MISSOURI S&T

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

Agenda
Campus Curricula Committee Meeting
January 4, 2012
12 p.m. Room 117 Fulton Hall

Approval of the December 07, 2011 minutes.

Review of submitted DC forms:
DC 0402, Nuclear Engineering, Bachelor of Science, effective Fall 2012. A proposal to modify the current curriculum for the BS in Nuclear Engineering by adding Computer Science 53 and 54.

DC 0403, Architectural Engineering, Bachelor of Science, effective Fall 2012. A proposal to modify the current curriculum for the BS in Architectural Engineering by replacing ME 371 with ArchE 371.

DC 0404, Mining Engineering, Bachelor of Science, effective Fall 2012. A proposal to modify the current curriculum for the BS in Mining Engineering by the replacing the Fundamentals of Engineering Exam with the Graduating Mining Engineers Exam.

DC 0405, Geological Engineering, Bachelor of Science, effective Fall 2012. A proposal to modify footnote F the Engineering Economy elective.

DC 0406, Chemistry, Bachelor of Arts, effective Fall 2012. A proposal to modify the current curriculum for the Bachelor of Arts in Chemistry.

DC 0407, Chemistry, Bachelor of Arts, Secondary Education Emphasis Area. A proposal to modify the current curriculum the Secondary Education Emphasis Area.

Review of submitted CC forms:
CC 8186, Computer Engineering 409, Topics in VLSI Systems, effective Fall 2012.

CC 8192, Nuclear Engineering 407, Advanced Nuclear Thermal Hydraulics, effective Fall 2012.

CC 8193, Nuclear Engineering 403, Advanced Reactor Physics, effective Spring 2012.

CC 8195, Business 320, Managerial Accounting, effective Fall 2012.

CC 8196, Business 360, Business Operations, effective Fall 2012.

Office of the Registrar • 103 Parker Hall • 300 West 13th Street • Rolla, MO 65409-0930
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CC 8197, Finance 250, Corp Finance I, effective Fall 2012.

CC 8198, Electrical Engineering 385, Computer Science 345, Computer Engineering 385, Introduction to Robotics, effective Spring 2012.

CC 8199, Computer Science 345, Computer Engineering 385, Electrical Engineering 385, Computational Robotic Manipulation, effective Spring 2012.

CC 8200, Chemical Engineering 234, Chemical Engineering Laboratory I, effective Fall 2012.

CC 8201, Chemical Engineering 236, Chemical Engineering Laboratory II, effective Fall 2012.

CC 8202, Chemical Engineering 252, Process Dynamics and Control Laboratory, effective Fall 2012.

CC 8203, Chemical Engineering 281, Reactor Design, effective Spring 2012.

CC 8204, Chemical Engineering 251, Chemical Engineering Process Dynamics and Control.

Review of submitted EC forms:
EC 2373, Geological Engineering 301, Fundamentals of Groundwater Hydrology, effective Fall 2012.

EC 2381, Mining Engineering 301, Global Leadership in the Mining Industry, effective Fall 2012.

EC 2382, Mining Engineering 301, Tech Innovations in Mining Engineering, effective Fall 2012.

EC 2383, Math 401, Numerical Analysis, effective Fall 2012.

EC 2384, Math 401, Finite Element Methods for Partial Differential Equations, effective Spring 2013.

EC 2385, Chemical Engineering 301, Kinetics of Complex Chemical Reactions, effective Fall 2012.

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EC 2388, Geology 301, Summer Field Geology in Southern China, effective Summer 2012.

EC 2389, Geological Engineering 301, Fundamentals of Groundwater Hydrology, effective Fall 2012.

EC 2390, Geological Engineering 401, Slope Stability, effective Fall 2012.

EC 2391, Theatre 101, Voice Diction and Interpretation, effective Fall 2012.

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Effective Year: 2012
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

DC # 0402-2011-NucEng-000-00

Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

Title of degree program, emphasis area, or minor:
B.S. in Nuclear Engineering

Department: Mining & Nuclear Engineering

Briefly describe action requested (Attach documentation as appropriate):

1. Replace Comp Sci 73 or 74 – Basic Scientific Programming
   by
   Comp Sci 53 or 73 or 74 –Introduction to Programming

2. Replace Comp Sci 77 or 78 – Computer Programming Lab
   by
   Comp Sci 54 or 77 or 78 – Introduction to Programming Lab

   (See pages 116 and 221 , Undergraduate Catalog (2011-2013)

Recommended by Department: Arvind Kumar (Chair signature) Date: 10-26-2011

Recommended by: Steve Vallem (Chair signature) Date: 12/14/11
Discipline Specific Curricula Committee

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

algebra, trigonometry, Arts & Sciences 110, Math 8, 14, 15, 21, Physics 21, 22, 23, 24, 25, 26, 27, 28, 31, 35 and the first two years of ROTC do not count toward the free electives.

9) Fifteen hours are CS electives. At least twelve hours must be 300 level or higher CS courses (excluding CS 398 and CS 317). CS 202 and CS X7X courses are not accepted as CS electives.

10) Any nine hours chosen from departments that offer a B.S., (or Basic Engineering), excluding computer science.These may not be Math 8, 14, 15, 21, Physics 21, 22, 23, 24, 25, 26, 27, 28, 31, or 35.

11) Philosophy 225 or 235 or 340 or 368.

12) Laboratory not required.

13) Or English 160 - Technical Writing.

14) Or Chemistry 110, Physics 1, Math 1, or Fr Eng 10.

Computer Science Minor Curriculum

A student with a minor in computer science must meet the following requirements:

A) Cmp Sc 153 and 12 elective hours in computer science beyond Cmp Sc 53, 54, 73 & 77 or 74 & 78.

B) A member of the computer science faculty will serve as the student's minor advisor. The student and his/her minor advisor will plan a course of study to meet the specific interests and needs of the student.

C) Students pursuing a minor in computer science must earn a "C" or better, in Cmp Sc 53, Cmp Sc 54, Cmp Sc 153, Cmp Sc 128, and Cmp Sc 253 if any of these courses are taken for the minor.

Bioinformatics Minor

Students majoring in computer science are eligible to pursue a minor in bioinformatics. See the description of the bioinformatics minor.

Computer Science Courses

1 Introduction To Computer Science (LEC 1.0) This course is devoted to an introduction of various areas of Computer Science, the faculty members, and lab equipment. Computer ethics will be discussed in several lectures.

53 Introduction To Programming (LEC 3.0) Programming design and development using C++. Emphasis placed on problem solving methods using good programming practices and algorithm design and development. Topics included are syntax/semantics, logical, relational and arithmetic operators, decision branching, loops, functions, file I/O,arrays, output formatting, C-strings, and an introduction to Object-Oriented Programming including the development and use of classes. Prerequisite: Accompanied by Cmp Sc 54.

54 Introduction To Programming Laboratory (LAB 1.0) Practical applications of concepts learned in Computer Science 53. Hands-on instruction in C++ developing, debugging, and testing programming projects. Prerequisite: Accompanied by Comp Sci 53.

73 Basic Scientific Programming (LEC 2.0) Introduction to the structure of programs and programming techniques in Fortran to solve science and engineering problems. Topics include data representation, basic solutions of numerical problems and the debugging and verification of programs. Prerequisite: Entrance requirements.

74 Introduction To Programming Methodology (LEC 2.0) Basic structured programming and problem solving techniques using C++. Development, debugging, and testing of programs, data representation. Topics to include syntax/semantics, operators, loops, decision branching, arrays, file I/O. This course is a terminal course for non-majors and is not sufficient for entry into Computer Science 153.

77 Computer Programming Laboratory (LAB 1.0) A laboratory to accompany Cmp Sc 73 which emphasizes the designing, writing and debugging of programs in Fortran. Prerequisite: Accompanied by Cmp Sc 73.

78 Programming Methodology Laboratory (LAB 1.0) A hands-on introduction to structured programming in C++. Development, coding, debugging, and execution of programming concepts discussed in Computer Science 74. Prerequisite: Accompanied by Computer Science 74.

101 Special Topics (Variable 0.0-6.0) This course is designed to give the department an opportunity to test a new course. Variable title.

128 Discrete Mathematics For Computer Science (LEC 3.0) A rigorous treatment of topics from discrete mathematics which are essential to computer science. Principal topics include: formal logic (propositional & predicate), proof techniques, mathematical induction, program correctness, sets, combinatorics, probability, relations, functions, matrices, graph theory and graph algorithms. Prerequisite: Comp Sci 53 or at least sophomore standing.

