

Approval Dates:
Division 1/12/94
CRC 2/28/94
Board of Trustees _____

**MISSION COLLEGE
ASSOCIATE DEGREE CREDIT COURSE OUTLINE**

SECTION I Course Data

| COURSE NUMBER | COURSE TITLE | UNITS |
|----------------------|--|--------------|
| CET-67 | Computer Diagnostics, Repair, and Upgrade | 3 |

| LECTURE HOURS (PER WEEK) | LAB HOURS (PER WEEK) |
|---------------------------------|-----------------------------|
| 2 | 3 |

CREDIT / NO CREDIT OPTION YES NO

MAY THIS COURSE BE REPEATED? YES NO; How many times? 1

RECOMMENDED FOR CREDIT BY EXAMINATION? YES NO

CATALOG COURSE DESCRIPTION

This is an introductory course on the diagnostics, repair, and upgrade of IBM PC/clones. This course requires no previous experience with computers, and is designed to provide for a wide range of needs: from entry-level high-tech positions, to job retraining, to skill upgrading. This course will include hardware configuration, software diagnostics, maintenance procedures, memory upgrade, floppy and hard disk installation and setup, power supply analysis, troubleshooting, and much more.

DESCRIPTION FOR THE SCHEDULE OF CLASSES

An introductory course on the diagnostics, repair, and upgrade of IBM PC/clones. No previous experience with computers is required. Course includes hardware configuration, software diagnosis, maintenance procedures, memory upgrade, floppy and hard disk installation and setup, troubleshooting, and much more.

ACCEPTABLE FOR TRANSFER CREDIT:

California State University; Yes No

University of California; Yes No (Check Yes if you wish to apply.)

PREREQUISITE

Recommended eligibility for

COREQUISITE

None

SECTION II Course content

A. COURSE CONTENT AND SCOPE

1. STUDENT COURSE OBJECTIVES

Upon completion of this course, the student will be able to:

- a) Identify and classify the major computer sub-systems
- b) Use disk-operating system (DOS) and basic-input-output-system (BIOS) utilities
- c) Compare the various computer types, such as the 386 vs 486
- d) Diagnose a malfunctioning computer and correct the problems.
- e) Upgrade an older computer system to comply with newer standards.
- f) Assess and perform required maintenance procedures

2. OUTLINE OF TOPICS TO BE ADDRESSED IN COURSE BY INSTRUCTOR

- I. Introduction
 - A. Electrical and mechanical safety
 - B. Identification and use of hand tools
- II. Basic Skills
 - A. Computer familiarization
 - B. Rework
 1. soldering and desoldering techniques
 2. wire-wrapping techniques
 3. cable troubleshooting
 - C. Schematic and logic diagrams
- III. Basic Instruments
 - A. Diagnostics Software
 - B. Oscilloscope and digital-volt-meter (DVM)
 - C. In-circuit resistance
- IV. The disk operating system (DOS)
 - A. files
 1. management
 2. commands
 - B. EDLIN vs Edit editor
 - C. DOS utilities
 - D. System setup
- V. Microcomputer systems
 - A. hardware
 1. mother board
 2. central-processing-unit (CPU) and coprocessor
 3. Video board
 4. input/output (I/O) board

- 5. primary, secondary, and backup memory
- 6. keyboard and mouse
- B. DOS and ROM (read-only-memory)/BIOS
 - 1. software interrupts
 - 2. versions of DOS and ROM/BIOS
- C. comparison of types
- VI. Troubleshooting and upgrading
 - A. Software diagnostics
 - B. self and post test
 - C. error codes
 - D. board, disk, and adapter replacement

B. TITLE V REQUIREMENTS

1. APPROPRIATE READINGS AND TEXTBOOKS

a) TEXTBOOKS

Mueller, Scott. Upgrading and Repairing PCs A+ Certification. Upper Saddle River, N.J.: Prentice Hall, 2001.

Schmidt, Cheryl. The Complete Computer Repair Textbook (A+ Material Covered). Upper Saddle River, N.J.: Prentice Hall, 2001

b) READINGS / OTHER

No author (company publication). Advanced PC troubleshooting. Oradell, New Jersey, Essential Seminars, 1994.

2. WRITING ASSIGNMENTS, DEMONSTRATION OF ABILITY TO USE SYMBOL SYSTEMS OR DEMONSTRATION OF ABILITY TO APPLY SKILLS LEARNED IN THE COURSE.

Course includes a variety of activities in this area, such as:

- a) In one page or less, compare the major characteristics of primary, secondary, and backup memory.
- b) Replace a 486 motherboard, and set up DIP switches and jumpers to the correct positions and run Bios Setup.
- c) Run the post-card diagnostic program and identify a parity error.

3. APPROPRIATE OUTSIDE ASSIGNMENTS

Course includes a variety of outside assignments, such as:

- a) Read Chapter 25, and explain how to transfer a DOS file to another disk..
- b) Convert various numbers between decimal, binary, and hexadecimal.
- c) Derive a formula that determines hard disk capacity from sector and track data.

4. APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE

CRITICAL THINKING.

Course includes a variety of critical thinking activities, such as:

- a) Assemble a computer system, properly initializing and setting all switches and jumpers.
- b) Compare the extended and expanded memory requirements of the 286, 386, and 486 computers.
- c) Use "dead PC" troubleshooting methods to identify and correct a power supply error. .
- d) Determine the location of a bad memory chip by using the POST diagnostics software.

5. **CULTURAL PLURALISM; Yes** ___ **Not applicable** X ___

6. **METHOD OF INSTRUCTION;**

Lecture X Laboratory X Discussion ___
Self Paced ___ Individualized ___ Computer Assisted ___
Collaborative Groups ___ Demonstration X ___
Other (Please explain)

7. **STUDENT EVALUATION**

Student questionnaires and student feedback.
Student designed projects.
Written tests, quizzes, assignments.

8. **CLASSIFICATION OF COURSE FOR MAJOR AND/OR GENERAL EDUCATION**

___ No, this course is not for a major
X No, this course is not General Education
X Yes, I wish to use the course in a specific major and will fill out the supplemental form in Form M.
___ Yes, I wish to apply for GE And will fill out the supplemental form in Form G

SECTION III Course Support

NEEDS ASSESSMENT

According to the Occupational Outlook Handbook (U.S. Dept. of Labor 1992-93 edition), "Employment of computer equipment repairers will grow much faster than the average for all occupations through the year 2005".

Furthermore, our surveys (such as the employer program review survey) indicate that many companies request that their technicians and engineers know how to repair and troubleshoot computer systems.. This is a skill that has never been adequately taught in our program.

DISCIPLINE AREA

Computer/Electronics Technology

RESOURCES NEEDED OR ANTICIPATED

This course can be taught with existing facilities.

PLAN FOR EVALUATION OF COURSE

This course will be evaluated by students, by industry contacts, and by the faculty of the CET department every semester.

PREPARED BY: Roger Lewis (sponsor: Roy Goody) **DATE** 1/3/94
CURRICULUM COMMITTEE DIVISION REPRESENTATIVE Roy Goody **DATE** 1/20/94

THIS OUTLINE MUST BE SUBMITTED WITH AN APPROPRIATE SIGNATURE FORM.