

Memo To: Faculty Senate

From: Missouri S&T Campus Curriculum Committee Meeting

RE: Substitute report for December 2, 2008 and January 6, 2009 meetings

This substitute report replaces the original report circulated to the faculty senate. It is identical to the original report except for the removal of DC 0307. This DC has been returned to the committee for further consideration, in compliance with instructions from the Rules, Procedure & Agenda committee.

The Missouri S&T Campus Curricula Committee recommends to the Faculty Senate that the curriculum changes and degree proposals on the following DC forms be approved.

Approved DC forms:

DC 0300, Mining Engineering, Mineral Process Engineering, approved effective Fall 2009. A proposal to create a new minor in Mineral Process Engineering.

DC 0303, Business and Information Technology, approved effective Fall 2009. A proposal to create a minor in Enterprise Resource Planning.

DC 0304, Technical Communication, approved effective Fall 2009. A proposal to modify the current curriculum for the BS in Technical Communication.

DC 0306, Computer Science, approved effective Fall 2009. A proposal to modify the BS in Computer Science because the department is renumbering several courses.

The Missouri S&T Campus Curricula Committee recommends to the Faculty Senate that the course changes on the following CC forms be approved.

Approved CC forms:

CC 7491, Economics 437, Math 437, Financial Mathematics II. New course approved effective Spring 2009.

Catalog Description: Continuation of Math/Econ 337. Topics include martingales and measures, stopping times, discrete and continuous time finance, Brownian motion, Ito calculus, stochastic differential equations, Black-Scholes-Merton formula, numerical procedures.

Credit Hours: 3 hour lecture

Prerequisites: Math 337 or Econ 337

CC 7492, Math 437, Financial Mathematics II. The following changes were approved effective Spring 2009.

Co-listing: Econ 437

CC 7493, Chemical Engineering 372, Alternative Fuels. New course approved effective Fall 2009.

Catalog Description: Global energy outlook and available resources are discussed.

Alternative energy options and their technologies are covered associated environmental concerns and technology are assessed. Special emphases are placed on renewable energies, transportation fuels, energy efficiencies, and clean technologies.

Credit Hours: 3 hour lecture

Prerequisites: Ch Eng 235 or senior or graduate standing

CC 7494, Computer Science 309, Software Requirements Engineering. The following changes are approved effective Fall 2009.

Course Number – Proposed: 409

Catalog Description - Proposed: This course will cover advanced methods, processes, and technique for discovering, analyzing, specifying and managing software requirements of a software system from multiple perspectives. It will discuss both functional and non-functional requirements analysis.

Prerequisite – Present: CS 306

Proposed: CS 206

CC 7495, Civil Engineering 332, Transport Processes in Environmental Flows. New course approved effective Spring 2009.

Catalog Description: Dynamics, mixing and contaminant transport in surface water bodies, including rivers and lakes. Buoyancy modifications to the mixing and dynamics of pollutant discharges and surface water bodies. Transport of sediments. Exchange processes at the air/water and sediment/water interfaces.

Credit Hours: 3 hour lecture

Prerequisites: At least a “C” in CE 230

CC 7496, Finance 260, Investments I. The following changes are approved effective Fall 2009.

Course Number – Proposed: 360

Catalog Description – Proposed: Introduction to fundamental elements of investment analysis. Students learn financial tools and gain necessary knowledge to select among alternative financial assets. Real world experience includes stock analysis, portfolio simulations and interactions with professionals in the securities industry.

CC 7497, IDE 325, Introduction to Decision Analysis. New course approved effective Fall 2009.

Catalog Description: This course is an introduction to decision analysis, a decision-making method under uncertainty. The course topics include probability theory, influence diagram, decision tree, subjective probability, sensitivity analysis, value of information, risk attitude, and utility models.

Credit Hours: 3 hour lecture

Prerequisites: Stat 211 or Stat 213 or Stat 215 or Stat 217

CC 7498, Mechanical Engineering 331, Aerospace Engineering 331, Thermofluid Mechanics II. The following changes are approved effective Fall 2009.

