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MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

Agenda Campus Curricula Committee Meeting December 8, 2010 Meeting 11 a.m. Room 117 Fulton Hall

Review of submitted CC forms:

CC 8031, Geology 434, Granite and Rhyolite Petrogenesis, effective Fall 2010.

CC 8032, Geology 420, Analytical Structural Geology, effective Spring 2011.

CC 8033, Geology 320, Advanced Structural Geology, effective Spring 2011

CC 8070, Mechanical Engineering 312, Introduction to Finite Element Analysis, effective Spring 2011.

CC 8071, Metallurgical Engineering 318, Principles for Microstructural Design, effective Spring 2012.

CC 8072, MSE 418, Principles for Advanced Microstructural Design, effective Spring 2011.

CC 8073, Ceramic Engineering 222, Applied Glass Forming, effective Spring 2011.

CC 8074, Explosives Engineering 491, Internship, effective Summer 2011.

CC 8075, Explosives Engineering 499, Practicum, effective Summer 2011.

CC 8080, Mechanical Engineering 330, Applied Computational Methods, effective Spring 2011.

CC 8082, Business 490, Research, effective Fall 2011.

CC 8083, Marketing 490, Research, effective Fall 2011.

CC 8084, Business 496, Project Research, effective Fall 2011.

CC 8085, Mechanical Engineering 423, effective Spring 2011.

CC 8086, Mechanical Engineering 435, effective Spring 2011.

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Office of the Registrar • 103 Parker Hall • 300 West 13th Street • Rolla, MO 65409-0930 Phone: 573-341-4181 • Fax: 573-341-4362 • Email: registrar@mst.edu • Web: http://registrar.mst.edu From: 573 341 4362 Page: 2/23 Date: 11/8/2010 12:20:52 PM



Missouri University of Science and Technology

Formerly University of Missouri-Rolla

CC 8087, Mechanical Engineering 220, Engineering Design Methodology, effective Spring 2011.

CC 8090, Mining Engineering 270, Mining Industry Economics, effective Fall 2011.

CC 8091, Technical Communication 331, Technical Editing, effective Fall 2011.

CC 8092, Technical Communication 361, History of Technical Communication, effective Fall 2011.

CC 8093, Computer Science 253, Algorithms, effective Fall 2011.

CC 8094, Business 350, Customer Focus and Satisfaction, effective Fall 2011.

CC 8095, Marketing 350, New Product Development, effective Spring 2011.

CC 8096, Marketing 450, Advanced New Product Development, effective Fall 2011.

CC 8097, Business 450, Advanced Customer Focus and Satisfaction, effective Fall 2011.

Review of submitted EC forms:

EC 2293, Geological Engineering 401, Surface Waves (MASW) & Ground Penetrating Radar (GPR), effective Spring 2011.

EC 2294, Explosives Engineering 401, Regulatory Issues in the Explosives Industry, effective Summer 2011.

EC 2295, Mechanical Engineering 301, Fuel Cell Principles, effective Spring 2011.

EC 2297, Economics 301, Economic Analysis of Natural Resources of South Africa, effective Spring 2011.

EC 2298, Economics 301, Field Investigation of the Economics of Natural Resources of South Africa, effective Spring 2011.

EC 2299, Geology 301, Geological Field Investigation of Natural Resources of South Africa, effective Spring 2011.

EC 2300, Geology 301, Geological Analysis of Natural Resources of South Africa, effective Spring 2011.

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Missouri University of Science and Technology

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EC 2301, ERP 301, Enterprise Resource Planning systems in small and Medium size Enterprise, effective Fall 2011.

EC 2302, Mechanical Engineering 401, Advanced Digital Design and Manufacturing, effective Spring 2011.

EC 2303, Civil Engineering, Environmental Engineering 301, Phytoremediation and Natural Treatment Systems: Science and Design, effective Spring 2011.

EC 2304, MSE 401, Advanced Principles of Microstructural Design, effective Spring 2011.

EC 2305, Geology 401, Advanced Depositional Systems, effective Spring 2011.

EC 2306, Geology 401, Stratigraphy and Basin Evolution, effective Spring 2011.

Tabled Items:

CC 8004, Aerospace Engineering 319, Advanced Thermodynamics. Tabled

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Date: 9/22/2010 3:39:11 PM Page: 3/7 From: 573 341 4362 cc File # 8031-2010-Leo-434-1 Effective Year: 2010 Spring 🗆 Fail 🖾 Effective Term: Summer 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🗀 Credit Hours 🔲 Course Deletion New Course 🗵 Co-listing 🗀 Course Number 🔲 Catalog Description 🗆 Course Title 🔲 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: Geological Sciences and Engine Proposed: Geo 434 Discipline and Course Number: Present: 3, Course Title: Present: Proposed: Granite and Rhyolite Petrogenesis Abbreviated Course Title: Granite Petrogenesis (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (40 Words or Less) Present: Proposed: The origin of granites and rhyolites with respect to extreme fractionation, crustal anatexis, magma mixing, and tectonic setting will be explored through critical reading of the literature and examination of hand samples and thin sections from classic geologic terranes. A research paper is required as well as a field trip at the student's expense. 5. If course requires field trip check box: 🛛 Total: Lab: Lecture: Present: 6. Credit Hours: Total: 4 Lab: 1 Lecture: 3 Proposed: 7. Prerequisites: Present: Geology 130 Proposed: Elective for Majors: \boxtimes 8. Required for Majors: 🗌 Please approve the CC from directly as this course will meet concurrently with the 9. Justification: current undergraduate class (Geo 330). Graduate students will complete additional assignments (research papers, oral presentations, additional excercises), in addition to all other assignments. 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. 2) 1) 5) 4) Recommended by Department Recommended by Discipline Specific Curricula Committee (Chair signature) Date: _ Approved by Curricula Committee: _ (Chair signature) Date: . Approved by Faculty Senate:_

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(Chair signature)

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Date: 9/22/2010 3:39:11 PM

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4 Department	t: Geological S	clences and En	iā i i ie			-2 Geo 420
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Abbreviate	d Course Title	: Analyt Struct	tural Geo needed for New Co	urses or Title	e Changes.)	
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Approved by	Faculty Senat	81 <u></u>	(Chair signature)		<u>—</u> :	(Revised 1/31/08)
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cc file # 8033-2010 - Men - 320-11) Effective Year: 2011 Spring 🖾 Fall 🗀 Effective Term: Summer 🗌 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🗀 Credit Hours 🛄 Course Deletion 🔲 New Course 🖾 Co-listing 🛄 Course Number 🗆 Catalog Description 🗌 Course Title 🗆 Course Information (1-9 Must Be Completed. Leave "Proposed" Items blank if no change is being made.) 1. Department: Geological Sciences and Engine Proposed: 320 320 Geo 320 2. Discipline and Course Number: 3. Course Title: Present: Proposed: Advanced Structural Geology Abbreviated Course Title: Adv Structural Geology (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (40 Words or Less) Present: Proposed: The course provides theoretical background, analytical techniques, and hands-on exeperience, for analyzing geologic structures at a variety of scales - hand sample to global. 5. If course requires field trip check box: \Box Total: tab: Lecture: Present: 6. Credit Hours: Total: 3 Lab: 1 Lecture: 2 Proposed: 7. prerequisites: Geology 220, Geophysics 381 Present: Proposed: < Elective for Majors: 🗵 8. Required for Majors: 🗔 Considerable interest from undergraduate students to have an advanced course in 9. Justification: structural geology. This course will meet with the graduate class (420), but with different expectations for assignments and assessment for both groups. different expectations for assignments and discussions for assignment and discussions for assignments and discussions for assignment and discussions for a sign and discus 11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below. 2) 1) 5) 4) Recommended by Department Recommended by Discipline Specific Curricula Committee (Chair signature) Date: Approved by Curricula Committee: (Chair signature) Date: Approved by Faculty Senate:. (Chair signature) (Revised 1/31/08) This fax was received by GFI FAXmaker fax server. For more information, visit: http://www.gfi.com

From: 573 341 4362 Page: 7/23 Date: 11/8/2010 12:20:54 PM

From: 573 341 4362 Page: 4/7 Date: 9/22/2010 3:39:12 PM

Dear colleagues,

Please find the attached revised CC forms requesting approval for a graduate level course in Geological Sciences "Granite and Rhyolite Petrogenesis" as well as for Advanced Structural Geology and Analytical Structural Geology. I believe I have made all the changes requested. I apologize for wasting the committee's time correcting my grammatical errors as well as technical errors (placing information in section 11 rather than section 10).

"Granites and Rhyolites"

To clarify my request, this course will meet concurrently with the current undergraduate elective course Geology 330 "Granites & Rhyolites. This is standard practice across campus- it is essential for programs with a limited number of faculty to make this adjustment if they are to be able to offer the courses necessary to maintain a graduate program. I am requesting that the EC requirement for the graduate course be waived because there is a similar permanent course already on the books. In addition, I would like to have this course approved for the Fall semester, so that two graduate students that are currently taking this course may drop Geology 330 and add Geology 434. These two students need this 400 level course to meet the requirement for their graduate degree. They are both funded by their government and are on a strict timetable to complete their degree requirements. I thought I had taken care of submitting this form the last time I taught the course several semesters ago. It became clear to me late last spring that this was not the case. Because this request involves a very small number of students and will impact them in a very positive way, I hope you will see fit to agree to this request.

