SOUTHEAST COMMUNITY COLLEGE
ADVAVANCED TECHNOLOGIES & SKILLED TRADES DIVISION
ELECTRONIC SYSTEMS TECHNOLOGY
COURSE SYLLABUS
Revision Date: August 2025

I. CATALOG DESCRIPTION

Course Number:	ELEC 2046
Course Title	Low Voltage Systems
Prerequisite(s):	none

Catalog Description: This low voltage systems course will explore installing and maintaining low voltage systems such as fire suppression, security, and nurse call systems. This course will also review the National Electrical Code related to these systems.

Credit Hours:	3.0
Class Hours:	30
Lab Hours:	45
Total Contact Hours:	75

II. COURSE OBJECTIVES: *Course will:*

1. Present the technical aspect of low voltage systems.
2. Explain and assess current low voltage technologies.
3. Discuss and demonstrate how to install and maintain low voltage systems solutions.
4. Provide the opportunity for students to practice and develop their troubleshooting skills.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. STUDENT LEARNING OUTCOMES: *Student will be able to:*

1. Demonstrate a working knowledge of low voltage systems.
2. Explain National electrical code as it pertains to low voltage systems.
3. Explain and demonstrate how to install and maintain low voltage systems.
4. Analyze and troubleshoot low voltage systems.

B. GENERAL EDUCATION LEARNING OUTCOMES

GELO #3: Critical Thinking & Problem Solving
Outcome:

2) Synthesize information to arrive at reasoned solutions to problems.

IV. CONTENT/TOPICAL OUTLINE

A. **<u>The National Electrical Code</u>**

1. Purpose of the National Electrical Code
2. Important Coding Definitions
3. Table of Contents and National Electrical Code Format
4. Important National Electrical Code Chapters and Articles for Power-Limited Systems
5. Standards and Standards Agencies
6. Listing and Labeling Laboratories
7. Types of Electrical Circuits

8. Classification of Circuits and Classes
9. Power-Limited Tray Cable and Instrumentation Tray Cable
10. Circuits, Markings, and Separation Requirements
11. Installation Requirements
12. Support of Conductors and Cables
13. Classifications of Fiber and National Electrical Code Article 770
14. National Electrical Code Article 800 Communication Circuits

B. **Types of Low Voltage Systems**

1. **Power Supplies, Batteries, and Emergency Systems**
    a. Transformers
    b. Alternating Current Voltage Regulators
    c. Surge Protectors, Conditioners, and Filters
    d. Generators
    e. Static Uninterruptible Power Supply
    f. Direct Current Power Supplies
    g. Storage Batteries
    h. National Electrical Code Article 700
2. **Fire Alarm Systems**
    a. The Intended Purpose of Fire Alarm Systems
    b. What Is a Fire Alarm System?
    c. Control Units and Alarm-Initiating Devices
    d. Notification Appliances
    e. Electrical Requirements of Power-Limited and Non–Power-Limited Fire Alarm Systems, National Electrical Code Article 760
    f. Wiring of Fire Alarm Systems
    g. Distributed Antenna Systems (DAS)
    h. General radio operators license (GROL)
    i. Troubleshooting
3. **Nurse call Systems**
    a. Types of systems
    b. Installation
    c. Maintenance
    d. Troubleshooting
4. **Security and Access-Control System Basics**
    a. Security Alarm Systems
    b. Wiring a Security Alarm System
    c. Access-Control Systems
    d. Wiring an Access-Control System
    e. Open Source Systems
    f. Electrical Code 402
5. **Video Surveillance**
    a. Artificial intelligence to replace video surveillance.
    b. Artificial Intelligence platform
    c. Video Surveillance Components
    d. Video Surveillance System Specifications
    e. Transmission Link
    f. Viewing Monitors and Video Formats

g. Recording Devices

V. INSTRUCTIONAL MATERIALS

A. **Required Text(s):** Introduction to Low Voltage Systems 2nd Edition
ISBM: 978-1111639532

B. **Other Resources:** Instructor handouts

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:
1. Classroom discussion
2. Demonstrations
3. Lab work

VII. METHODS OF EVALUATION

A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
1. Exams and quizzes
2. Homework
3. Lab evaluation
4. Observation

B. SCC STANDARD GRADING SCALE POLICY:

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIREMENTS