, audio and visual systems, and central vacuum systems.
- Describe several methods used for wall insulation, energy conservation and noise reduction.
- Demonstrate the ability to install and finish drywall.
- Be able to explain the principles and processes associated with wall, ceiling and decorative finishes.
- Demonstrate the ability to properly install various interior trims, doors, and casings.

CTC* 216 Advanced Residential Building Finishes — 2 Credits

This course is designed to provide students with a work experience in the construction field that will synthesize the student's previous construction educational activities. Students will be required to work at an Externship situation for 20 hours a week over a five-week period. Classroom instruction will take place before and after the Externship to ensure specific curricular goals have been met; and construction of advanced elements such as staircases, kitchen and bath finishes, and built-up molding details will be demonstrated. Basic hand tools will be required.

The student will:

- Explain stairway design, components, layout, and code considerations.
- Demonstrate an understanding of the principles associated with advanced kitchen and bath design, specialty components, and applications of ancillary materials and sub-trades.
- Apply the processes associated with advanced molding and trim applications.
- Analyze future trends and advancing technologies, such as more energy efficient designs, market trends, and advancement in affordable housing in the construction industry.
- Work in varying capacities in an Externship situation.
- Conform to reasonable expectations or policies associated with an Externship opportunity.
- Perform a minimum of 100 hours in an Externship situation.