STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

CITA 170 - COMPUTER CONCEPTS AND OPERATING SYSTEMS

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CANINO SCHOOL OF ENGINEERING TECHNOLOGY
DECISION SYSTEMS
FALL 2018

A. **TITLE**: Computer Concepts and Operating Systems

B. **COURSE NUMBER:** CITA 170

C. **CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)**

 # Credit Hours: 3
 # Lecture Hours: 3 **per week**
 # Lab Hours: **per week**
Other: **per week**

Course Length: 15 **Weeks**

D. **WRITING INTENSIVE COURSE**: No

E. **GER CATEGORY:** None

F. **SEMESTER(S) OFFERED:** Fall/Spring

G. **COURSE DESCRIPTION:** A study of the terminology and concepts associated with computer systems hardware and software. Topics will include: system hardware components, memory organization and management, operating systems, troubleshooting fundamentals, hardware security and software security etc. This course should be taken concurrently with CITA 175 Computer Concepts and Operating Systems Lab course.

H. **PRE-REQUISITES/CO-REQUISITES:**

a. Pre-requisite(s): none
b. Co-requisite(s): CITA 175 Computer Concepts and Operating Systems Lab
c. Pre- or co-requisite(s): none

I. **STUDENT LEARNING OUTCOMES:**

By the end of this course and CITA 175 Computer Concepts and Operating Systems Lab course, the student will be able to:

Course Student Learning Outcome [SLO]	***PSLO***	***ISLO***
a. Describe basic computer hardware architecture and hardware components	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
b. Install and configure computer operating systems	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
c. Manage basic computer system assembly	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
d. Describe the function of typical computer peripherals	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5
e. Install typical computer peripherals	3. Demonstrate a solid understanding of the methodologies and foundations of IT	5

f. Use basic troubleshooting techniques to isolate faults in hardware/software	4. Apply problem solving and troubleshooting skills	2[CA] 5
g. Work in teams to troubleshoot and repair computer equipment	2. Identify issues and collaborate on solutions concerning IT in an effective and professional manner	4[T] 5

J. APPLIED LEARNING COMPONENT: **Yes** X **No**

- Classroom/Lab

K. TEXTS:

- A+ Essentials 220-701. Testout.
- A+ Practical Application 220-702. Testout.

L. REFERENCES: Internet resources selected by the instructor

M. EQUIPMENT: Computer lab classroom

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- Exams
- Quizzes
- Assignments

P. DETAILED COURSE OUTLINE:

I. How Computers Work - An Overview

A. Basic Computer Concepts
B. Interaction between Hardware and Software

II. An Introduction to Hardware

A. Introduction to Digital Circuits
1. Number systems: decimal, binary, hexadecimal, conversions
2. Basic digital circuit elements
3. Basic digital logic gates

B. Computer Architecture
    1. CPU and chipset
    2. BIOS
    3. Memory systems
    4. Permanent storage systems
    5. Common I/O ports
    6. Peripherals
    7. Buses

III. How Hardware and Software Work Together

A. Software Fundamentals
    1. What is software; it's role in a computer system
    2. Types of software – system and application
    3. Operating systems – history, functions, tools

B. Boot Up Sequence
    1. Role of hardware
    2. Role of BIOS
    3. Role of operating system

C. System Resources
    1. How an Operating System uses system resources
    2. How system resources are assigned

IV. PC Maintenance and Repair Fundamentals

A. Hardware and Software Tools
B. Preventive Maintenance Plan
C. Safety Procedures
D. Troubleshooting Approaches

V. Electricity and Power Supplies

A. Basic electrical concepts and devices
B. Description and preventions of electricity-based damages
C. Form factors
D. Energy conservation – Energy Star standards
E. Troubleshooting PC power supply problems

VI. Processors and Chipsets

A. Processor Types and Performance Evaluation Criteria
B. How Processors Work
C. Chipsets and How They Work
D. Maintaining Processor Performance and Integrity – Cooling Systems
E. Processor Installation and Upgrade

VII. Motherboards

A. Components on a Motherboard
B. Installing or Replacing
C. Configuring, Supporting, and Troubleshooting
D. Buses and Bus Architectures

VIII. Managing Memory

A. Types of Memory and How Each Works
B. Error Checking
C. Measuring Memory Speed

D. Upgrading
E. Troubleshooting

IX. Hard Drives

A. Floppy Drives Organization
B. Hard Drives – Physical and Logical Organization
C. Hard Drives Technologies
D. Communication between PC and HD
E. Installation and Troubleshooting
F. Maintenance, Optimization and Protection

X. I/O Devices

A. Types of I/O Devices
B. Principles of Installation and Support
C. Using ports and expansion slots for add-on devices
D. Multimedia Devices

XI. Operating Systems

A. The Role and Architecture of and Operating System
B. Common Operating Systems for PCs – MS Windows Family
C. Other Operating Systems
D. Windows Operating System
    1. Installation
    2. Maintenance and Support
    3. Troubleshooting
E. UNIX like Operating Systems (Linux)
    1. Installation
    2. Maintenance and Support
    3. Troubleshooting

XII. Purchasing a PC or Building Your Own

XIII. Hardware Security and Software Security

Q. <u>LABORATORY OUTLINE</u>: N/A