153 Data Structures (LEC 3.0) A continuation of the development of structured programming concepts and their use in program development. Stacks, queues, linked list, arrays, trees, sorting and searching will be taught together with their use in implementations of a number of algorithms. Prerequisite: Grade of "C" orbetter in Cmp Sc 53.

200 Special Problems (IND 0.0-6.0) Problems or readings on specific subjects or projects in the department. Consent of instructor required.

201 Special Topics (Variable 0.0-6.0) This course is designed to give the department an opportunity to test a new course. Variable title.

202 Cooperative Work Training (IND 1.0-5.0) On-the-job experience gained through cooperative education with industry, with credit arranged through departmental cooperative advisor. Grade received depends on quality of reports submitted andwork supervisors evaluation. Not more than 9 hours may be applied to the B.S. degree.

from the humanities and the social sciences areas and should be chosen according to the following rules:

1) All students are required to take one American history course and one economics course. The history course is to be selected from History 112, 175, History 176, or Political Science 90. The economics course may be either Economics 121 or 122. Some disciplines require one humanities course to be selected from the approved lists for art, English, foreign languages, music, philosophy, speech and media studies, or theater.

2) Of the remaining hours, six credit hours must be taken in humanities or social sciences at the 100 level or above and must be selected from the approved lists. One of these courses must have as a prerequisite one of the humanities or social sciences courses already taken. Foreign language courses numbered 70 to 80 can be considered to be one of these courses. (Students may receive humanities credit for foreign language courses in their native tongue only if the course is at the 300 level.)

3) Some departments list specific requirements; e.g. a psychology course, a literature course, and /or a second semester of economics. Selections should be made to ensure that these requirements are met.

4) Skill courses are not allowed to meet humanities and social sciences requirements except in foreign languages. Students who select the foreign language option are urged to take more than one course.

5) Special topics, special problems courses and honors seminars are allowed only by petition to and approval by the student's department chair.

The Nuclear Engineering program at Missouri S&T is characterized by its focus on the scientific basics of engineering and its innovative application; indeed, the underlying theme of this educational program is the application of the scientific basics to engineering practice through attention to problems and needs of the public. The necessary interrelations among the various topics, the engineering disciplines, and the other professions as they naturally come together in the solution of real world problems are emphasized as research, analysis, synthesis, and design are presented and discussed through classroom and laboratory instruction.

FRESHMAN YEAR

First Semester	Credit
Freshman Chemistry Requirement[1]	5
Eng 20-Exposition and Argumentation	3
FE 10-Study and Careers in Engineering	1
Math 14-Calculus for Engineers I	4
Nu Eng 25-Nuclear Technology Applications[2]	1
	14

Second Semester	
Elective-Hum or Soc Sci[3]	3
History 112, 175, 176, or Political Science 90	3
Physics 23-Engineering Physics I	4
IDE 20-Intro to Engr Design.	3
Math 15-Calculus for Engineers II	4
	17

SOPHOMORE YEAR

First Semester	Credit
Cmp Sc 73 or 74-Basic Scientific Programming	2
Cmp Sc 77 or 78-Computer Programming Lab	1
IDE 50-Eng Mech-Statics	3
Math 22-Calculus w/Analytic Geometry III	4
Nu Eng 105-Intro to Nuclear Engineering	2
Physics 24-Engineering Physics II	4
	16

Second Semester	
Cmp Sc 228-Intro to Numerical Methods	3
Econ 121 or 122-Micro/Macroeconomics	3
Nu Eng 206-Reactor Operations I	1
IDE 110-Mechanics of Materials	3
Math 204-Elem Diff Equations	3
Nu Eng 203-Interactions of Radiation w/Matter or Physics 107-Intro to Modern Physics	3
	16

JUNIOR YEAR

First Semester	Credit
Elective-Hum or Soc Sci[3]	3
Stat 215-Engineering Statistics	3
Mt Eng 121-Metallurgy for Engineers	3
Nu Eng 205-Fundamentals of Nuclear Engineering	3
Nu Eng 221-Reactor Fluid Mechanics	3
	15

Second Semester	
English 160-Technical Writing	3
Nu Eng 312-Nuc Radiation Measurement & Spectro	3
Nu Eng 223-Reactor Heat Transfer	3
Nu Eng 303-Reactor Physics I	3
Nu Eng 319-Nuclear Power Plant Systems	3
Technical Electives-200 or 300 level[5]	3
	18

SENIOR YEAR

First Semester	Credit
Elective-Hum or Soc Sc[3]	3
Nu Eng 304-Reactor Lab I	2
Nu Eng 307-Nuclear Fuel Cycle	3
Elective-300 level Math	3
Nu Eng 322-Nuclear System Design I	1
Nu Eng 341-Nuclear Materials I	3
	15

Second Semester	
Elective-Hum or Soc Sci[3]	3
Technical Elective-300 level[5]	3
Free Elective[4]	6
Nu Eng 308-Reactor Lab II	2
Nu Eng 323-Nuclear System Design II	3
	17

NOTE: Minimum credit hours for graduation is 128.

1) Chemistry 1 and 2 or Chemistry 5 and Chemistry 4 or an equivalent training program approved by Missouri S&T.
2) Nuclear Engineering students are expected to take Nuclear Technology Applications (Nu Eng 25) during their freshman year.
3) Humanities and Social Science to be taken in accordance with the policy described above.
4) Courses which do not count towards this requirement are remedial courses such as algebra

Effective Year: 2012
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

DC # 0403-2011-ArchEng-000-00

Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

Title of degree program, emphasis area, or minor:
Architectural Engineering

Department: Civil, Architectural and Environmental Engineering

Briefly describe action requested (Attach documentation as appropriate):
Remove the required course ME 371 Environmental Controls (3 credits) and replace it with ArchE 371 Environmental Controls (3 credits), which has recently been approved for cross-listing with ME 371.

Recommended by Department: _____ Date: 10/27/11
(Chair signature)

Recommended by Discipline Specific Curricula Committee: Steve Watkins Date: 12/14/11
(Chair signature)

Approved by Curricula Committee: _____ Date: _____
(Chair signature)

Approved by Faculty Senate: _____ Date: _____
(Chair signature)

Effective Year: 2012
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

DC # 0404-2011-MinEng-00-00

Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

Title of degree program, emphasis area, or minor:
B.S. IN MINING ENGINEERING

Department: MINING AND NUCLEAR ENGINEERING

Briefly describe action requested (Attach documentation as appropriate):
Replace the Fundamental Engineering Exam as a requirement for Senior Assessment with Graduating Mining Engineers Exam as per the attachment.

Recommended by Department: _____ (Chair signature) Date: 10/10/11

Recommended by Discipline Specific Curricula Committee: Steve Watkins (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

MISSOURI S&T

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

October 31, 2011

MEMO TO: Curriculum Committee

Robert W Schwartz

FROM: Robert W. Schwartz, Interim Provost

RE: Approval of DC Form to Replace the Fundamental Engineering Exam as a Requirement for Senior Assessment with Graduating Mining Engineers (GME) Exam

The attached description of the Graduating Mining Engineers (GME) Exam dated 10/31/2011 "SENIOR ASSESSMENT FOR THE B.S. DEGREE IN MINING ENGINEERING" meets my approval to replace the Fundamental Engineering Exam as a replacement for the Senior Assessment. If you have further questions, please do not hesitate to contact me.

RWS/krc

Attachment: SENIOR ASSESSMENT FOR THE B.S. DEGREE IN MINING ENGINEERING dated 10/31/2011

Office of the Provost and Executive Vice Chancellor for Academic Affairs

204 Parker Hall • 300 West 13th Street • Rolla, MO 65409-0830

Phone: 573-341-4138 • Fax: 573-341-6777 • Email: rschwartz@mst.edu • Web: www.mst.edu

SENIOR ASSESSMENT FOR THE B.S. DEGREE IN MINING ENGINEERING

Department of Mining and Nuclear Engineering
Missouri University of Science and Technology
1870 Miner Circle, 226 McNutt Hall, Rolla, MO 65409-0450
Phone: (573) 341-4753, Fax: (573) 341-6934

INTRODUCTION

Effective Fall 2012 semester, the Mining Engineering program has eliminated the fundamental engineering (FE) examination as a requirement for senior assessment for completing the Bachelor of Science degree in Mining Engineering at Missouri University of Science and Technology (Missouri S&T). This decision was based on thorough discussions by the Department Chairs Council over a considerable period of time given the Provost's charge to the Council on the use of FE examination to fulfill the senior assessment requirement. The pros and cons for replacing the FE examination as a senior assessment requirement were considered by the mining engineering faculty members. *By a unanimous decision, the faculty voted to replace the FE Exam with a Graduating Mining Engineers (GME) Exam as a requirement for senior assessment.*

REPLACEMENT EXAMINATION

Effective Fall 2012, the FE Exam is replaced with the GME Exam. The GME Exam will be prepared by the Mining Engineering Faculty and reviewed by selected professional mining engineers. The GME Exam will focus on problems in surface mining methods and equipment, underground mining methods and equipment, mine atmospheric control, rock mechanics and ground control, materials handling, mineral processing, drilling and blasting, mine economics, mine health and safety and elements of mine design.

