

**GREAT PLAINS TECHNOLOGY CENTER
COURSE OF STUDY**

<u>Career Cluster:</u>	Architecture and Construction (AC)	
<u>Career Pathway:</u>	Construction (AC003)	
<u>Career Major:</u>	Unlimited Electrician's Assistant (AC0030040)	
<u>Career Major Hours:</u>	Adult Students:	1815 Hours
<u>Instructor:</u>	Name:	Mike Klein
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<u>Academic Credit:</u>	Adult Students:	Transcript
<u>Prerequisites:</u>	None	

Career Major Description:

This major prepares students as electrician's assistants who assist in installing, diagnosing and repairing electrical systems for residential, commercial and industrial applications. Students are trained in safety practices, hand and power tools/equipment use and application and electrical theory along with AC/DC circuitry, and wiring applications. Included are motors, motor control circuits, and power distribution systems as well as industrial controls and electromechanical devices, the National Electrical Code, and security and alarm systems. Hours completed in this major can be counted toward the 8,000 hours (four years) of work experience required for the journeyman electrician license.

Career Major Goals:

Students enrolled in this career major will be given the opportunity to develop the skills and attitude needed to successfully enter the electrical field.

Related Career Opportunities:

- Entry Level Electrician's Assistant

Career Major Objectives:

Upon successful completion of this career major, the student should be able to:

- Demonstrate knowledge of basic electrical theory as it applies to residential wiring.
- Use test instruments to test and troubleshoot electrical circuits.
- Apply fabrication skills to construct and install wiring circuitry.
- Demonstrate proper use of various residential wiring tools.
- Properly wire residential circuits per N.E.C. specifications.
- Rewire/add new electrical circuits to existing dwellings per N.E.C. specifications.
- Troubleshoot and repair faulty electrical circuits.
- Complete a cost-estimate for a given job.
- Demonstrate proper job applications procedures.

Career Major Course Sequence:

- Full-time Adult (Year One): Course Sequence I, II and III (Summer)
- Full-time Adult (Year Two): Course Sequence IV

**DESCRIPTION OF COURSES
SEQUENCE I**

<u>Course #</u>	<u>Course Name</u>	<u>ADT</u>	<u>ADL</u>	<u>Total</u>
TI00771	General Construction Safety and First Aid General construction safety including tool and equipment safety, blood borne pathogens, CPR, PPE, confined space entry, hazardous materials and right to know.	30	0	30
TI00203	Electrical Safety in Construction Safety rules and regulations for electricians, precautions for electrical and mechanical hazards on the job, tool and equipment safety, first aid, CPR, blood borne pathogens, OSHA and NFPA mandated lockout/tagout, personal protective equipment, right to know, and confined space entry procedures.	5	10	15
TI00204	Electrical Theory in Construction This course covers Ohms law and concepts of electrical theory necessary to install, maintain and troubleshoot electrical circuits.	40	80	120
TI00773	Electrical Power, Hand Tools & Equip. in Construction This course covers the safe use, operations, and maintenance of power and hand tools used in construction.	10	20	30
TI00774	Direct Current Circuits in Construction This course covers electrical theory in DC circuits and develops a student's understanding of electrical units of volts, ohms, amps, and watts, measurement equipment methods and interrelationships, and troubleshooting skills.	20	40	60
TI00205	Residential Wiring Methods This course covers the circuits used in wiring residential premises including service entry and branch circuit installation, load distribution, device installation, grounding, overcurrent devices, and lighting.	100	140	240
TI00802	Workforce Staging This course is designed to be delivered as an integrated component within the courses taken by the individual student. Course is designed for the development of leadership, personal development and employability skills.	0	30	30

Sequence I Subtotal Hours:	Theory	Lab	Total
Adult Student:	205	320	525

**DESCRIPTION OF COURSES
SEQUENCE II**

<u>Course #</u>	<u>Course Name</u>	<u>ADT</u>	<u>ADL</u>	<u>Total</u>
TI00718	Professional Service This course covers the essential knowledge and skills necessary to provide quality customer service, build character and customer relations, and participate in professional development.	5	10	15

TI00772	Electrical Schematic & Blueprint Reading in Const.	15	30	45
This course prepares the student to interpret standard electrical schematics and construction blueprints.				
TI00168	Alternating Current Circuits in Construction	30	60	90
This course covers electrical theory in AC circuits and develops understanding of generation, amplitude, phase, phase shift, power factor, measurement methods, and troubleshooting skills.				
TI00893	National Electrical Code in Construction	40	80	120
This course prepares the student to locate and interpret specific standards in the NFPA's National Electrical Code. Instruction includes load calculations, conductor sizing, conduit fill calculations, and standards for wiring practices.				
TI00775	Commercial Wiring Methods	40	80	120
This course covers the circuits used in wiring commercial premises including service entry and branch circuit installation, load distribution, device installation, grounding, over-current devices, conduit bending and installation, panels and switchboards, and hazardous locations.				
TI00253	Industrial Wiring Methods	40	80	120
This course covers the circuits used in wiring industrial premises including service entry and branch circuit installation, load distribution, device installation, grounding, over-current devices, conduit bending and installation, panels and switchboards, and hazardous locations.				
TI00776	Motor Theory and Operation in Construction	5	10	15
This course covers the theory of operation of AC and DC motors, their construction, selection of appropriate motors for specific applications, and feeder calculations. (<i>*This course is continued in Sequence IV</i>)				

Sequence II Subtotal Hours:	Theory	Lab	Total
Adult Student:	175	350	525

**DESCRIPTION OF COURSES
SEQUENCE III (Summer)**

<u>Course #</u>	<u>Course Name</u>	<u>ADT</u>	<u>ADL</u>	<u>Total</u>
TI00791	Workforce Induction	0	240	240
This course is a formalized mentor ship based instructional process for the purpose of accelerating the learner's skill development and individual transition into the workforce. Content and specific application of skill development is driven on an individual basis by the respective occupation, career major and/or pathway. Definition of a specific learner's content is reflected within an Individual Skill Development Plan (ISDP).				

