I. VERNON COLLEGE GENERAL EDUCATION PHILOSOPHY STATEMENT

General education at Vernon College reflects the institution’s deep conviction that successful, satisfying lives require a wide range of skills and knowledge. Through the Texas Core Curriculum and through support and reinforcement in all non-core courses, students will gain a foundation of knowledge of human cultures and the physical and natural world, develop principles of personal and social responsibility for living in a diverse world, and advance intellectual and practical skills that are essential for all learning.

CORE OBJECTIVES (GENERAL EDUCATION OUTCOMES)

- Critical Thinking Skills – to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information
- Communication Skills – to include effective development, interpretation, and expression of ideas through written, oral, and visual communication
- Empirical and Quantitative Skills – to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
- Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
- Personal Responsibility – to include the ability to connect choices, actions and consequences to ethical decision making
- Social Responsibility – to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

II. CATALOG DESCRIPTION:

Principles of electricity as required by HVAC technician including proper use of test equipment, electrical circuits, and component theory and operation. Lab Fee: $24.00; Special Fee: $60.00

III. REQUIRED BACKGROUND:

High school graduate, successful completion of GED, or admission under special circumstances.

IV. TEXTS, TOOLS, OTHER REFERENCE MATERIALS:

COURSE NUMBER AND TITLE: HART 1401 Basic Electricity for HVAC

**Recommended tools:**

- 1- 8” adjustable wrench
- 1-way service wrench
- 1- 10” adjustable wrench
- 25’ tape measure
- 1- Needle nose pliers
- 2- ¼” & ½” sockets & ratchets
- 1- Diagonal pliers
- 1- 1/8”x6” Common screw driver
- electronic thermostat
- 1- ¼” x 6” common screw driver
- open and box wrenches
- 1- #1x6” Philips screw driver
- flat file
- 1- #2x6” philips screw driver
- sling psychrometer
- 1- 10” Slip joint pliers
- scratch awl
- pipe wrench
- 1/4” – 5/8” swag set/block
- ¼” – 1 1/8” tubing cutters
- 1- 1/16”-3/8” hex key wrenches
- 1- flaring tool
- 1- ¼” – 1 1/8” tubing cutters
- 1-Volt-ohm meter
- Tin snips; left, right, straight
- 1- Amp meter
- chisel and punch set
- 1- Set of R-22 compound gages
- flashlight
- 1 – Tool box
- R-410a gauges
- 1- ¼” nut driver
- 1- 5/16” nut driver
- Clear Safety Glasses

V. **METHODS OF INSTRUCTION:**

Lecture/Discussion, Hands on lab work, Demonstrations, Video, and Reading assignments.

Students desiring auxiliary aids and services for this course should make their requests to the instructor and the Special Services Director.

VI. **COURSE CONTENT:**

1. Chapter 1 - Science
2. Chapter 2 – Instruments
3. Chapter 3 – circuit materials
4. Chapter 4 – energy
5. Chapter 5 – sources of electricity.
6. Chapter 6 – series circuits
7. Chapter 7 – parallel circuits
8. Chapter 8 – combinations
9. Chapter 9 – magnetism
10. Chapter 10 – generators
11. Chapter 12 – transformers
12. Chapter 13 – ac motors
13. Chapter 14 – inductance
14. Chapter 15 – capacitance
COURSE NUMBER AND TITLE: HART 1401 Basic Electricity for HVAC

VII. COURSE OUTCOMES:

The course outcomes for this course meet Scans competencies – F12, F3, C12, C18, F13, F16, C6, C11, C19, F4, F11, F6, F10, F1

When the student has completed this course he/she will be able to:

1. Demonstrate knowledge of basic principles of electricity, electric current, circuitry, and air conditioning devices.
2. Apply Ohm’s Law to electrical calculations, perform electrical continuity, voltage, and current tests with appropriate meters.
3. Demonstrate electrical safety.

VIII. OBJECTIVES:

1. Exhibit knowledge of basic principles of electricity, electrical current, circuitry, and A/C devices. F12
2. Apply OHM’s law to electrical calculations. F3, C12
3. Perform electrical continuity, voltage, and current tests with appropriate meters. F13, C18, C12
4. Demonstrate electrical safety. F16, C6
5. List the units of measurement for electricity. C11
6. Explain the differences between series and parallel circuits. C19
7. State the formula for determining electrical power. F4
8. Describe a solenoid. C19
9. Explain inductance. C19
10. Describe the construction of a transformer and the way that a current is induced in a secondary circuit. C19
11. Describe how a capacitor works. C19
12. State the reasons for using proper wire sizes. F11
13. Describe the physical characteristics and the function of several semiconductors. C19
14. Describe procedures for making electrical measurements. F6
15. Follow the sequence of electrical events in a heat-cool electrical circuit C19
16. Differentiate between a pictorial and a line-type electrical wiring diagram. F10, F1

IX. ASSESSMENT:

The student will demonstrate proficiency in the objectives listed above through participation in the class activities/projects and performance on quizzes and/or examinations. (See course outline for time schedules of examinations and grading computations.)