In addition, there is a possibility that a student with a BS in Geology and Geophysics from Missouri S&T will have taken Geology 330. This student may subsequently enroll in the graduate program in Geology and Geophysics at Missouri S&T and then request to take Geology 434 as part of their graduate degree program. The decision as to whether or not to accept this course as part of the student's graduate program will be subject to the approval of the student's graduate committee. I would not have a problem with this or a similar request. Many geoscientists have established impressive scientific careers researching the origin of granites and rhyolites. If a Missouri S&T student wished to pursue a similar career path as a result of having taken Geology 330 as an undergraduate and then at a later date wanted to take Geology 434 I know I could honor that student's request by continuing to provide a challenging and stimulating learning environment rather than just duplicating previous course material.

Advanced Structural Geology and Analytical Structural Geology

I know in the past there were problems with the EC forms for this class. However, a variation of these courses was taught in 2008, 2009, and 2010 with good enrollment. This information was inadvertently placed in section 11 rather than section 10. Therefore I am requesting they be made permanent course. It is important to have these courses listed in the catalog to recruit high quality graduate students to the program.

Thank you for your consideration.

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Effective Year: 2011

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Date: 9/24/2010 3:25:30 PM

CC File # 8070-2010- M.C-312-32 Fall 🗀 Term: Summer 🗌 Spring 🖾 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: Mech & Aero Eng. 2. Discipline and Course Number: Present: Mc Eng 312 Proposed: 3. Course Title: Present: Introduction to Finite Element Analysis 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: Variational formulation of the governing equations. Finite element moedel, interpolation functions, numerical integration, assembly of elements and solution procedures. Applications to solid mechanics, fluid mechanics and heat transfer problems. Computer implementation and use of commercial codes. Proposed: 5. If course requires field trip check box: 🗌 6. Credit Hours: Lecture: 3 Total: 3 Present: Lab: Proposed: Total: Lecture: Lab: 7. Prerequisites: Present: Math 204 Proposed: Mc Eng 208 or Ae Eng 253; or consent of instructor for majors that do not require either of these courses. 8. Required for Majors: 🔲 Elective for Majors: 🖾 9. Justification: Separate prerequisites are required to maintain the course background for various majors. 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) AE 352 2) 3) 4) 5) Recommended by Department (Chair signature)
Recommended by Discipline Specific Curricula Committee Date: 10-15-10 (Chair signature) Approved by Curricula Committee: _ Date: _____ (Chair signature) Approved by Faculty Senate: _ Date: _____ (Chair signature)

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From: 573 341 4362

Page: 2/11

Date: 9/24/2010 3:25:30 PM

cc File #8071-2010-Matting-318-10 Effective Year: 2012 Fall 🗀 Spring 🗵 Term: Summer 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🔲 Credit Hours Course Deletion 🗌 New Course 🛛 Course Number 🗌 Co-listing 🔲 Catalog Description [Course Title 🗌 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) Department: Materials Science & Engineerin Proposed: Met 318 2. Discipline and Course Number: Present: Present: 3. Course Title: Proposed: Principles for Microstructural Design Abbreviated Course Title: Microstructural Design (24 Spaces or Less, Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Present: Proposed: This course will introduce the basics of microstructural principles that can be used to design advanced materials. It will help students learn about the basic principles and microstructural design approaches. 5. If course requires field trip check box: 🗀 Total: Lab: 6. Credit Hours: Present: Lecture: Total: 2.0 Lecture: 2.0 Lab: 0.0 Proposed: 7. Preregulsites: Present: Proposed: At least junior standing, and Met 215 and Met 217 or equivalent. Elective for Majors: 🖾 8. Required for Majors: 🔲 This course is need for students to acquire the latest in Integrated Computational 9. Justification: Materials Engineering (ICME) approach. ICME is being promoted by NAE, NSF and other federal agencies. 10. Semesters previously offered as an experimental course (101, 201, 301, 401); FS2004; SP2006 11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below. 1) 2) 4) 5) Recommended by Department (Chair signature) Date: 10-15-10 Recommended by Discipline Specific Curricula Committee (Chair signature) Date: ______ Approved by Curricula Committee: _ (Chair signature) Date: _ Approved by Faculty Senate: ___ (Chair signature)

From: 573 341 4362 Page: 10/23 Date: 11/8/2010 12:20:55 PM

From: 573 341 4362

Effective Year: 2011

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Date: 9/24/2010 3:25:30 PM

CC File # 8072-2010 - MSE-418-10

Term: Summer 🗌	Fall 🗌 Spring 🖾					
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1. Department: Ma	aterials Science & Engin	eerin				
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	oposed: Principles for A		ıctural Desigr	1		
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Approved by Faculty	Senate!	·		<u>. </u>	Date:	
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Date: 9/24/2010 3:25:31 PM cc File # 80 73-2010-Lerlog-222-10

Effective Year: 201 Term: Summer []	Fall Spring 2			013-2010 GG =
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Abbreviated Co	- 181 8156-d	Glass Forming niv needed for New Co	urses or Title	Changes.)
Proppsed: Exam includ	ines the properties a ling off-hand shapin	and behavior of molter g, molding and casting	ı glass along \ I.	with basic forming techniques,
5. If course requires	s field trip check bo	k: 🗆		
6. Credit Hours:	Present:	Lecture: Lecture: 1.0	Lab: Lab: 1.0	Total: Total: 2.0
7. Prerequisites: Present:	∳roposed:	birbii a. a.a.		
Proposed: Ce	r 104 or Met 125; ft	eshmen, sophomore, (or junior only	or by instructor permission
8. Required for Majo	ors: 🗌 🛮 Elective	for Majors: 🗵		
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10. Semesters prev 11. List all co-listed 1)	riously offered as an courses, initialed b 2)	experimental course y Dept. Chair, if signat 3)	(101, 201, 30 ure does not :	1, 401): SP2010; FS2010 appear below.
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	ula Committee:	(Cuan sidilara.e.)		Date:
Approved by Faculty		(Chair signature)		Date:

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From: 573 341 4362

Spring 🗌

Fall 🔲

Effective Year; 2011 Term: Summer ⊠ Page: 5/11

Date: 9/24/2010 3:25:31 PM

Date: 11/8/2010 12:20:56 PM

CC File #8074-2010-ExpEng-491-10

Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Credit Hours Prerequisites 🗌 New Course 🖾 Course Deletion 🗌 Course Number Co-listing 🗌 Course Title 🔲 Catalog Description Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: Mining & Nuclear Engineering Proposed: ExpEng 491 2. Discipline and Course Number: Present: 3. Course Title: Present: Proposed: Internship Abbreviated Course Title: internship (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Present: Proposed: Students apply critical thinking skills and discipline specific knowledge in a work setting based on a project designed by the advisor and employer. Activities will vary depending on the student's background and the setting. Requires major report and formal presentation to sponsoring organization. 5. If course requires field trip check box: \Box 6. Credit Hours: Presenti Lecture: Labi Total: Proposed: Lab: Total: 0-6 Lecture: 0-6 7. Prerequisites: Presenti Proposed: 12hrs of ExpEng courses including ExpEng307. 8. Required for Majors: 🛄 Elective for Majors: 🔲 9. Justification: See attached Justification 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) Recommended by Department (Chair signature Date: 10-15~10 Recommended by Discipline Specific Curricula Committee (Chair signature) Approved by Curricula Committee: _ Date:__ (Chair signature) Approved by Faculty Senate: Date: (Chair signature)

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Date: 9/24/2010 3:25:31 PM

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Explosives Engineering

Proposed courses:

491 Internship (IND 0.0-6.0) Students apply critical thinking skills and discipline specific knowledge in a work setting based on a project designed by the advisor and employer. Activities will vary depending on the student's background and the setting. Requires major report and formal presentation to sponsoring organization. 12hrs of ExpEng courses including ExpEng307.

499 Practicum (IND 0.0-6.0) This course is similar to the ExpEng 491 Internship course. The difference is that this course is intended for students who are already employed by an organization for whom they wish to continue working. Prerequisite: Prerequisite: 12hrs of ExpEng courses including ExpEng307.

Justification.

On 22 April 2010 the Coordinating Board of Higher Education (CBHE) approved (at state level) the new Master of Science in Explosives Engineering at the Missouri University of Science and Technology. The degree has been put in place and is listed in the new 2010-2012 graduate catalog with the first 11 classes/courses listed with the new ExpEng designation. We are very proud of this accomplishment.

The approved proposal package includes a 491 internship which is intended for students to gain practical experience in the explosives industry. The internship is modeled on the 5&T Business program graduate internship. It is our intent to require the MS student in Explosives Engineering to acquire practical experience related to explosives in industry or government before graduating. We feel this is very important.

For persons already employed in industry or government the graduate "practicum" as offered by the S&T Business program, Business 499, makes sense over the 491 designation. The difference is the practicum is for students already employed. For the explosives engineering program it will be in explosives related employment. In addition we have currently submitted a Master of Science of Explosives Engineering non thesis degree option to cater for nontraditional students, such as those who are unable to stay on campus for 6 months to do a research project due to work, military commitments, or financial considerations due to loss of salary and having to support a family. For these persons whom the explosives engineering masters is a means of job advancement in their field we are opting for the practicum over the internship. The MS in explosives engineering without thesis will be reserved for those who are not able to complete a full research project and will be reserved for those in an explosives related industry or government position.

The above is explains the background of our submission of a request for approval of ExpEng 491 internship and ExpEng 499 practicum. We are still in the process of applying for new courses as we try to get everything up and running with the new program and we hope to have everything fully in place by fail 2011. Enrollment is already 13 MS students, 2 of which have already completed their thesis defense and will be graduating at Christmas. We also have 13 in the graduate certificate 6 of which have voiced the intent to join the masters when they have completed their certificates and a host of other applications anticipated to be processed before Christmas.