QUALIFICATIONS OF GME REVIEWERS

GME reviewers shall include professional mining engineers, who hold the B.S. degree certification in Mining Engineering from accredited mining engineering programs in the United States. Members shall have a minimum of 10 years experience in industry and shall have the position of Senior Mining Engineer or higher. Potential candidates shall be reviewed thoroughly by the Mining Engineering faculty for final approval. The reviewers shall have a minimum of five members selected from surface and underground coal and metal, aggregates and industrial minerals industries.

MECHANICS AND TIMING OF EXAMINATION

The GME Exam shall be two 2-hour exams, including SURFACE MINING ENGINEERING and UNDERGROUND MINING ENGINEERING Exams. ***Surface Mining Engineering Exam*** will cover problems in Mi Eng 215 (Materials Handling in Mines), Mi Eng 225 (Surface Mine Design), Mi Eng 241 (Principles of Mineral Processing), Mi Eng 307 (Principles of Explosives Engineering), Mi Eng 326 (Surface Mining Methods and Equipment), and Mi Eng 332 (Soils and Overburden Materials). ***Underground Mining Engineering Exam*** will cover Mi Eng 235 (Underground Mine Design), Mi Eng 270 (Mining Industry Economics), Mi Eng 317 (Mine Power and Drainage), Mi Eng 318 (Mine Atmospheric Control), Mi Eng 324 (Underground Mining Methods and Equipment), and Mi Eng 331 (Rock Mechanics). The Exams will be held twice a year in the October-November (Fall) and March-April (Spring) periods.

MANAGEMENT OF EXAMINATION

The Chair of Mining Engineering at Missouri S&T or designate shall administer the examinations. Examination questions will be prepared by the Mining Engineering faculty in Missouri S&T, type-written, printed and sealed for review by selected professional mining engineers. The examination and the subsequent marking will also be administered by the Chair or designate.

REQUIREMENT FOR GRADUATION

Students are required to pass the GME Exam in order to graduate. The GME Exam will be graded with PASS or FAIL designation. A mark below 50% will be assigned a failing grade and a mark of 85% or above will be a PASS with Distinction. Graduating seniors will have two opportunities to complete the GME requirement. However, students who fail these two attempts can register and complete the examination after completing the required 128 credits in Mining Engineering.

FEE ASSESSMENT

Registration fee for the GME Exam shall be $50.00. This fee will be used to administer the examination and to provide honorarium to the GTA markers and the external reviewers.

10/31/2011

DC # 0405-2011-GE-000-00

Effective Year: 2012
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

Title of degree program, emphasis area, or minor:
Bachelor of Science in Geological Engineering

Department: Geological Sciences and Engineering

Briefly describe action requested (Attach documentation as appropriate):
Superscript (f) with respect to Engineering Econmy elective, currently states:

"To be selected from CE241, Eng Mgt 208, Eng Mgt 209, or PE 357."

change to:

"To be selected from Eng Mgt 124 and Eng Mgt 137 (both required), Eng Mgt 308, or PE 357."

Recommended by Department: _____ Date: 11-28-11
(Chair signature)

Recommended by Discipline Specific Curricula Committee: _____ Date: 12/14/11
(Chair signature)

Approved by Curricula Committee: _____ Date: _____
(Chair signature)

Approved by Faculty Senate: _____ Date: _____
(Chair signature)

11/28/11

(Revised 1/31/2008)

Effective Year: 2012 **DC #** 0406-2011-Chem-000-00
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

Title of degree program, emphasis area, or minor:
Bachelor of Arts
Chemistry

Department: Chemistry

Briefly describe action requested (Attach documentation as appropriate):
Change in listing of Chem Elective course options to remove incorrect course listing. Chem 342 is not a valid course number.

Change in notes giving an example of a program for pre-medical studies to make corrections on number of hours for Bio Sc courses: Bio Sc 110 is now 3 hours and Bio Sc 112 is now 2 hours. Also change from Bio Sc 211 - Cellular Biology, 4 credit hours to Bio Sci 211 - Cell Biology, 3 credit hours and Bio Sci 212 - Cell Biology Laboratory, 1 credit hour. This course used to be a combined lecture and lab and is now split into two separate courses.

(See attached for present curriculum and proposed curriculum.)

Recommended by Department: _____ Date: 11-19-2011
(Chair signature)

Recommended by: _____ Date: 12/13/2011
Discipline Specific Curricula Committee (Chair signature)

Approved by Curricula Committee: _____ Date: _____
(Chair signature)

Approved by Faculty Senate: _____ Date: _____
(Chair signature)

Present

Bachelor of Arts Chemistry

FRESHMAN YEAR

First Semester	Credit
Chem 1-General Chemistry	4
Chem 2-General Chemistry Lab	1
Chem 4-Intro to Lab Safety	1
Math 8-Calculus with Analytic Geometry I	5
English 20-Exposition & Argumentation	3
	14

Second Semester	
Chem 3-General Chemistry	3
Chem 8-Qualitative Analysis	2
History 111-Early Western Civ	3
Math 21-Calc w/Analytic Geometry II	5
Humanities Electives	3
	16

SOPHOMORE YEAR

First Semester	Credit
Chem 221-Organic Chemistry I	4
Chem 226-Organic Chemistry I Lab	1
Electives	5
History 112-Modern Western Civ	3
Humanities Elective	3
	16

Second Semester	
Chem 223-Organic Chemistry II	4
Chem 228-Organic Chemistry II Lab	1
Elective	4
English 60-Writing & Research	3
Social Sciences Elective	3
	15

JUNIOR YEAR

First Semester	Credit
Chem 151-Analytical Chemistry I	4
Physics 21-General Physics I	4
Physics 22-General Physics Lab I	1
Stat 213-Applied Engineering Stat	3
Elective	3
	15

Second Semester	
Chem Electives (see list below)	4
Physics 25-General Physics II	4
Physics 26-General Physics Lab II	1
Electives	6
	15

SENIOR YEAR

First Semester	Credit
Chem 241, 243 or 343-Phy Chem	3
Chem 242 or 244-Phy Chem Lab	1
Humanities Elective Literature	3
Social Sciences Electives	6
Elective	3
	16

Second Semester	
Chem 310-Seminar	1
Humanities Elective	3
Social Sciences Elective	3
Electives	6
	13

Students must complete a minimum of 120 credit hours for the Bachelor of Arts in Chemistry degree. Students may have to take more than the minimum number of coursework hours to comply with the B.A. requirements due to variations in minor degree and foreign language requirements within an individual's program of study.

Elective credits include a required minor in one of the following areas: English, economics, history, philosophy, psychology, sociology, communications, speech, media, political science, music, mathematics, statistics, foreign language, computer science, biology, or art. See Undergraduate catalog for courses required for specific minor. All chemistry majors are encouraged to do research through Chem 390. A total of 9 credits of a modern foreign language must also be taken as part of the electives above.

Chem Elective must be from one or more of the following: Chem 321, 328, 342, 346, 355, 361, 362, 363, 375, 381, 384, 385. This program of study allows students to design, in conjunction with their chemistry advisor, a program for many disciplines including pre-law, business, pre-dentistry, pre-veterinary medicine, as well as pre-medicine. An example of such a program is shown for pre-medical studies:

Bio Sc 110-Gen Bio	4
Bio Sc 112-Bio Lab	1
Bio Sc 211-Cellular Bio	4
Chem 361-Biochem	3
Chem 362-Biochem Lab	2

A grade of "C" or better is required for each Chemistry course counted towards the degree.

