



Campus Curricula Committee Meeting Agenda

August 14, 2019

9:00am - 10:30am, Bertelsmeyer 110H

(For Faculty Senate Meeting of September 26, 2019)

Review of submitted Course Change forms:

File: 4642	BIO SCI 4343: Introduction to Geomicrobiology
File: 4643	BIO SCI 6343: Advanced Geomicrobiology
File: 4647	CER ENG 4230: Introduction to Composite Materials
File: 2422.1	CER ENG 6230: Composite Materials
File: 326.1	CHEM 4210: Intermediate Organic Chemistry
File: 618.1	CHEM 5210: Fundamentals of Synthetic Organic Reactions
File: 1970.1	CHEM ENG 5150: Intermediate Process Computing
File: 4645	CIV ENG 6123: Pavement Management, Evaluation and Rehabilitation
File: 4646	CIV ENG 6131: Fundamentals of Rheology & Self Consolidating Concrete
File: 2027.3	GEOLOGY 5741: Micropaleontology
File: 2255.1	MATH 5737: Financial Mathematics
File: 313.5	MET ENG 5310: Corrosion and Its Prevention
File: 751.1	MIL ARMY 1250: Leadership and Personal Development
File: 421.1	MIL ARMY 1500: Introduction to Tactical Leadership
File: 1734.1	MIL ARMY 2250: Innovative Team Leadership
File: 1395.1	MIL ARMY 2500: Foundations of Tactical Leadership

Review of submitted Certificate forms:

File: 342	NUNOPRO-CT: Nuclear Nonproliferation
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Review of submitted Experimental Course forms:

File: 4633	CHEM 4001.002: Practical Aspects of NMR Spectroscopy
File: 4638	CHEM ENG 5001.008: Introduction to Process Intensification
File: 4641	CHEM ENG 5001.009: Multiscale Process Modeling
File: 4644	ENGLISH 2001.002: Comics and Graphic Novels
File: 4639	HISTORY 4001.002: France and the Second World War
File: 4634	HISTORY 4001.003: Native American History
File: 4648	MS&E 5001.003: Advanced Cement Chemistry
File: 4649	MS&E 6001.004: Computer-Aided Understanding of Cement Chemistry
File: 4635	POL SCI 3001.003: Policy for Science, Technology, and Innovation

Discussion from the Campus Curricula Committee to implement the AY 2019-2020 Curricula meeting dates and submission deadlines.

Discussion over a new course proposal skipping the experimental course stage if it is a required course for an emphasis area of a degree program.

Course Change Request

New Course Proposal

Date Submitted: 06/26/19 4:03 pm

Viewing: **BIO SCI 4343 : Introduction to Geomicrobiology**

File: 4642

Last edit: 07/30/19 1:42 pm

Changes proposed by: shannonk

Requested	Spring 2020
Effective Change Date	
Department	Biological Sciences
Discipline	Biological Sciences (BIO SCI)
Course Number	4343
Title	Introduction to Geomicrobiology
Abbreviated Course Title	Intro Geomicro

In Workflow

1. **RBIOLSCI Chair**
2. **CCC Secretary**
3. **Sciences DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Catalog Description	Microorganisms have profound effects on the environment around them and have influenced biochemical and mineralogical processes throughout time. This course will explore the impact microorganisms have on geological processes.				
Prerequisites	Bio Sci 3313.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	No				
Elective for Majors	Yes				
Justification for new course:	Area of interest for both Biology and Geology students				
Semesters previously offered as an experimental course	Spring 2014 - nine undergraduate students Spring 2016 - ten undergraduate students Spring 2018 - six undergraduate students (Spring 2018 Bio Sci 4001 -6 undergraduate students)				
Co-Listed Courses:					
Course Reviewer Comments					

Approval Path

1. 06/26/19 4:05 pm
David Duvernell (duverneld):
Approved for RBIOLSCI Chair
2. 06/28/19 3:38 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 07/08/19 11:00 am
Katie Shannon (shannonk):
Approved for Sciences DSCC Chair
4. 07/30/19 1:42 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 4642

[Preview Bridge](#)

Course Change Request

New Course Proposal

Date Submitted: 06/26/19 4:05 pm

Viewing: **BIO SCI 6343 : Advanced Geomicrobiology**

File: 4643

Last edit: 07/02/19 10:58 am

Changes proposed by: shannonk

Requested	Spring 2020
Effective Change Date	
Department	Biological Sciences
Discipline	Biological Sciences (BIO SCI)
Course Number	6343
Title	Advanced Geomicrobiology
Abbreviated Course Title	Advanced Geomicrobiology

In Workflow

1. **RBIOLSCI Chair**
2. **CCC Secretary**
3. **Sciences DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Catalog

Description

Microorganisms have profound effects on the environment around them and have influenced biochemical and mineralogical processes throughout time. This course will explore the impact microorganisms have on geological processes. Students will prepare a NSF-style report and defend it.

Prerequisites

Field Trip

Statement

Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
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Required for Majors No

Elective for Majors Yes

Approval Path

1. 06/26/19 4:06 pm David Duvernell (duvernellD): Approved for RBIOLSCI Chair
2. 06/28/19 3:46 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 07/08/19 11:00 am Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 07/30/19 1:43 pm Brittany Parnell (ershenb): Approved for

Justification for

new course:

Area of interest for Biological Sciences and Geology graduate students

Semesters

previously

offered as an
experimental
course

Pending CCC
Agenda post

Spring 2014 - there were nine undergraduate students and two graduate students
Spring 2016 - there were ten undergraduate students and two graduate students
Spring 2018 - there were six undergraduate students and three graduate students

Co-Listed
Courses:

Course Reviewer
Comments

Key: 4643

[Preview Bridge](#)

Course Change Request

New Course Proposal

Date Submitted: 07/12/19 11:06 am

Viewing: **CER ENG 4230 : Introduction to Composite Materials**

File: 4647

Last edit: 07/22/19 9:27 am

Changes proposed by: smiller

Requested	Spring 2020
Effective Change Date	
Department	Materials Science & Engineering
Discipline	Ceramic Engineering (CER ENG)
Course Number	4230
Title	Introduction to Composite Materials
Abbreviated Course Title	Intro to Composites

In Workflow

1. **RMATSENG Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Catalog Description	The objective of this course is to provide students a foundational understanding of process-structure-property relationships in composite materials. Topics will include composite architecture, constituents, and interfaces, fabrication techniques, introduction to macromechanical analytical treatments such as classical lamination theory, and design criteria.				
Prerequisites	Senior standing and a grade of "C" or better in Civ Eng 2210 or equivalent.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	No				
Elective for Majors	Yes				

Approval Path

1. 07/12/19 11:23 am
Greg Hilmas (ghilmas):
Approved for RMATSENG Chair
2. 07/22/19 9:28 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 07/30/19 9:13 am
Stephen Raper (sraper):
Approved for Engineering DSCC Chair
4. 07/30/19 1:43 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Justification for new course: undergraduate level version of existing Cer Eng 6230 course

Semesters previously offered as an experimental course: none

Co-Listed Courses:

Course Reviewer
Comments

Key: 4647

[Preview Bridges](#)

Course Change Request

Date Submitted: 07/12/19 11:08 am

Viewing: **CER ENG 6230 : Composite Materials**

File: 2422.1

Last edit: 07/22/19 9:28 am

Changes proposed by: smiller

Requested **Spring 2020** ~~08/01/2014~~
 Effective Change
 Date
 Department Materials Science & Engineering
 Discipline Ceramic Engineering (CER ENG)
 Course Number 6230
 Title Composite Materials
 Abbreviated Composite Materials
 Course Title

In Workflow

1. **RMATSENG Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Catalog

Description

The objective of this course is to **provide** ~~give the~~ students an **advanced** understanding of **process-structure-property relationships in composites. the processing, design, and mechanical behavior of composite materials. Topics will include composite architecture, constituents, and interfaces, fabrication techniques, analytical and numerical micromechanics and macromechanics, design criteria, and contemporary issues in composite materials. The course will treat both fiber reinforced and laminate based composites with an emphasis on the macromechanical behavior of these composites with respect to their architecture.**

Prerequisites

Graduate Standing.

