



OFFICE OF THE REGISTRAR

103 Parker Hall
1870 Miner Circle
Rolla, MO 65409-0930
Phone: 573.341.4181
Fax: 573.341.4362
registrar@umr.edu
campus.umr.edu/registrar

Memo To: Academic Council
From: UMR Campus Curriculum Committee Meeting
RE: October 24, 2006 Meeting

The UMR Campus Curricula Committee recommends to the Academic Council that the curriculum changes and degree proposals on the following DC forms be approved.

Approved DC forms:

DC 0201, College of Arts & Sciences, Biological Sciences, approved effective Fall 2007. A proposal to change the current curriculum for the BA and BS in Biological Sciences by splitting Biological Sciences 211 into a lecture class 211 and a lab class 212.

DC 0204, College of Arts & Sciences, Biological Sciences, Chemistry, Computer Science, Mathematics and Statistics, Physics, Business Administration, Information Science and Technology, and Engineering Management, approved effective Fall 2007. A proposal to create a new degree called a Professional Science Master's Degree.

DC 0206, SoMEER, Ceramic Engineering, approved effective Fall 2007. A proposal to change the current curriculum for the BS in Ceramic Engineering.

DC 0207, College of Arts & Sciences, Psychology, approved effective Spring 2007. A proposal to add an additional minor in Psychology called Psychometrics.

DC 0208, SoMEER, Metallurgical Engineering, approved effective Fall 2007. A proposal to modify the current curriculum for the BS in Metallurgical Engineering.

DC 0210, School of Engineering, Environmental Engineering, approved effective Fall 2007. A proposal to modify the current curriculum for the BS in Environmental Engineering.

DC 0211, SoMEER, Geology and Geophysics, approved effective Fall 2007. A proposal to modify the current curriculum for the BS in Geology and Geophysics.

The UMR Campus Curricula Committee recommends to the Academic Council that the course changes on the following CC forms be approved.

Approved CC forms:

CC 7031, Biological Sciences 211, Cellular Biology. The following changes are approved effective Fall 2007.

Course Title – Proposed: Cell Biology



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Catalog Description – Proposed: The structure and function of eukaryotic and prokaryotic cells. Emphasis on macromolecules, organelles, metabolic pathways, bioenergetics, cell signaling, the cycle, and information processing.

Credit Hours – Present: Lecture: 3 Lab: 1 Total: 4
Proposed: 3 hour lecture

CC 7032, Biological Sciences 212, Cell Biology Laboratory. The following changes are approved effective Fall 2007.

Catalog Description: Laboratory course to accompany Cell Biology (Biol 211). Laboratory work includes microscopy, biochemical assays, enzymology, and genetic analysis (PCR, mapping, electrophoresis, transfection, sequencing).

Credit Hours: 1 hour lab

Prerequisites: Preceded or accompanied by Biol 211

CC 7066, Computer Science 71, Introduction to Basic. Course deletion approved effective Spring 2007.

CC 7067, Computer Science 72, Software Application on the PC. Course deletion approved effective Spring 2007.

CC 7068, Computer Science 137, Assembly Language Programming. Course deletion approved effective Spring 2007.

CC 7069, Computer Science 260, Introduction to Operations Research. Course deletion approved effective Spring 2007.

CC 7070, Computer Science 273, Software Systems Survey I. Course deletion approved effective Spring 2007.

CC 7071, Computer Science 274, Software Systems Survey II. Course deletion approved effective Spring 2007.

CC 7072, Computer Science 360, Deterministic Modeling. Course deletion approved effective Spring 2007.

CC 7073, Computer Science 366, Statistics 346, Regression Analysis. Course deletion approved effective Spring 2007.

CC 7074, Computer Science 376, Operations Research Techniques for Managerial Decisions. Course deletion approved effective Spring 2007.

CC 7075, Computer Science 422, Numerical Differential Equations. Course deletion approved effective Spring 2007.



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CC 7076, Computer Science 428, Parallel Numerical Linear Algebra. Course deletion approved effective Spring 2007.

CC 7084, History 361, American Environmental History. New course approved effective Spring 2007.

Catalog Description: This class discusses the impact of human interactions with the physical environment and the natural world's influence on human civilizations with emphasis on the 19th and 20th centuries.

Credit Hours: 3 hour lecture

Prerequisites: Hist 112 or Hist 175 or Hist 176

CC 7085, Statistics 211, Statistical Tools for Decision Making. The following changes are approved effective Spring 2007.

Prerequisites – Present: Math 8 or 14 with a grade of “C” or better

Proposed: Math 8 or 12 or 14 with a grade of “C” or better

CC 7095, Biological Sciences 452, Space Biology. The following changes are approved effective Spring 2007.

Course Title – Proposed: Astrobiology

Catalog Description – Proposed: The origins of life on early earth and the possibility of life on extraterrestrial bodies will be explored in this course through lectures and journal article discussions. In addition, the means to study extraterrestrial environments will be considered.

CC 7097, IST 480, Social Informatics. New course approved effective Spring 2007.

Catalog Description: The course examines web and new-media technologies from a socio-psychological perspective. The class will focus on recent innovations, integrating these approaches into class interaction and student projects.

Credit Hours: 3 hour lecture

Prerequisites: Graduate standing

CC 7098, IST 343, Database Applications in Business. New course approved effective Fall 2007.

Catalog Description: Design, development and implementation of application software typical to the modern business environment utilizing popular commercial database management systems such as Oracle and Access. Focus given to business case modeling, requirement analysis, database design, and implementation challenges. Project oriented.

Credit Hours: 3 hour lecture

Prerequisites: IST 243



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CC 7099, Metallurgical Engineering 355, Process Metallurgy Applications. The following changes are approved effective Fall 2007.

Credit Hours – Present: 2 hour lecture
Proposed: 3 hour lecture
Prerequisites – Present: Mt Eng 281
Proposed: Cr Eng 259

CC 7100, Metallurgical Engineering 354, Metallurgical Process Simulation and Control. The following changes are approved effective Fall 2007.

Course Title – Proposed: Electrical Systems and Controls for Materials
Catalog Description – Proposed: This course will cover analysis of alternating and direct current circuits as experienced in the materials industry. Current, voltage, and power relationships in single and three-phase electrical power systems. Introduction to continuous and batch instrumentation including programmable logic controllers (PLCs) and computer interfacing for materials applications.
Credit Hours – Present: 1 hour lecture
Proposed: 2 hour lecture, 1 hour lab, Total: 3.0
Prerequisites – Present: Mt 121, Mt 125,, Mt 126
Proposed: Physics 24

CC 7101, Ceramic Engineering 262, Ceramic Engineering Design Lab. The following changes are approved effective Fall 2007.

Course Title – Proposed: Materials Senior Design II
Catalog Description – Proposed: A continuation of the Materials Senior Design I. Students working in groups will complete a capstone design project including process and product simulation and/or fabrication, safety aspects, environmental impact and capital and operating economics.
Prerequisites – Present: Cr Eng 261
Proposed: Cr Eng 261 or Mt Eng 261
Co-listing: Mt Eng 262

CC 7102, Ceramic Engineering 261, Ceramic Engineering Design Laboratory. The following changes are approved effective Fall 2007.

Course Title – Proposed: Materials Senior Design I
Catalog Description – Proposed: Students working in groups will be assigned a capstone design project related to a specific materials technology. This course will focus on project plan and all aspects of product and process design.
Prerequisites – Present: Cr Eng 242
Proposed: Senior Standing
Co-listing: Mt Eng 261

CC 7103, Ceramic Engineering 259, Thermodynamics of Solid State Materials. The following changes are approved effective Fall 2007.



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Course Title – Proposed: Thermodynamics of Materials

Catalog Description – Proposed: Basic thermodynamics concepts are applied to materials. Calculations involving enthalpy entropy, and Gibbs' free energy are studied. Inter-relationships among properties are emphasized. Fundamental concepts of phase equilibria are presented.

Prerequisites – Present: None

Proposed: Mt Eng 125 or Chem 3

CC 7104, Metallurgical Engineering 126, Computer Application in Metallurgical Engineering. Course deletion approved effective Fall 2007.

CC 7105, Geological Engineering 352, Metallurgical Engineering 352, Ceramic Engineering 352, International Engineering & Design. New course approved effective Spring 2007.

Catalog Description: A multi-disciplinary engineering course focused on sustainable design and technology transfer to developing countries. Course includes elements of traditional capstone design classes. Experiential learning through competitions and/or field work is a major component of the class.

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

Prerequisites: Senior standing, instructor approval

CC 7106, Biological Sciences 310, Senior Seminar. The following change is approved effective Fall 2007.

Credit Hours – Present: Variable

Proposed: 1 hour lecture

CC 7107, Biological Sciences 402, Problems in Applied and Environmental Biology. The following change is approved effective Spring 2007.

Credit Hours – Present: 2 hour lecture

Proposed: Variable 0-3

CC 7108, Computer Science 319, Management of Computing Services. The following changes are approved effective Fall 2007.

Course Title – Proposed: Security Operations & Program Management

Catalog Description – Proposed: An overview of information security operations, access control, risk management, systems and application life cycle management, physical security, business continuity planning, telecommunications security, disaster recovery, software piracy, investigations, ethics and more. There will be extensive reporting, planning and policy writing.

Prerequisites – Present: Consent of instructor required

Proposed: Writing Emphasized course and Operating System course and Computer Networking course



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CC 7109, Math 354, Computer Science 354, Philosophy 354, Mathematical Logic I. The following change is approved effective Spring 2007.

Prerequisites – Present: Phil 15 with junior standing or Math 305 or Comp Sci 253

Proposed: Phil 15 with junior standing or Math 305 or Comp Sci 253 or
Comp Eng 111

Co-listing: Comp Sci 354, Phil 354

CC 7110, Computer Engineering 354, Mathematical Logic I. New course approved effective Summer 2007.

Catalog Description: A mathematical introduction to logic with some applications.

Functional and relational languages, satisfaction, soundness and completeness theorems, compactness theorems. Examples from Mathematics, Philosophy, Computer Science, and/or Computer Engineering.

Credit Hours: 3 hour lecture

Prerequisites: Phil 15 with junior standing or Math 305 or Comp Sci 253 or Comp Eng 111

Co- listing: Comp Sci 354, Phil 354, Math 354

CC 7111, Nuclear Engineering 317, Two-phase Flow in Energy Systems. New course approved effective Spring 2007.

Catalog Description: It is an introductory course for both undergraduate or graduate students who are interested in the application of two-phase flow in energy systems. It will acquaint students with governing equations for both single-phase and two-phase fluid flow, state-of-the-art analytical methods and various two-phase flow phenomena related to energy systems.

Credit Hours: 3 hour lecture

Prerequisites: NE 221 or Ch Eng 231 or ME 231

CC 7113, Geology 52, Evolution of the Earth. The following changes are approved effective Spring 2007.

Catalog Description – Proposed: A survey of the Earth history from the coalescence of the solar system to the present and the events that have profoundly transformed the planet in the context of the dynamic feedback between physical and biological systems. A one day field trip is required.

Credit Hours – Present: 3 hour lecture, 1 hour lab, Total: 4

Proposed: 3 hour lecture

CC 7114, Geology 51, Physical and Environmental Geology. The following changes are approved effective Spring 2007.

Catalog Description – Proposed: Materials, structure, and surface features of the Earth and planets are studied in the context of the processes that continuously transform the Earth and affect management of Earth resources, hazards, and environmental challenges. A one day field trip is required.



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Credit Hours – Present: 3 hour lecture, 1 hour lab, Total: 4

Proposed: 3 hour lecture

Prerequisites – Present: None

Proposed: Entrance requirements

CC 7115, Geology 54, Evolution of the Earth Laboratory. New course approved effective Spring 2007.

Catalog Description: Geol 54 is designed to accompany Geol 52 and consists of laboratory explorations of fundamental concepts in geology and the diversity of the fossil record.

Credit Hours: 1 hour lab

Prerequisites: Preceded or accompanied by Geol 52

CC 7116, Geology 446, Geological Engineering 446, Advanced Remote Sensing and Image Processing. New course approved effective Spring 2007.

Catalog Description: Quantitative methods of utilizing remote sensing technology for terrain analysis. Digital imaging processing.

