Acceptable Cognate Courses for M.S.E. and Ph.D.

Shown below is a partial list of courses that can be used to satisfy the advanced math cognate course requirement for the CEE Department’s M.S.E. degrees. In general, the math courses should have a prerequisite of Math 215 or equivalent.

Math 404  Intermediate Differential Equations  |  Aero 452  Probabilistic Methods in Engineering
Math 412  Introduction to Modern Algebra  |  BioStat 553  Applied Biostatistics
Math 417  Matrix Algebra I  |  ChemE 508  Applied Numerical Methods I
Math 419  Linear Spaces and Matrix Theory  |  IOE 472  Operations Research
Math 425  Intro. to Probability  |  IOE 510  Linear Programming
Math 433  Intro. to Differential Geometry  |  Stat 412  Intro Prob Stat
Math 450  Adv. Math for Engineers I
Math 451  Adv. Calculus I
Math 454  Boundary Value Prob. For PDE
Math 462  Mathematical Models
Math 471  Intro. to Numerical Methods
Math 5XX  Any 500 level math course

Shown below is a partial list of math-oriented courses that cannot be used to satisfy the advanced math cognate requirement. However, these courses can be used to satisfy the second cognate course requirement for the CEE Department’s M.S.E. degrees.

ME 400  Mechanical Engineering Analysis  |  Aero 414  Structural Mechanics II
ME 401  Engineering Statistics for Manufact.  |  Aero 416  Theory of Plates and Shells
ME 501  Analytical Methods in Mechanics  |  Aero 510  Finite Elements – Introductory Level
ME 502  Methods of Diff. Eqns. in Mechanics  |  Aero 511  Finite Elements – Intermediate Level
ME 504  Principles of Variational Methods  |  Aero 516  Mechanics of Fibrous Composites
ME 505  Finite Element Methods  |  Aero 518  Theory of Elastic Stability I
ME 511  Theory of Solid Continua  |  Aero 552  Probability and Random Processes
ME 512  Theory of Elasticity  |  Aero 553  Stochastic Processes
ME 519  Theory of Elasticity I  |  Aero 611  Advanced Topics in Finite Element
ME 543  Analytical and Comp. Dynamics I  |  AM 412  Advanced Strength of Materials
ME 555  Design Optimization  |  AM 515  Contact Mechanics
ME 558  Discrete Design Optimization  |  AM 565  Optimal Structural Design
ME 563  Time Series Modeling  |  AM 618  Theory of Elastic Stability II
ME 564  Linear Systems Theory  |  AM 619  Theory of Plasticity II
Stat 405  Introduction to Statistics  |  MSE 514  Composite Materials
SNRE 438  Natural Resources Statistics

There are many other courses in engineering, math, science, and architecture/urban planning that may satisfy the requirements for the non-math cognate course. (A cognate course must not be cross-listed with a CEE course, must be at the 400 level or higher, must be related to the field of specialization, and must be listed in the Rackham Bulletin.) Such courses must be approved for cognate credit in advance by the student’s academic advisor.