Field Trip

Statement

Credit Hours LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3

Required for
Majors No

Elective for
Majors No

Justification for
change:

Approval Path

1. 07/12/19 11:23 am
Greg Hilmas (ghilmas):
Approved for RMATSENG Chair
2. 07/22/19 9:28 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 07/30/19 9:13 am
Stephen Raper (sraper):
Approved for Engineering DSCC Chair
4. 07/30/19 1:54 pm
Brittany Parnell (ershenb):
Approved for

re-word course description to better reflect current content of the course

Pending CCC
Agenda post

Semesters
previously
offered as an
experimental
course

Co-Listed
Courses:

Course Reviewer
Comments

Key: 2422

[Preview Bridge](#)

Course Change Request

Date Submitted: 06/17/19 4:53 pm

Viewing: **CHEM 4210 : Intermediate Organic Chemistry †**

File: 326.1

Last edit: 06/18/19 3:50 pm

Changes proposed by: balcht

Other Courses referencing this course	In The Prerequisites: CHEM 6220 : Advanced Synthetic Organic Chemistry CHEM 6240 : Physical Organic Chemistry
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Requested **Spring 2020 ~~08/14/2018~~**

Effective Change Date

Department Chemistry

Discipline Chemistry (CHEM)

Course Number 4210

Title Intermediate Organic Chemistry †

Abbreviated Course Title Intermediate Org Chem †

Catalog Description **Fundamental** ~~An advanced course designed to give the student a mastery of the fundamentals of organic chemical reactions~~ **are discussed based on reaction mechanisms and synthetic applications emphasizing the synthon approach.** ~~theory.~~

Prerequisites Chem 2220.

Field Trip Statement

Credit Hours LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3

Required for Majors No

Elective for Majors No

Justification for change: adjustment of content

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments

In Workflow

1. RCHEMIST Chair
2. CCC Secretary
3. Sciences DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda

6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 06/17/19 5:53 pm
Rainer Glaser (GlaserR):
Approved for RCHEMIST Chair
2. 06/18/19 3:50 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 06/24/19 1:37 pm
Katie Shannon (shannonk):
Approved for Sciences DSCC Chair
4. 07/30/19 1:56 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 326

[Preview Bridge](#)

Course Change Request

Date Submitted: 06/18/19 9:57 am

Viewing: **CHEM 5210 : Fundamentals of Synthetic Organic Reactions**

File: 618.1

Last edit: 06/18/19 3:57 pm

Changes proposed by: balcht

Requested **Spring 2020** ~~08/14/2018~~
 Effective Change
 Date
 Department Chemistry
 Discipline Chemistry (CHEM)
 Course Number 5210
 Title Fundamentals of **Synthetic** Organic Reactions
 Abbreviated **Fund Synth Org Rxns** ~~Fund of~~
 Course Title ~~Organic Reactions~~

Catalog Description **Fundamental** ~~An advanced course designed to give the student a mastery of the fundamentals of~~ organic ~~chemical~~ reactions **are discussed based on reaction mechanisms and synthetic applications emphasizing the synthon approach.** ~~theory.~~

Graduate students are required to demonstrate a higher level of learning on assessments.

Prerequisites Chem 2220.

Field Trip Statement

Credit Hours LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3

Required for Majors No

Elective for Majors No

Justification for change: content adjustment

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer **glaserr (06/18/19 9:48 am)**: Rollback: Suggested Abbreviation: Fund Synth Org Rxns
 Comments

In Workflow

1. **RCHEMIST Chair**
2. **CCC Secretary**
3. **Sciences DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 06/18/19 9:48 am
Rainer Glaser (GlaserR):
Rollback to Initiator
2. 06/18/19 10:22 am
Rainer Glaser (GlaserR):
Approved for RCHEMIST Chair
3. 06/18/19 3:58 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
4. 06/24/19 1:37 pm
Katie Shannon (shannonk):
Approved for Sciences DSCC Chair
5. 07/30/19 1:56 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 618

[Preview Bridge](#)

Course Change Request

Date Submitted: 05/12/19 6:04 pm

Viewing: **CHEM ENG 5150 : Intermediate ~~Chemical~~ Process Computing**

Flowsheeting

File: 1970.1

Last edit: 05/14/19 10:35 am

Changes proposed by: jcwang

Requested **Spring 2020 ~~08/14/2018~~**
 Effective Change
 Date
 Department Chemical and Biochemical Engineering
 Discipline Chemical Engineering (CHEM ENG)
 Course Number 5150
 Title Intermediate ~~Chemical~~ Process **Computing Flowsheeting**
 Abbreviated Int ~~Che~~-Process **Computing**
 Course Title **Flowsheeting**

In Workflow

1. **RCHEMENG Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Catalog Description	Analysis of chemical processes from model development to solution. Emphasis on numerical computational techniques and tools appropriate for ordinary and partial differential equation solution. The development, implementation, and evaluation of methods for determining the mathematical model of a chemical process, ordering the equations in the mathematical model, and solving the model. Projects on special topics and presentations related to the course materials will be included.					Approval Path
Prerequisites	Graduate graduate standing.					
Field Trip Statement						1. 05/12/19 6:16 pm Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
Credit Hours	LEC: 2	LAB: 1	IND: 0	RSD: 0	Total: 3	
Required for Majors	No					2. 05/14/19 10:35 am Brittany Parnell (ershenb): Approved for CCC Secretary
Elective for Majors	Yes No					
Justification for change:	This change of course title is to better reflect the pedagogical approach and course content currently adopted by the chemical engineering department and the recently assigned instructors who cover more than flowsheeting.					3. 06/03/19 12:43 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
Semesters previously offered as an experimental course						
Co-Listed Courses:						4. 07/30/19 2:01 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post
Course Reviewer Comments						

Key: 1970

[Preview Bridge](#)

Course Change Request

New Course Proposal

Date Submitted: 07/08/19 2:44 pm

Viewing: **CIV ENG 6123 : Pavement Management, Evaluation and Rehabilitation**

File: 4645

Last edit: 07/08/19 2:44 pm

Changes proposed by: seelyj

Requested	Spring 2020
Effective Change Date	
Department	Civil, Architectural, and Environmental Engineering
Discipline	Civil Engineering (CIV ENG)
Course Number	6123
Title	Pavement Management, Evaluation and Rehabilitation
Abbreviated Course Title	PV MGMT

In Workflow

1. **RCIVILEN Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Catalog

Description

Advanced knowledge of pavement performance; pavement evaluation; implementation of pavement management at network and project levels; maintenance and rehabilitation strategies; life-cycle cost analysis.

Prerequisites

Graduate Standing.