Proposed

Bachelor of Arts Chemistry

FRESHMAN YEAR

First Semester	Credit
Chem 1-General Chemistry	4
Chem 2-General Chemistry Lab	1
Chem 4-Intro to Lab Safety	1
Math 8-Calculus with Analytic Geometry I	5
English 20-Exposition & Argumentation	3
	14

Second Semester	
Chem 3-General Chemistry	3
Chem 8-Qualitative Analysis	2
History 111-Early Western Civ	3
Math 21-Calc w/Analytic Geometry II	5
Humanities Electives	3
	16

SOPHOMORE YEAR

First Semester	Credit
Chem 221-Organic Chemistry I	4
Chem 226-Organic Chemistry I Lab	1
Electives	5
History 112-Modern Western Civ	3
Humanities Elective	3
	16

Second Semester	
Chem 223-Organic Chemistry II	4
Chem 228-Organic Chemistry II Lab	1
Elective	4
English 60-Writing & Research	3
Social Sciences Elective	3
	15

JUNIOR YEAR

First Semester	Credit
Chem 151-Analytical Chemistry I	4
Physics 21-General Physics I	4
Physics 22-General Physics Lab I	1
Stat 213-Applied Engineering Stat	3
Elective	3
	15

Second Semester	
Chem Electives (see list below)	4
Physics 25-General Physics II	4
Physics 26-General Physics Lab II	1
Electives	6
	15

SENIOR YEAR

First Semester	Credit
Chem 241, 243 or 343-Phy Chem	3
Chem 242 or 244-Phy Chem Lab	1
Humanities Elective Literature	3
Social Sciences Electives	6
Elective	3
	16

Second Semester	
Chem 310-Seminar	1
Humanities Elective	3
Social Sciences Elective	3
Electives	6
	13

Students must complete a minimum of 120 credit hours for the Bachelor of Arts in Chemistry degree. Students may have to take more than the minimum number of coursework hours to comply with the B.A. requirements due to variations in minor degree and foreign language requirements within an individual's program of study.

Elective credits include a required minor in one of the following areas: English, economics, history, philosophy, psychology, sociology, communications, speech, media, political science, music, mathematics, statistics, foreign language, computer science, biology, or art. See Undergraduate catalog for courses required for specific minor. All chemistry majors are encouraged to do research through Chem 390. A total of 9 credits of a modern foreign language must also be taken as part of the electives above.

Chem Elective must be from one or more of the following: Chem 321, 328, 346, 355, 361, 362, 363, 375, 381, 384, 385. This program of study allows students to design, in conjunction with their chemistry advisor, a program for many disciplines including pre-law, business, pre-dentistry, pre-veterinary medicine, as well as pre-medicine. An example of such a program is shown for pre-medical studies:

Bio Sc 110-Gen Bio	3
Bio Sc 112-Bio Lab	2
Bio Sc 211-Cell Biology	3
Bio Sc 212-Cell Biology Lab	1
Chem 361-Biochem	3
Chem 362-Biochem Lab	2

A grade of "C" or better is required for each Chemistry course counted towards the degree.

GEN

Effective Year: 2012
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

DC # 0407-2011-Chem-000-00

Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

Title of degree program, emphasis area, or minor:
Bachelor of Arts
Chemistry
Secondary Education Emphasis Area

Department: Chemistry

Briefly describe action requested (Attach documentation as appropriate):
Change in listing of Chem Elective course options to remove incorrect course listing. Chem 342 is not a valid course number. (See attached for present curriculum and proposed curriculum.)

Recommended by Department: _____ (Chair signature) Date: 11-19-2011

Recommended by: Daniel Jones (Chair signature) Date: 12/13/2011
Discipline Specific Curricula Committee

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

Present

Bachelor of Arts
Chemistry
Secondary Education Emphasis Area

FRESHMAN YEAR

First Semester	Credit
Chem 1-General Chemistry	4
Chem 2-General Chemistry Lab	1
Chem 4-Intro to Lab Safety	1
Math 8-Calculus with Analytic Geometry I	5
English 20-Exposition & Argumentation	3
Psychology 50	3
	17

Second Semester	
Chem 3-General Chemistry	3
Chem 8-Qualitative Analysis	2
Political Science 90	3
Math 21-Calc w/Analytic Geometry II	5
English 60	3
	16

SOPHOMORE YEAR

First Semester	Credit
Chem 221-Organic Chemistry I	4
Chem 226-Organic Chemistry I Lab	1
Physics 21-General Physics I	4
Physics 22-General Physics I Lab	1
Education 40	2
Education 104	2
Bio Sci 110	3
	17

Second Semester	
Chem 223-Organic Chemistry II	4
Chem 228-Organic Chemistry II Lab	1
Physics 25-General Physics II	4
Physics 26-General Physics II Lab	1
Stat 213-Applied Engineering Stat	3
Education 174	2
Psychology 208	3
	18

JUNIOR YEAR

First Semester	Credit
Chem 151-Analytical Chemistry I	4
Physics 6-Environmental Physics I	3
Psychology 155	3
History 175 or 176	3
Education 164	2
Humanities Elective	3
	18

Second Semester	
Chem 241, 243, or 343-Physical Chemistry	3
Chem 242 or 244-Physical Chemistry Lab	1
Speech and Media Studies 85	3
History 275	3
Education 280	6
Humanities Elective	3
	19

SENIOR YEAR

First Semester	Credit
Chemistry Elective	4
Chemistry 310-Undergraduate Seminar	1
Psychology 354	3
Education 216	3
Education 251	3
Humanities Elective	3
	17

Second Semester	
Education 298	1
Education 299	12
	13

Students must complete a minimum of 135 credit hours for the Bachelor of Arts in Chemistry degree with a Secondary Education Emphasis Area. The degree program is intended to culminate in a Certification Recommendation for an initial Missouri teaching certification. Students should also consult the Secondary Teacher Education Program section for Teacher Certification requirements through the Education department.

For this Bachelor of Arts degree program, the minor degree and foreign language requirements of the typical program of study are waived and there are other course substitutions in lieu of education coursework and requirements. A total of nine humanities credit hours are required to be selected from Literature 105 or 106, Philosophy 5, Art 80, Music 50, or Theatre 90.

Four hours of a Chemistry Elective must be selected from one or more of the following: Chem 321, 328, 342, 346, 355, 361, 362, 363, 375, 381, 384, 385, and 390. Chem 390 may not count for more than 3 hr credit toward the degree. All chemistry majors are encouraged to do research through Chem 390.

A grade of "C" or better is required for each Chemistry course counted towards the degree.

Proposed

Bachelor of Arts
Chemistry
Secondary Education Emphasis Area

FRESHMAN YEAR

First Semester	Credit
Chem 1-General Chemistry	4
Chem 2-General Chemistry Lab	1
Chem 4-Intro to Lab Safety	1
Math 8-Calculus with Analytic Geometry I	5
English 20-Exposition & Argumentation	3
Psychology 50	3
	17

Second Semester	
Chem 3-General Chemistry	3
Chem 8-Qualitative Analysis	2
Political Science 90	3
Math 21-Calc w/Analytic Geometry II	5
English 60	3
	16

SOPHOMORE YEAR

First Semester	Credit
Chem 221-Organic Chemistry I	4
Chem 226-Organic Chemistry I Lab	1
Physics 21-General Physics I	4
Physics 22-General Physics I Lab	1
Education 40	2
Education 104	2
Bio Sci 110	3
	17

Second Semester	
Chem 223-Organic Chemistry II	4
Chem 228-Organic Chemistry II Lab	1
Physics 25-General Physics II	4
Physics 26-General Physics II Lab	1
Stat 213-Applied Engineering Stat	3
Education 174	2
Psychology 208	3
	18

JUNIOR YEAR

First Semester	Credit
Chem 151-Analytical Chemistry I	4
Physics 6-Environmental Physics I	3
Psychology 155	3
History 175 or 176	3
Education 164	2
Humanities Elective	3
	18

Second Semester	
Chem 241, 243, or 343-Physical Chemistry	3
Chem 242 or 244-Physical Chemistry Lab	1
Speech and Media Studies 85	3
History 275	3
Education 280	6
Humanities Elective	3
	19

SENIOR YEAR

First Semester	Credit
Chemistry Elective	4
Chemistry 310-Undergraduate Seminar	1
Psychology 354	3
Education 216	3
Education 251	3
Humanities Elective	3
	17

Second Semester	
Education 298	1
Education 299	12
	13

Students must complete a minimum of 135 credit hours for the Bachelor of Arts in Chemistry degree with a Secondary Education Emphasis Area. The degree program is intended to culminate in a Certification Recommendation for an initial Missouri teaching certification. Students should also consult the Secondary Teacher Education Program section for Teacher Certification requirements through the Education department.