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

Prerequisites: Ge Eng 346

Co-listing: Ge Eng 446

CC 7117, Geology 346, Geological Engineering 346, Applications of Geographic Information Systems. New course approved effective Spring 2007.

Catalog Description: Applications of Geographical Information systems and remote sensing to environmental monitoring, mineral resource exploration, and geotechnical site evaluation.

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

Prerequisites: Ge Eng 275 or consent of instructor

Co-listing: Ge Eng 346

CC 7118, Geology 248, Geological Engineering 248, Fundamentals of Geographic Information Systems. New course approved effective Spring 2007.

Catalog Description: Introduction to the fundamental concepts and components of Geographic Information Systems. Techniques for acquiring, manipulating and analyzing digital terrain data for geological and geotechnical applications.

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

Prerequisites: Ge Eng 275

Co-listing: Ge Eng 248

CC 7119, Geology 344, Geological Engineering 344, Remote Sensing Technology. New course approved effective Spring 2007.

Catalog Description: Principals of digital image processing including image enhancement and multi-spectral classification. Emphasis upon design and implementation of



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remote sensing systems and analysis of remotely sensed data for geotechnical and environmental investigations.

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

Prerequisites: Ge Eng 248

Co-listing: Ge Eng 344

CC 7120, Geology 53, Physical and Environmental Geology Laboratory. New course approved effective Spring 2007.

Catalog Description: Geol 53 is designed to accompany Geol 51 and consists of laboratory explorations of the study of common rocks and minerals, air photographs, maps, and case studies of geological problems related to management of Earth resources, hazards, and environmental challenges.

Credit Hours: 1 hour lab

Prerequisites: Preceded or accompanied by Geol 51

CC 7141, Psychology 303, Psychometrics. New course approved effective Spring 2007.

Catalog Description: The application of statistical methods to the study of human behavior in the design and analysis of research and in the measurement of human characteristics and individual differences.

Credit Hours: 3 hour lecture

Prerequisites: Psych 50 and Psych 140

CC 7142, Metallurgical Engineering 262, Materials Senior Design II. New course approved effective Fall 2007.

Catalog Description: A continuation of the Materials Senior Design I. Students working in groups will complete a capstone design project including process and product simulation and/or fabrication, safety aspects, environmental impact and capital and operating economics.

Credit Hours: 1 hour lab

Prerequisites: Cr Eng 261 or Mt Eng 261

Co-listing: Cer Eng 262

CC 7143, Metallurgical Engineering 261, Materials Senior Design I. New course approved effective Fall 2007.

Catalog Description: Students working in groups will be assigned a capstone design project related to a specific materials technology. This course will focus on project plan and all aspects of product and process design.

Credit Hours: 1 hour lab

Prerequisites: Senior standing

Co-listing: Cer Eng 261

CC 7144, Geological Engineering 446, Geology 446, Advanced Remote Sensing and Image Processing. The following changes are approved effective Spring 2007.



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Prerequisite – Present: Ge Eng 246
Proposed: Ge Eng 346
Co-listing: Geology 446

For the information of the Academic Council, 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 1824, Computer Science 401, Cyber Security Research & Development, approved effective Spring 2008.

Course Description: Advanced research topics in cyber security will be used to address real-world security problems. Problem-based learning (PBL) as well as experiential learning, centered around team projects, will be used to prepare students for cyber security R&D jobs in industry, government, national labs and academia.

Credit Hours: 3 hour lecture

Prerequisites: Cmp Sc 384 or Cmp Sc 385 or Cmp Sc 483 or Cp Eng 349

EC 1832, Art 201, Artists and the Art of Documentary, approved effective Spring 2007.

Course Description: This course will explore the artistic process as presented in documentaries and feature films, allowing investigation into both art history and film. “Artist at work” documentaries to be screened include BURDEN OF DREAMS and RIVERS AND TIDES.

Credit Hours: 3 hour lecture

Prerequisites: Art 80 or Art 85

EC 1833, History 301, European Migration, Emigration and Immigration, approved effective Spring 2007.

Course Description: Surveys migration, emigration and immigration patterns in Europe, in context of global population movements from ancient times through the present. Students will learn the push and pull factors and analyze and synthesize the personal decisions involved in these movements.