Field Trip

Statement

Credit Hours	LEC: 2	LAB: 1	IND: 0	RSD: 0	Total: 3
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Required for Majors	No
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Elective for Majors	No
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Approval Path

1. 07/29/19 3:04 pm
Joel Burken (burken):
Approved for RCIVILEN Chair
2. 07/29/19 4:30 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 07/30/19 9:15 am
Stephen Raper (sraper):
Approved for Engineering DSCC Chair
4. 07/30/19 2:02 pm
Brittany Parnell (ershenb):
Approved for

Justification for

new course:

Looking for permanent number for already taught course.

Semesters
previously
offered as an
experimental
course

Civ Eng 6001 previously taught in SP19 (5), SP18 (6)

Pending CCC
Agenda post

Co-Listed
Courses:

Course Reviewer
Comments

Key: 4645

[Preview Bridge](#)

Course Change Request

New Course Proposal

Date Submitted: 07/08/19 3:04 pm

Viewing: **CIV ENG 6131 : Fundamentals of Rheology & Self Consolidating Concrete**

File: 4646

Last edit: 07/08/19 3:04 pm

Changes proposed by: seelyj

Requested	Spring 2020
Effective Change Date	
Department	Civil, Architectural, and Environmental Engineering
Discipline	Civil Engineering (CIV ENG)
Course Number	6131
Title	Fundamentals of Rheology & Self Consolidating Concrete
Abbreviated Course Title	Concrete Rheology & SCC

In Workflow

1. RCIVILEN Chair
2. CCC Secretary
3. Engineering DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

<p>Catalog Description</p> <p>Prerequisites</p> <p>Field Trip Statement</p> <p>Credit Hours</p> <p>Required for Majors</p> <p>Elective for Majors</p>	<p>Discuss various rheological testing protocols & models applicable to cement-based materials and present relationships between rheological parameters and workability of grout and concrete. Understand key performance characteristics of specialty concretes, including self-consolidating, underwater, pumped & shotcrete.</p> <p>Consent of instructor and Graduate Standing.</p> <p>LEC: 3.0 LAB: 0 IND: 0 RSD: 0 Total: 3.0</p> <p>No</p> <p>No</p>	<h4>Approval Path</h4> <ol style="list-style-type: none"> 1. 07/29/19 3:04 pm Joel Burken (burken): Approved for RCIVILEN Chair 2. 07/29/19 4:30 pm Brittany Parnell (ershenb): Approved for CCC Secretary 3. 07/30/19 9:15 am Stephen Raper (sraper): Approved for Engineering DSCC Chair 4. 07/30/19 2:02 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post
<p>Justification for new course:</p> <p>Semesters previously offered as an experimental course</p> <p>Co-Listed Courses:</p>	<p>looking for permanent number for Civ Eng 6001 previously taught SP19 (10 enrolled) & SP15 (14 enrolled)</p> <p>Civ Eng 6001 previously taught SP19 (10 enrolled) & SP15 (14 enrolled)</p>	
<p>Course Reviewer Comments</p>		

Key: 4646

[Preview Bridge](#)

Course Change Request

Date Submitted: 05/14/19 12:16 pm

Viewing: **GEOLOGY 5741 : Micropaleontology**

File: 2027.3

Last approved: 05/04/15 3:20 am

Last edit: 05/21/19 10:05 am

Changes proposed by: ikuenobe

Other Courses referencing this course	In The Prerequisites: GEOLOGY 6611 : Advanced Palynology
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Requested	Spring 2020 08/17/2015
Effective Change Date	
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Geology (GEOLOGY)
Course Number	5741
Title	Micropaleontology
Abbreviated Course Title	Micropaleontology

Catalog Description	This course studies the fossil and soft-body characteristics of bacteria, protists, microinvertebrates and organic-walled microfossils (palynomorphs). Focused discussions on systematics, evolutionary histories, paleoecology, and geologic applications of the microfossil groups. Extraction of foraminifera and palynomorphs from rocks in lab.				
Prerequisites	Geology 4630. 3631.				
Field Trip Statement					
Credit Hours	LEC: 2	LAB: 1	IND: 0	RSD: 0	Total: 3
Required for Majors	No				
Elective for Majors	Yes				

Justification for change:	Catalog number for prerequisite has changed.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

- In Workflow
1. **RGEOENG Chair**
 2. **CCC Secretary**
 3. **Sciences DSCC Chair**
 4. **Pending CCC Agenda post**
 5. **CCC Meeting Agenda**
 6. Campus Curricula Committee Chair
 7. FS Meeting Agenda
 8. Faculty Senate Chair
 9. Registrar
 10. CAT entry
 11. Peoplesoft

- Approval Path
1. 05/15/19 9:05 am
David Borrok (borrokd):
Approved for RGEOENG Chair
 2. 05/21/19 10:06 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
 3. 06/06/19 11:50 am
Katie Shannon (shannonk):
Approved for Sciences DSCC Chair
 4. 07/30/19 2:05 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

- History
1. May 4, 2015 by ikuenobe (2027.1)

Course Reviewer

Comments

Key: 2027

[Preview Bridge](#)

Course Change Request

Date Submitted: 04/16/19 1:53 pm

Viewing: **MATH 5737 : Financial Mathematics**

File: 2255.1

Last edit: 06/03/19 11:05 pm

Changes proposed by: prunnon

Programs referencing this course	CP ENG-BS: Computer Engineering BS
Other Courses referencing this course	In The Prerequisites: ECON 6337 : Financial Mathematics II MATH 6737 : Financial Mathematics II

Requested **Spring 2020 ~~08/14/2018~~**
Effective Change Date

Department Mathematics & Statistics
Discipline Mathematics (MATH)
Course Number 5737
Title Financial Mathematics
Abbreviated Course Title Financial Mathematics

Catalog Description	The course objective is to provide an understanding of the fundamental concepts of financial mathematics. Topics include pricing, assets-liability management, capital budgeting, valuing cash flow, bonds, futures, swaps, options. Preparation for the financial mathematics actuarial exam will be provided.				
Prerequisites	Math 1215 or Math 1221, Econ 1100 2100 or Econ 1200 , 2200 or Finance 2150 or Finance 5160 , Stat 3111 or Stat 3113 or Stat 3115 or Stat 3117 or Stat 5643.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	No				
Elective for Majors	Yes No				

Justification for change: In practice, this course is taught such that an introductory economics course is sufficient - the old prerequisite which required intermediate economic theory (either macro or micro) was excessive.

Semesters previously offered as an experimental course

In Workflow

1. **RMATHEMA Chair**
2. **CCC Secretary**
3. **RECONOMI Chair**
4. **Sciences DSCC Chair**
5. **Pending CCC Agenda post**
6. **CCC Meeting Agenda**
7. Campus Curricula Committee Chair
8. FS Meeting Agenda
9. Faculty Senate Chair
10. Registrar
11. CAT entry
12. Peoplesoft

Approval Path

1. 04/16/19 2:23 pm
sclark: Approved for RMATHEMA Chair
2. 04/16/19 3:37 pm
Brittany Parnell (ershenb): Approved for CCC Secretary
3. 05/03/19 2:41 pm
Brittany Parnell (ershenb): Approved for RECONOMI Chair
4. 06/03/19 11:05 pm
Katie Shannon (shannonk): Approved for Sciences DSCC Chair
5. 07/30/19 2:06 pm
Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Co-Listed ECON 5337 - Financial Mathematics

Courses:

Course Reviewer **ershenb (05/03/19 2:41 pm)**: Approving per the email request of Dr. Gelles
Comments (technical issues).

