Engineering Electives for CEEN Majors

BIOL 113  Essentials in Biology (3-3) 4 credits – One semester in introductory biology for non-majors; chemical basis of life, cellular and molecular biology, genetics, evolution, biodiversity and interaction of organisms with their environment; includes a laboratory to supplement and reinforce lecture topics.

MATH 414  Fourier Series and Wavelets (3-0) 3 credits – Fourier series and wavelets with applications to data compression and signal processing. Prerequisites: 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 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: Admission to upper division in an engineering major; MATH 251 or 253 or registered therein; PHYS 218.

MEEN 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.

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 221; MATH 251 or 253; U3 or U4 classification.

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 172; registration in MATH 221, 308.

PHYS 222  Modern Physics for Engineers (3-0) 3 credits – Atomic, quantum, relativity and solid state physics. Prerequisites: PHYS 208 or PHYS 219; MATH 308 or registration therein.

Note: MATH 470 approved as an Engineering Elective for CEEN majors prior to fall 2013; AERO 320 approved as an Engineering Elective for CEEN majors prior to fall 2014

Updated 3/30/15