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New Course	Course Delei		Credit Ho		Prerequi		
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īs co	intended for stude entinue working.	ents who are a	g 491 Intern Iready empid	ship course. eyed by an o	The differer ganization (nce is that this cours for whom they wish t	e to
·	uires field trip che		_				
6. Credit Hours:			:ture: :ture: 0-6	Lab: Lab:	Total: Total: 0-	4	
7. Prerequisites Present:	Propos:	ag: Loc	;ture: o-o	-au-	10,4,1	-	
Proposed:	Prerequisite: 12hr	s of ExpEng co	ourses includ	ing ExpEng3	07.		
	Majors: D Ele See attached ju		s: 🗵				
11. List all co-lis	previously offered sted courses, initia	as an experim led by Dept. Cl 3)	ental course hair, if signa	(101, 201, 3 ture does no	01, 401): : appear bel	ow.	
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Recommended b	y Department	MAIN	مرکزتها پ	<u> </u>		Date: 0 1/17/1	- -
	y Discipline Speci	fic Curric i lla Co	r signatúre) mmittee r signature)	Jung Ber	Lin	Date: 10-15-(0	
Approved by Cui	rricula Committee:	·	r signature)	· · ·		Date:	-
Approved by Fac	culty Senate:	-	r signature)	mail 10 - 11 - 12 - 12 - 12 - 12 - 12 - 12	<u> </u>	Date:	-

From: 573 341 4362 Page: 15/23 Date: 11/8/2010 12:20:57 PM

From: 573 341 4362 Page: 8/11 Date: 9/24/2010 3:25:32 PM

Explasives Engineering

Proposed courses:

491 Internship (IND 0.0-6.0) Students apply critical thinking skills and discipline specific knowledge in a work setting based on a project designed by the advisor and employer. Activities will vary depending on the student's background and the setting. Requires major report and formal presentation to sponsoring organization. 12hrs of ExpEng courses including ExpEng307.

499 Practicum (IND 0.0-6.0) This course is similar to the ExpEng 491 Internship course. The difference is that this course is intended for students who are already employed by an organization for whom they wish to continue working. Prerequisite: Prerequisite: 12hrs of ExpEng courses including ExpEng307.

Justification,

On 22 April 2010 the Coordinating Board of Higher Education (CBHE) approved (at state level) the new Master of Science in Explosives Engineering at the Missouri University of Science and Technology. The degree has been put in place and is listed in the new 2010-2012 graduate catalog with the first 11 classes/courses listed with the new ExpEng designation. We are very proud of this accomplishment.

The approved proposal package includes a 491 internship which is intended for students to gain practical experience in the explosives industry. The internship is modeled on the S&T Business program graduate internship. It is our intent to require the MS student in Explosives Engineering to acquire practical experience related to explosives in industry or government before graduating. We feel this is very important.

For persons already employed in industry or government the graduate "practicum" as offered by the S&T Business program, Business 499, makes sense over the 491 designation. The difference is the practicum is for students already employed. For the explosives engineering program it will be in explosives related employment. In addition we have currently submitted a Master of Science of Explosives Engineering non thesis degree option to cater for nontraditional students, such as those who are unable to stay on campus for 6 months to do a research project due to work, military commitments, or financial considerations due to loss of salary and having to support a family. For these persons whom the explosives engineering masters is a means of job advancement in their field we are opting for the practicum over the internship. The MS in explosives engineering without thesis will be reserved for those who are not able to complete a full research project and will be reserved for those in an explosives related industry or government position.

The above is explains the background of our submission of a request for approval of ExpEng 491 internship and ExpEng 499 practicum. We are still in the process of applying for new courses as we try to get everything up and running with the new program and we hope to have everything fully in place by fall 2011. Enrollment is already 13 MS students, 2 of which have already completed their thesis defense and will be graduating at Christmas. We also have 13 in the graduate certificate 6 of which have voiced the intent to join the masters when they have completed their certificates and a host of other applications anticipated to be processed before Christmas.

	From: 573 341	4362 Page: 16/	23 Date: 11/8/	/2010 12:20:	57 PM	
Effective Year: 203 Term: Summer [11 Fall 🗌 Sprin	g 🖾	CC	File # 80	080-20	10 - ME-330-11
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Course Changes				,	Prerequisit	
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Course Informat	<u>tion</u> (1-9 Must Be	Completed. Lea	ve "Proposed" it	ems blank	it do cuande	is being made.)
1. Department: M	AE					224
2. Discipline and (Course Number:	Present:		Propose	ed: Mc Eng	330
3.044.22	resent:	_	• •			
	roposed: Applied					
Abbreviated Co	ourse Title: Comp 24 Spaces or Less	outational Metho	ods or New Course	es or Title	Changes.)	
4. Catalog Descripti	24 Spaces or Less ion <i>(300 Character</i>	Spaces or Less.)	01 14644 604136			
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therr basic unce	nodynamics, and numerical techni rtainty quantifical	controls proble ques, topics co tion.	ms in aerospac	ce and me	chanical en	i fluids, structures, gineering. Besides ization and
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Proposed: C	mp Sc 53 or 73 o	r 78; Math 204				
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Recommended by	Discipline Specific	: Curricula Com	mittee <u>Mir</u>	o Wat	them	Date:
	cula Committee:	(Chair s	ignature)			Date:

(Revised 1/29/09)

Date:

(Chair signature)

(Chair signature)

Approved by Curricula Committee: _____

Approved by Faculty Senate:

From: 573 341 4362 Page: 17/23 Date: 11/8/2010 12:20:57 PM

CC File # 8082-2010-BUS-490-31 Effective Year: 2011 Spring Term: Summer 🗌 Fall 🛛 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🖾 Credit Hours 🛛 Course Deletion 🗌 New Course 🔲 Co-listing 🔲 Course Number 🗌 Catalog Description 🖾 Course Title 🔲 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: Business and Information Techn Proposed: 2. Discipline and Course Number: 3. Course Title: Present: Research Proposed: Abbreviated Course Title: Research (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) The research project will involve students applying research techniques and discipline specific Present: knowledge working on a project designed by the advosor, often working with a business organization. Requires major report and formal presentation to sponsoring organization. Research investigation of an advanced nature leading to a major report suitable for publication in a journal or in a conference proceedings. 5. If course requires field trip check box: \Box Total: 0-6 Lecture: 0-6 Lab: Present: 6. Credit Hours: Total: 0-9 Lecture: 0-9 Lab: Proposed: 7. Prerequisites: Present: **BUS 420** Proposed: Permission of the instructor. Elective for Majors: 🗵 8. Required for Majors: 🔲 Provide consistency with 490 designations for other programs without Thesis. 9. Justification: 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) 6) 5) 4) Recommended by Department _ (Chair signature) Recommended by Discipline Specific Curricula Committee (Chair signature) Date: ___ Approved by Curricula Committee: _____ (Chair signature) Date: _____ Approved by Faculty Senate: ___ (Chair signature)

From: 573 341 4362 Page: 18/23 Date: 11/8/2010 12:20:58 PM

CC File # 8083-2010-MKT-490-31 Effective Year: 2011 Spring 🔲 Fall 🖾 Term: Summer 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🗌 Credit Hours 🛛 Course Deletion 🗌 New Course 🗌 Course Number 🗌 Co-listing 🗔 Catalog Description oximesCourse Title 🗌 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: Business and Information Techn Present: MKT 490 Proposed: 2. Discipline and Course Number: Present: Research 3. Course Title: Proposed: Abbreviated Course Title: Research (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Investigations of an advanced nature. Present: Proposed: Research investigation of an advanced nature leading to a major report suitable for publication in a journal or in a conference proceedings. 5. If course requires field trip check box: \Box Total: 0-15 Lecture: 0-15 Lab: Present: 6. Credit Hours: Lab: Total: 0-9 Lecture: 0-9 Proposed: 7. Prerequisites: Present: Proposed: Elective for Majors: 🛛 🖯 8. Required for Majors: 🔲 Provide consistency with 490 designations for other programs without Thesis. 9. Justification: 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. 2) 1) 5) 4) Recommended by Department (Chair signature) Recommended by Discipline Specific Curricula Committee (Chair signature) Date: _____ Approved by Curricula Committee: ___ (Chair signature)

Date: _____

(Chair signature)