For this Bachelor of Arts degree program, the minor degree and foreign language requirements of the typical program of study are waived and there are other course substitutions in lieu of education coursework and requirements. A total of nine humanities credit hours are required to be selected from Literature 105 or 106, Philosophy 5, Art 80, Music 50, or Theatre 90.

Four hours of a Chemistry Elective must be selected from one or more of the following: Chem 321, 328, 346, 355, 361, 362, 363, 375, 381, 384, 385, and 390. Chem 390 may not count for more than 3 hr credit toward the degree. All chemistry majors are encouraged to do research through Chem 390.

A grade of "C" or better is required for each Chemistry course counted towards the degree.

Effective Year: 2012
Term: Summer ☐ Fall ☒ Spring ☐

CC File #8186-2011-CpE-409-33

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐	**Course Deletion** ☐	**Credit Hours** ☐	**Prerequisites** ☐
Course Title ☒	**Catalog Description** ☒	**Course Number** ☐	**Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. **Department:** Computer Engineering
2. **Discipline and Course Number:** **Present:** CpE 409 **Proposed:**
3. **Course Title:** **Present:** **Topics in VLSI Systems**
   Proposed: Design Automation of VLSI Systems
   Abbreviated Course Title: VLSI CAD
   (24 Spaces or Less. Only needed for New Courses or Title Changes.)
4. **Catalog Description** *(300 Character Spaces or Less.)*
   Present: This course deals with issues related to VLSI systems, rather than low-level issues at the transistor or layout level. Topics inlclude VLSI testing, design for test, noise and defect modeling, formal verification, yield analysis, timing analysis and systems-on-a-chip.

   Proposed: This course covers fundamentals in VLSI design automation. Topics include logic synthesis, design planning and optimization, placement and routing, parasitic extraction, circuit simulation, timing analysis, design verification and testing.
5. **If course requires field trip check box:** ☐
6. **Credit Hours:** **Present:** **Lecture:** 3.0 **Lab:** 0.0 **Total:** 3.0
   Proposed: **Lecture:** **Lab:** **Total:**
7. **Prerequisites:**
   Present: CpE 311
   Proposed:
8. **Required for Majors:** ☐ **Elective for Majors:** ☒
9. **Justification:** VLSI design automation is an important area which contains a lot of must-know concepts for circuit designers. The old course covers some of them, but not in a systematic way. The new course title and catalog description follows the actual design flow to provide a full-angle overview.
10. **Semesters previously offered as an experimental course (101, 201, 301, 401):**
11. **List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.**

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department Kale Eisele (Chair signature) Date: 10/5/11

Recommended by Discipline Specific Curricula Committee Steve Watkins (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☒ **Spring** ☐

CC File # 8192-2011-NE-407-10

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☒ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☐
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Mining & Nuclear Engineering

2. Discipline and Course Number: **Present :** **Proposed:** NE 407

3. Course Title: **Present:**
Proposed: Advanced Nuclear Thermal Hydraulics

Abbreviated Course Title: Nuc Thermal Hydraulics
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*

Present:

Proposed: Integrated treatment of thermodynamics and advanced mass, momentum and energy transport in solids and fluids; velocity and temperature distributions in laminar and turbulent flow; flow and thermal analysis with applications to nuclear engineering systems.

5. If course requires field trip check box: ☐

6. Credit Hours:	**Present:**	**Lecture:**	**Lab:**	**Total:**
	Proposed:	**Lecture: 3**	**Lab: 0**	**Total: 3**

7. Prerequisites:
Present:

Proposed: Math 325

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: Required for all graduate students in Nuclear Engineering

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department _____ (Chair signature) Date: 10-24-2011

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☐ **Spring** ☒

CC File # 8193-2011-NE-403-10

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☒ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☐
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Mining & Nuclear Engineering

2. Discipline and Course Number: **Present :** **Proposed:** NE 403

3. Course Title: **Present:**
Proposed: Advanced Reactor Physics

Abbreviated Course Title: Reactor Analysis
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*
Present:

Proposed: Transport and diffusion theory; multigroup approximation; criticality calculations; cross-section processing; buildup and depletion calculations; delayed neutrons and reactor kinetics; lattice physics calculations; full core calculations; analysis and measurement of reactivity coefficients.

5. If course requires field trip check box: ☐

6. Credit Hours: **Present:** **Lecture:** **Lab:** **Total:**
Proposed: **Lecture: 3** **Lab: 0** **Total: 3**

7. Prerequisites:
Present:

Proposed: MATH 325

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: Required for MS or Ph.D. degree in Nuclear Engineering

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department _____ (Chair signature) Date: 10-24-2011

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☒ **Spring** ☐

CC File # 8195-2011-BUS-320-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☒
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Business & Information Technol

2. Discipline and Course Number: **Present :** BUS 320 **Proposed:**

3. Course Title: **Present:** **Managerial Accounting**
Proposed:

Abbreviated Course Title:
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*

Present: Emphasizes internal use of accounting information in establishing plans and objectives, controlling operations, and making decisions involved with management of an enterprise (the determination of costs relevant to a specific purpose such as inventory valuation, control of current operation, or spec

Proposed:

5. If course requires field trip check box: ☐

6. Credit Hours: **Present:** **Lecture:** 3 **Lab:** **Total:** 3
Proposed: **Lecture:** **Lab:** **Total:**

7. Prerequisites:
Present: BUS 120 or EMgt 130 or EMgt 131 or EMgt 230

Proposed: BUS 120 or EMgt 147

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: EMgt 130 and EMgt 131 have been deleted. EMgt 230 isn't being taught any more. EMgt 147 is now EMgt's core course for Accounting and Finance.
Note: The description hasn't changed, but the present description no longer fits in the box.

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department Caroline Joshua (Chair signature) Date: 11/4/11

Recommended by Discipline Specific Curricula Committee Amy Hackbart (Chair signature) Date: 11/8/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: **Summer** ☐ **Fall** ☒ **Spring** ☐

CC File # 8196-2011-BUS-360-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☒
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Business & Information Technol

2. Discipline and Course Number: **Present :** BUS 360 **Proposed:**

3. Course Title: **Present:** **Business Operations**
Proposed:

Abbreviated Course Title:
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*

Present: This course examines the concepts, processes, and institutions that are fundamental to an understanding of business operations within organizations. Emphasis is on the management and organization of manufacturing and service operations and the application of quantitative methods to the solution of s

Proposed:

5. If course requires field trip check box: ☐

6. Credit Hours: **Present:** **Lecture:** 3 **Lab:** **Total:** 3
Proposed: **Lecture:** **Lab:** **Total:**

7. Prerequisites:
Present: (Math 8 or Math 12 or Math 14); any Statistics course; (BUS 120 or EMgt 130 or EMgt 131 or EMgt 230)

Proposed: (Math 8 or Math 12 or Math 14); any Statistics course; (BUS 120 or EMgt 147)

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: EMgt 130 and EMgt 131 have been deleted. EMgt 230 isn't being taught any more. EMgt 147 is now EMgt's core course for Accounting and Finance.
Note: The description hasn't changed, but the present description no longer fits in the box.

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department Caroline Tsoka (Chair signature) Date: 11/9/11

Recommended by Discipline Specific Curricula Committee (Chair signature) Date: 11/8/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: **Summer** ☐ **Fall** ☒ **Spring** ☐

CC File # 8197-2011 - FIN-250-30

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☒
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. **Department:** Business & Information Technol
2. **Discipline and Course Number:** **Present :** FIN 250 **Proposed:**
3. **Course Title:** **Present:** **Corp Finance I**
   Proposed:
   Abbreviated Course Title:
   (24 Spaces or Less. Only needed for New Courses or Title Changes.)
4. **Catalog Description** *(300 Character Spaces or Less.)*
   Present: This course studies the need for funds in business and the techniques of analysis used to determine how effectively these funds are invested within the firm. Topics include the institutions, instruments, and markets concerned with raising funds.
   Proposed:
5. **If course requires field trip check box:** ☐
6. **Credit Hours:** **Present:** **Lecture:** 3 **Lab:** **Total:** 3
   Proposed: **Lecture:** **Lab:** **Total:**
7. **Prerequisites:**
   Present: (BUS 120 or EMgt 130 or EMgt 131 or EMgt 230); (Econ 121 or Econ 122)
   Proposed: (BUS 120 or EMgt 147); (Econ 121 or Econ 122)
8. **Required for Majors:** ☒ **Elective for Majors:** ☐
9. **Justification:** EMgt 130 and EMgt 131 have been deleted. EMgt 230 isn't being taught any more. EMgt 147 is now EMgt's core course for Accounting and Finance.
10. **Semesters previously offered as an experimental course (101, 201, 301, 401):**
11. **List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.**

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department Caroline Frohn (Chair signature) Date: 11/4/11

Recommended by Discipline Specific Curricula Committee Gary Blackburn (Chair signature) Date: 11/8/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☐ **Spring** ☒

CC File # 8198-2011-EE-385-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☒ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☐
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☒

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Electrical and Computer Engine

2. Discipline and Course Number: **Present :** **Proposed:** EE 385

3. Course Title: **Present:**
Proposed: Introduction to Robotics

Abbreviated Course Title: Introduction to Robotics
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*
Present:

Proposed: This course provides an introduction to robotics, covering robot hardware, fundamental kinematics, trajectories, differential motion, robotic decision making, and an overview of current topics in robotics.

