Computer Engineering (CESC)

CESC 220 Digital Circuit Design 3 Credits (3,0)

Knowledge and skills in logic design, interfacing digital circuits, Boolean algebra, combinatorial logic circuits, circuit minimization techniques, flip-flop storage elements, shift registers, counting devices, sequential logic circuits, state machines, and computer structure.
Worldwide Prerequisites: ENGR 101W

Corequisites: CESC 220L

Course Offered at: Daytona Beach, Prescott, Worldwide, Asia

CESC 220L Digital Circuit Design Laboratory 1 Credit (0,1)

Laboratory experiments in measurement and verification of digital circuits. Design analysis and measurements of discrete and integrated logic circuits.
Corequisites: CESC 220

Course Offered at: Daytona Beach, Prescott, Worldwide, Asia

CESC 299 Special Topics in Computer Engineering 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in computer engineering.
Course Offered at: Daytona Beach, Prescott, Worldwide

CESC 300 Computing in Aerospace and Aviation 3 Credits (3,0)

Exploration of computer engineering aspects of systems from embedded sensor and actuator controllers to high-performance computing systems used in air traffic control and weather forecasting. Includes engineering techniques, database management, human-computer interaction, and network systems.
Daytona Beach Prerequisites: ENGR 115 or CPSC 223

Worldwide Prerequisites: CPSC 223

Course Offered at: Daytona Beach, Worldwide

CESC 315 Signals and Systems 3 Credits (3,0)

Graphical interpretation of differentiation and integration; singularity functions and properties; time-domain analysis of linear time-invariant (LTI) systems; convolution and stability of linear systems. Periodic signals; exponential Fourier series; Fourier series properties; Parseval's theorem. Transfer function of LTI systems; Fourier transform development and evaluation; inverse Fourier transform. Laplace transform; unilateral Laplace transform and properties; inverse Laplace transform; network analysis using Laplace transform. Pole/zero concept; transfer function and frequency response of LTI systems in the complex frequency domain.
Daytona Beach Prerequisites: ENGR 115 or CPSC 223

Course Offered at: Daytona Beach

CESC 320 Microprocessor Systems 3 Credits (3,0)

Microprocessor or microcontroller organizations and programming. Members of a current microprocessor or microcontroller family. Assembly language programming techniques for microprocessors or microcontrollers. General purpose input and output, serial communications, and other peripherals. Hardware and software relationships.
Daytona Beach Prerequisites: CESC 220

Daytona Beach Corequisites: CESC 320L

Prescott Prerequisites: CE/EE/SE majors must have C or better in CESC 220 and CPSC 125 and CPSC 223

Prescott Corequisites: CESC 320L

Worldwide Prerequisites: CESC 220

Worldwide Corequisites: CESC 320L

Course Offered at: Daytona Beach, Prescott, Worldwide

CESC 320L Microprocessor Systems Laboratory 1 Credit (0,1)

Hands-on experience with microprocessors through weekly experiments involving hardware and software techniques.
Prerequisites: CESC 220L (CE/EE/SE majors C or better)

Corequisites: CESC 320

Course Offered at: Daytona Beach, Prescott, Worldwide

CESC 325 Fundamentals of Applied Microcontrollers 3 Credits (3,0)

Applications-oriented study of microcontrollers for non-majors. Fundamentals of digital logic, microcontroller peripherals, programming, interfacing, and application. Must be taken concurrently with the Fundamentals of Applied Microcontrollers Laboratory.
Prerequisites: C or better in CPSC 125 and CPSC 223

Corequisites: CESC 325L and [(ELEC 223 and ELEC 223L) or (ELEC 335 and ELEC 335L)]

Course Offered at: Prescott

CESC 325L Fundamentals of Applied Microcontrollers Laboratory 1 Credit (0,1)

Hands-on experience with digital circuits and microcontrollers through weekly experiments. Must be taken concurrently with Fundamentals of Applied Microcontrollers.
Corequisites: CESC 325

Course Offered at: Prescott

CESC 330 Digital Systems Design with Aerospace Applications 4 Credits (4,0)

Principles of advanced digital design, use of computer-aided design tools, and prototype designs using programmable logic devices and field-programmable gate arrays (FPGAs). Lab component involving VHDL and FPGAs.
Prerequisites: CESC 220 and CESC 220L

Course Offered at: Daytona Beach

CESC 330L Digital Systems Design Laboratory 0 Credits (0,0)

Advanced digital design principles, use of computer-aided design tools, development of complex digital circuits, and prototype designs using FPGAs. Lab component involving VHDL.
Corequisites: CESC 330

Course Offered at: Daytona Beach

CESC 399 Special Topics in Computer Engineering 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in computer engineering.
Course Offered at: Daytona Beach, Prescott, Worldwide

CESC 410 Digital Signal Processing 3 Credits (3,0)

Introduction to discrete-time signal processing; fundamental principles of discrete-time systems and signals in time and frequency domains. Signal classification, time and frequency domain analysis, difference equations, z-transform, Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters, Discrete-Time Fourier Transform (DTFT), and Discrete Fourier Transform (DFT).
Daytona Beach Prerequisites: CESC 315

Daytona Beach Corequisites: CESC 410L

Prescott Prerequisites: ELEC 314

Prescott Corequisites: CESC 410L

Course Offered at: Daytona Beach, Prescott

CESC 410L Digital Signal Processing Laboratory 1 Credit (0,1)

Real-time digital signal processing (DSP) principles. Discrete-time signal development and analysis using MATLAB; waveform generation; Discrete-Time Fourier Transform (DTFT) and Fast Fourier Transform (FFT) operations; spectral analysis. Fourier Transform properties; lowpass and bandpass sampling techniques. Hands-on filter design using MATLAB Simulink.
Prerequisites: CESC 315

Corequisites: CESC 410

Course Offered at: Daytona Beach, Prescott

CESC 420 Computer Systems Design I 3 Credits (3,0)

Participate in a two-semester multidisciplinary capstone design course; engage in requirements gathering, team management, analysis, design, implementation, and testing of software/hardware systems; collaborate in teams using defined processes for product development; assess project work with industrial standards and review techniques; emphasize skills for effective participation in engineering development teams in industrial environments.
Daytona Beach Prerequisites: Computer Engineering Major, Senior Standing and CESC 320 and ELEC 401

Prescott Prerequisites: CE majors must have a C or better in CESC 320 and CESC 320L and ELEC 401

Course Offered at: Daytona Beach, Prescott

CESC 421 Computer Systems Design II 3 Credits (3,0)

Participate in a two-semester multidisciplinary capstone design course; engage in requirements gathering, team management, analysis, design, implementation, and testing of software/hardware systems; collaborate in teams using defined processes for product development; assess project work with industrial standards and review techniques; emphasize skills for effective participation in engineering development teams in industrial environments.
Prerequisites: CESC 420

Course Offered at: Daytona Beach, Prescott

CESC 440 Autonomous Vehicle Design 3 Credits (3,0)

Development of autonomous vehicles in aerospace and aviation. Concepts in robotics, control, sensing, vision, intelligence, and mechanics. Participation in a project to design and build an autonomous vehicle for an international robotics competition.
Prerequisites: CESC 320

Course Offered at: Daytona Beach

CESC 450 Real-Time Embedded Systems 3 Credits (3,0)

Overview of real-time embedded systems, including requirements, design, implementation, interrupts, task synchronization, resource sharing, and software reliability.
Daytona Beach Prerequisites: CPSC 225 and CESC 320

Prescott Prerequisites: CE/SE students must have C or better in CESC 320 and CESC 320L, and CPSC 420

Worldwide Prerequisites: CPSC 225 and CESC 320

Course Offered at: Daytona Beach, Prescott, Worldwide

CESC 460 Telecommunications Systems 3 Credits (3,0)

Techniques and applications in telecommunications, data communication methods, hardware requirements, speed versus quality, and security and encoding algorithms.
Daytona Beach Prerequisites: CESC 320 and CESC 320L

Prescott Prerequisites: CE/SE students must have C or better in CESC 320 and CESC 320L

Course Offered at: Daytona Beach, Prescott

CESC 470 Computer Architecture 3 Credits (3,0)

Detailed exploration of Von Neuman computer architecture, including processors, memory, input/output, machine language, assembly language, microprogramming, and operating systems. Coverage of advanced topics in computer architecture and systems.
Prerequisites: CESC 320 and CESC 320L (CE/SE students must have C or better)

Course Offered at: Daytona Beach, Prescott, Worldwide

CESC 499 Special Topics in Computer Engineering 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in computer engineering.
Course Offered at: Daytona Beach, Prescott, Worldwide