Course Title – Proposed: Intermediate Thermofluid Mechanics

Catalog Description – Proposed: Derivation of Navier-Stokes equations, analytical solutions of viscous flows; flow in pipes, flow networks; intermediate treatment of boundary layer theory; micro-fluidics & MEMS; introduction to numerical methods for solving fluid flows; and, preliminary treatise on turbulence.

CC 7499, Mechanical Engineering 312, Aerospace Engineering 352, Finite Element Approximation I – An Introduction. The following changes are approved effective Fall 2009.

Course Title – Proposed: Introduction to Finite Element Analysis

Catalog Description – Proposed: Variational formulation of the governing equations. Finite element model, interpolation functions, numerical integration, assembly of elements and solution procedures. Applications to solid mechanics, fluid mechanics and heat transfer problems. Two-dimensional problems. Computer implementation and use of commercial finite element codes.

CC 7500, Mechanical Engineering 408, Aerospace Engineering 408, Finite Element Approximation II Second Course. The following changes are approved effective Fall 2009.

Course Title – Proposed: Advanced Finite Element Analysis

Catalog Description – Proposed: Higher order, isoparametric and mixed finite elements. Eigenvalue and time-dependent problems. Solution procedures for dynamic analysis. Implicit and explicit methods. Applications to viscous incompressible fluid and plate bending problems. Three-dimensional problems. Nonlinear finite element analysis. Practical applications using commercial software.

Prerequisites – Present: ME 312

Proposed: Me 312 or AE 352

CC 7501, Engineering Management 482, Systems Engineering 482, Financial Engineering II. New course approved effective Spring 2009.

Catalog Description: This course introduces advanced topics in financial engineering, which includes introduction to Wiener processes, martingales and Ito's Lemma; basic numerical methods for options pricing, exotic options; interest rate models; stochastic volatility models and jump-diffusion models; and value-at-risk.

Credit Hours: 3 hour lecture

Prerequisites: Emgt/Sys Eng 481

CC 7502, Computer Science 158, Discrete Mathematics for Computer Science. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 128

CC 7503, Computer Science 230, Theory of Computer Science. The following change approved effective Fall 2009.

Course Number – Proposed: CS 220

Prerequisites – Present: CS 158 and CS 153

Proposed: CS 128 and CS 153

CC 7504, Computer Science 232, Modular Software Systems. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 272

Prerequisites – Present: CS 253 and IST 231

Proposed: CS 53

CC 7505, Computer Science 236, Programming Languages and Translators. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 256

Prerequisites – Present: CS 253

Proposed: CS 153

CC 7506, Computer Science 285, Computer Network Concepts and Technology. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 265

CC 7507, Computer Science 303, Multimedia Systems. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 353

CC 7508, Computer Science 304, Database Systems. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 338

Prerequisites – Present: (CS 238 or CS 274) and CS 158

Proposed: CS 128 and CS 238

CC 7509, Computer Science 319, Security Operations & Program Management. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 362

CC 7510, Computer Science 333, The Structure of a Compiler. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 356

Prerequisites – Present: CS 236 or CS 274 and CS 253 (or graduate standing)

Proposed: CS 256 and CS 253

CC 7511, Computer Science 343, Interactive Computer Graphics. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 358

CC 7512, Computer Science 355, Analysis of Algorithms. The following change is approved effective Fall 2009.

Course Number – Proposed: CS 325

CC 7513, Computer Science 385, Computer Communications and Networks. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 365

Prerequisites – Present: CS 284 and CS 158

Proposed: CS 284

CC 7514, Computer Science 404, Data Mining & Knowledge Discovery. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 434

Prerequisites – Present: CS 304 or CS 347, Stat 215

Proposed: (CS 338 or CS 347), and Stat 215

CC 7515, Computer Science 408, Object-Oriented Database Systems. The following change has been approved effective Fall 2009.

Course Number – Proposed: CS 439

CC 7516, Computer Science 412, Web Data Management And Xml. The following changes are approved effective Fall 2009.

Course Title – Proposed: Web Data Management And XML

Course Number – Proposed: CS 437

Prerequisites – Present: CS 238 or CS 304, or equivalent with instructor's permission

Proposed: CS 338

CC 7517, Computer Science 433, Theory of Compiling. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 456

Prerequisites – Present: CS 333

Proposed: CS 356

CC 7518, Computer Science 435, Theory of Computation. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 426

Prerequisites – Present: CS 230

Proposed: CS 220

CC 7519, Computer Science 443, Computer Graphics and Realistic Modeling. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 458

Prerequisites – Present: CS 343

Proposed: CS 358

CC 7520, Computer Science 455, Algorithmics II. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 425

Prerequisites – Present: CS 355

Proposed: CS 325

CC 7521, Computer Science 483, Computer Security. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 463

Prerequisites – Present: CS 285 and CS 355

Proposed: CS 265 and CS 325

CC 7522, Computer Science 485, Distributed Systems Theory and Analysis. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 465

Prerequisites – Present: CS 385 or equivalent

Proposed: CS 365 or equivalent

CC 7523, Computer Science 486, Mobile and Sensor Data Management. The following changes are approved effective Fall 2009.

Course Number – Proposed: CS 467

Prerequisites – Present: CS 284 and CS 285

Proposed: CS 265

CC 7524, Mining Engineering 352, Metallurgical Engineering 351, Mineral Processing I (Flotation and Hydrometallurgy). New course approved effective Fall 2009.

Catalog Description: Forth flotation including mineral surfaces, double layer theory, zeta potential, hydrophobicity, adsorption, collectors, frothers, modulation, kinetics, and sulphide and acid flotation systems. Hydrometallurgy including leaching, ion exchange and liquid/liquid extraction.

Credit Hours: 2 hour lecture, 1 hour lab, Total: 3

Prerequisites: Min Eng 241

CC 7525, Mining Engineering 353, Metallurgical Engineering 353, Mineral Processing II (Mechanics & Design). New course approved effective Fall 2009.

Course Description: Mineral particle mechanics of comminution, sizing, classification, concentration, filtering and thickening. Mill and equipment selection and design including flowsheet, development and plant assessment.

Credit Hours: 2 hour lecture, 1 hour lab, Total: 3

Prerequisites: Min Eng 241

CC 7526, Civil Engineering 430, Stochastic Theory of Structural Dynamics. New course approved effective Fall 2009.

Catalog Description: Probability theory and application in structural dynamics. Stochastic models for earthquake induced forces and wind effects on structure. Solutions for linear and nonlinear structures. Reliability-based evaluation of structural performance under random loading. Simulation of stochastic processes.

Credit Hours: 3 hour lecture

Prerequisites: Math 204; ME 307 or CE 424; and Stat 215

CC 7527, Mining Engineering 303, Aggregate Materials Sizing and Characterization.
New course approved effective Fall 2009.

Catalog Description: Geological formation of aggregates; aggregate properties and their measurements; aggregates for specific end-user applications; specifications and standards; processing (Crushing, screening, classification, and washing); plant design and flow sheet analysis; quality control and assurance.

Credit Hours: 2 hour lecture, 1 hour lab, Total: 3

Prerequisite: Min Eng 241

CC 7528, Electrical Engineering 205, Electromechanics. The following change is approved effective Fall 2009.

Prerequisites – Present: EE 153 with a grade of C or better, passing grade on EE Advancement Exam II, EE 208 is a corequisite

Proposed: Physics 24 with a grade of C or better, EE 153 with a grade of C or better, passing grade on EE Advancement Exam II. EE 208 is a corequisite.

CC 7529, Psychology 240, Theories of Learning. The following change is approved effective Fall 2009.

Catalog Description – Proposed: An examination of basic learning processes and the behavioral phenomena that arise from them. Topics include non-associative learning, classical conditioning, operant conditioning, and vicarious learning.

CC 7530, Psychology 303, Psychometrics. The following changes are approved effective Fall 2009.

Course Number – Proposed: Psychology 403

Catalog Description – Proposed: An examination of statistical methods used to develop and refine measures of human performance, aptitudes, and personality. Topics include reliability and validity, data reduction, measuring inter-relationships among variables (e.g., factor analysis, multiple regression), and testing group differences.

CC 7531, Psychology 307, Industrial Psychology. The following change is approved effective Fall 2009.

Catalog Description – Proposed: An overview of the field of industrial psychology including topics such as criterion development, job analysis, selection, training, performance assessment, and some human factors concerns.

CC 7532, Psychology 308, Social Psychology. The following change is approved effective Fall 2009.

Catalog Description – Proposed: An exploration of the phenomena involved in human social behavior and the theories that explain them. Topics typically include social thinking, attitudes and attitude change, conformity, persuasion, interpersonal attraction, and more.

CC 7533, Psychology 345, Evolutionary Psychology. The following change is approved effective Fall 2009.

Catalog Description – Proposed: Fundamental principles of evolution, and their applicability to human behavior and psychological processes are examined. Topics include interpersonal attraction, sperm competition, altruism, aggression, and creationism/intelligent design.

CC 7534, Psychology 360, Personality Theory. The following change is approved effective Fall 2009.

Catalog Description – Proposed: An examination of the ways in which personality traits develop and the sources of differences among people in the traits they exhibit. The emphasis is on major theories of personality development, as well as recent research in the field.

CC 7535, Psychology 374, Organizational Psychology. The following change is approved effective Fall 2009.

Catalog Description – Proposed: Analysis, comprehension, and prediction of human behavior in organizational settings through the scientific study of individual processes, group processes, and organizational structure and function.

CC 7536, Finance 200, Special Problems. New course approved effective Fall 2009.

Catalog Description: Problems or readings on specific subjects or projects in the department. Consent of instructor required.

Credit Hours: 0-6

Prerequisites: None

CC 7537, Finance 300, Special Problems. New course approved effective Fall 2009.

Catalog Description: Problems or readings on specific subjects or projects in the department. Consent of instructor required.

Credit Hours: 0-6

Prerequisites: None

CC 7538, Finance 390, Undergraduate Research. New course approved effective Fall 2009.

Catalog Description: Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six credit hours allowed towards graduation credit. Subject and credit to be arranged with the instructor.

Credit Hours: 0-6

Prerequisites: None

CC 7539, Finance 400, Special Problems. New course approved effective Fall 2009.

Catalog Description: Problems or readings on specific subjects or projects in the department.

Credit Hours: 0-6

Prerequisites: None

CC 7540, Finance 401, Special Topics. New course approved effective Fall 2009.

Catalog Description: This is designed to give the department an opportunity to test a new course. Variable title.

Credit Hours: Variable

Prerequisites: None

CC 7541, Finance 490, Research. New course approved effective Fall 2009.

Catalog Description: The research project will involve students applying research techniques and discipline specific knowledge working on a project designed by the advisor, often working with a business organization. Requires major report and formal presentation to sponsoring organization.

Credit Hours: 0-15

Prerequisites: None

CC 7542, Geological Engineering 311, Introduction to International Engineering & Design Lab. New course approved effective Fall 2009.

Catalog Description: The lab for multi-disciplinary design course will be as follows:

Students will develop a work plan to address design objectives and other considerations including scheduling, budgeting, environmental impacts, and life cycle design.

Credit Hours: 1 hour lab

Prerequisites: Senior standing, instructor approval, accompanied by Geo Eng 345

CC 7543, Geological Engineering 347, Introduction to International Engineering & Design. New course approved effective Fall 2009.

Catalog Description: A multi-disciplinary design course focused on sustainable design and technology transfer to developing countries. Students will develop a work plan to address design objectives and other considerations including scheduling, budgeting, environmental impacts, and life cycle design.

Credit Hours: 2 hour lecture

Prerequisites: Senior standing, instructor approval, accompanied by Geo Eng 311

For the information of the Faculty Senate, the following EC forms have been submitted by the University departments for an experimental course that will be offered in the near future.

Approved EC forms:

EC 2130, ERP 401, Customer Relationship Management in ERP Environment, approved effective SS 2009.

Course Description: This course emphasizes identification (targeting), acquisition, retention, and development (expansion) of (profitable) customers. It also covers effective and efficient management of customers with utilization of information technology. The SAP CRM and SAS BI tools are used to enhance student education with real world applications and prepare graduates for future career requirements.

Credit Hours: 3 hour lecture

Prerequisites: ERP 345

EC 2131, Chemistry 301, Nanomaterials – Synthesis, Structure, Properties & Applications, approved effective Fall 2009.

Course Description: Chemistry of Nanomaterials. Understanding the fundamentals of nanoscience. Synthesis of nanostructures, and learning about their characterization. Understanding the properties of nanomaterials and their possible applications.

Credit Hours: 3 hour lecture

Prerequisites: Chem 237

EC 2132, Geological Engineering 301, Applications of Ground Penetrating Radar, approved effective Spring 2009.

Course Description: Basic theory and the acquisition, processing and interpretation of ground penetrating radar (GPR) data are covered. Emphasis is placed on geotechnical and structural applications of this non-invasive imaging technology. Students will work with the instrument, and have the opportunity to process and interpret real world GPR data.

Credit Hours 2 hour lecture, 1 hour lab, Total: 3

Prerequisite: Junior level standing or higher

EC 2133, Biological Sciences 301, Global Ecology, approved effective Fall 2009.

Course Description: This class will include ecological topics at large scales, including global scales. Topics include biogeochemical cycles of carbon, nitrogen, and other biologically important elements. Global ecosystems and biodiversity will also be discussed, including an examination of current threats and management options.

Credit Hours: 3 hour lecture

Prerequisites: None

EC 2136, Mechanical Engineering 301, Aerospace Engineering 301, Applied Computational Methods, approved effective Spring 2009.

Course Description: Detailed study of various computational methods for efficient numerical solution of selected fluid/structural mechanics, thermodynamics, and controls problems in aerospace and mechanical engineering. In addition to basic numerical method techniques, topics to be covered include gradient-based optimization techniques, response surface approximation, and uncertainty quantification involving spectral approaches.

Credit Hours: 3 hour lecture

Prerequisites: CS 53 or 73 or 74; Math 204

EC 2137, Aerospace Engineering 401, Mechanical Engineering 401, Advanced Topics in Decision and Control, approved effective Spring 2009.

Course Description: This course will deal with latest topics in the areas of decision and control. Course may be repeated if topics vary.

Credit Hours: 3 hour lecture

Prerequisites: AE 381 or ME 381 or equivalent

EC 2138, Geology 401, Advanced Structural Geology, approved effective Spring 2009.

Course Description: The course provides theoretical background and hands-on experience for understanding the evolution of geological structures at the local, regional and global scales and advanced techniques for their geometrical and mathematical analysis.

Credit Hours: 2 hour lecture, 1 hour lab, Total: 3

Prerequisites: Geol 220

EC 2140, Petroleum Engineering 301, approved effective Spring 2009.

Catalog Description: One week field trip with required pre-reading material held at the end of spring semester. The course introduces principles of Petroleum Engineering integrated with earth sciences topics through field exercises and site visits. Students will be expected to bear a portion of the field trip expenses.

Credit Hours: 1 hour lecture

Prerequisites: None

EC 2141, History 301, Nazi Germany and the Holocaust, approved effective Fall 2009.

Course Description: This course focuses on the rise of Nazism and its consequences for politics, society, and culture in Europe. The period's history will be examined from the perspective of perpetrators, victims, and bystanders with emphasis on the Holocaust and its legacy.

Credit Hours: 3 hour lecture

Prerequisites: History 112

EC 2143, Geology 401, Radar Remote Sensing, approved effective Spring 2009.

Course Description: Principles of radar remote sensing and its application in geoscientific studies. Principles of Interferometric Synthetic Aperture Radar (InSAR) and its application in change detection. Discussion on sub-orbital and orbital radar remote sensing sensors including SIR-C/X-SAR, RADARSAT, and SRTM. Hands-on experience in digital image processing of radar data.

Credit Hours: 2 hour lecture, 1 hour lab, Total: 3

Prerequisites: GE 344, Geology 344

J. Keith Nisbett, Chair

Missouri S&T Campus Curricula Committee