Approved by Faculty Senate: __

From: 573 341 4362 Page: 19/23 Date: 11/8/2010 12:20:58 PM

Effect	ive Year: 201	.1	_
Term:	Summer 🗌	Fall 🖾	Spring 🛄

CC File # 8084-2010-BUS-496-10

	Cours This form is fo	e Chan				
<u>Course Chan</u> e	ges (Check all changes.		• - ,			
New Course 🛚	Course Deletion [] (redit Hours [Prerequisite	s □
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<u>Course Infor</u>	mation (1-9 Must Be C	ompleted. Leav	ve "Proposed"	items blank	if no change is	s being made.)
1. Department	t: Business and Informa	ation Techn				
2. Discipline a	nd Course Number:	Present : BUS	S 496	Propose	ed:	
3. Course Title:	Present:					
	Proposed: Project Re					
Abbreviated	I Course Title: Project (24 Spaces or Less. (Research	or New Cours	es or Title	Changes \	
4. Catalog Desc Present:	ription (300 Character Sp		or now dodne	,		
k	he research project will nowledge working on a rganization. Requires r	project design	ned by the ac	ivosor, ofte	en working w	ith a business
5. If course req	uires field trip check bo	ж: 🗌				
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9. Justification:	This is BUS 490 toda other 490 courses for continue to be an op the change to BUS 4	or non-thesis o ption for MBA :	granting prog	rams. But	BUS needs t	his course to
10. Semesters	previously offered as a	n experimenta	al course (10	1, 201, 301	, 401):	
11. List all co-li	sted courses, initialed l	y Dept. Chair,	, if signature	does not a	ppear below	•
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Approved by Cu	rricula Committee:		/		D:	ate:
Approved by Fa	culty Senate:	(Chair sig			D	ate:
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Date: 11/8/2010 12:20:58 PM From: 573 341 4362 Page: 20/23 CC File #8085-2010-ME-423-3: Effective Year: 2011 Spring 🖾 Fall 🔲 Term: Summer 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🖾 Credit Hours 🗍 Course Deletion \square New Course 🗍 Co-listing 🛄 Course Number 🗌 Catalog Description 🛭 Course Title 🗌 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: MAE Proposed: 2. Discipline and Course Number: Present : Mc Eng 423 Present: Viscous Fluid Flow 3. Course Title: Proposed: Abbreviated Course Title: (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Fundamentals of viscous fluids for incompressible and compressible flows governed by Navier-Stokes Present: equations; exact, approximate, and numerical solutions for steady and unsteady laminar flows; stability, transition, and turbulence, CFD simulations of internal and external flows. Proposed: Fundamentals of viscous fluids for incompressible and compressible flows governed by Navier-Stokes equations; exact, approximate, and numerical solutions for steady and unsteady laminar flows; boundary layer theory for incompressible and compressible flows; stability and transition. 5. If course requires field trip check box: \Box Total: 3 Lab: Lecture: 3 Present: 6. Credit Hours: Total: Lab: Lecture: Proposed: 7. Prerequisites: Present: ME/AE 331 Proposed: ME/AE 331 or ME/AE 339 or equivalent. Elective for Majors: 🛛 8. Required for Majors: \square The course was last taught in Fall 2008. The prerequisite change will open the course 9. Justification: to suitably motivated students in MAE and other department interested in the topic. The change in the catalog description is to account for changes to the course contents: discussion on turbulent flows have been omitted as a separate course: ME/AE 435 (Turbulent Flows) is being taught in the department. The textbook to be used for the course is : Viscous Fluid Flow by Frank White, McGraw Hill, 3rd Edition, 2006. 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. 3) 1) Ae Eng 423 2) 5) 4) Recommended by Department (Chair signature) Date: 11/5/10

(Revised 1/29/09)

Date:

(Chair signature)

(Chair signature)

(Chair signature)

Recommended by Discipline Specific Curricula Committee

Approved by Curricula Committee: ___

Approved by Faculty Senate: __

Date: 11/8/2010 12:20:59 PM From: 573 341 4362 Page: 21/23

cc File # 8086-2010-ME-435-3 Effective Year: 2011 Spring \boxtimes Fall 🔲 Term: Summer 🔲 Course Change Form (CC) This form is for creating or modifylng permanent courses. Course Changes (Check all changes.) Prerequisites 🗵 Credit Hours 🗔 Course Deletion 🗌 New Course 🗀 Co-listing 🔲 Course Number Catalog Description \boxtimes Course Title 🛛 Course Information (1-9 Must Be Completed, Leave "Proposed" items blank if no change is being made.) 1. Department: MAE 2. Discipline and Course Number: Present : Mc Eng 435 Proposed: Present: Turbulence in Fluid Flow 3. Course Title: Proposed: Turbulent Flows - Theory, Measurements & Modeling Abbreviated Course Title: Turbulent Flows (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Fundamentals of statistical theory of turbulence; turbulence modeling for transport processes of heat, mass, and momentum; closure schemes for Reynolds-averaged Navier-Stokes equations in free Present: turbulence and wall turbulence; CFD simulations of turbulent flows. Proposed: Navier-Stokes equations; statistical description and mean-flow equations; behavior of free shear and wall bounded flows; the energy cascade; turbulence spectra and Kolmogorov hypothesis; measurement techniques: PIV, hot-wires, LDV; turbulence modeling for transport processes and closure schemes for RANS equations; evaluation of model constants, introduction to LES, DNS and hybrid-RANS. 5. If course requires field trip check box: \Box Total: 3 Lab: Lecture: 3 Present: 6. Credit Hours: Total: Lab: Lecture: Proposed: 7. Prerequisites: Present: ME/AE 331 Proposed: ME/AE 331 or ME/AE 339 or equivalent. Elective for Majors: oximes8. Required for Majors: 🗌 The course was last taught in Fall 2009 (after a gap of 11 years). The prerequisite change will open the course to suitably motivated students in MAE and other 9. Justification: department interested in the topic. The change in the catalog description is to account for changes to the course contents and make it current and topical. The textbook to be used for the course is: Turbulent Flows by Stephen B. Pope. Cambridge University 10. Semesters Press, 2000. 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. 3) 2) 1) Ae Eng 435 5) 4) Recommended by Department _ (Chair signature) Stere Vather Recommended by Discipline Specific Curricula Committee (Chair signature) Date: _____ Approved by Curricula Committee: ____ (Chair signature) Date: ____ Approved by Faculty Senate: __ (Chair signature)

Date: 11/8/2010 12:20:59 PM From: 573 341 4362 Page: 22/23

CC File # 8087-2010-ME-220-32 Effective Year: 2011 Effective Term: Summer 🗌 Spring 🖂 Fall 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. **Course Changes** (Check all changes.) Credit Hours Prerequisites 🗵 New Course 🔲 Course Deletion Course Number 🖾 Co-listing Course Title 🗌 Catalog Description Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: MAE 2. Discipline and Course Number: Present: Mc Eng 220 Proposed: Mc Eng 361 3. Course Title: Present: Engineering Design Methodology Proposed: Abbreviated Course Title: (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (40 Words or Less) Present: This course examines structured engineering design theory and methodologies for conceptual design and redesign of products. Topical coverage includes customer needs gathering, functional modeling, engineering specifications creation (OFD), concept generation, selection and design embodiment. Team work/hands-on projects emphasized. Proposed: 5. If course requires field trip check box: 🔲 6. Credit Hours: Present: Lecture: 3 Lab: 0 Total: 3 Total: Lab: Proposed: Lecture: 7. Prerequisites: Present: Junior standing in engineering and at least 12 hours major field credit Proposed: Senior standing in engineering Elective for Majors: 🗵 8. Required for Majors: 9. Justification: Advanced topics in design team forming, customer need organization and segmentation, reverse engineering, concept testing and selection have been added to the course. 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. 2) 3) 1.) 5) 4) Recommended by Department . Recommended by Discipline Specific Curricula Committee (Chair signature) Approved by Curricula Committee: _ (Chair signature) Date: __

(Revised 1/31/08)

Approved by Faculty Senate: __

(Chair signature)

From: 573 341 4362 Page: 23/23 Date: 11/8/2010 12:20:59 PM

Effective Year: 2011 Term: Summer \square Fall \boxtimes Spring \square

cc file # 8090 - 2010-Min E-270-3.

Course Change Form (CC)

	This form is for creat	ting or modifying	permanent o	courses.	
<u>Course Changes</u> (C	heck all changes.)		_		6 2
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Course Information			ed" items blan	k if no change	is peing made.)
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- -	ent: Mining Industry	Economics			
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4. Catalog Description	(300 Character Spaces o	or Less.)			
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7 Manualisitasi	Proposed:	Lecture:	Lab:	Total:	
7. Prerequisites: Present: None	•				
Proposed: Econ	121 or 122				
8. Required for Majors	s: 🛭 Elective for M	4ajors: 🗌			
9. Justification:					
10. Semesters previo	usły offered as an exp	erimental course	(101, 201, 3	101, 401):	
11. List all co-listed co	ourses, initialed by De	pt. Chair, if signa	ture does no	t appear belo	w.
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43	5)	(6) n 0 ===	}		
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Approved by Curricula	Committee:	¥		<u>-</u> -	Date:
Approved by Faculty 9		(Chair signature)			Date:
Whiten the denity		(Chair signature)			

Date: 11/8/2010 12:32:02 PM From: 573 341 4362 Page: 1/23 CC File #8091-2010-1Com-851-54 Effective Year: 2011 Spring 🗆 Fali 🛛 Term: Summer 🗆 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) prerequisites 🖾 Credit Hours 🗆 Course Deletion 🗆 New Course 🗆 Co-listing 🔲 Course Number 🗆 Catalog Description \Box Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: ENGL & TCH COM Proposed: 2. Discipline and Course Number: Present: TCH COM 331 3. Course Title: Present: Technical Editing Proposed: Abbreviated Course Title: (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) The principles and practices of technical editing, including usability, audience analysis, contextual editing, the conventions of scientific and technical communication, and the role of present: the editor in document development and publication. Proposed: S. If course requires field trip check box: \Box Total: 3 Lab: 0 Lecture: 3 Present: 6. Credit Hours: Total: Lab: Lecture: Proposed: 7. Prerequisites: TCH COM 65 and TCH COM 240 Present: Proposed: TCH COM 65, English 65, or consent of instructor Elective for Majors: s. Required for Majors: \Box The prerequisite of ENGL/TCH COM 240 Layout and Design for all 300-level tech com courses was part of the original proposals for the BS and MS tech com degrees. 9, Justification: Experience has taught us that ENGL/TCH COM 240 is not necessary for success in our 300-level courses. The prerequisite serves only to discourage (or prevent) students who do not have 240 from taking the course. 10. Semesters previously offered as an experimental course (101, 201, 301, 401): n/a 11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below. 2) 1)

4) 5) -7 - 2. (6)	Date: 18/20/10
Recommended by Department The Line were (Cyair signature) / Moseum	Date: 11/1/2010
Recommended by Discipline Specific Curricula/Committee (Chair signature)	Date:
Approved by Curricula Committee:(Chair signature)	Date:
Approved by Faculty Senate: (Chair signature)	

From: 573 341 4362 Date: 11/8/2010 12:32:02 PM Page: 2/23 cc File # 8092-2010-1 Com - 361-32 Effective Year: 2011 Fatt 🖾 Spring 🔲 Term: Summer 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🖾 Credit Hours New Course 🗀 Course Deletion Co-listing 🔲 Course Number 🗌 Catalog Description 🔲 Course Title 🔲 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: ENGL & TCH COM 2. Discipline and Course Number: Present: TCH COM 361 Proposed: Present: History of Technical Communication 3, Course Title: Proposed: **Abbreviated Course Title:** (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Introduction to the roles of the technical communicator and the technologies of Present: communication from ancient cultures to the present Proposéd: 5. If course requires field trip check box: 🗌 Total: 3 Lab: 0 Lacture: 3 Present: 6. Credit Hours: Total: Lab: Proposed: Lecture: 7. Prereguisites: Present: TCH COM 65 and TCH COM 240 Proposed: TCH COM 65, English 65, or consent of instructor Elective for Majors: 🛛 8. Required for Majors: 🛄 The prerequisite of ENGL/TCH COM 240 Layout and Design for all 300-level tech com 9. Justification: courses was part of the original proposals for the BS and MS tech com degrees. Experience has taught us that ENGL/TCH COM 240 is not necessary for success in our 300-level courses. The prerequisite serves only to discourage (or prevent) students who do not have 240 from taking the course. 10. Semesters previously offered as an experimental course (101, 201, 301, 401): n/a 11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below. 1) 5) 4) Recommended by Department 💪 (Chair signature) Recommended by Discipline Specific Curricula Committee (Chair signature)

(Revised 1/29/09)

Date:

Date: _

(Chair signature)

(Chair signature)

Approved by Curricula Committee: _

Approved by Faculty Senate: _

From: 573 341 4362 Page: 3/23 Date: 11/8/2010 12:32:03 PM

From: 573 341 4362

Page: 1/3

Date: 10/28/2010 3:50:08 PM

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<u>Course Cha</u>	inges (Check all chai	<u> </u>			_	. 6
New Course 🗀	·¬		Credit Hou		Prerequis	
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	ormation (1-9 Must		Leave "Propos	ed" (tems b):	ank if no chang	je is being made.)
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	ed Course Title: (24 Spaces or Le scription <i>(300 Charac</i> i	ess. Only needs ter Spaces or Le	ed for New Coss.)	ourses or Ti	itle Changes.)	ł
Present:	Students will work t	o solve recurre ty, develop stra computing alg	ince relations ategies for dy orithms for sl	namic prog	gramming and	correctness and time digreedy algorithms, anning trees,
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5. If course re 5. Credit Hou 7. Prerequisit Present;	Propos	t: Led ed: Led	t ure: 3 :ture: 3	Lab: Lab:	Total: 3 Total:	
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3. Required fo 9. Justification			makes it hard	for studen	ts to meet th	is course's
	s previously offered -listed courses, initia	=		•	·	ow.
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i)	5)	$(\sqrt{2})^2$				A.T 27 a .
Recommende	d by Department				<u>√ </u>	Date: 6,727, 2010
Recommende	d by Discipline Speci	fic Curricula Co	r signature) 🔵 ommittee 💆 r signature)	Janul J	erote.	Date: 11/5/2010
•	Curricula Committee	:	r signature)		 	Date:
Abbroned by (Faculty Senate:	(Chai	r signature)	· <u> </u>		Date:

From: 573 341 4362 Page: 4/23 Date: 11/8/2010 12:32:03 PM

CC File # 8094-2010-BUS-350-10

Effective Year: 2011

Term: Summer 🔲

Fall 🖾

Spring 🔲

Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🗌 New Course ⊠ Course Deletion Credit Hours 🗌 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 and Information Tech 2. Discipline and Course Number: Present: Proposed: BUS 350 3. Course Title: Present: Proposed: Customer Focus and Satisfaction Abbreviated Course Title: Customer Focus (24 Spaces or Less. Only needed for New Courses or Title Changes.) **4. Catalog Description** (300 Character Spaces or Less.) Present: **Proposed:** Major emphais is given to the concept of customer focus, with coverage of techniques for obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and maximizing the benefits of customer feedback. A semester long HoQ project will be done. 5. If course requires field trip check box: \Box 6. Credit Hours: Present: Lecture: Lab: Total: Total: 3 Lecture: 3 Lab: Proposed: 7. Prerequisites: Present: Proposed: MKT 310 or MKT 307 or Eng Mgt 251 8. Required for Majors: 🔲 Elective for Majors: 🛛 This is to create a co-listing for MKT 350, an established course. 9. Justification: 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) MKT3 2) 3) 4) 5) Recommended by Department (Chair signature) Recommended by Discipline Specific Curricula Committee (Chair signature) Approved by Curricula Committee: ____ Date: (Chair signature) Approved by Faculty Senate: __ Date: (Chair signature)

From: 573 341 4362 Page: 5/23 Date: 11/8/2010 12:32:03 PM

Effective Year: 2011

CC File # 8095-2010-MKT-350-33

Fall 🗵 Spring 🗵 Term: Summer 🗌

Course Change Form (CC)

		r creating or modifyin	ig permanent	courses.	
	nges (Check all changes.)				
New Course 🗌		 -		Prerequisites	Ц
Course Title 🗵 -			lumber 🛄	Co-listing 🗵	1
	rmation (1-9 Must Be C	·	osed" items bla	ink if no change is	peing made.)
-	nt: Business and Informa				
•	and Course Number:		Prop	osed:	
3. Course Title	: Present: New Production Proposed: Customer		n		
Abbroviate	ed Course Title: Custom		••		
	(24 Spaces or Less. C	Only needed for New (Courses or Ti	tle Changes.)	
-	cription (300 Character Sp		_	51	
Present:	Major emphais is given to obtaining customer need	o the concept of customs	omer focus, v er eatisfaction	vith coverage of t	echniques for ducts and
	services to satisfy custor	ners, and mazimizing	the benefits	of customer feed	lback. Students
	will work through a new	product devel.			
Proposed:	Major emphais is given t	o the concept of custo	omer focus, v	vith coverage of t	echniques for
	obtaining customer need services to satisfy custor	s, measuring custom ners, and mazimizing	er satisfaction the benefits	of customer feed	iback. A semester
	long HoQ project will be	done.			
5. If course re	quires field trip check bo	ж: 🗆			
6. Credit Hours	s: Present:	Lecture: 3	Lab:	Total: 3	
	Proposed:	Lecture:	Lab:	Total:	
7. Prerequisite Present:	MKT 311 or MKT 307	or Ena mat 251			
	1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u>-</u>			
Proposed	:				
B. Required fo	<u> </u>	e for Majors: 🛛			
9. Justification		se description more a	ccurately and	to add BUS 350	as a co-listed
	course.				
	s previously offered as a				
	listed courses, initialed t	y Dept. Chair, if sign	ature does no	ot appear below.	
1) BUS 350	2)	3)			
4)	5)	6) //	•		
		Jest Test		α D∋	ite: 11/3/10
	by Department	(Chair signature)	0 11/	///	//
Recommended	d by Discipline Specific C	urricula Committee (Chair signature)	ry Pasts	<i>GegXI</i> Da	te: <u>///3//0</u>
Approved by C	Curricula Committee:			Da	te:
Annroyed by 5	faculty Senate:	(Chair signature)		. Da	ite:
White common the common of the	acuity Jenater	(Chair signature)			

From: 573 341 4362 Page: 6/23 Date: 11/8/2010 12:32:04 PM CC File # 8096-2010-MKT-450-33 Effective Year: 2011 Fall 🛛 Spring 🔲 Term: Summer 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🗌 Credit Hours 🔲 Course Deletion \square New Course 🗌 Co-listing 🛛 Course Number 🗌 Catalog Description 🛭 Course Title 🛛 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: Business and Information Tech 2. Discipline and Course Number: Present: MKT 450 Proposed: Present: Advanced New Product Development 3. Course Title: **Proposed: Advanced Customer Focus and Satisfaction** Abbreviated Course Title: Advanced Customer Focus (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Major emphais is given to the concept of customer focus, with coverage of techniques for Present: obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and mazimizing the benefits of customer feedback. Each student will complete an individual new pr Proposed: Major emphais is given to the concept of customer focus, with coverage of techniques for obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and mazimizing the benefits of customer feedback. Individual focused research is included. 5. If course requires field trip check box: 🗌 Total: 3 Lab: Lecture: 3 6. Credit Hours: Present: Total: Lab: Lecture: Proposed: 7. Prerequisites: Present: MKT 311 or MKT 307 or Eng mgt 251 Proposed: Elective for Majors: 🛛 8. Required for Majors: 🔲 Title to reflect course description more accurately and to add BUS 450 as a co-listed 9. Justification: course. 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.

4)	5)	6)	
Recommended I	by Department _	Carolin Festin	Date: <u>#/3/10</u>
Recommended l	by Discipline Spec	(Chair signature)	Date: <u>" \$/ 0</u>
Approved by Cu	rricula Committee	(Chair signature) (Chair signature)	Date:
Approved by Fa	culty Senate:	(Chair signature)	Date:

3)

6)

1) BUS 450

2)

5)

From: 573 341 4362 Page: 7/23 Date: 11/8/2010 12:32:04 PM CC File # 8097-2010-BUS-450-10 Effective Year: 2011 Term: Summer 🗌 Fall 🖾 Spring 🔲 Course Change Form (CC) This form is for creating or modifying permanent courses. Course Changes (Check all changes.) Prerequisites 🔲 Credit Hours 🗌 Course Deletion 🗌 New Course 🛛 Co-listing 🔲 Course Number Catalog Description Course Title 🔲 Course Information (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.) 1. Department: Business & Information Tech Proposed: BUS 450 2. Discipline and Course Number: Present: 3. Course Title: Present: Proposed: Advanced Customer Focus and Satisfaction Abbreviated Course Title: Advanced Customer Focus (24 Spaces or Less. Only needed for New Courses or Title Changes.) 4. Catalog Description (300 Character Spaces or Less.) Present: Proposed: Major emphais is given to the concept of customer focus, with coverage of techniques for obtaining customer needs, measuring customer satisfaction, developing products and services to satisfy customers, and mazimizing the benefits of customer feedback. Individual focused research is included. 5. If course requires field trip check box: 🛄 Total: Lab: Lecture: 6. Credit Hours: Present: Total: 3 Lecture: 3 Lab: Proposed: 7. Prerequisites: Present: Proposed: MKT 311 or MKT 307 or Eng Mgt 251 8. Required for Majors: 🔲 Elective for Majors: 🛛 This is to create a co-listing for MKT 450, an established course. 9. Justification: 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.

2)

3)

4)

5)

6)

From: 573 341 4362 Page: 8/23 Date: 11/8/2010 12:32:04 PM

From: 573 341 4362

Page: 9/11

Date: 9/24/2010 3:25:32 PM

Effective Year: 2011 Effective Term: Summer \square Fall \square Spring \boxtimes

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:

department chai initial release of	the Schedule of Cl	asses are as folio	Ws:	
	Spring Sei	nd Fall Semester mester Offerings	– August 1	
	t be submitted eac I course that Is req Itted on one form, (uiren snouta ac a	Chillitica all a a.	to exceed two offerings. : form. <i>Co-listed offerings</i> pline.
Department: GS	E			
Discipline and C	ourse Number: GE	401		
Course Title: Sur	rface Waves (MASW)	& Ground Penetral	ing Radar (GPR)	
Abbreviated Titl	e (24 spaces or les	s): MASW and GPF	ŧ	
Instructor(s): A	nderson			
Credit Hours:	Lecture: 2	Lab: 1	Total:	
Prerequisites:	GE 50 or CE 215 or	equivalent, and gr	aduate standing	
Semester(s) pre	eviously taught: Sp	ring 2010		
Basic theory and it and ground penet structural applicat presented in orde	rating radar (GPR) di tions of these non-in r to illustrate the util	essing and interpret ata are covered. E asive imaging tech ity of these geophy	inologies. Numerou sical tools.	to come armines and
List all co-listed 1)	courses: Include in 2)	itials of Pept. Chai	r, if algnature is no 3)	t aiready included below.
4)	5)		6)	
Department Chair	- delt	Muy (Chair:	Signature)	Date: <u>9-21-70</u>
Discipline Specific	: Curricula Committee	e: Juny	ignature)	Date: 10-15-10
Curricula Commit	tee:	(Chair S	ignature)	Date:

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Date: 11/8/2010 12:32:05 PM

From: 573 341 4362

Page: 10/11

Date: 9/24/2010 3:25:33 PM

Effective Year: 2011 Effective Term: Summer 🖾

Fall 🗆

Spring 🗆

EC File # 2294-552011-ExpEng - 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: Mining and Nuclear Engineering

Discipline and Course Number: ExpEng 401

Course Title: Regulatory Issues in the Explosives Industry

Abbreviated Title (24 spaces or less): Explosives Regulations

Instructor(s): Dr. Paul Worsey Dr. Gillian Worsey

Credit Hours:

Lecture: 3

Lab:

Total: 3

Prerequisites:

Semester(s) previously taught:

Brief Course Description: (40 words or less)

A comprehensive coverage of the regulations governing the explosives industry, including those of the Bureau of Alcohol, Tobacco Firearms and Explosives (ATF), the Department of Transportation (DOT), the Environmental Protection Agency (EPA) and other federal agencies.

List all co-listed courses: Inc 1)	clude initials of Dept. Chair, if signature is n 2) 3)	ot already included below.
4)	- 5 0 , 0 = 3	, ,
Department Chair:	(Chair Signature)	Date: 09/19/10
Discipline Specific Curricula Cor	nmittee: Juni Burlus (Chair signature)	Pate: 10-15-10
Curricula Committee:	(Chair Signature)	Date:

Page: 10/23 From: 573 341 4362 Date: 11/8/2010 12:32:05 PM

From: 573 341 4362

Page: 11/11

Date: 9/24/2010 3:25:33 PM

Effective Year: 2011

Spring 🗵 Effective Term: Summer 🔲 Fall 🔲

EC File #2295-5p2011-ME-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 evperimenta	I course that is req	uired should be	to be offered, not to submitted on a CC f the primary discipi	exceed two offerings. form. <i>Co-listed offerings</i> ine.
Department: Me	chanical and Aerospa	ice Engineering		,
Discipline and C	ourse Number: ME	301		
Course Title: Fue	el Cell Principles			
Abbreviated Titl	e (24 spaces or les	ss): Fuel Cell Princ	iples	
Instructor(s): U	mit O. Koylu			
Credit Hours:	Lecture: 3	Lab: 0	Total: 3	
Prerequisites:	ME 221			•
Semester(s) pre	eviously taught: -			
Fuel cell fundamer	discussed. Different vered together with a	odynamics, reactives of fuel cells	on kinetics, mass tran such as proton excha and system integratio	sport, characterization, nge membrane and n as well as
List all co-listed	courses: Include in 2)	itials of Dept. Cha	ir, if signature is not a 3)	iready included below.
4)	5)	t.	6)	
Department Chair	: <i>lkri</i>	Medla (Chair	Signature)	Date: <u>09/16/10</u>
Discipline Specific	Curricula Committee	e: Jun f	Sky (AA signature)	Date:\0-\5-\6
Curricula Committ	ee:	(Chair s	Signature)	Date:
			• •	

From: 573 341 4362

Page: 11/23

Date: 11/8/2010 12:32:05 PM

Effective Year: 2011

Effective Term: Summer ☐ Fall ☐ Spring ⊠

EC File # 2297-Sp 2011- Econ-30

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

		opinig oci		go August 1	
	An experimenta	I course that is requ	uired should b		o exceed two offerings. form. <i>Co-listed offerings</i> line.
	Department: Eco	onomics			
	Discipline and C	ourse Number: Ecor	n 301		
	Course Title: Eco	onomic Analysis of Na	tural Resources	of South Africa	
	Abbreviated Titl	e (24 spaces or les	s): Econ of S.A.	Resources	
	Instructor(s): D	r. Gregg Gelles			
	Credit Hours:	Lecture: 1	Lab:	Total:	
) ece	Semester(s) previously taugl Brief Course Des Economic analysis minerals, solid ear	ht: none scription: (40 words of the utilization of north energy resources, te technology to comp	s or less) atural resources bling minerals (Total: Tural Resources of Sout TICS Analysis of Natural S of South Africa with a (diamond, gold), and er tis with students from t	n emphasis on strategic ndagered species.
	List all co-listed 1) 4)	courses: Include init	ials of Dept. Ch	air, if signature is not a 3) 6)	ilready included below.
	Department Chair	Mas		rySignalkuré)	Date: <u>10/11/1</u> 0
	Discipline Specific	/ Curricula Committee:	, -,	r signature)	Date: 10/22/10
	Curricula Committ	ee:	(Chair	Signature)	Date:

From: 573 341 4362 Page: 12/23 Date: 11/8/2010 12:32:06 PM

Effective Year: 2011

Effective Term: Summer 🔲 💮 Fall 🔲

Spring \boxtimes

EC File # 2298-5p2011-600N-30.

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. <i>Co-listed offerings</i> should be submitted on one form, originating from the primary discipline.						
Department: Ec	onomics		·			
Discipline and C	Course Number: Eco	on 301				
Course Title: Fie	eld Investigation of th	ne Economics of N	latural Resources of So	uth Africa		
Abbreviated Tit	le <i>(24 spaces or le</i> :	ss): Econ. Field S	tudies S.A.			
Instructor(s): [Dr. Greg Gelles					
Credit Hours:	Lecture: 2	Lab:	Total:	Preceded of Preced		
Prerequisites: Semester(s) previously taught: none	Geological Analysis Field Investigation of	of Natural Resou of Natural Resouc	ural Resources of Sout res of South Africa, ar es of South Africa (tak ion of Natural Resourc	rd/Geo 301 - Geological en concurrently with		
Brief Course Description: (40 words or less) A three week field studies in South Africa examining the economic utilization of the natural resources of the country including site visits to mines (diamond, gold), geological sites (Cape of Good Hope), big game animal parks, and areas of cultural interest associated with utilization of these resources.						
List all co-listed 1)	courses: Include in 2)	itials of Dept. Ch	air, if signature is not a 3)	ilready included below.		
Department Chair Discipline Specific	Curricula Committee		r Signature)	Date: 10/11/10		

(Revised 1/31/2008)

Date: ___

Curricula Committee:

(Chair Signature)

From: 573 341 4362 Page: 13/23 Date: 11/8/2010 12:32:06 PM

Huffman, Angie L.

From:

Scott, Marcy L.

Sent:

Wednesday, October 20, 2010 10:47 AM

To:

Huffman, Angie L.

Subject:

Updates for Econ EC forms

Importance:

High

Hi Angie,

I need to update the wording on the 'Prerequisites' for both the forms I just sent you for the Econ 301's.

EC form Econ 301/*Economic Analysis of Natural Resources of South Africa* Prerequisites should read:

Preceded or accompanied by Geol 301 — Geological Analysis of Natural Resources of South Africa.

EC form Econ 301/Field Investigation of the Economics of Natural Resources of South Africa Prerequisites should read:

Geol 301 Geological Analysis of Natural Resources of South Africa, Econ 301 Economic Analysis of Natural Resources of South Africa, preceded or accompanied by Geol 301 – Geological Field Investigation of Natural Resources of South Africa.

The curriculum committee within Geological wanted the wording changed on theirs to include 'preceded or accompanied by' so that decision affects our forms as the four courses (our 2 and their 2) are taken together, in tandem or in some combination intertwined. Thank you!!

~marcy

Marcy L. Scott

Administrative Assistant
Department of Economics
101 Harris Hall
500 W. 13th St.
Missouri University of Science and Technology
Rolla, MO 65409-1250
573-341-4800
573-341-4866 (fax)
www.mst.edu
(FORMERLY University of Missouri-Rolla/UMR)

From: 573 341 4362 Page: 14/23 Date: 11/8/2010 12:32:06 PM

From: 573 341 4362

Page: 1/2

Date: 10/14/2010 10:22:09 AM

Effective Year: 2011 Effective Term: Summer 🔲

Fall 🔲

Spring 🖾

EC File # 2299 - Sp2011- Geol - 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 somester 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: Ge	eological Sciences and	d Engineering		
Discipline and (Course Number: Ge	o 301		
Course Title: Ge	eological Field Investi	gation of Natural	Resources of Sout	h Africa
	de <i>(24 spaces or le</i> Or, John P. Hogan	ss): Geol. Field S	itudies S.A.	PRECEDED OR ACCOMPANIED BY
Credit Hours:	Lecture: 2	Lab:	Total:	
Prerequisites:	Economic Analysis	of Natural Resour	rces of South Africa	South Africa, Econ 301 - a, and Econ 301 - Field South Africa (taken
Semester(s) previously taught: none	concurrently with E Resources of South	con 3 01 - Field In	vestigation of the	Economics of Natural
A three week fiel	escription: (40 word d studies in South Af its to mines (diamon	rica of the geolog	y of the natural re cal sites (Cape of G	sources of the country Good Hope), and areas of

cultural interest associated with utilization of these resources.

1)	2)	3)	·
4)	5)	6)	
Department Chair:	appor		
Discipline Specific Curri	cula Committee:	chair Signature) nul funts Chair(signature)	Date: 10/22/2510
Curricula Committee:_			Date:

10/11/10

From: 573 341 4362 Page: 15/23 Date: 11/8/2010 12:32:07 PM

From: 573 341 4362

Page: 2/2

Date: 10/14/2010 10:22:10 AM

EC File # 2300-Sp 2011- Geol-301 Effective Year: 2011 Effective Term: Summer 🔲 Fail 🔲 Spring 🖾

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:

		Fall Semester O ter Offerings –	fferings – Janua: August 1	ry 1
	rse that is require	d should be sub	mitted on a CC f	exceed two offerings. orm. <i>Co-listed offerings</i> ine.
Department: Gaologic	zal Sciences and Eng	ineering		
Discipline and Cours	e Number: Geo 301	L		
Course Title: Geologic	al Analysis of Natura	a) Resources of S	outh Africa	
Abbreviated Title (24	f spaces or less): (Geol. Resources o	f S.A.	
Instructor(s): Dr. Joh	ın P. Hogan			
PREC	cture: 1 EOED OR ACCON		Total:	
Prerequisites: Econ				Africa (taken rces of South Africa)
Semester(s) previou	sly taught: none			
Brief Course Descript Geological analysis of n (platinum), solid earth bling minerals (diamond students from the University	atural resources of S energy resources (co ds, gold). Students v	South Africa with pal,tight gas shak vill utilize technol	es), industrial mine ogy to complete jo	erals (iron, lead), and
List all co-listed cour 1)	ses: Include initials 2)	of Dept. Chair, if	signature is not al 3)	ready included below.
4)	5)		6)	
Department Chair:	appar	(Chair Slor	ature)	Date: 10-11-10
Discipline Specific Curri	cula Committee:	Danzel faur (Cháir sign	ature)	Date: 10/22/2010
Curricula Committee:	<u>, , , , , , , , , , , , , , , , , , , </u>	(Chair Signi	ature)	Date:

From: 573 341 4362

Page: 16/23

Date: 11/8/2010 12:32:07 PM

Effective Year: 2011
Effective Term: Summer □ Fall ☒ Spring □

EC File # 2301-FS2011-ERP-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.	DESITION OF THE PROPERTY OF TH	,
Discipline an	d Course Number: ER	P 301

Course Title: Enterprise Resource Planning Systems in Small and Medium Size Enterprise

Abbreviated Title (24 spaces or less): ERP for Small, Med Ent.

Instructor(s): Yu-Hslen Chiu

Credit Hours: Lecture: 3.0 Lab: Total: 3.0

Prerequisites: ERP346 or (BUS120 and ERP 246)

Developed Publishers & Information Technology

Semester(s) previously taught: None

Brief Course Description: (40 words or less)

The course provides an overview of enterprise applications for small and midsize companies. SAP Business One is introduced to illustrate the enterprise-wide application for entrepreneurs, who manage business functions across sales, operation, and financials, all in a single integrated system. Enterprise integration will be examined and examples developed.

List all co-listed cours 1)	ses: Include initials of Dept. (2)	Chair, if signature is not a 3)	Iready included below.
4)	5)	6)	
Department Chair:	Carolin Fish	alr S <u>igna</u> ŧure) /	Date: 10/19/10
Discipline Specific Currl	cula Committee:	air signature)	Date: 10/20/10
Curricula Committee:	, (Ch.	air Sionature)	Date:

From: 573 341 4362 Page: 17/23 Date: 11/8/2010 12:32:07 PM

Effective Year: 2011

Effective Term: Summer ... Fall ... Spring ...

EC File # 2302-5p2011-ME-40

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:

			ster Offerings – January 1gs – August 1	1
An experimental	course that is requir	ed should i	is to be offered, not to o be submitted on a CC fo om the primary disciplin	rm. <i>Co-listed offerings</i>
Department: Med	chanical and Aerospace	Engineering		
Discipline and Co	ourse Number: Mc Eng	401		
Course Title: Adv	anced Digital Design an	d Manufactı	ıring	
Abbreviated Title	e (24 spaces or less):	Digital Desi	gn & Manuf	
Instructor(s): Dr	. Ming C. Leu			
Credit Hours:	Lecture: 3	Lab:	Total: 3	
Prerequisites:	Mc Eng 308 or Mc Eng 3	363		
Semester(s) pre	viously taught: None			
This course covers topics include freet design and manufactures	form modeling, reverse	al to advance engineering earn theoret	ed digital design and man , NC path generation, and loal and practical materials ses.	immersive digital
List all co-listed (courses: Include initial 2)	s of Dept. C	hair, if signature is not air 3)	eady included below.
4)	5)	•	6)	
Department Chair:		hell (CH	Asignature)	Date: <u>IO//3/IO</u>
Discipline Specific	Curricula Committee: _	lter (Chē	o Wathing nir signature)	Date:
Curricula Committe	ee:	(Cha	ir Signature)	Date:

10/05/10

From: 573 341 4362 Page: 18/23

Fall 🔲

Effective Year: 2011

Effective Term: Summer ...

Spring 🗵

Date: 11/8/2010 12:32:08 PM EC File # 2303-Sp 2011-CE-30

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

initial release o	f the Schedule of Cla	sses are as 1	follows:	g deadlines for inclusion in th	e
	Summer an Spring Sem	d Fall Seme: ester Offeri	ster Offerings – ngs – August 1	January 1	
An experimenta	st be submitted each al course that is requi nitted on one form, or	ired should t	be submitted on	, not to exceed two offerings. I a CC form. <i>Co-listed offering</i> discipline.	7:
Department: Civ	vil, Architectural and En	vironmental E	Engineering		
Discipline and C	ourse Number: CE 30)1			
Course Title: Ph	ytoremediation and Nat	ural Treatme	nt Systems: Scier	nce and Design	
Abbreviated Tit	le (24 spaces or less)): Phytoremed	diation		
Instructor(s): D	r. Joel G. Burken				
Credit Hours:	Lecture: 3	Lab:	Total: 3		
Prerequisites: CE/EnvE 265, Graduate standing, or concent of instructor					
Semester(s) pre	eviously taught:				
Student learn the fundamental plant in design of phyto	scription: (40 words of scientific basics of cheres physiology and proce remediation and naturation guidance available.	nical transpor sses. Student	s then learn how	these processes are utilized	
List all co-listed 1) EnvE 301 WE	courses: Include initia 2)	als of Dept. Ch	nair, if signature i 3)	is not already included below.	
4)	5)		6)		
Department Chair: Discipline Specific	: Wharf Curricula Committee:	(Cha	ir Signature)	Date: 10/20/10	
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Curricula Committe	ee:			Data	

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CE/EnvE 301 Phytoremediation

Lectures:

J.G. Burken

Syllabus: Phytoremediation and Natural Treatment Systems: Science and Design Department of Civil, Architectural and Environmental Engineering Spring 2011

1.5 hours 2 times/week.

Instructor: Dr. Joel G. Burken

(burken@mst.edu) Phone: (573) 341-6547 224 Butler-Carlton C.E. Hall Office Hours: ????? and - open door

Text/readings: Required Textbook: None!

We will use the ITRC Phytoremediation guidance document as an initial reference available at:

Location: TBD - Distance class

http://www.itrcweb.org/Documents/PHYTO-3.pdf

We will focus mostly on notes I've developed with colleagues (perhaps a text will develop). We will also be reading a lot of current literature the last 2/3 of the class nad getting inpur form

the authors of the papers.

References: Phytoremediation: Degradation and Control of Contaminants. Editors: S.C. McCutcheon and

J.L. Schnoor, John Wiley and Sons, 2003 (worth the \$\$ if you plan to work in the field) Environmental Organic Chemistry, Schwartzenbach, Gschwend, and Imboden Wiley, 1993

Phytoremediation: Methods and Reviews, N. Willey (Editor) Humana Press 2007

Course Description: Student learn the scientific basics of chemical transport in soil and groundwater and learn the fundamental plants physiology and processes. Students then learn how these processes are utilized in design of phytoremediation and natural treatment systems, including the most up to date literature and design guidance available.

Objectives of this class. Students will be able to:

- evaluate hydrogeologic data to estimate contaminant transport in soil and groundwater.
- Develop a working knowledge of plant processes and physiology that are important in phytoremediation applications.
- critically evaluate phytoremediation approaches and applications on mechanistic and feasibility (technical and economic) levels.
- access information on new scientific breakthroughs in the field and propose potential applications in the remediation field
- communicate knowledge and findings in a technically accurate and professional manner, including conversations with technological leaders in the field

Grading: (Subject to changes)	Quizzes	20 %
	Midterm Exam	10 %
	Final	15 %
	Homework	25 %
	Class project & Presentations	20 %
	Class Participation	10 %

QUIZZES: All quizzes will be announced ahead of time. Quizzes are mostly over innovative technologies covered in class to ensure comprehension of materials before we critically evaluate the papers and applications. The goal is to stay atop of current material. Quizzes will be conceptual, not on design or technical details.

HOMEWORK: Various types, many are research-oriented or mini-project in nature. Students will demonstrate scientific and engineering detail in the homework that represents the expected depth of technical competency. I encourage working together but present separate work when requested. Note Collaborations that might be construed as cheating. Show originality in each person's work to show From: 573 341 4362 Page: 20/23 Date: 11/8/2010 12:32:08 PM

CE/EnvE 301 Phytoremediation

J.G. Burken

that all parties gained an understanding of the objectives behind each homework project or assignment. If the final product of working together is very similar, briefly describe each contribution. Quality of presentation is always important. Use proper units, present the problem and conceptual solution clearly, label any spreadsheet work clearly.

PROJECT/PRESENTATION: Each student or teams will pick one of the topic below (Week 7 and on) and do a detailed, critical review not only of the paper assigned for the week, but related articles and applications. This will be presented to the class. Presentations are expected to be thorough and professional. We anticipate linking up with some author's via distance technology and inviting a couple to town also.

EXAMS: Midterms will be closed book and in 2 parts. Definitions and concepts will be covered first and then problems of a technical, quantifiable nature. Final may be take home in nature. to be determined.

<u>Week</u>	Reading	<u>Topics</u>
1	Groundwater and	Background: Contaminant physical-chemical characteristics.
	contaminant handout	Contaminant solubility, partitioning, phase transfers
2	Handout, epa.gov/superfund	The Laws! CERCLA, RCRA, Clean Water Act
	, ,	Plant processes intro
3	Chapter Raven's book	Plant physiology basics
	ITRC Phyto Section	chemical reactions & Oxidation/reduction.
4	ITRC Phyto Section	Rhizoremediation transformation reaction mechanisms under
		different electron acceptor conditions
5	ITRC Phyto Section	Plant uptake of contaminants and fate in plants
	JGB's Green Liver chapter	
6	ITRC Phyto Section	Vapor phase transport and fate
	JGB's Phytovolatilization	
7	ITRC Phyto Section	Metals transport and fate
	Current Literature	Hyperaccumulators - Rufus Chaney
8	Current Literature	Novel mechanisms in contaminant uptake and transport - Jason
		White or Barb Zeeb
9	Current Literature	Endophytic degradation: Novel plant-bacterial interactions - Jaco
		Vongronsfeldt or Lee Newman
10	Current Literature	Selenium and metalloids uptake and potential volatilization -
		Norm Terry or Gary Banuelos
11	ITRC Alternative Capping	Alternative Capping & Leachate treatment - Ron Zalesny or Steve
	Current Literature	Rock
12	ITRC Constructed wetlands	Constructed wetlands for municipal wastewater - Scott Wallace
	Current Literature	
13	ITRC Constructed wetlands	Constructed wetlands for metals - Rinus Otte or Mark Fitch
	Current Literature	
14	Current Literature	Full Scale systems. Decade of experiences - Lou Licht
15	Open Topics	Coolest thing anyone can find throughout the year that we do not
		yet cover.
16	Final,	(? Take home week earlier?)

I like quotes, Feel free to give me good ones. Here's one for you:

"I am a member of a fragile species, still new to the earth, the youngest of creatures of any scale, here only a few moments as evolutionary time is measured, a juvenile species, a child of a species. We are only tentatively set in place, error-prone, at risk of fumbling, in real danger at the moment of leaving behind only a thin layer of our fossils, radioactive at that." -Lewis Thomas, From *The Fragile Species*

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Effective Year: Spring Effective Term: Summe	2011 r	pring 🛭	EC File #2304-5p 2011-1	MSE-
E	xperimen	tal Cou	rse 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 to be submitted on a CC	required as part (form to receive (of a degree p a permanent	rogram, minor, or graduate certificate course number	: may
Co-listed offerings sh	ould be submitte	d on one for	m, originating from the primary discip	line.
Department: Materials	Science and Engir	neer		
Discipline and Course	Number: MSE 40)1		
Course Title: Advance	d Principles of Micr	ostructural Des	sign	
Abbreviated Title (24	spaces or less):	Adv Microstru	ctural	
Instructor(s): Dr. Raj	iv S. Mishra			
Credit Hours: Le	cture: 3.0	Lab: 0.0	Total: 3.0	
Prerequisites:		·		
Semester(s) previou	sly taught: FS200	4; SP2006		
Brief Course Description: (40 words or less) This course will introduce the microstructural principles that can be used to design advanced materials. It will help students learn about the principles and microstructural design approaches. In addition, they will design a theoretical microstructure for high efficiency structure.				
List all co-listed cour	rses: Include initia)	ils of Dept. Cha 3)	air, if signature is not already included bel	low.

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(6)	
Hully (Chair Signature)	Date:
tee: <u>I two Valkim</u> (Chair signature)	Date:
(Chair Signature)	Date:
	(Chair Signature)

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Date: 10/28/2010 3:50:08 PM

EC FILE # 2305-Sp2011-G20-401 Effective Year: 2011 Spring 🖾 Fall 🔲 Effective Term: Summer 🗌 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: Dept. of Geology&Engineering Discipline and Course Number: Geo 401 Course Title: Advanced depositional systems Abbreviated Title (24 spaces or less): Adv depo systems Instructor(s): Wan Yang Totali Lab: Lecture: 3 Credit Hours: Geo 223 Prerequisites: Semester(s) previously taught: None Brief Course Description: (40 words or less) Development of three dimensional depositional models using Walther's Law, Walther's Warning and seismic stratigraphy. Emphasis on overall geometries and internal porosity and permeability characteristics of aquifers and hydrocarbon reservoirs. Literature research, class project, and class presentation are required. (Currently teaching as a 330, want to create a 400 level.) List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below. 1) <u>Geo 33</u>2 5) 4) Kalph & Hori Date: 10-25-10 (Chair Signature) Discipline Specific Curricula Committae: (Chair signature)

(Revised 10/12/2010)

Date: __

Curricula Committee: __

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EC File # 2306-5p2011-6c0-	401

Effective Year: 2011

Effective Term: Summer 🗌

Fall 🗀

Spring 🖾

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.

CO-listed atterm	, 4	r	
Department: De	pt. of Geology&Engi	neering	
Discipline and C	Course Number: Ge	o 401	
Course Title: Æ	wanted stratigraphy	and basin evolution	ρŋ
Abbreviated Tit	le (24 spaces or le	ess): Adv strat&ba	ısin
Instructor(s): \	Van Yang		
Credit Hours:	Lecture: 3	Lab:	Total:
Prerequisites:	Geo 223, <i>GEO</i>	220	
Semester(s) p	reviously taught: N	lone	
Brief Course De	escription: (40 Wo	r ds or less) ogy and time-stra	tigraphy, espec

Advanced topics in sedimentary geology and time-stratigraphy, especially sequence stratigraphy. Concepts, models, and critical thinking in sequence stratigraphic analysis of basin fills by integrating microscopic, outcrop, well, and seismic data and observations. Applications in basin analysis and groundwater and petroleum exploration. Class project and presentations are required.

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

1) Sec 324-	2)	3)	
4)	5)	6)	
Department Chair	. Role	h E Hori (Chair Signature)	Date: 10-25-10
Department Chair	- 0	(Gitali Alainania)	Date: 11/5/2010
Discipline Specific	Curricula Com	nittee: Daniel Joseph (Chair signature)	
	taa.		Date:
Curricula Commit	ree:	(Chair Signature)	

(Revised 10/12/2010)