Acceptable Cognate Courses for M.S.E. and Ph.D. in Civil and Environmental Engineering

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

Course #	Course		
Math 404	Intermediate Differential Equations	BioStat 521	Applied Biostatistics
Math 412	Introduction to Modern Algebra		
Math 416	Theory of Algorithms		
Math 417	Matrix Algebra I		
Math 419	Linear Spaces and Matrix Theory	IOE 510	Linear Programming
Math 433	Intro. to Differential Geometry		
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		

Shown below is a partial list of courses that may be used to satisfy the second cognate course requirement for the CEE Department's M.S.E. and Ph. D. degrees.

Course #	Course		
ME 400	Mechanical Engineering Analysis	Aero 416	Plates and Shells
ME 401	Statistical Quality Control and Design	Aero 513	Solid and Structura l Mechanics I
ME 412	Advanced Strength of Materials	Aero 514	Solid and Structura l Mechanics II
ME 515	Contact Mechanics	Aero 516	Mechanics of Composites
ME 501	Analytical Methods in Mechanics	Aero 518	Theory of Elastic Stability I
ME 502	Methods of Diff. Eqns. In Mechanics	Aero 565	Optimal Structural Design
ME 511	Theory of Solid Continua	Aero 611	Advanced Finite El ements
ME 519	Theory of Plasticity I		
ME 543	Analytical and Comp. Dynamics I	MSE 514	Composite Materia ls
ME 555	Design Optimization		
ME 558	Discrete Design Optimization		
ME 563	Time Series Modeling		
ME 564	Linear Systems Theory		
ME 605	Adv. Finite Element Methods in Mech.		

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. Cognate courses must be passed with a B- or better to count towards the degree.) Such courses must be approved for cognate credit in advance by the student's academic advisor. Courses outside of engineering, math, science, and architecture/urban planning are generally not acceptable as cognate courses. Except as listed above, generally 400 level courses are not acceptable.

Examples of courses accepted in the past: UP 538, UP 594, UP 565