

**GREAT PLAINS TECHNOLOGY CENTER
COURSE OF STUDY**

<u>Career Cluster:</u>	Architecture and Construction (AC)
<u>Career Pathway:</u>	Construction
<u>Local Program:</u>	Construction Technology Level II (AC0030108)
<u>Career Major Hours:</u>	Secondary Students: 1000 Hours Adult Students: 1000 Hours
<u>Instructor:</u>	Name: Bryan Smith Office Number: (580) 335-5525 or 800-460-5525 E-Mail Address: bjsmith@greatplains.edu
<u>Academic Credit:</u>	Secondary Students: 3 high school credits per year Adult Students: Transcript
<u>Prerequisites:</u>	Construction Technology Level I

Career Major Description:

The construction technician career major is an introduction to the safety practices, tools and equipment, trade related math, blueprint reading and job opportunities in the construction industry. Students will be able to perform all course work related to handling, placing, and finishing concrete. Basic wood framing, concrete form building, roofing applications, thermal and moisture protection, exterior finishing, CNC design and operation, safety practices, general construction tools and equipment uses/operations. Basic introduction will be covered in the following trade areas, residential electrical services, safety, drain waste and vent systems, plastic pipe and fittings, copper pipe and fittings. Students will receive "hands-on" experience building on-site portable buildings and various community service projects as well as general maintenance projects on campus.

Career Major Goals:

Students enrolled in this program will be given the opportunity to develop the skills and attitudes needed to successfully enter the construction trades field according to their personal choice, ability, and resourcefulness.

Upon achieving the goals of this career major, students will:

- Become competent in the basic skills of the occupation.
- Become qualified for further related education and/or entry into the job market.
- Work as a team member.
- Pass at least one Occupational State of Oklahoma certification test.
- Become qualified for further related education and/or enter the job market.
- Demonstrate independence in using problem solving and critical thinking techniques in completing all work assignments.
- Develop the ability to work with limited supervision.
- Accept and abide by the rules and regulations established by the school and/or place of employment.

Related Career Opportunities:

- Commercial Carpenter
- Frame Carpenter
- Concrete form Carpenter
- Concrete Finisher
- CNC setup and Operation

Career Major Objectives:

After successful completion of this career major, the student will be able to:

- Utilize hand tools, power tools, ladders, and scaffolding in a safe, efficient manner.
- Apply basic concepts of math and measurement to perform various construction-related tasks.
- Apply proper layout and construction procedures for building projects.
- Develop an acceptable level of speed and accuracy to perform helper-level skills of the trade.
- Apply proper layout, cutting, and construction procedures for building projects.
- Apply proper design, layout, cutting, procedures for CNC operations.

Career Major Course Sequence:

- HS Student and Part-time Adult (Year One): Course Sequence I
- HS Student and Part-time Adult (Year Two): Course Sequence II

**DESCRIPTION OF COURSES
SEQUENCE I**

<u>Course #</u>	<u>Course Name</u>	<u>HST</u>	<u>HSL</u>	<u>ADI</u>	<u>ADL</u>
C00000	General Construction Safety & First Aid Level II General construction safety including tool and equipment safety, blood borne pathogens, CPR, PPE, confined space entry, hazardous materials, and right to know.	10	20	10	20
C00000	Basic Stair layout Introduces types of stairs and common building code requirements related to stairs. Focuses on techniques for measuring and calculating rise, run, and stairwell openings, laying out stringers, and fabricating basic stairways.	12.5	25	12.5	25
TI00203	Electrical Safety in Construction Covers safety rules and regulations for electricians, including precautions for electrical hazards found on the job. Also covers the OSHA mandated lockout/tagout procedure.	10	20	10	20
C00000	Residential Electrical Services Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the appropriate NEC requirements.	15	30	15	30
C00000	Introduction to Drain, Waste, and Vent (DWV) Systems Explains how DWV systems remove waste. Discusses how system components such as pipe, drains, traps, and vents work. Reviews drain and vent sizing, grade and waste treatment. Also discusses how building sewers and sewers drains connect the DWV system to the public sewer system.	10	20	10	20
C00000	Plastic Pipe and Fittings Introduces the types of plastic pipe and fittings used in plumbing applications, used in plumbing applications, including ABS, PVC, CPVC, PE, PEX, and PB. Describes how to measure, cut, join and	10	20	10	20

support plastic pipe according to manufacturer's instructions and applicable codes. Also discusses pressure testing of plastic pipe once installed.

TI00939 Copper Pipe and Fittings **10 20 10 20**
 Discusses sizing, labeling, and applications of copper pipe and fittings and reviews the type of valves that can be used on copper pipe systems. Explains proper methods for cutting, joining, and installing copper pipe. Also addresses insulation, pressure testing, seismic codes, and handling and storage requirements.

C00000 Introduction to Cabinetmaking **25 55 25 55**
 This module expands on the knowledge and skills gained through the Carpentry Curriculum and provides the basic information needed to construct and apply finishes to custom cabinetry. It identifies and discusses various types of wood products, wood-joining techniques, power tools, cabinet doors, shelves, and hardware. Specific guidance is also provided for the installation of laminated countertops.

C00000 Cabinet installation **10 20 10 20**
 Provides detailed instructions for the selection and installation of base and wall cabinets and countertops.

C00000 Introduction to Construction Equipment **7.5 15 7.5 15**
 Introduces construction equipment, including the aerial lift, skid steer loader, electric power generator, compressor, compactor, and forklift. An overview of general safety, operation, and maintenance procedures is provided.

C00000 CNC Design Software Level II **20 40 20 40**
 This course covers more advanced tool pathing, double sided machining, tiled tool paths and basic cabinet parts layout.

C00000 CNC Set up and Operation Level II **25 50 25 50**
 This course covers the setup, and replacement of various, machine components such as the ball screw mechanism, servo and stepper motors, control towers for both stepper and servo motors, machine alignment and calibration.

Sequence I Subtotal Hours:	Theory	Lab	Total
High School Student:	165	335	500
Adult Student:	165	335	500

**DESCRIPTION OF COURSES
SEQUENCE II**

<u>Course #</u> <u>Course Name</u>	<u>HST</u>	<u>HSL</u>	<u>ADT</u>	<u>ADL</u>
C00000 Intro to Concrete Construction and Finishing	10	20	10	20
Provides an introduction to the methods and procedures used in concrete finishing. Introduces terms of the trade and tools and equipment used to place, finish, and cure concrete. Explains methods and techniques for constructing concrete structures.				

C00000 Concrete Safety	5	10	5	10
Explains safety requirements for concrete construction and finishing. Provides information on OSHA requirements with regard to hazard communication, fall protection, and use of personal protective equipment. Covers topics such as general work site safety, use of chemicals, and safe use of hand and power tools.				
C00000 Properties of Concrete	10	20	10	20
Introduces the properties of concrete and the components that make up the concrete mixture. Describes chemical and physical properties of cement, aggregate, and admixtures. Explains basic tests used to determine properties such as slump and ultimate strength.				
TI00658 Concrete Tools and Equipment	7.5	15	7.5	15
Describes tools and equipment used in the production, placing, and curing of concrete. Explains safe operation and maintenance requirements. Provides opportunities for hand tool operation and demonstration of larger pieces of power equipment.				
C00000 Preparing for Placement	12.5	25	12.5	25
Details the methods and procedures used to prepare for placing concrete. Covers site layout, forms requirements, and subgrade preparation. Describes requirements for joints and reinforcement. Explains how to order concrete from a mixing or batch plant.				
C00000 Placing Concrete	12.5	25	12.5	25
Presents requirements and methods for properly placing concrete. Includes information on conveying and placing fresh concrete using equipment such as wheelbarrows, pumps, and conveyors. Describes techniques for spreading, consolidating, and striking off concrete.				
C00000 Finishing, Part One	15	30	15	30
Presents requirements and methods for properly placing concrete. Includes information on conveying and placing fresh concrete using equipment such as wheelbarrows, pumps, and conveyors. Describes techniques for spreading, consolidating, and striking off concrete.				
C00000 Curing and Protecting Concrete	5	10	5	10
Introduces methods and procedures used in curing and protecting concrete. Covers curing commonly performed for both horizontal and vertical placement. Describes techniques for protecting concrete during hot and cold weather.				
C00000 Introduction to Troubleshooting	5	10	5	10
Describes problems of placing, finishing, and curing. Defines symptoms of problems and discusses their causes. Presents ways to reduce or eliminate these problems.				
C00000 Properties of Concrete, Part two	10	20	10	20
Describes the physical and chemical properties of materials used in a concrete mix. Includes descriptions of chemical and mineral admixtures, lightweight concrete, high strength concrete, flow able fill, and types of paving materials. Discusses expected results of the use of admixtures.				
C00000 Estimating Concrete Quantities	10	20	10	20
Covers the methods and techniques used in estimating materials quantities for concrete construction. Explains the use of plans and drawings as well as math calculations. Gives example calculations for estimating quantities of concrete for curb and gutter, stairs, slab, wall footings, and columns.				
C00000 Forming	20	40	20	40
Describes forming requirements. Includes types of forms, forming materials, use of release agents, form accessories, placement of anchors and embedments, and form removal. Highlights safety requirements with emphasis on reshoring precautions and procedures.				
C00000 Site Concrete	15	50	15	50
Includes descriptions and techniques for forming, constructing, and finishing steps and stairs, curbs and gutters, sidewalks and driveways, and low vertical structures.				

C00000 Surface Treatments 12.5 25 12.5 25
 Provides an overview of surface treatments applied to concrete structures. Includes the requirements for and application of dry shakes, self-leveling topping, epoxies, and shotcrete.

C00000 Making Repairs 10 20 10 20
 Explains the requirements for making repairs to concrete based on specific problems. Explains and demonstrates repair methods. Describes the use of special tools and materials.

Sequence II Subtotal	Theory	Lab	Total
Hours:			
High School Student:	160	340	500
Adult Student:	160	340	500

Career Major Total:	Theory	Lab	Total
High School Student:	325	675	1000
Adult Student:	325	675	1000

* High school students may complete this career major in an adult enrollment status if necessary. Please see your instructor or counselor for details.

Evaluation Policy:

Employability Grades (100 points per week; 50% of final grade)

The employability skills grade is based on 20 points per day (which may include: attitude, attendance, safety, punctuality, cooperation, participation, clean-up, class preparation, school/classroom rules, and time management). Points will be deducted if these responsibilities are not met at the instructor's discretion. Students will be allowed to make up unearned employability points for **excused** absences only. Full credit will be given for assignments/tests that have been made up due to excused absences only (see Student Handbook).

Performance Grades (30% of final grade)

- Live projects
- Performance or skill tests
- Homework
- Written Assignments

Test Grades (20% of final grade)

- Test grades will be based on a 100-point scale.
- Test grades include written and/or skills tests.
- A test will be given for each unit of instruction.
- Tests are to be taken as a unit is completed.
- Tests must be completed within allotted time.

Final Grade (9 Weeks Period)

9-weeks grade will be calculated by averaging grades in each category and summing each category according to their assigned weight. Progress reports will be sent to home schools at six

and twelve-week intervals each semester as required or requested. Grades are accessible online at <http://sonisweb.greatplains.edu/studsect.cfm>

Grading Scale:

The grading scale as adopted by the Board of Education is as follows:

- A = 90 – 100
- B = 80 – 89
- C = 70 – 79
- D = 60 – 69
- F = Below 60
- W = Withdrawn
- I = Incomplete
- N = No Grade (Refer to Student Handbook)

Make-Up Work Policy:

All Make-Up Work Is The Responsibility Of The Student. Make-up work will be handled as specified in the Student Handbook. Please be sure to read and understand all student policies, especially make-up of assignments, tests and employability due to absences. Students should always arrange for any make-up work with the instructor as per the Student Handbook. Students should keep track of his or her progress and grades.

Attendance Policy:

For specific information related to attendance and tardiness, refer to the Student Handbook. Students should keep a written record of their absences and tardiness.

Course Requirements and Expectations:

The general course requirements and expectations include:

- Teaching methods consist of lecture and “hands on” projects.
- The student must demonstrate the ability to apply safety to all aspects of the construction field.
- It is recommended that the student meet with the teacher and their parents at least once per semester.
- All students must adhere to the policies and procedures in the GPTC Student Handbook.
- SkillsUSA is the student organization for the residential construction carpentry field. This club offers an outstanding opportunity to develop leadership and social skills. Students are highly encouraged to participate. Dues are paid by the superintendent.
- It is highly recommended that the student has purchased or attained the required tools and equipment for employment as a carpenter. Possessing a valid driver’s license will also benefit the student and is recommended.

Student Behavior Includes:

- Safety glasses must be worn at all times when in the shop area.
- Name badges must be worn at all times.
- Follow all rules and regulations of Great Plains Technology Center.

NOTE: For additional information or questions regarding the GPTC School policies and procedures, please refer to the Student Handbook and/or the Instructor.

Industry Alignments:

- National Center for Construction Education and Research (NCCER)
- National Association of Home Builders (NAHB)
- National Occupational Competency Testing Institute (NOCTI)

Certification Outcomes:

Tier 2 – Certifications Endorsed by Industry Organizations

- ODCTE: Construction Trainee (3001)
- ODCTE: Frame Carpenter (3005)
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Tier 6 – Certifications Administered/Proctored by Instructor

- OSHA 10-Hour General Industry Assessment
- Power Truck Operator card (forklift)
- First aid/CPR Certification-Medic First Aid

CIP Code and SOC Code Crosswalk:

- CIP Code – 46.0201
- SOC Code – 47-2031

OCAS program codes:

- 9098 – Carpentry (first year)
- 9099 – Construction Technology (second year)

Instructional Materials:

High School Students are not required to purchase textbooks or supplemental materials.

Textbooks (Digital Versions used where available):

National Center for Construction Education and Research (NCCER). Construction Technology: Construction Technology, NCCERconnect Access Card. 4th ed. ISBN-13 9780134751269. Saddle Hill: Pearson Prentice Hall, 2016. (\$140.00)

National Center for Construction Education and Research (NCCER). Concrete Finishing Level 1 Concrete Finishing level 1 trainee Guide, paperback, ISBN-13 9780130101461. Saddle Hill: Pearson Prentice Hall, 1998. (\$89.33)

National Center for Construction Education and Research (NCCER). Concrete Finishing Level 2 Concrete Finishing Level 2 Trainee Guide, paperback, ISBN-13 9780130148605. Saddle Hill: Pearson Prentice Hall, 1998. (\$129.33)