

# Computer Engineering Technology - CPS (CET)

## **CET 1990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

## **CET 2100. Essentials of Computer Organization. (3 Hours)**

Covers the structure and organization of computing systems. Topics include basic computer architecture, CPU and arithmetic-logic unit design, the datapath, input/output methods, memory management including caches and virtual memory, storage, instruction execution, assembly programming and assemblers, instruction formats, addressing modes, peripherals and interfacing, interrupts, and an introduction to operating systems and compilers.

**Prerequisite(s):** GET 1100 (may be taken concurrently) with a minimum grade of D- or ITC 1200 (may be taken concurrently) with a minimum grade of D-

## **CET 2200. Data Structures and Algorithms. (3 Hours)**

Covers the design, analysis, and implementation of data structures and algorithms to solve engineering problems using an object-oriented programming language. Topics include elementary data structures (including arrays, stacks, queues, and lists); advanced data structures (including trees and graphs); the algorithms used to manipulate these structures; and their application to solving practical engineering problems.

**Prerequisite(s):** ALY 2100 with a minimum grade of D- or GET 2100 with a minimum grade of D- or ITC 2100 with a minimum grade of D-

## **CET 2300. Object-Oriented Programming. (3 Hours)**

Discusses the fundamental principles of object-oriented programming (OOP) and associated concepts and definitions such as classes, objects, encapsulation, coupling, cohesion, inheritance, abstraction, polymorphisms, and generic dispatch. Provides contextual comparisons of programming paradigms drawing on simple examples and case studies, particularly of purely object-oriented, hybrid, and procedural programming. Examines applicability and illustrates techniques and idioms of OOP in the C++ language using a wide variety of in-class examples and via students' assignments and small projects. Examines methods of OOP analysis and design via the Unified Modeling Language diagrams.

**Prerequisite(s):** CET 2200 with a minimum grade of D-

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## **CET 3000. Computer Operating Systems. (3 Hours)**

Covers the structure of modern operating systems. Topics include operating system structure, processes, threads, interprocess communication, system calls, context switching, address space, memory management, virtual memory, context switching, scheduling, synchronization, deadlocks, storage management, mass storage, file systems, I/O systems, security, and virtual machines.

**Prerequisite(s):** CET 2100 with a minimum grade of D- ; CET 2200 with a minimum grade of D-

## **CET 3100. Computer Networking and Communications Technology. (3 Hours)**

Covers the technical foundation for designing, installing, maintaining, and monitoring computer networks. Covers technologies, protocols, and techniques used to connect computers to other computers and hardware components. Topics include the Open Systems Interconnection network model (OSI), internet protocols (TCP/IP), the User Datagram Protocol (UDP), Local Area Networks (LANs) and Wide Area Networks (WANs), wireless networks, network security, virtual private networking, and network management. Covers both circuit-switched and IP-based communications.

**Prerequisite(s):** CET 2100 with a minimum grade of D- ; CET 2200 with a minimum grade of D-

## **CET 3990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

## **CET 4210. Robotics. (3 Hours)**

Covers the theory and practice of robotics. Topics include kinematics, dynamics, position and orientation, trajectories, coordinate frames, navigation, closed-loop control, obstacle detection, manipulation of objects, actuators, sensors, systems modeling, analysis, motion control, and techniques for programming robots. Offers students an opportunity to obtain practical experience in constructing and programming a robot system.

**Prerequisite(s):** CET 2100 with a minimum grade of D- ; EET 3100 with a minimum grade of D- ; EET 3300 with a minimum grade of D-

**CET 4220. Embedded Systems. (3 Hours)**

Introduces fundamental concepts of digital signal processing. Offers students an opportunity to understand how to represent, analyze, and manipulate digital signals via theoretical background and hands-on work. Provides technical bases to evaluate, design, and program digital signal processors, considering their architecture and match to embedded applications. Students use acquired knowledge and skills in digital electronics and programming to design, implement, and test simple embedded microprocessors systems for data collection, control, and/or analysis. Topics include embedded systems characteristics, custom and general-purpose processors, general and dedicated software, testing and debugging approaches, memory system design, interfacing, serial and parallel communication, bus standards, protocols, and arbitration.

**Prerequisite(s):** CET 2100 with a minimum grade of D- ; EET 3300 with a minimum grade of D-

**CET 4950. Seminar. (1-4 Hours)**

Offers an in-depth study of selected topics.

**CET 4955. Project. (1-4 Hours)**

Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. May be repeated without limit.

**CET 4983. Topics. (1-4 Hours)**

Covers special topics in computer engineering technology. May be repeated without limit.

**CET 4990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**CET 4991. Research. (1-4 Hours)**

Offers students an opportunity to conduct research under faculty supervision.

**Attribute(s):** NUpath Integration Experience

**CET 4992. Directed Study. (1-4 Hours)**

Offers independent work under the direction of members of the department on a chosen topic.

**CET 4993. Independent Study. (1-4 Hours)**

Offers independent work under the direction of members of the department on a chosen topic.

**CET 4994. Internship. (1-4 Hours)**

Provides students with an opportunity for internship work.

**Attribute(s):** NUpath Integration Experience

**CET 4995. Practicum. (1-4 Hours)**

Provides eligible students with an opportunity for practical experience.

**CET 4996. Experiential Education Directed Study. (1-4 Hours)**

Draws upon the student's approved experiential activity and integrates it with study in the academic major.

**Attribute(s):** NUpath Integration Experience