5. If course requires field trip check box: ☐

6. Credit Hours: **Present:** **Lecture:** **Lab:** **Total:**
Proposed: **Lecture: 3** **Lab: 0** **Total: 3**

7. Prerequisites:
Present:

Proposed: A "C" or better in both Math 208 and CmpSc 153

8. Required for Majors: ☐ **Elective for Majors:** ☒

9. Justification: This form creates both EE 385 and CpE 385 and adds them as co-listings for CS 345.

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) CS 345 MRJ **2)** **3)**

4) CpE 385 KJE **5)** **6)**

Recommended by Department Kelm Emilio (Chair signature) Date: 15 Nov 2011

Recommended by Discipline Specific Curricula Committee Steve Watkins (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☐ **Spring** ☒

CC File # 8199-2011- CS-345-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐	**Course Deletion** ☐	**Credit Hours** ☐	**Prerequisites** ☒
Course Title ☒	**Catalog Description** ☒	**Course Number** ☐	**Co-listing** ☒

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. **Department:** Computer Science
2. **Discipline and Course Number:** **Present :** CmpSc 345 **Proposed:**
3. **Course Title:** **Present: Computational Robotic Manipulation**
   Proposed: Introduction to Robotics
   Abbreviated Course Title: Introduction to Robotics
   (24 Spaces or Less. Only needed for New Courses or Title Changes.)
4. **Catalog Description** *(300 Character Spaces or Less.)*
   Present: Analysis of methods for the design and operation of robotic systems. Spatial descriptions and transformations. Arm control: coordinate transformations. Manipulator Kinematics and inverse Kinematics. Jacobians: velocities and static forces. Robot path trajectory generation. Project: programming robot
   Proposed: This course provides an introduction to robotics, covering robot hardware, fundamental kinematics, trajectories, differential motion, robotic decision making, and an overview of current topics in robotics.
5. **If course requires field trip check box:** ☐
6. **Credit Hours:** **Present:** **Lecture:** 3 **Lab:** 0 **Total:** 3
   Proposed: **Lecture:** **Lab:** **Total:**
7. **Prerequisites:**
   Present: Comp Sci 253; Math 208; Physics 24 or Physics 25
   Proposed: A "C" or better in both Math 208 and CmpSc 153
8. **Required for Majors:** ☐ **Elective for Majors:** ☒
9. **Justification:** The field of robotics is quickly expanding and this change will update the course and make it consistent with how it's currently being taught.
10. **Semesters previously offered as an experimental course (101, 201, 301, 401):**
11. **List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.**

1) CpE ~~356~~ 385 Prof 2) – New 3)

4) EE ~~356~~ 385 Prof 5) – New 6)

Recommended by Department _____ (Chair signature) Date: Sept 22, 11

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/13/2011

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☒ **Spring** ☐

CC File # 8200-2011-ChEng-234-34

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☐
Course Title ☐ **Catalog Description** ☒ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Chemical and Biological Engr

2. Discipline and Course Number: **Present :** Chem Eng 234 **Proposed:**

3. Course Title: **Present:** **Chemical Engineering Laboratory I**
Proposed:

Abbreviated Course Title: Unit Ops Lab I
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*

Present: Experiments associated with the unit operations with fluid flow and heat transfer. Design of experiments and uncertainty analysis are introduced. ... This is a communication emphasized course. Generally offered winter semester only.

Proposed: Experiments associated with unit operations involving fluid flow and heat transfer. Principles of data and uncertainty analysis are introduced with emphasis on model building. Communication skills are stressed. This is a communication emphasized course.

5. If course requires field trip check box: ☐

6. Credit Hours: **Present:** **Lecture:** 1 **Lab:** 1 **Total:** 2
Proposed: **Lecture:** **Lab:** **Total:**

7. Prerequisites:
Present: Chem Eng 231 and Chem Eng 233

Proposed:

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: Original description is greater than 300 characters so the new description is shortened. Removed the comment on scheduling from the description. (We now offer the laboratory both semesters.)

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department _____ (Chair signature) Date: 11/28/11

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☒ **Spring** ☐

CC File # 8201-2011-ChEng-236-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☒
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. **Department:** Chemical and Biological Engr
2. **Discipline and Course Number:** **Present :** Chem Eng 236 **Proposed:**
3. **Course Title:** **Present:** **Chemical Engineering Laboratory II**
   Proposed:
   Abbreviated Course Title: Unit Ops Lab II
   (24 Spaces or Less. Only needed for New Courses or Title Changes.)
4. **Catalog Description** *(300 Character Spaces or Less.)*
   Present: Experiments illustrating the unit operations of continuous and staged separation. Experimental design methods are extended to include the principles of regression and model building. Communication skills are stressed. This is a communication emphasized course.
   Proposed:
5. **If course requires field trip check box:** ☐
6. **Credit Hours:** **Present:** **Lecture:** 1 **Lab:** 2 **Total:** 3
   Proposed: **Lecture:** **Lab:** **Total:**
7. **Prerequisites:**
   Present: Chem Eng 234, Chem Eng 235, Chem Eng 237 preceded or accompanied by Chem Eng 281.
   Proposed: Chem Eng 235, Chem Eng 237 preceded or accompanied by Chem Eng 281.
8. **Required for Majors:** ☒ **Elective for Majors:** ☐
9. **Justification:** Chem Eng 234 does not provide any content on continuous or staged separation and is not required as a prerequisite.
10. **Semesters previously offered as an experimental course (101, 201, 301, 401):**
11. **List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.**

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department _____ (Chair signature) Date: 11/23/11

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☒ **Spring** ☐

CC File # 8202-2011-ChEg-252-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☒
Course Title ☐ **Catalog Description** ☒ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Chemical and Biological Engr

2. Discipline and Course Number: **Present :** Chem Eng 252 **Proposed:**

3. Course Title: **Present: Process Dynamics and Control Laboratory**
Proposed:

Abbreviated Course Title: Process Controls Lab
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*

Present: Application of concepts of industrial process dynamics and control using experiments that demonstrate different control and sensing devices and software. Generally offered fall semester only. This is a communications emphasized course.

Proposed: Application of concepts of industrial process dynamics and control using experiments that demonstrate different control and sensing devices and software. This is a communications emphasized course.

5. If course requires field trip check box: ☐

6. Credit Hours: **Present:** **Lecture:** **Lab:** 1 **Total:** 1
Proposed: **Lecture:** **Lab:** **Total:**

7. Prerequisites:
Present: Preceded or accompanied by Chem Eng 236, or Chem Eng 264; accompanied by Chem Eng 251.

Proposed: Preceded or accompanied by Chem Eng 251.

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: The laboratory content depends on material offered in Chem Eng 251 and its prerequisites. Removed scheduling from the course description. (We now offer the course both semesters.)

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department _____ (Chair signature) Date: 11/28/11

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: Summer ☐ **Fall** ☐ **Spring** ☒

CC File # 8203-2011-ChEng-281-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☒
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Chemical and Biological Engr

2. Discipline and Course Number: **Present :** Chem Eng 281 **Proposed:**

3. Course Title: **Present:** **Chemical Engineering Reactor Design**
Proposed:

Abbreviated Course Title: Reactor Design
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*

Present: The study of chemical reaction kinetics and their application to the design and operation of chemical and catalytic reactors.

