



NEW YORK CITY COLLEGE OF TECHNOLOGY

Electromechanical Engineering Technology | Course Outline

Course: EMT 2370: Computer Hardware Systems

Course Coordinator: Prof. Yu Wang

Credits: 2

This course is: Required Elective

Revised on: Spring 2020

Selective Elective

Contact Hours: 3

Class Hours: 1

Lab Hours: 2

Ind. Study Hours: 0 **Internship Hours:** 0

Catalogue Description:

Computer hardware systems, along with several software concepts, are studied to understand the function and relationship of the CPU, memory and peripheral equipment. Course material is chosen for relevance to industry certification exams such as A+. The peripheral equipment includes monitors, disk drives, scanners and printers. During laboratory exercises, computer systems, with monitor and operating system, are provided for analysis by students working in teams. However, as an option, each student can build, configure, analyze and troubleshoot his or her own IBM PC (or compatible) computer.

Pre-Requisites: EMT 1250

Co-Requisites: None

Required Texts [Title. Authors. Publisher. Year.]

1. **CompTIA A+ Certification All-in-One Exam Guide, Tenth Edition.** Mike Meyers. McGraw Hill Professional, 2019, ISBN10: 1260458229, ISBN13: 9781260458220

Other Suggested References or Supplemented Material

1. **Upgrading and Repairing PCs, 22nd Edition.** Scott Mueller. Published 2016 by Que. (ISBN Print): 978-0789756107, Also available as eBook.

Course Learning Outcomes

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

1. Set up a new computer
2. Identify system requirements when purchasing a new computer
3. Understand the technology and specifications used to describe computer components, and make informed choices about which device characteristics are required for the situation.
4. Install or upgrade the operating system.
5. Manage external devices.
6. Troubleshoot common computer problems that can be resolved without replacing internal components.
7. Connect to a small home network

General Education Outcomes

SKILLS/Inquiry/Analysis: Employ scientific reasoning and logical thinking.

SKILLS/Inquiry/Analysis: Use creativity to solve problems

KNOWLEDGE/Lifelong learning/Acquire tools for lifelong learning—how to learn, how they learn, knowledge of resources.

VALUES, ETHICS, AND RELATIONSHIPS/Professional/Personal Development/Demonstrate Intellectual honesty and personal responsibility.

Student Outcomes listed in the ETAC/ABET Criterion 3 Addressed in this Course

Student Outcomes	Level
1. An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline;	R
2. An ability to design solutions for well-defined technical problems and assist with the engineering design of systems, components, or processes appropriate to the discipline;	I
3. An ability to apply written, oral, and graphical communication in well-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;	R
4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results;	R
5. An ability to function effectively as a member of a technical team;	R

ABET Program Criteria: Electromechanical Engineering Technology

Curricular Area	Level
a. Application of computer-aided drafting or design tools to prepare graphical representations of electromechanical systems.	R
b. Application of circuit analysis, analog and digital electronics, basic instrumentation, associated software and computers to aid in the characterization, analysis, and troubleshooting of electromechanical systems.	R
c. Application of statics, dynamics (or applied mechanics), strength of materials, engineering materials, engineering standards, and manufacturing processes to aid in the characterization, analysis, and troubleshooting of electromechanical systems.	I

Legend: I (Introduce), R (Reinforce) and E (Emphasize). Unmarked means not addressed.

Brief list of topics to be covered

Week 1	Introduction and motivation: Protection and Safety, Professionalism, Intercultural Knowledge, PC Tools, PC Maintenance
Week 2	Hardware: How the PC Works, Case and External Connections, Installed Devices and their connectors.
Week 3	Microprocessors: CPU Core Components, Registers, Clocks, Data Bus, Memory
Week 4	LAB #1: Build PC: Build a Personal Computer from parts supplied by the Lab. Test the PC for functionality.
Week 5	BIOS and CMOS: Updating ROM and Device Drivers, Power-on-self Test, The Boot Process, Expansion Boards.
Week 6	LAB #2: Bios Lab. Study the BIOS of the computer and the multiple uses. Configuration of Computer Peripherals.
Week 7	Mid Semester Exam
Week 8	Power Supplies, Hard Drive Technology: Parallel and Serial ATA, SCSI, RAID, SATA.
Week 9	LAB #3: Windows Installation. Study the types of window installation in the corporate environment.
Week 10	Local Area Network, Special I/O Devices: Biometric, Bar code, touch Screen. Multimedia, Printers.
Week 11	LAB #4: Install a Workgroup LAN; Study the characteristic and capabilities of Workgroup Network.
Week 12	Networks: Installing and Configuring Wired and Wireless Networks, The Internet, and Network Security.
Week 13	LAB #5: Install a Wireless LAN; Study capabilities and characteristic of Wireless Networks.
Week 14	Securing computers, application encryption in computer, and troubleshooting.
Week 15	Final Exam.