

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

ELRN 439

COURSE TITLE

CONSUMER ELECTRONICS TECH

TYPE COURSE

NON-FEE

VOCATIONAL

CATALOG COURSE DESCRIPTION

An open entry/exit modular course in the entry level skills required for employment as a Consumer Electronics Service Technician. This course presents instruction in radios and televisions, VCR's CD's, camcorders, and other consumer products repair and services. Students will learn the process of effective troubleshooting and repairing various types of consumer electronic products. Instruction will enable the student to gain necessary workplace skills required for employment. (FT)

LECTURE HOURS

200

LABORATORY HOURS

400

ADVISORIES

NONE

RECOMMENDED SKILL LEVEL

Students must meet a 10th grade math/reading level or better and possess the ability to communicate effectively in the English language. Students must have normal color perception and above average manual dexterity.

INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility
SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication
SDCE students demonstrate effective communication skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking
SDCE students critically process information, make decisions, and solve problems independently or cooperatively.
4. Personal and Professional Development
SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self-advocacy skills to cope with changing situations in their lives.

COURSE GOALS

To provide instruction in the theory of operation and repair of consumer electronic equipment. Students will learn correct safety procedures and develop safe habits necessary to work in an accident-free work environment. Diagnostic and repair skills required to repair malfunctions in consumer electronic units will also be developed. Acquiring these skills will enable students to troubleshoot, repair and maintain consumer electronic equipment and their circuitry. Students will learn to show a spirit of cooperation and team work by completing assigned group tasks. Completion of these tasks will enhance the student's reading, writing, communications and mathematical competencies. Interpretation of technical terms used in the consumer electronic industry, both verbal and written, is covered. Instruction in common business practices, ethics and integrity will be an integral part of this curriculum. Students who successfully complete the course will be qualified for entry-level positions in the consumer electronic repair industry or start their own business.

COURSE OBJECTIVES

Upon successful completion students will demonstrate, through theory and practical application, problem solving; critical thinking; written and oral communication; and mathematical ability and that they are able to:

1. Correctly use various test instruments to view, identify and troubleshoot normal and abnormal conditions through various picture and waveform analysis in:
 - 1.1. Television.
 - 1.2. Videocassette recorders.
 - 1.3. Camcorders.
 - 1.4. Monitors.
 - 1.5. Other video systems.
2. Correctly use various test instruments to diagnose and repair normal and abnormal conditions in:
 - 2.1. AM/FM frequency generating equipment.
 - 2.2. Stereo Hi-Fi systems.
 - 2.3. Telephone systems.
3. Correctly use various test equipment to diagnose and repair:
 - 3.1. Compact disc players.
 - 3.2. Laser disc players.
4. Demonstrate correct troubleshooting and repair procedures.

COURSE OBJECTIVES (CONTINUED)

5. Correctly use computer specialized equipment and diagnostic software to interpret and solve equipment malfunctions.
6. Demonstrate the ability to converse and write effectively in technical terms.
7. Demonstrate the ability to satisfy the requirements for C.E.T. preparation.
8. Demonstrate professional ethics, personal integrity, good business practices and consumer relation skills, meeting the Department of Consumer Affairs standards.

SECTION II

COURSE CONTENT AND SCOPE

All modules of the program contain the following:

1. Basic/Advanced Electronics
2. AC/DC Theory and Circuit Applications
3. Electronic Systems and Theory of Operation
4. Mathematics, Reading and Writing Concepts
5. Equipment Operation
6. Troubleshooting, Repair and Maintenance

Math review for this module will cover the following areas: addition, subtraction, multiplication and division of whole numbers, fractions, decimals.

MODULE I

5 Hrs.

SAFETY

1. Electronics Test Technician Program Orientation
2. Facilities Orientation
 - 2.1. Safety Equipment
 - 2.1.1. Types
 - 2.1.2. Locations
 - 2.1.3. Operation
3. Common Types of Injuries
 - 3.1. Electrical burns
 - 3.2. Chemical hazards
4. Tool Safety
 - 4.1. Hand tools
 - 4.2. Electrical tools
5. Fire Safety
 - 5.1. Escape procedures
 - 5.2. Overloading
6. Equipment Safety
 - 6.1. Grounding
 - 6.2. High voltage
 - 6.3. Electrical power distribution

COURSE CONTENT AND SCOPE (CONTINUED)

7. Material Safety Data Sheets (MSDS)
 - 7.1. Electrostatic discharge (ESD)
 - 7.2. Electrostatic protective Devices

Math review for this module will cover these areas: addition, subtraction, multiplication, division of whole numbers, fractions, decimals, percents, square roots, algebraic expressions and the metric system; trigonometry, charts and graphing. Emphasis is placed on problem solving and critical thinking skills as an integral part of this module.

COURSE CONTENT AND SCOPE (CONTINUED)

MODULE II 150 Hrs.
TELEVISION AND VIDEO SYSTEMS

1. Television Systems
2. Television Receivers
3. Electronic Components
4. Test Equipment and Servicing Aids
5. Troubleshooting and Repair Techniques
6. Power Supplies
7. Vertical Deflection Circuits
8. Horizontal Sweep and Control Circuits
9. Sync Stages and Circuits
10. Horizontal Drivers, Output and High Voltage Circuits
11. Shutdown/Startup Systems
12. Tuners and Remote Controls
13. Video Amplifiers
14. Video Detection and AGC Circuits
15. Digital Television, Monitors and Picture Enhancement
16. Video Troubleshooting, Maintenance and Repair
17. Projection Television

Math review for this module will cover the following areas: addition, subtraction, multiplication and division of whole numbers, fractions and decimals; percentages, square roots, algebraic expressions and the metric system; trigonometry, charts and graphing. Emphasis is placed on the problem solving and critical thinking skills as an integral part of this module.