Key: 2255

[Preview Bridge](#)

Course Change Request

Date Submitted: 07/03/19 11:49 am

Viewing: **MET ENG 5310 4230: Corrosion and And-Its Prevention**

File: 313.5

Last approved: 12/13/17 3:32 am

Last edit: 07/30/19 12:05 pm

Changes proposed by: ershenb

Requested **Spring 2020** ~~01/09/2018~~

Effective Change

Date

Department Materials Science & Engineering

Discipline Metallurgical Engineering (MET ENG)

Course Number **5310 4230**

Title Corrosion **and And**-Its Prevention

Abbreviated Corrosion & Its Prevent

Course Title

Catalog Description A study of the theories of corrosion and its application to corrosion and its prevention.

Prerequisites A grade of "C" or better in either Chem Eng 3120 or Cer Eng 3230.

Field Trip Statement

Credit Hours LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3

Required for Majors No

Elective for Majors Yes

Justification for change: Realign course numbers between Chem Eng and Met Eng and upgrade prerequisites.

TECHNICAL NOTE: The prerequisites for this course are currently approved as "A grade of "C" or better in either Chem Eng 2110 or Cer Eng 3230."

You will not be able to view the proposed change from CHEM ENG 2110 to CHEM ENG 3120.

Semesters previously offered as an experimental course

Co-Listed ~~CHEM ENG 4320 - Course Not Found~~

Courses: **CHEM ENG 5315 - Corrosion And Its Prevention**

Course Reviewer **ershenb (07/03/19 11:50 am)**: Submitted per the request of Dr. Scott Miller due to CourseLeaf editing issues.

In Workflow

1. **RMATSENG Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 07/03/19 11:54 am
Greg Hilmas (ghilmas): Approved for RMATSENG Chair
2. 07/03/19 2:46 pm
Brittany Parnell (ershenb): Approved for CCC Secretary
3. 07/17/19 9:53 am
Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 07/30/19 2:07 pm
Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. May 8, 2017 by smiller (313.1)
2. Dec 13, 2017 by ershenb (313.4)

Key: 313

[Preview Bridge](#)

Course Change Request

Date Submitted: 05/01/19 1:28 pm

Viewing: **MIL ARMY 1250 : Leadership and Personal Development**

File: 751.1

Last edit: 05/02/19 11:16 am

Changes proposed by: bakervi

Other Courses referencing this course

In The Prerequisites:
[MIL ARMY 3250 : Adaptive Tactical Leadership](#)

Requested **Fall 2020 ~~08/01/2014~~**
 Effective Change Date
 Department Military Science - Army ROTC
 Discipline Military Science - Army (MIL ARMY)
 Course Number 1250
 Title Leadership and Personal Development
 Abbreviated **Ldrsp and Leadership &**
 Course Title Personal Dev

Catalog Description Introduces cadets to the personal challenges and competencies that are critical for effective leadership. Cadets learn how the personal development of life skills such as critical thinking, goal setting, time management, physical fitness, and stress management relate to leadership, officership, and the Army profession.

Prerequisites

Field Trip Statement

Credit Hours LEC: 1 LAB: **1 0** IND: 0 RSD: 0 Total: **2 1**

Required for Majors No

Elective for Majors No

Justification for change: This class much have a lab in order to meet requirements for credit of course. The lab will be Wednesday 3:30pm to 5:00pm.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer **ershenb (05/02/19 10:54 am)**: corrected the total hours to 2 credit hours per the
 Comments request of Vickie Baker

In Workflow

1. **RMILARMY Chair**
2. **CCC Secretary**
3. **Krista Chambers**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 05/01/19 3:30 pm
Otis Register (registro):
Approved for RMILARMY Chair
2. 05/02/19 11:42 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 05/02/19 1:09 pm
Krista Chambers (krista): Approved for krista
4. 07/30/19 2:08 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

ershenb (05/02/19 11:04 am): updated effective term to FS 2020 per the request of
Vickie Baker

Key: 751

[Preview Bridge](#)

Course Change Request

Date Submitted: 05/01/19 1:24 pm

Viewing: **MIL ARMY 1500 : Introduction to Tactical Leadership**

File: 421.1

Last edit: 05/02/19 11:18 am

Changes proposed by: bakervi

Requested	Spring 2020 08/01/2014
Effective Change Date	
Department	Military Science - Army ROTC
Discipline	Military Science - Army (MIL ARMY)
Course Number	1500
Title	Introduction to Tactical Leadership
Abbreviated Course Title	Intro to Tactical Ldrsp Leadership

Catalog Description	Overviews leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback, and using effective writing skills. Cadets explore dimensions of leadership values, attributes, skills, and actions in the context of practical, hands-on, and interactive exercises.				
Prerequisites					
Field Trip Statement					
Credit Hours	LEC: 1	LAB: 1 0	IND: 0	RSD: 0	Total: 2 1
Required for Majors	No				
Elective for Majors	No				

Justification for change: This Class needs a Lab attached the lab will be Wednesdays 3:30pm to 5:00pm.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer **ershenb (05/02/19 11:18 am)**: corrected total credit hours to "2" and updated eff date to Spring 2020 per the request of Vickie Baker.

In Workflow

- RMILARMY Chair**
- CCC Secretary**
- Krista Chambers**
- Pending CCC Agenda post**
- CCC Meeting Agenda**
- Campus Curricula Committee Chair
- FS Meeting Agenda
- Faculty Senate Chair
- Registrar
- CAT entry
- Peoplesoft

Approval Path

- 05/01/19 3:30 pm
Otis Register (registro):
Approved for RMILARMY Chair
- 05/02/19 11:42 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
- 05/02/19 1:09 pm
Krista Chambers (krista): Approved for krista
- 07/30/19 2:08 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 421

[Preview Bridge](#)

Course Change Request

Date Submitted: 05/01/19 1:29 pm

Viewing: **MIL ARMY 2250 : Innovative Team Leadership**

File: 1734.1

Last edit: 05/02/19 11:22 am

Changes proposed by: bakervi

Requested	Fall 2020 08/01/2014
Effective Change Date	
Department	Military Science - Army ROTC
Discipline	Military Science - Army (MIL ARMY)
Course Number	2250
Title	Innovative Team Leadership
Abbreviated Course Title	Innovative Team Ldrsp Leadership

Catalog Description	Develop knowledge of self, self-confidence and individual leadership techniques through problem solving and critical thinking skills. Apply communication, feedback, and conflict resolution skills.
---------------------	--

Prerequisites

Field Trip Statement

Credit Hours	LEC: 3	LAB: 1 0	IND: 0	RSD: 0	Total: 4 3
--------------	--------	----------------------------	--------	--------	------------------------------

Required for Majors

No

Elective for Majors

No

Justification for change: This class must have a lab in order to meet requirements for credits. The lab will be Wednesdays 3:30pm to 5:00pm.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments	ershenb (05/02/19 11:21 am) : corrected total hours to "4" and updated eff date to Fall 2020 per the request of Vickie Baker.
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In Workflow

- RMILARMY Chair**
- CCC Secretary**
- Krista Chambers**
- Pending CCC Agenda post**
- CCC Meeting Agenda**
- Campus Curricula Committee Chair
- FS Meeting Agenda
- Faculty Senate Chair
- Registrar
- CAT entry
- Peoplesoft

Approval Path

- 05/01/19 3:30 pm
Otis Register (registro):
Approved for RMILARMY Chair
- 05/02/19 11:42 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
- 05/02/19 1:09 pm
Krista Chambers (krista): Approved for krista
- 07/30/19 2:08 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 1734

[Preview Bridge](#)

Course Change Request

Date Submitted: 05/01/19 1:26 pm

Viewing: **MIL ARMY 2500 : Foundations of Tactical Leadership**

File: 1395.1

Last edit: 05/02/19 11:25 am

Changes proposed by: bakervi

Other Courses referencing this course	In The Prerequisites: MIL ARMY 2750 : Basic Leadership Laboratory
---------------------------------------	--

Requested **Spring 2020 08/01/2014**
 Effective Change Date
 Department Military Science - Army ROTC
 Discipline Military Science - Army (MIL ARMY)
 Course Number 2500
 Title Foundations of Tactical Leadership
 Abbreviated Found of Tactical **Ldrsp**
 Course Title **Leadership**

Catalog Description	Examines the challenges of leading tactical teams in the complex contemporary operating environment (COE). The course highlights dimensions of terrain analysis, patrolling, and operation orders. Further study of the theoretical basis of the Army leadership framework explores the dynamics of adaptive leadership in the context of military operations.				
Prerequisites					
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 1 0	IND: 0	RSD: 0	Total: 4 3
Required for Majors	No				
Elective for Majors	No				

Justification for change: This course must complete a lab as part of requirements for credit. The lab will be Wednesdays from 3:30pm to 5:00PM

Semesters previously offered as an experimental course
 Co-Listed Courses:

Course Reviewer **ershenb (05/02/19 11:25 am)**: corrected total hours to "4" and updated eff request date to Spring 2020 per the request of Vickie Baker.

- In Workflow
1. **RMILARMY Chair**
 2. **CCC Secretary**
 3. **Krista Chambers**
 4. **Pending CCC Agenda post**
 5. **CCC Meeting Agenda**
 6. Campus Curricula Committee Chair
 7. FS Meeting Agenda
 8. Faculty Senate Chair
 9. Registrar
 10. CAT entry
 11. Peoplesoft

- Approval Path
1. 05/01/19 3:30 pm
Otis Register (registro):
Approved for RMILARMY Chair
 2. 05/02/19 11:43 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
 3. 05/02/19 1:09 pm
Krista Chambers (krista): Approved for krista
 4. 07/30/19 2:09 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 1395

[Preview Bridge](#)

Program Change Request

New Program Proposal

Date Submitted: 07/03/19 10:12 am

Viewing: **NUNOPRO-CT : Nuclear Nonproliferation**

File: 342

Last edit: 07/03/19 10:45 am

Changes proposed by: alajoa

Start Term	Spring 2020
Program Code	NUNOPRO-CT
Department	Mining & Nuclear Engineering
Title	Nuclear Nonproliferation

Program Requirements and Description

In Workflow

1. NUC ENG Chair
2. CCC Secretary
3. NUC ENG Chair
4. VC of Research & Dean of Grad Studies
5. Engineering DSCC Chair
6. Pending CCC Agenda post
7. CCC Meeting Agenda
8. Campus Curricula Committee Chair
9. FS Meeting Agenda
10. Faculty Senate Chair
11. Registrar
12. CAT entry
13. Peoplesoft

Approval Path

1. 07/03/19 10:37 am
Hyoung-Koo Lee (leehk): Approved for NUC ENG Chair
2. 07/03/19 11:39 am
Brittany Parnell (ershenb): Approved for CCC Secretary
3. 07/03/19 11:43 am
AYODEJI Alajo (alajoa): Approved for NUC ENG Chair
4. 07/03/19 4:01 pm
Costas Tsatsoulis (tsatsoul): Approved for VC of Research & Dean of Grad Studies
5. 07/17/19 9:53 am
Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 07/30/19 2:10 pm
Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Nuclear Nonproliferation

The nuclear engineering program offers a graduate certificate program to professionals and students who desire to undergo formal instruction in nuclear nonproliferation. The topics in comprising the certificate program are selected from courses available to graduate students in the nuclear engineering program at Missouri University of Science and

Technology. All courses are available both in traditional on-campus delivery and online format. The certificate program deployment strategy allows all enrollees to pace their study in manner consistent with the individual's plans.

The Graduate Certificate in Nuclear Nonproliferation is open to all persons holding a B.S., M.S., or Ph.D. degree in Engineering, Science, and/or Mathematics as well as related B.A. or M.A. degrees, or are currently accepted into a graduate degree program at Missouri S&T.

Curriculum

The certificate program requires 4 courses equivalent to 12 credit hours. There are 8 course available to the certificate program, 1 of which is required for the completion of the graduate certificate in nuclear nonproliferation. Program enrollees may select any 3 of the remaining 7 courses towards the completion of the graduate certificate. Enrollees may take 1 or 2 classes each semester so that the certificate program may be completed within 1 to 2 years.

Required Course:		
NUC ENG 5509	Nuclear Proliferation	3
Elective Courses:		
NUC ENG 5207	Nuclear Fuel Cycle	3
NUC ENG 5281	Probabilistic Risk Assessment I	3
NUC ENG 5312	Nuclear Radiation Measurements and Spectroscopy	3
NUC ENG 5347	Radiological Engineering	3
NUC ENG 5577	Advanced Nuclear Forensics and Radiochemistry	3
NUC ENG 5507	Nuclear Policy	3
NUC ENG 6331	Radiation Shielding	3

Justification for request

The graduate certificate in nuclear nonproliferation is designed to provide graduate level studies to professionals and students who are on nuclear security career path or intend to have a career in nuclear security. The United States of America, through various executive departments like Department of Energy (DOE), Department of State (DOS) and Department of Defense (DoD), is fully vested in nuclear security. For example, DOE's National Nuclear Security Administration (NNSA), DoD's Defense Threat Reduction Agency (DTRA), and DOS's Threat Reduction Programs are staffed by personnel who require continuous knowledge certification. These agencies also require continued staffing by hiring people who are knowledgeable in nuclear nonproliferation. By putting together specific courses relevant to the NNSA and other organizations vested in nuclear security, it facilitates training and human capital development in this career path through the certificate program.

Supporting Documents

[Nuc Eng Nonproliferation Grad CT approvals.pdf](#)

Course Reviewer Comments

ershenb (07/03/19 10:45 am): CIP CODE: 28.0605

Key: 342

Office of Graduate Studies

320 W. 12th Street | G8 Norwood Hall | Rolla, MO 65409
573-341-4141 | grad@mst.edu | grad.mst.edu

April 15, 2019

MEMORANDUM TO: Robert J. Marley
Provost and Executive Vice Chancellor

FROM: Costas Tsatsoulis *C.T.*
Vice Chancellor of Research and Dean of Graduate Studies

RE: Graduate Certificate in Nuclear Nonproliferation

With the recommendation of the Mining and Nuclear Engineering and the Office of the Vice Provost and Dean of College of Engineering and Computing, I agree and request that the Nuclear Nonproliferation Graduate Certificate in its form be accepted as a graduate certificate by the Missouri University of Science & Technology.

Please contact me if you have any questions or need additional information.

Approved by:


Robert J. Marley,
Provost and Executive Vice Chancellor
for Academic Affairs

Attachment



Mining and Nuclear Engineering

An equal opportunity institution

226 McNutt Hall | 1400 N. Bishop | Rolla, MO. 65409-0450
(573) 341-4753 | minnuc@mst.edu | <https://mne.mst.edu>

February 11, 2019

To: Richard Wlezien, Vice Provost and Dean,
College of Engineering & Computing

Constantinos Tsatsoulis,
Vice Chancellor for Research and Dean of Graduate Studies

From: Hyoung Koo Lee,
Department of Mining and Nuclear Engineering

Subject: Proposal for a Graduate Certificate in Nuclear Nonproliferation

We are submitting the attached proposal for a Graduate Certificate in Nuclear Nonproliferation. The Department of Mining and Nuclear Engineering will be the home department and primary overseer of the proposed program.

GRADUATE CERTIFICATE IN NUCLEAR NONPROLIFERATION

OFFERED BY:

Department of Mining and Nuclear Engineering.

PARENT DEPARTMENT AND DEGREE:

Department of Mining and Nuclear Engineering, Nuclear Engineering, MS)

INTENDED AUDIENCE: Main Campus Students Distance Students Both

PROGRAM DESCRIPTION:

The nuclear engineering program offers a graduate certificate program to professionals and students who desire to undergo formal instruction in nuclear nonproliferation. The topics comprising the certificate program are selected from courses available to graduate students in the nuclear engineering program at Missouri University of Science and Technology. All courses are available both in traditional on-campus delivery and online format. The certificate program deployment strategy allows all enrollees to pace their study in manner consistent with the individual's plans.

PURPOSE:

The graduate certificate in nuclear nonproliferation is designed to provide graduate level studies to professionals and students who are on nuclear security career path or intend to have a career in nuclear security. The United States of America, through various executive departments like Department of Energy (DOE), Department of State (DOS) and Department of Defense (DoD), is fully vested in nuclear security. For example, DOE's National Nuclear Security Administration (NNSA), DoD's Defense Threat Reduction Agency (DTRA), and DOS's Threat Reduction Programs are staffed by personnel who require continuous knowledge certification. These agencies also require continued staffing by hiring people who are knowledgeable in nuclear nonproliferation. By putting together specific courses relevant to the NNSA and other organizations vested in nuclear security, it facilitates training and human capital development in this career path through the certificate program.

ADMISSION:

The Graduate Certificate in Nuclear Nonproliferation is open to all persons holding a B.S., M.S., or Ph.D. degree in Engineering, Science, and/or Mathematics as well as related B.A. or M.A. degrees, or are currently accepted into a graduate degree program at Missouri S&T. Once admitted to the program, the student must take the four designated courses (provided in the curriculum section). In order to receive a Graduate Certificate, the student must have an average cumulative grade point of 3.0 or better in the certificate courses. Students who do not have English as first language may be required to provide evidence of English language proficiency. Once admitted to the program, a student will be given three years to complete the program.

Students admitted to the Graduate Certificate in Nuclear Nonproliferation Program will have non-degree graduate status, however, they will earn graduate credit for the course they complete. If the student completes the four-course sequence with a grade of B or better in each of the courses taken, they, upon application, will be admitted to the M.S. degree program in Nuclear Engineering. The certificate credits taken by the students admitted to the M.S. degree program will count towards their master's degrees.

Students who do not have all of the prerequisite courses necessary to begin the courses in the Graduate Certificate in Nuclear Nonproliferation Program will be allowed to take "bridge" courses at either the graduate or undergraduate level to prepare for the formal certificate courses.

CONTRIBUTING FACULTY:

Ayodeji Alajo
Carlos Castano Giraldo
Hyoung Koo Lee
Xin Liu
Joshua Schlegel
Shoaib Usman

CURRICULUM:

The certificate program requires 4 courses equivalent to 12 credit hours. There are 8 courses available to the certificate program, 1 of which is required for the completion of the graduate certificate in nuclear nonproliferation. Program enrollees may select any 3 of the remaining 7 courses towards the completion of the graduate certificate. Enrollees may take 1 or 2 classes each semester so that the certificate program may be completed within 1 to 2 years.

Required Course:

- NUC ENG 5509 – Nuclear Nonproliferation

Elective Courses:

- NUC ENG 5207 – Nuclear Fuel Cycle
- NUC ENG 5281 – Probabilistic Risk Assessment I
- NUC ENG 5312 – Nuclear Radiation Measurements and Spectroscopy
- NUC ENG 5347 – Radiological Engineering
- NUC ENG 5577 – Nuclear Forensics
- NUC ENG 5507 – Nuclear Policy
- NUC ENG 6331 – Radiation Shielding

COURSE DESCRIPTIONS:

Note: All courses are available for delivery both online and on campus.

NUC ENG 5207 Nuclear Fuel Cycle (LEC 3.0)

Nuclear fuel reserves and resources; milling, conversion, and enrichment; fuel fabrication; in-and-out-of core fuel management; transportation, storage, and disposal of nuclear fuel; low level and high-level waste management; economics of the nuclear fuel cycle. Prerequisite: Nuc Eng 3205.

NUC ENG 5281 Probabilistic Risk Assessment I (LEC 3.0)

A study of the techniques for qualitative and quantitative assessment of reliability, safety and risk associated with complex systems such as those encountered in the nuclear power industry. Emphasis is placed on fault tree analysis. Prerequisite: Nuc Eng 3205.

NUC ENG 5312 Nuclear Radiation Measurements and Spectroscopy (LAB 1.0 and LEC 2.0)

Contemporary radiation detection theory and experiments with high resolution gamma-ray spectroscopy, solid state detectors, neutron detection and conventional gas filled detectors. Neutron activation analysis of unknown material, statistical aspects of nuclear measurements. Prerequisite: Nuc Eng 3205.

NUC ENG 5347 Radiological Engineering (LEC 3.0)

Radiation exposure pathways analysis. Modeling of radionuclides transport through atmosphere, surface and ground water. Human health impact. Transportation of nuclear waste. Nuclear Waste characterization. Regulatory structure and requirements. Scenario case studies and computer simulation of transport. Prerequisite: Nuc Eng 3205.

NUC ENG 5507 Nuclear Policy (LEC 3.0)

This course introduces nuclear security and safeguards policy. It explores the following topics: history of domestic and international nuclear policy, evolution of U.S. nuclear weapons policy, factors influencing policy, the IAEA, nuclear deterrence policy, nuclear safeguards policy, policy in non-proliferation issues, comprehensive safeguards agreement, additional Protocol, 123 agreement, nuclear deterrence theory, and nuclear policy-driven international relations.

NUC ENG 5509 Nuclear Nonproliferation (LEC 3.0)

This course will introduce IAEA mission specific to nonproliferation. The class will provide discussion of essential elements of a nuclear weapon, followed by a brief historical over of nonproliferation treaties in place to deter proliferation. Methods of fissile material production will be discussed followed by a survey of tool and techniques available and employed by IAEA to monitoring and account for Special Nuclear Material (SNM) to ensure treaty compliance.

NUC ENG 5577 Nuclear Forensics (LEC 3.0)

Learn concepts and terminology associated with nuclear forensics and radiochemistry through study of nuclear forensic case studies. Learn about the applications of some of the techniques of nuclear forensics via laboratory demonstrations. Become acquainted with cosmochemistry, isotope production in a neutron field, solvent extraction principles, and fuel reprocessing. Students will research and prepare a demonstration related to nuclear forensics and share the experience with the rest of the class (PPT Presentation, plus video of the laboratory, or simulation results).

NUC ENG 6331 Radiation Shielding (LEC 3.0)

Radiation sources; interactions of radiation with matter; dosimetry and radiation protection guidelines. The particle transport equation and methods of solving it; the Monte Carlo Method; special computational methods for neutron and gamma attenuation. Computer codes used in shielding. Shielding materials, shield design. Prerequisite: Nuc Eng 4203.

If you have any questions about this form, please contact the Office of Graduate Studies, 573-341-4141.



June 3, 2019

Dr. Mun Y. Choi, President
University of Missouri System
321 University Hall
Columbia, MO 65211

Dear President Choi

I am pleased to inform you that the Missouri Department of Higher Education has approved the attached program changes submitted on behalf of the Missouri University of Science and Technology. These changes will be reported to the Coordinating Board for Higher Education at its meeting on September 11, 2019.

Sincerely,

Zora Mulligan
Commissioner of Higher Education

- c: Dr. Steven Graham, Senior Associate Vice President for Academic Affairs, University of Missouri System
Dr. Christopher Maples, Interim Chancellor, Missouri University of Science and Technology
Dr. Robert Marley, Provost and Executive Vice Chancellor for Academic Affairs, Missouri University of Science and Technology
Ms. Jana Moore, Sr. Program/Project Support Coordinator, University of Missouri System

Program Changes
Missouri University of Science and Technology

- 1) Current Program:
MS, Nuclear Engineering, CIP 142301

Proposed Change:
Add certificate program from approved existing parent degree

Program as Changed:
GRCT, Nuclear Nonproliferation, CIP 280605

- 2) Current Program:
N/A

Proposed Change:
Add free-standing certificate program

Program as Changed:
C0, Automation Engineering, CIP 144200

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/29/19 3:01 pm

Viewing: **CHEM 4001.002 : Practical Aspects of NMR Spectroscopy**

File: 4633

Last edit: 07/30/19 1:38 pm

Changes proposed by: woelkk

Requested Fall 2019

Effective Change
Date

Department Chemistry

Discipline Chemistry (CHEM)

Course Number 4001

Topic ID 002

Experimental Practical Aspects of NMR Spectroscopy
TitleExperimental Pract NMR Spectroscopy
Abbreviated
Course Title

Instructors Klaus Woelk

Experimental
Catalog
Description

A theoretical understanding of basic and advanced NMR experiments is provided in the lecture component. The lecture is supplemented with a practicum of hands-on activities using industry-standard NMR instrumentation and software. In the recitation section, experimental results from the hands-on activities will be discussed and evaluated.

Prerequisites

Physics 2135; preceded or accompanied by Chem 2510.

Field Trip
Statement

Credit Hours LEC: 1 LAB: 1 IND: 0 RSD: 1 Total: 3

Justification for
new course:

In Workflow

1. **RCHEMIST Chair**
2. **CCC Secretary**
3. **Sciences DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. CAT entry
8. Registrar

Approval Path

1. 05/08/19 8:54 pm
Rainer Glaser (GlaserR):
Approved for RCHEMIST Chair
2. 05/14/19 10:33 am
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 06/03/19 11:04 pm
Katie Shannon (shannonk):
Approved for Sciences DSCC Chair
4. 07/30/19 1:54 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

NMR is the only spectroscopic method for which hands-on experience is explicitly required by the American Chemical Society (ACS) for students of ACS-certified degree programs. This course will provide an elective course for students who are interested in expanding their knowledge about NMR spectroscopy with respect to NMR theory and hands-on training.

Semester(s)
previously taught

Co-Listed
Courses:

Course Reviewer
Comments

Key: 4633

[Preview Bridge](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 05/18/19 3:50 pm

Viewing: **CHEM ENG 5001.008 : Introduction to Process Intensification**

File: 4638

Last edit: 07/30/19 1:39 pm

Changes proposed by: smithjose

Requested	Spring 2020
Effective Change Date	
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	008
Experimental Title	Introduction to Process Intensification
Experimental Abbreviated Course Title	Intr to Proc Intens
Instructors	Joseph Smith and Peter Ryan

Experimental Catalog Description	This course builds on basic knowledge of staged separations and reactor design to develop novel apparatus, techniques, and methods to increase process efficiency, lower energy/ material costs, enhance safety, and increase sustainability. These topics are part of Process Intensification aimed at continuous process improvement.				
Prerequisites	Senior or Graduate Standing.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3

Justification for new course: Process Intensification is an emerging field in Advanced Manufacturing and is important to the fields of chemical process industry, environmental engineering, and sustainable development. This devoted course is the first such course on this campus to cover this subject in depth and breadth. It will benefit interested students across several disciplines and can also become a key course to future graduate certificate programs on campus.

Semester(s) previously taught: None

Co-Listed Courses:

Course Reviewer Comments

In Workflow

1. RCHEMENG Chair
2. CCC Secretary
3. Engineering DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. CAT entry
8. Registrar

Approval Path

1. 05/22/19 1:04 pm
Muthanna Al-Dahhan
(aldahhanm):
Approved for
RCHEMENG Chair
2. 05/22/19 4:24 pm
Brittany Parnell
(ershenb):
Approved for CCC
Secretary
3. 06/03/19 12:42 pm
Stephen Raper
(sraper):
Approved for
Engineering DSCC
Chair
4. 07/30/19 1:57 pm
Brittany Parnell
(ershenb):
Approved for
Pending CCC
Agenda post

Key: 4638

[Preview Bridges](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 06/07/19 10:23 am

Viewing: **CHEM ENG 5001.009 : Multiscale Process Modeling**

File: 4641

Last edit: 07/30/19 1:39 pm

Changes proposed by: baruad

Requested	Spring 2020
Effective Change Date	
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	009
Experimental Title	Multiscale Process Modeling
Experimental Abbreviated Course Title	Multiscale Modeling
Instructors	Dipak Barua

Experimental Catalog Description	Introduction of new process modeling concepts and methodologies that complement conventional approaches and expand modeling capabilities. Use of molecular modeling to analyze phenomena and establish suitable laws to be incorporated into macroscale process simulations, and special examples including biosignaling and self-assembled structures will be covered.				
Prerequisites	Chem Eng 3141.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3

Justification for new course: Chemical and biochemical processes often involve phenomena at different scales of length and time. The study of the relationship between these scales and the inclusion of molecular-based models can provide the students and the chemical process industry with new and alternative tools to achieve more effective designs and process operations, which are also important to other fields including environmental engineering, energy sustainability, and biotechnology.