Sequence III Subtotal Hours:	Theory	Lab	Total
Adult Student:	0	240	240

**DESCRIPTION OF COURSES
SEQUENCE IV**

<u>Course #</u>	<u>Course Name</u>	<u>ADT</u>	<u>ADL</u>	<u>Total</u>
TI00776	Motor Theory and Operation in Construction	5	10	15
This course covers the theory of operation of AC and DC motors, their construction, selection of appropriate motors for specific applications, and feeder calculations. (<i>*This course is a continuation from Sequence II.</i>)				
TI00207	Motor Control Wiring in Construction	10	20	30
This course covers relays, motor starters, overload sizing, ladder diagrams, and design of complex systems used to control motors in various commercial and industrial applications.				
TI00206	Electrical Distribution in Construction	20	40	60
This course covers the common practices of electrical distribution and the repair and maintenance of distribution systems.				
TI00471	Electromechanical Devices and Applications	30	60	90
This course covers the theory and application of common electromechanical devices used in a manufacturing environment, including relays, solenoids, motors, sensors, and valves. Emphasis will be placed on maintenance, troubleshooting, and repairs for safety and reliability.				
TI00777	Programmable Logic Controllers in Construction	30	60	90
This course covers the application of programmable logic controllers in various commercial and industrial applications and includes the application of internal relays, timers, counters, and special functions. Analog inputs and outputs are covered.				
TI00745	Security Systems Installation	40	80	120
This course covers the regulations and accepted practices of security system installation, maintenance, and repairs.				
TI00209	Alarm Systems Installation	40	80	120
This course covers the regulations and accepted practices for the installation, maintenance, and repair of fire alarm systems.				

Sequence IV Subtotal Hours:	Theory	Lab	Total
Adult Student:	175	350	525

Career Major Total Hours:	Theory	Lab	Total
Adult Student:	555	1260	1815

Evaluation Policy:

Employability Grades (100 points per week; 30% 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 (35% of final grade)

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

Test Grades (35% 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 on-line 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 electrical 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 electrical field. This club offers an outstanding opportunity to develop leadership and social skills. Students are highly encouraged to participate.
- It is highly recommended that the student have purchased or attained the required tools and equipment for employment as an electrician's assistant. Possessing a valid driver's license will also benefit the student and is recommended.

Student Behavior Includes:

- All students will wear navy-blue coveralls.
- Safety precautions prohibit the wearing of tank tops, sleeveless shirts and visible body piercings.
- The required class dress is a program t-shirt with jeans or shorts and work boots or shoes. T-shirts cost \$10.00 each and are paid for by the student.
- Students will also be expected to wear their student ID badge appropriately any time they are on campus. This includes break times.
- Student ID badges will not be altered in any way or be required to purchase a new one.
- Students will wear shoes that completely cover the feet.
- Students will wear clear safety glasses at all times while in the shop environment and may not be altered without specific permission of the instructor. Clear prescription glasses will be permitted.

These rules are in addition to the Student Handbook. Students will be provided a wall-locker and lock to secure all items.

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)
- Oklahoma Construction Industry Board (OCIB)

Certification Outcomes:

Tier 2 – Certifications Endorsed by Industry Organizations

- ODCTE: Construction Trainee (3001)

Tier 3 – Certifications Aligned with National Standards

- ODCTE: Commercial Industrial Electrician's Assistant (3201)
- ODCTE: Residential Electrician's Assistant (3202)

Tier 7 – National Career Readiness Certificate in Applied Mathematics, Locating Information and Reading for Information:

- Platinum Level – 6 or above in all three areas
- Gold Level – 5 or above in all three areas
- Silver Level – 4 or above in all three areas
- Bronze Level – 3 or above in all three areas

CIP Code and SOC Code Crosswalk:

- CIP Code – 46.0302
- SOC Code – 47-2111.00

Instructional Materials:

Students are required to purchase the following list of textbooks and/or supplemental reference materials. The prices listed are approximate and subject to change.

Textbooks:

Benfield, Jack. Benfield Conduit Bending Manual. 0-872-885900. Overland Park: EC&M Books, 1996. (\$45.00)

Hart, George, and Sammie Hart. UGLY'S Electrical References. 9-780-763771-263. Huston: United Printing Arts, 1996. (\$17.00)

National Center for Construction Education and Research (NCCER). Core Curriculum. 0-131-091875. Columbus: Prentice Hall, 2000. (\$52.00)

National Center for Construction Education and Research (NCCER). Electrical Level One. 9-780-136046-04. Columbus: Prentice Hall, 2002. (\$71.00)

National Center for Construction Education and Research (NCCER). Electrical Level Two. 9-780-136044-666. Columbus: Prentice Hall, 2003. (\$103.00)

National Center for Construction Education and Research (NCCER). Electrical Level Three. 9-780-136044-710. Columbus: Prentice Hall, 2002. (\$103.00)

National Electrical Code (NEC). 2002. (\$77.00)