MODULE III 145 Hrs.
VIDEO CASSETTE RECORDERS (VCR)

1. Video Cassette Recording
2. Basic Format Fundamentals
3. VCR and Magnetic Recordings
4. Troubleshooting Techniques
5. All-Format VCR Analyzer
6. Servo and Control Systems
7. Sensor System Control and Electrical Alignment

COURSE CONTENT AND SCOPE (CONTINUED)

8. Routine Maintenance
9. Electromechanical and Mechanical Operations
10. Tuner and IF Circuits
11. Special Circuits and Accessories
12. Hi-Fi/Stereo and Digital Audio Circuits

Math review for this module will cover the following areas: addition, subtraction, multiplication and division of whole numbers, fractions and decimals; percentages, square roots, algebraic expressions and the metric system; trigonometry, charts and graphing. Emphasis is placed on the problem solving and critical thinking skills as an integral part of this module.

COURSE CONTENT AND SCOPE (CONTINUED)

MODULE V 100 Hrs.
CAMCORDERS

1. Camcorder and Video Cassette Formats
2. Power Supplies
3. Camera Section Theory of Operation
4. Video Circuits
5. Audio Circuits
6. Servo Control
7. System Control
8. Mechanical/Electrical Adjustments
9. Special Tools and Test Equipment
10. Troubleshooting, Repair and Maintenance

Math review for this module will cover the following areas: addition, subtraction, multiplication and division of whole numbers, fractions and decimals; percentages, square roots, algebraic expressions and the metric system; trigonometry, charts and graphing. Emphasis is placed on the problem solving and critical thinking skills as an integral part of this module.

MODULE VI 100 Hrs.
MISCELLANEOUS CONSUMER PRODUCTS

1. Computer System Features and Components
2. Computer Fundamentals
3. Troubleshooting, Repair and Maintenance of Computers
4. Microwave Oven Features and Components
5. Microwave Oven Fundamentals
6. Troubleshooting, Repair and Maintenance of Microwave Ovens
7. Fax Machines Features and Components
8. Fax Machines Fundamentals
9. Troubleshooting, Repair and Maintenance of Fax Machines
10. Telephones and Answering Machines Features and Components
11. Telephones and Answering Machines Fundamentals
12. Troubleshooting, Repair and Maintenance of Telephones and Answering Machines

APPROPRIATE READING

Power Quality, monthly magazine
Radio Electronics, monthly magazine
Popular Electronics, monthly magazine
Cabling, monthly magazine
Electronic Servicing Technology, monthly magazine

WRITING ASSIGNMENTS

Typical writing assignments will include:

1. Completing assigned reports.
2. Providing written answers to assigned questions.
3. Performing arithmetic calculations as assigned.
4. Completing repair orders.

OUTSIDE ASSIGNMENTS

Students are expected to spend a minimum of 3 hours per day outside of class in practice and preparation for each day in class. Appropriate assignments may include, but not limited to:

1. Appropriate readings.
2. Preparing research reports.
3. Preparing appropriate writing assignments.
4. Studying as needed to perform successfully in class.

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Students will perform analysis and evaluation of reading and/or classroom materials and utilize this analysis in classroom discussions, writing assignments, and in performing laboratory activities. Students must select and use appropriate methods and materials needed to complete laboratory assignments.

EVALUATION

A student's grade will be based on multiple measures of performance. The assessment will measure development of independent critical thinking skills and will include evaluation of the student's ability to:

1. Perform the manipulative skills of the craft, as required, to industry standards.
2. Apply Theory to laboratory assignments.
3. Perform on written, oral, or practical examinations.
4. Maintain attendance per current policy.

Satisfactory completion of the course requires completion of a culmination activity, which may include, but not be limited to, on of the following:

1. Written report.
2. Classroom presentation.
3. Research project.
4. Industry involvement.

The Culminating activity will require the student to use the new skills that he/she acquired during the course. The student will receive an evaluation at the end of each module or when

EVALUATION (CONTINUED)

requested by the student. A grade point average of 2.0 or letter grade of C or better must be achieved for satisfactory completion.

Upon satisfactory completion of all modules, a Certificate of Completion will be issued.

NOTE: If a student's goal is to complete one or more of the individual modules, upon satisfactory completion of that module(s) a Certificate of Achievement may be issued.

METHOD OF INSTRUCTION

Classroom lectures and demonstrations, laboratory assignments, audio-video presentation, computer assisted instruction, group and individual instruction. Field trips, job shadowing and internships may be utilized.

TEXTS AND SUPPLIES

Texts:

Television & Video Systems, Charles G. Buscombe
Troubleshooting Compact Disc Player, Homer L. Davidson
Upgrading & Repairing PC's, 5th Edition, Scott Mueller
Certified Electronic Technician C.E.T., Prep Exam Workbook
Electronic Principles, Malvino, 1993
Introductory Principles for Solid State Devices, Paytner
Electronic Communication Systems, Freznel
Troubleshooting & Repairing Camcorders

PREPARED BY: Rickey E. Hyatte DATE: August 19, 1997

REVISED BY: Instructional Services, SLOs added DATE: March 8, 2017

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

REFERENCES:

San Diego Community College District Policy 3100
California Community Colleges, Title 5, Section 55002
Continuing Education Catalog