Credit Hours: 3 hour lecture

Prerequisites: History 112

EC 1844, Biological Sciences 201, Principles of Human Nutrition, approved effective Spring 2007.

Course Description: The study of the nutrients derived from foods, their reactions, interactions, and physiological impact; and subsequent application of knowledge acquired to health improvement.

Credit Hours: 3 hour lecture

Prerequisites: Bio Sci 110 or Bio Sci 111 or any college level chemistry course



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EC 1848, Education 301, Teachers' Academy: Effective Instructional Strategies, approved effective Spring 2007.

Course Description: Participants will develop an understanding of research-based instruction and the ability to implement the instructional strategies in their classrooms. In addition to effective instructional practices, the teachers' academy will focus on leadership, empowerment, collaboration and renewal.

Credit Hours: 3 hour lecture

Prerequisites: Graduate standing

EC 1849, IST 301, ERP System Administration, approved effective Summer 2007.

Course Description: System administration and performance monitoring practices for an Enterprise Resource Planning (ERP) system will be studied. Students will install an instance of an ERP system and establish user management attributes and system security.

Credit Hours: 3 hour lecture

Prerequisites: IST 346 or extensive SAP experience

EC 1850, IST 301, Use of Business Intelligence, approved effective Fall 2007.

Course Description: Application of "intelligent" techniques from CS (AI, data mining), and OR (stochastic modeling, simulation, forecasting) to business decision-making. Overview of the theory, but with a focus on the application to business problem solving. Use of SAP as a tool to access and present data, search for patterns, and identify exceptions, as well as forecast, optimize, and schedule resources.

Credit Hours: 3 hour lecture

Prerequisites: Database experience

EC 1851, Education 301, School Leadership (SAP-Satellite Academy Program), approved effective Spring 2007.

Course Description: The focus of this course is to develop school leaders who can positively and significantly impact student performance through effective school improvement practices. Participants will develop the understanding of change processes, data collection and analysis and professional development for teaching and learning.

Credit Hours: 3 hour lecture

Prerequisites: Graduate standing

EC 1852, Finance 301, Portfolio Management, approved effective Spring 2007.

Course Description: This course introduces a wide variety of financial securities and asset pricing theories. The focus of the course is on the fundamentals of portfolio management, with an aim to help students develop important skills needed to succeed as an investment professional.

Credit Hours: 3 hour lecture

Prerequisites: Finance 250 or equivalent



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EC 1853, Mining Engineering 401, Mine Management II, approved effective Spring 2007.

Course Description: The course covers advanced concepts in managing mine operations.

Topics to be covered include: TQM, statistical process control, benchmarking, KPI, standards and standardization, ISO 9000: Quality Control, ISO 14000:

Environmental systems, OHSAS 18000: Management systems, SA8000: Social Accountability and others.

Credit Hours: 3 hour lecture

Prerequisites: Consent of instructor

EC 1854, Psychology 301, Psychometrics, effective Spring 2007. This form was approved as a CC since the course is required in a minor curriculum. See CC 7141.

EC 1855, IST 401, Information Network Analysis, approved effective Fall 2007.

Course Description: Focus is on applied analysis of complex information networks in the form of web and text systems. Topics include web system link analysis, text mining, consensus analysis, collaborative filtering, recommender systems. Uses interactive data analysis tools such as SAS.

Credit Hours: 3 hour lecture

Prerequisites: Database and Statistics Familiarity

EC 1856, Spanish 301, Advanced Spanish Grammar, approved effective Fall 2007.

Course Description: The goals of the course are to identify and describe the intuitive knowledge that a native speaker possesses of Spanish and to deepen the non-native student's knowledge of various aspects of Spanish grammar via theoretical explanations and problem-solving.

Credit Hours: 3 hour lecture

Prerequisites: Span 180

EC 1857, Engineering Management 401, Systems Engineering 401, Advanced Financial Engineering, approved effective Spring 2007.

Course Description: Additional topics in the theory and practice of financial engineering and financial risk management, including market risk, credit risk, credit derivatives, operational risk, exotic options, interest rate derivatives, the Basel accord, financial engineering case studies, ethics, and corporate governance.

Credit Hours: 3 hour lecture

Prerequisites: EMgt 481 or Sys Eng 481

EC 1858, Engineering Management 401, Global Project Management, approved effective Spring 2007.