Proposed:

5. If course requires field trip check box: ☐

6. Credit Hours: **Present:** **Lecture:** 3 **Lab:** **Total:** 3
Proposed: **Lecture:** **Lab:** **Total:**

7. Prerequisites:
Present: Chem Eng 237 or Chem Eng 263

Proposed: Preceded or accompanied by Chem Eng 237 or Chem Eng 263

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: Students are presented the necessary content in the prerequisite course before the subject material in Chem Eng 281 requires it. This prerequisite change allows the two courses to be taught in the same semester leading to tighter integration of the content.

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department _____ (Chair signature) Date: 11/28/11

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Term: **Summer** ☐ **Fall** ☒ **Spring** ☐

CC File # 8204-2011-ChEng-251-32

Course Change Form (CC)

This form is for creating or modifying permanent courses.

Course Changes (Check all changes.)

New Course ☐ **Course Deletion** ☐ **Credit Hours** ☐ **Prerequisites** ☒
Course Title ☐ **Catalog Description** ☐ **Course Number** ☐ **Co-listing** ☐

Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Chemical and Biological Engr

2. Discipline and Course Number: **Present :** Chem Eng 251 **Proposed:**

3. Course Title: **Present:** **Chemical Engineering Process Dynamics and Control.**
Proposed:

Abbreviated Course Title: Process Controls
(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description *(300 Character Spaces or Less.)*

Present: Study of the dynamics of chemical processes and the instruments and software used to measure and control temperature, pressure, liquid level, flow, and composition. Generally offered fall semester only.

Proposed:

5. If course requires field trip check box: ☐

6. Credit Hours:

Present:	**Lecture:** 3	**Lab:**	**Total:** 3
Proposed:	**Lecture:**	**Lab:**	**Total:**

7. Prerequisites:

Present: Preceded or accompanied by Chem Eng 236 or Chem Eng 264; accompanied by Chem Eng 252.

Proposed: Preceded or accompanied by Chem Eng 234, Chem Eng 236 or Chem Eng 264.

8. Required for Majors: ☒ **Elective for Majors:** ☐

9. Justification: The course teaches control strategies and equipment for various chemical process unit operations, including those taught in Chem Eng 234 as well as Chem Eng 236 or Chem Eng 264. Students may now take the corresponding laboratory course, Chem Eng 252, in the same semester or in a semester subsequent to taking Chem Eng 251.

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) **2)** **3)**

4) **5)** **6)**

Recommended by Department _____ (Chair signature) Date: 11/28/11

Recommended by Discipline Specific Curricula Committee _____ (Chair signature) Date: 12/14/11

Approved by Curricula Committee: _____ (Chair signature) Date: _____

Approved by Faculty Senate: _____ (Chair signature) Date: _____

(Revised 1/29/09)

Effective Year: 2012
Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2373-FS2012-GE-301

Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings – January 1
Spring Semester Offerings – August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. *Co-listed offerings should be submitted on one form, originating from the primary discipline.*

Department: Geological Sciences and Engineering

Discipline and Course Number: GE 301

Course Title: Fundamentals of Groundwater Hydrology

Abbreviated Title *(24 spaces or less)*: Groundwater Hydrology

Instructor(s): Cawlfield

Credit Hours: **Lecture:** 3 **Lab:** 0 **Total:** 3

Prerequisites: Permission of instructor.

Semester(s) previously taught: Previously taught as GE 331, Subsurface Hydrology, needs a different course number to differentiate from the on campus GE 331 class.

Brief Course Description: (40 words or less)
The course will focus on fundamental analysis and overall survey of groundwater hydrology with emphasis on practical geo-environmental and subsurface hydrology issues of interest to working professionals. Topics will include general hydrology, surface and subsurface hydrologic intercconnection, basic groundwater flow and well test analysis, and a brief introduction to contaminant transport. This class is intended to be taught as a distance class to working professionals from a wide variety of academic backgrounds; therefore, the mathematical complexity will be at a basic level and the focus is on a general understanding of groundwater hydrology.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.

1) **2)** **3)**

4) **5)** **6)**

Department Chair: _____ (Chair Signature) Date: 9/7/11 9-13-11

Discipline Specific Curricula Committee: Needs signed (Chair signature) Date: _____

Curricula Committee: _____ (Chair Signature) Date: _____

09/09/11 (Revised 1/31/2008)

Effective Year: FS2012
Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2381-FS2012-MIN-301

Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings – January 1
Spring Semester Offerings – August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. *Co-listed offerings should be submitted on one form, originating from the primary discipline.*

Department: Mining and Nuclear Engineering

Discipline and Course Number: MIN 301

Course Title: Global Leadership in the Mining Industry

Abbreviated Title *(24 spaces or less)*: Global Leadership

Instructor(s): Samuel Frimpong

Credit Hours: **Lecture:** 3.0 **Lab:** **Total:**

Prerequisites: Senior or Junior Standing

Semester(s) previously taught:

Brief Course Description: (40 words or less)
This course will focus on the leadership challenges and opportunities associated with the global mining industry. Students will be introduced to the challenges associated with environmental stewardship, diversity and indegenization, technology transfer and management, partnerships, mergers and acquisitions, project financing, risks and opportunities associated with the global mining industry.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**

4) **5)** **6)**

Department Chair: _____ Date: 10/10/11
(Chair Signature)

Discipline Specific Curricula Committee: _____ Date: 12/14/11
(Chair signature)

Curricula Committee: _____ Date: _____
(Chair Signature)

Effective Year: FS2012
Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2382-FS2012-MIN-301

Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings – January 1
Spring Semester Offerings – August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. *Co-listed offerings should be submitted on one form, originating from the primary discipline.*

Department: Mining and Nuclear Engineering

Discipline and Course Number: MIN 301

Course Title: Tech Innovations in Mining Engineering

Abbreviated Title *(24 spaces or less)*: Tech Innovations

Instructor(s): Samuel Frimpong

Credit Hours: **Lecture:** 3.0 **Lab:** **Total:**

Prerequisites: Senior or Junior Standing

Semester(s) previously taught:

Brief Course Description: (40 words or less)
Familiarity and use of advanced technologies in the mining industry. Presentations by industry leaders on current and future technologies for impacting industry performance. Students participates in research on the impact of technology on safety, efficiency, economics and sustainability on the mining industry performance.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**
4) **5)** **6)**

Department Chair: _____ Date: 10/10/11
(Chair Signature)

Discipline Specific Curricula Committee: _____ Date: 12/14/11
(Chair signature)

Curricula Committee: _____ Date: _____
(Chair Signature)

Effective Year: 2012
Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2383-FS2012-Math-401

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Mathematics and Statistics

Discipline and Course Number: Math 401

Course Title: Numerical Analysis

Abbreviated Title *(24 spaces or less)*: Numerical Analysis

Instructor(s): Xiaoming He, Yanzhi Zhang, John Singler

Credit Hours: **Lecture:** 3 **Lab:** 0 **Total:** 3

Prerequisites: Math 309, programming competency

Semester(s) previously taught: n/a

Brief Course Description: (40 words or less)
A proof-based course emphasizing theoretical analysis of convergence and accuracy of various numerical methods including approximate solutions of linear and nonlinear equations, numerical integration, and function approximation, with implementation to validate results and illustrate the methods.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**

4) **5)** **6)**

Department Chair: Leon Hall (Chair Signature) Date: 11-14-11

Discipline Specific Curricula Committee: Daniel Spindt (Chair signature) Date: 12/13/2011

Curricula Committee: _____ (Chair Signature) Date: _____

Effective Year: 2013
Effective Term: Summer ☐ Fall ☐ Spring ☒

EC File # 2384-Sp2013-Math-401

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Mathematics and Statistics

Discipline and Course Number: Math 401

Course Title: Finite Element Methods for Partial Differential Equations

Abbreviated Title *(24 spaces or less)*: Finite Elements for PDEs

Instructor(s): Xiaoming He

Credit Hours: **Lecture:** 3 **Lab:** 0 **Total:** 3

Prerequisites: Math 325, programming competency

Semester(s) previously taught: n/a

Brief Course Description: (40 words or less)
Implementation and theoretical analysis of the finite element method for the approximate solution of partial differential equations. Implementation of finite element methods for Poisson and heat equations. Theoretical analysis of convergence, accuracy, and stability of approximate solutions.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**

4) **5)** **6)**

Department Chair: Leon Hall (Chair Signature) Date: 11-14-11

Discipline Specific Curricula Committee: Daniel Juedes (Chair signature) Date: 12/13/2011

Curricula Committee: _____ (Chair Signature) Date: _____

Effective Year: 2012
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐

EC File # 2385 - FS2012-ChEg-301

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Chemical and Biological Engr

Discipline and Course Number: Chem Eng 301

Course Title: Kinetics of Complex Chemical Reactions

Abbreviated Title *(24 spaces or less)*: Kinetics Complex Rxns

Instructor(s): Prof Gregory Yablonsky

Credit Hours: **Lecture:** 3 **Lab:** **Total:** 3

Prerequisites: Chem Eng 281

Semester(s) previously taught: none

Brief Course Description: (40 words or less)
Students will use contemporary methods to decode the kinetic complexity of chemical reactions to understand the relationships between observed kinetic behavior and reaction mechanism. Heterogeneous catalysis (complete and partial oxidation, combustion, and enzyme processes) with special emphasis on original data from TAP microreactor studies provide the many examples for student analysis.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**

4) **5)** **6)**

Department Chair: _____ Date: 11/23/11
(Chair Signature)

Discipline Specific Curricula Committee: _____ Date: 12/14/11
(Chair signature)

Curricula Committee: _____ Date: _____
(Chair Signature)

Effective Year: 2012
Effective Term: Summer ☒ **Fall** ☐ **Spring** ☐

EC File # 2388-552012-Geol-301

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Geological Sciences and Eng.

Discipline and Course Number: Geol 301

Course Title: Summer Field Geology in Southern China

Abbreviated Title *(24 spaces or less)*: Chinese Field Geology

Instructor(s): Wan Yang

Credit Hours: **Lecture:** 2 **Lab:** 1 **Total:** 3

Prerequisites: Geol 50 / Geol 51, ~~or any other introductory geology courses~~
OR

Semester(s) previously taught:

Brief Course Description: (40 words or less)
Studies of (1) fundamentals of field geology through lecture and field observations, AND ~~mapping,~~ ~~stratigraphic~~ measurement, focusing on evolution of ancient seas, reefs and life in south China (2 CHs), and (2) Chinese culture and history (1 CH) through interactions with Chinese people and students, and touring in Beijing. Co-taught with instructors from Trinity U. ~~(San Antonio)~~ and Guizhou U., China. EXPENSES TO BE PAID BY STUDENTS.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**

4) **5)** **6)**

Department Chair: Ralph Stern (Chair Signature) Date: 11-30-11

Discipline Specific Curricula Committee: Daniel Smith (Chair signature) Date: 12/13/2011

Curricula Committee: _____ (Chair Signature) Date: _____

Effective Year: 2012
Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2389-F52012-GE-301

Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings – January 1
Spring Semester Offerings – August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. *Co-listed offerings should be submitted on one form, originating from the primary discipline.*

Department: Geological Sciences and Engineering

Discipline and Course Number: GE 301

Course Title: Fundamentals of Groundwater Hydrology

Abbreviated Title *(24 spaces or less)*: Groundwater Hydrology

Instructor(s): Cawlfield

Credit Hours: **Lecture:** 3 **Lab:** 0 **Total:** 3

Prerequisites: Permission of instructor. This course cannot be used for Geological Engineering undergraduate credit for the B.S. in Geological Engineering degree.

Semester(s) previously taught: Previously taught as GE 331, Subsurface Hydrology, needs a different course number to differentiate from the on campus GE 331 class.

Brief Course Description: (40 words or less)
The course will focus on fundamental analysis and overall survey of groundwater hydrology with emphasis on practical geo-environmental and subsurface hydrology issues of interest to working professionals. Topics will include general hydrology, surface and subsurface hyrologic intercconnection, basic groundwater flow and well test analysis, and a brief introduction to contaminant transport. This class is intended to be taught as a distance class to working professionals from a wide variety of academic backgrounds; therefore, the mathematical complexity will be at a basic level and the focus is on a general understanding of groundwater hydrology.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.

1) **2)** **3)**

4) **5)** **6)**

Department Chair: Ralph Flores (Chair Signature) Date: Nov. 18. 11

Discipline Specific Curricula Committee: Steve Vatkins (Chair signature) Date: 12/14/11

Curricula Committee: _____ (Chair Signature) Date: _____

11/18/11 (Revised 1/31/2008)

Effective Year: 2012
Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2390-FS2012-GE-401

Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings – January 1
Spring Semester Offerings – August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. *Co-listed offerings should be submitted on one form, originating from the primary discipline.*

Department: Geological Sciences and Engineering

Discipline and Course Number: GE 401

Course Title: Slope Stability

Abbreviated Title *(24 spaces or less)*: App. Geol. Engineering

Instructor(s): Maerz

Credit Hours: **Lecture:** 3 **Lab:** 0 **Total:** 3

Prerequisites: Permission of instructor. A previous course in Soil or Rock Mechanics or Rock Engineering

Semester(s) previously taught:

Brief Course Description: (40 words or less)
The course will cover the fundamentals of slope stability in soil and rock with emphasis on characterization and analysis as well as mitigation and remediation techniques for slopes.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**

4) **5)** **6)**

Department Chair: _____ Date: Nov. 18/11
(Chair Signature)

Discipline Specific Curricula Committee: _____ Date: 12/14/11
(Chair signature)

Curricula Committee: _____ Date: _____
(Chair Signature)

Effective Year: 2012
Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2391-FS 2012-Theatre-101

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: ALP Theatre

Discipline and Course Number: 101

Course Title: Voice Diction and Interpretation

Abbreviated Title *(24 spaces or less)*: Voice and Diction

Instructor(s): Jeanne Stanley

Credit Hours: **Lecture:** 3 **Lab:** **Total:** 3

Prerequisites: None

Semester(s) previously taught: 0

Brief Course Description: (40 words or less)
Training the speaking voice; study of vocal mechanism, breathing, projection, articulation, enunciation; practical application of speaking principles in oral interpretation reading; mastering clarity of speech through vocal exercises.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1) **2)** **3)**

4) **5)** **6)**

Department Chair: _____ (Chair Signature) Date: Nov. 30, 2011

Discipline Specific Curricula Committee: _____ (Chair signature) Date: Dec. 1, 2011

Curricula Committee: _____ (Chair Signature) Date: _____

11/02/11 (Revised 10/12/2010)

Voice Diction and Interpretation

Instructor Jeanne Stanley
Phone: (Cell) 573-200-1966
e-mail: stanleyje@mst.edu

OBJECTIVE: In this class we will focus on the production of voice through spoken language. Because breath is the most important aspect of producing an effective voice, we will do vocal and breathing exercises for a portion of each class. The rest of the class period will focus on learning how to improve vocal production in the following areas:

PITCH: The perception of frequency, which defines the numbers of vibrations of a sound wave. Pitch is perceived as high or low.

LOUDNESS: In this case, loudness refers to the degree of intensity of vocal sound. Amplitude is its physical component.

RATE: The number of words spoken per minute.

QUALITY: The characteristics of vocal sound determined by resonance.

LANGUAGE: The written or spoken word.

ARTICULATION: The means by which intelligent sound is created.

VOWELS: Responsible for carrying the "music" of language.

CONSONANTS: Responsible for carrying the "meaning" of language.

REQUIREMENTS:

Attire: Wear loose, comfortable clothing, so that you can move freely.

Attendance: MANDATORY: Three unexcused absences, or any total of five absences will lower your grade automatically. Absences will only be excused if you have e-mailed, texted, or phoned, prior to the class/no exceptions. Time in class will be spent in a variety of exercises and group work. You must be there to learn the course material. Active participation is necessary to your success in this course.

Required text: *Fundamentals of Voice & Articulation* by Lyle V. Mayer Ed. 14. We will read part of the text in class, but there will be assigned reading outside of class.
Notebook: You will need to have a notebook or folder to keep handouts that will be used in class.

GRADING CRITERIA

ATTENDANCE:		100
PARTICIPATION:		100
VOCAL/TERMS QUIZ:		50
BIO/TEST:		50
CRITIQUES:	50 points each	100
SONNET:		50
PROSE READINGS:	75 points each	150
FINAL EXAM READING		100

CRITIQUES: You are required to attend one Missouri S&T play this term and write a two-page double-spaced reaction paper. You will receive a detailed listing of requirements prior to the production.

- **Academic Alert System:** http://academicalert.mst.edu
- **Academic Dishonesty:** http://registrar.mst.edu/academicregs/index.html http://ugs.mst.edu .
- **Disability Support Services:** http://dss.mst.edu
  "If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation."