

## ELECTRICAL ENGINEERING (ELEN) - TECHNICAL ELECTIVES

- CSCE 313** **Introduction to Computer Systems (3-2) 4 Credits** - Introduction to system support for application programs, both on single node and over network: OS application interface, inter-process communication, introduction to system and network programming, and simple computer security concepts; hands-on lab assignments. *Prerequisites: CSCE 221 with a grade of C or better; CSCE 312 or corequisite CSCE 350/ECEN 350.*
- CSCE 314** **Programming Languages (3-3) 3 Credits** - *Explores the design space of programming languages via an in-depth study of two programming languages, one subject-oriented (Java), one functional (Haskell); focuses on idiomatic uses of each language, and on features characteristic for each language. Prerequisites: Concurrent enrollment in CSCE 221; junior or senior classification or approval of instructor.*
- ESET 352** **Electronics Testing I (3-3) 4 Credits** - Testing of electronic devices and systems; including test planning, test reporting, test specifications, parametric testing, measurement accuracy, test hardware, sampling theory, digital signal processing based testing, and calibrations; both circuit analysis (2/3) and circuit design (1/3) with several analog and mixed-signal systems. *Prerequisites: ENTC 329 and ESET 350 with a grade of C or better.*
- MATH 414** **Fourier Series and Wavelets (3-0) 3 Credits** - Fourier series and wavelets with applications to data compression and signal processing. *Prerequisite: MATH 304, MATH 309, MATH 311, or MATH 323.*
- MATH 442** **Mathematical Modeling (3-0) 3 Credits** - The construction of mathematical models from areas such as economics, game theory, integer programming, mathematical biology and mathematical physics. *Prerequisites: MATH 304, MATH 309, MATH 311, or MATH 323; MATH 308 or equivalent.*
- MATH 470** **Communications and Cryptography (3-0) 3 Credits** - Introduction to coded communications, digital signatures, secret sharing, one-way functions, authentication, error control and data compression. *Prerequisites: MATH 304 or MATH 309 or MATH 311 or MATH 323; CSCE 110 or CSCE 111 or CSCE 121 or CSCE 206 or ENGR 112; approval of instructor.*
- MATH 471** **Communications and Cryptography II (3-0) 3 Credits** - Additional topics in coded communications; information and entropy, elliptical curves, error corrections, quantum methods. *Prerequisites: MATH 470 or consent of instructor.*
- MEEN 221** **Statics and Particle Dynamics (3-0) 3 Credits** - Application of the fundamental principles of Newtonian mechanics to the statics and dynamics of particles; equilibrium of trusses, frames, beams and other rigid bodies. *Prerequisites: For non-mechanical engineering majors; admission to an engineering major; MATH 251 or MATH 253 or registration therein; PHYS 218.*
- MEEN 222/ MSEN 222** **Materials Science (3-0) 3 Credits** - Mechanical, optical, thermal, magnetic and electrical properties of solids; differences in properties of metals, polymers, ceramics and composite materials in terms of bonding and crystal structure. *Prerequisites: CHEM 102, or CHEM 104 and CHEM 114, or CHEM 107 and CHEM 117; PHYS 218. Cross Listina: MSEN 222/MEEN 222.*
- MEEN 315** **Principles of Thermodynamics (3-0) 3 Credits** - Theory and application of energy methods in engineering; conservation of mass and energy; energy transfer by heat, work and mass; thermodynamic properties; analysis of open and closed systems; the second law of thermodynamics and entropy; gas, vapor and refrigeration cycles. *Prerequisites: MEEN 225; MATH 251 or MATH 253; junior or senior classification.*
- MSEN 460** **Electronic, Optical and Magnetic Properties of Materials (3-0) 3 Credits** - Origins of functional materials properties from their electronic and molecular structure; electron theory in solids; electronic transport and dielectric behavior; optical and magnetic properties; current applications of functional materials. *Prerequisite: MSEN 201, MSEN 222/MEEN 222, AERO 413, BMEN 343, CHEN 313, CVEN 306, ENTC 206, or NUEN 265, or approval of instructor.*
- PHYS 221** **Optics and Thermal Physics (3-0) 3 Credits** - Wave motion and sound, geometrical and physical optics, kinetic theory of gases, laws of thermodynamics. *Prerequisites: PHYS 208; MATH 152 or MATH 172; registration in MATH 221, MATH 308.*

*Additional 300/400 level courses within the Colleges of Engineering and Science may be acceptable; approval from the Department is required prior to registration.*