Course Description: In depth and advanced topics in project management including project management methodologies, strategic planning for excellence, project



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portfolio management, integrated processes, culture, and behavioral excellence;
normally includes a hands-on group project.

Credit Hours: 3 hour lecture

Prerequisites: EMgt 361

EC 1859, Electrical Engineering 401, Advanced Power Electronics, approved effective Spring 2007.

Course Description: This advanced power electronics course is designed for graduate-level students and covers the following topics: advanced power electronic converters, soft switching techniques, small signal analysis, voltage and current mode control, thermal design, and drive circuits.

Credit Hours: 3 hour lecture

Prerequisites: EE 353

EC 1860, Business 301, Business Information Systems, approved effective Spring 2007.

Course Description: This course familiarizes the students with the fundamental concepts and principles of business information systems. Topics covered include electronic commerce, wireless technology and its applications, enterprise applications, knowledge management, decision-making systems, and systems analysis and design. Programming knowledge is required.

Credit Hours: 3 hour lecture

Prerequisites: IST 51 or CS 53 or equivalent; and IST 141 or IST 246

EC 1861, Biological Sciences 301, MSE 301, Tissue Engineering I, approved effective Spring 2007.

Course Description: This course will introduce senior undergraduate students to the principles and clinical applications of tissue engineering, involving the use of biomaterials scaffolds, living cells and signaling factors to develop implantable parts for the restoration, maintenance, or replacement of biological tissues and organs.

Credit Hours: 3 hour lecture

Prerequisites: Senior standing

EC 1862, Biological Sciences 401, MSE 401, Tissue Engineering II, approved effective Spring 2007.

Course Description: This course will introduce graduate students to the principles and clinical applications of tissue engineering, involving the use of biomaterials scaffolds, living cells and signaling factors to develop implantable parts for the restoration, maintenance, or replacement of biological tissues and organs. A term paper and oral presentation on a tissue engineering topic are executed.

Credit Hours: 3 hour lecture

Prerequisites: Graduate standing



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EC 1863, Computer Science 301, Software Requirements Engineering, approved effective Spring 2007.

Course Description: Software Requirements Engineering (SRE) covers all the activities involved in discovering, analyzing, specifying and managing software requirements for a software system from multiple perspectives. In this course students will study how to elicit, analyze, specify, validate, and manage software requirements using advanced software requirements modeling methods, processes and tools.

Credit Hours: 3 hour lecture

Prerequisites: CS 206

EC 1864, Math 201, Philosophy 201, Computer Engineering 201, Lattices and Ordered Structures and their Applications, approved effective Spring 2007.

Course Description: Ordered sets, Lattices, CPOs, Domains, Information systems, Fix-point theorems, Modularity and distributivity, Boolean algebras, Ideals and filters, Formal Concept Analysis, Chain conditions, Duality, Sublattices, Products, Homomorphisms, Disjunctive Normal Form, Representation Theory, Applications to Computers and Philosophy; The laboratory will focus on problem solving and applications in a technological setting.

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

Prerequisites: Sophomore standing; Math 209 or Cmp Sc 158 or Cmp Eng 111 or Phil 15

EC 1865, Environmental Engineering 301, Architectural Engineering 301, Indoor Air Pollution, approved effective Spring 2007.

Course Description: Indoor air pollution sources, physics, chemistry and consequences. Students learn how radon, cigarette smoke, VOCs from furnishing, etc. affect indoor air quality and how standards are set to improve indoor health and comfort. Students apply engineering analysis to building air to specify ventilation rates, choose furnishings and minimize occupant exposure to pollutants.

Credit Hours: 3 hour lecture

Prerequisites: CE 261 and ME 371; or Graduate Status

EC 1868, Geophysics 301, MSE 301, Ceramic Engineering 301, Computational Geophysics, approved effective Spring 2007.

Course Description: Scientific programming in a UNIX environment, with emphasis on solving geophysical problems such as linear and nonlinear inversion, spectral analysis, seismicity, seismic wave attenuation, shear-wave splitting, and seismic tomography.

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



J. Keith Nisbett, Chair
UMR Campus Curricula Committee

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