Electrical Engineering (ELEC)

ELEC 500 Digital Control Systems 3 Credits (3,0)

Microcontroller-based control systems; basic architecture of microcontrollers; analog and digital input-output; advanced communications; hardware design for embedded systems; sensors and actuators; firmware programming using high-level languages; projects included.
Course Offered at: Daytona Beach

ELEC 505 Advanced Mechatronics 3 Credits (3,0)

Modeling and analysis of dynamic systems; system identification techniques; control sensors and actuators; analog and digital control electronics; interfacing sensors and actuators to a microcomputer/ microcontroller; analog and digital controller design; real-time programming for control.
Course Offered at: Daytona Beach

ELEC 510 Linear Systems 3 Credits (3,0)

Theory and application of linear systems; linear algebra and matrix theory; state-space representation; eigenvalues, eigenvectors, and eigenfunctions; orthonormal representation of signals.
Course Offered at: Daytona Beach, Prescott

ELEC 515 Random Signals 3 Credits (3,0)

Theory and application of random processes; probability theory, random signals, noise, correlation; stationary and ergodic processes; response of linear systems to random signals.
Course Offered at: Daytona Beach

ELEC 525 Avionics and Radio Navigation 3 Credits (3,0)

Fundamentals of avionics and aeronautical radio navigation; foundations of radio wave propagation, antenna types, and the radio spectrum. Capabilities and limitations of major radio navigation systems. Technical aspects of the historical context of these aids including the technological limitations at the time of their development. Implications for modern systems (LORAN, NDB, VORTAC, ILS, GPS, and aircraft radar.
Course Offered at: Daytona Beach

ELEC 527 Modern Control Systems 3 Credits (3,0)

State-space models; controllability, observability, stability; PID and state feedback controllers; continuous to discrete time conversions; z-transform; advanced topics such as model predictive control, adaptive control, robust control, Kalman filters.
Course Offered at: Prescott

ELEC 528 Sensors and Data Links 3 Credits (3,0)

Explores signal processing and sensor technology, focusing on efficient information capture, transmission, and analysis. Covers compression techniques, variable-length codes, Huffman and Hamming codes, and channel capacity. Applications include satellite navigation, radar, and lidar, emphasizing real-time data acquisition and system design. Evaluate signal transmission and sensor system performance in real world applications.
Course Offered at: Daytona Beach

ELEC 529 Electro-Optical Systems 3 Credits (3,0)

Principles and practices in electro-optical sensing systems; modern optics and optical devices; LIDAR, multispectral imaging, RFID, phased-array radars.
Course Offered at: Daytona Beach

ELEC 599 Special Topics in Electrical Engineering 1-6 Credit (1-6,0)

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

ELEC 620 Digital Communications 3 Credits (3,0)

Digital codes; generation, advantages, disadvantages of various types of codes; bandwidth considerations; intersymbol interference, bit error rates; tools for analyzing impairments including eye diagrams, constellation diagrams; improving digital communication techniques such as matched filters, error detection, error correction, and data compression.
Prerequisites: ELEC 510 and ELEC 515

Course Offered at: Daytona Beach

ELEC 625 Satellite-Based Communications and Navigation 3 Credits (3,0)

Satellite communications and navigation system design; microwave transmission, satellite transponders, earth station hardware, satellite networks; satellite orbits, propagation effects, satellite system technologies, earth station design, modulation techniques, satellite communications networks, satellite navigation. Design project required.
Course Offered at: Daytona Beach

ELEC 690 Graduate Research Project 3 Credits (3,0)

Master-level research project under advisor supervision. Focus on advanced topics in electrical engineering. Requires faculty advisor and program coordinator approval of goals, plan, and deliverables.
Course Offered at: Daytona Beach

ELEC 699 Special Topics in Electrical Engineering 1-6 Credit (1-6,0)

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

ELEC 700 Graduate Thesis 1-9 Credit (1-9,0)

Master-level research project in electrical engineering conducted under supervision of research advisor and thesis committee approved by the program coordinator. Thesis committee approval of an oral defense and final thesis report is required at the culmination of the research project.
Course Offered at: Daytona Beach

ELEC 800 Dissertation 1-9 Credit (1-9,0)

Ph.D. research under advisor and thesis committee supervision; submission of a final report, approved by the dissertation committee; oral defense of research required for dissertation credits.
Course Offered at: Daytona Beach