Semester(s) previously taught: None

Co-Listed Courses:

Course Reviewer Comments

In Workflow

1. RCHEMENG Chair
2. CCC Secretary
3. Engineering DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. CAT entry
8. Registrar

Approval Path

1. 06/13/19 8:15 am
Muthanna Al-Dahhan
(aldahhanm):
Approved for
RCHEMENG Chair
2. 06/13/19 9:57 am
Brittany Parnell
(ershenb):
Approved for CCC
Secretary
3. 06/26/19 3:16 pm
Stephen Raper
(sraper):
Approved for
Engineering DSCC
Chair
4. 07/30/19 2:01 pm
Brittany Parnell
(ershenb):
Approved for
Pending CCC
Agenda post

Key: 4641

[Preview Bridge](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 06/27/19 9:46 am

Viewing: **ENGLISH 2001.002 : Comics and Graphic Novels**

File: 4644

Last edit: 07/30/19 1:39 pm

Changes proposed by: kswenson

Requested	Fall 2019
Effective Change Date	
Department	English and Technical Communication
Discipline	English (ENGLISH)
Course Number	2001
Topic ID	002
Experimental Title	Comics and Graphic Novels
Experimental Abbreviated Course Title	Comics
Instructors	Rachel Schneider

Experimental Catalog Description	Comics and graphic novels represent not only a distinct narrative form, but are also important cultural objects which engages complex questions of identity and culture. This class studies comics and the graphic novel as literature and as a popular art form.	In Workflow 1. RENLISH Chair 2. CCC Secretary 3. Arts & Humanities DSCC Chair 4. Pending CCC Agenda post 5. CCC Meeting Agenda 6. Campus Curricula Committee Chair 7. CAT entry 8. Registrar Approval Path 1. 06/27/19 9:47 am Kristine Swenson (kswenson): Approved for RENGLISH Chair 2. 06/28/19 3:48 pm Brittany Parnell (ershenb): Approved for CCC Secretary 3. 06/29/19 3:32 pm Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair 4. 07/30/19 2:02 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post
Prerequisites	English 1120.	
Field Trip Statement		
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3	

Justification for new course: Title change for greater clarity for students.

Semester(s) previously taught: Approved and previously taught in SP17.

Co-Listed Courses:

Course Reviewer Comments

Key: 4644

[Preview Bridge](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 05/24/19 11:06 am

Viewing: **HISTORY 4001.002 : France and the Second World War**

File: 4639

Last edit: 07/30/19 1:39 pm

Changes proposed by: sfogg

Requested	Spring 2020
Effective Change Date	
Department	History and Political Science
Discipline	History (HISTORY)
Course Number	4001
Topic ID	002
Experimental Title	France and the Second World War
Experimental Abbreviated Course Title	France and World War II
Instructors	Shannon Fogg

Experimental Catalog Description	This seminar-style course will examine the complex history of France during the Second World War. It will cover topics such as the French defeat, resistance against the occupation, collaboration with the Nazis, the Holocaust in France, culture during the war, the effects of war on French colonies, and civilians' daily lives.				
Prerequisites	History 1200.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3

Justification for new course:	This will expand our range of upper-level European history courses and contribute to our classes in war studies.
Semester(s) previously taught	Fall 2011
Co-Listed Courses:	

Course Reviewer Comments

In Workflow

1. RHISTORY Chair
2. CCC Secretary
3. Arts & Humanities DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. CAT entry
8. Registrar

Approval Path

1. 05/24/19 11:07 am
Shannon Fogg (sfogg): Approved for RHISTORY Chair
2. 05/28/19 8:33 am
Brittany Parnell (ershenb): Approved for CCC Secretary
3. 05/28/19 11:13 am
Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair
4. 07/30/19 2:06 pm
Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4639

[Preview Bridge](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 05/01/19 10:40 am

Viewing: **HISTORY 4001.003 : Native American History**

File: 4634

Last edit: 07/30/19 1:39 pm

Changes proposed by: popejj

Requested	Spring 2020
Effective Change Date	
Department	History and Political Science
Discipline	History (HISTORY)
Course Number	4001
Topic ID	003
Experimental Title	Native American History
Experimental Abbreviated Course Title	Native American History
Instructors	Justin Pope

<p>Experimental Catalog Description</p> <p>Prerequisites</p> <p>Field Trip Statement</p> <p>Credit Hours</p>	<p>This course surveys the vibrant field of North American Indian history from Indigenous societies on the eve of first contact with Europeans to the end of the twentieth century. Students will be exposed to some of the best historical writing on the Native American experience and participate in a class research project examining Native history in Missouri.</p> <p>History 1300, History 1310 or History 1200.</p> <p>LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3</p>	<p>In Workflow</p> <ol style="list-style-type: none"> 1. RHISTORY Chair 2. CCC Secretary 3. Arts & Humanities DSCC Chair 4. Pending CCC Agenda post 5. CCC Meeting Agenda 6. Campus Curricula Committee Chair 7. CAT entry 8. Registrar <p>Approval Path</p> <ol style="list-style-type: none"> 1. 05/01/19 2:07 pm Shannon Fogg (sfogg): Approved for RHISTORY Chair 2. 05/01/19 4:29 pm Brittany Parnell (ershenb): Approved for CCC Secretary 3. 05/02/19 8:27 am Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair 4. 07/30/19 2:06 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post
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Justification for new course: Missouri S&T does not currently offer a course on Native American history. The course provides an opportunity for students to learn about the diverse experiences of underrepresented communities in the United States. The course also introduces students to experiential learning through a problem solving project with the Missouri Humanities Council and the Missouri State Historical Society.

Semester(s) previously taught

Co-Listed Courses:

Course Reviewer

Comments

Key: 4634

[Preview Bridges](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 07/12/19 12:23 pm

Viewing: **MS&E 5001.003 : Advanced Cement Chemistry**

File: 4648

Last edit: 07/30/19 1:40 pm

Changes proposed by: smiller

Requested	Spring 2020
Effective Change Date	
Department	Materials Science & Engineering
Discipline	Materials Science & Eng (MS&E)
Course Number	5001
Topic ID	003
Experimental Title	Advanced Cement Chemistry
Experimental Abbreviated Course Title	Adv Cement Chem
Instructors	Kumar

Experimental Catalog Description	The objective of this course is to utilize fundamental concepts of materials and computer science to describe the reactivity, development of microstructure, and evolution of properties in conventional and novel (e.g., geopolymers, sulfoaluminate cements, etc.) cementitious systems.				
Prerequisites	Senior Standing.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3

Justification for new course: Program needs an advanced cement course
co-listed with CIV ENG 5001
(co-listed course is listed in the justification section per the EC workflow process)

Semester(s) previously taught

Co-Listed Courses:

Course Reviewer Comments
ershenb (07/18/19 10:22 am): added the co-list CIV ENG 5001 per the request of Dr. Raper.
sraper (07/18/19 10:25 am): Rollback: Request to add Civ Eng as co-list
sraper (07/19/19 12:15 pm): Removed statement about quizzes and tests in course description.

In Workflow

1. **RMATSENG Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. CAT entry
8. Registrar

Approval Path

1. 07/12/19 1:09 pm
Greg Hilmas (ghilmas):
Approved for RMATSENG Chair
2. 07/16/19 4:17 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 07/18/19 10:25 am
Stephen Raper (sraper): Rollback to CCC Secretary for Engineering DSCC Chair
4. 07/18/19 1:13 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
5. 07/19/19 12:15 pm
Stephen Raper (sraper):
Approved for Engineering DSCC Chair
6. 07/30/19 2:09 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 4648

[Preview Bridge](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 07/12/19 12:40 pm

Viewing: **MS&E 6001.004 : Computer-Aided Understanding of Cement Chemistry**

File: 4649

Last edit: 07/30/19 1:40 pm

Changes proposed by: smiller

Requested	Spring 2020
Effective Change Date	
Department	Materials Science & Engineering
Discipline	Materials Science & Eng (MS&E)
Course Number	6001
Topic ID	004
Experimental Title	Computer-Aided Understanding of Cement Chemistry
Experimental Abbreviated Course Title	Comp Cement Chem
Instructors	Kumar
Experimental Catalog Description	Utilize fundamental concepts of materials and computer science to describe the reactivity, development of microstructure, and evolution of properties in conventional and novel cementitious systems. Emphasis will be to train students to use computer programs to simulate reaction kinetics of, and microstructure/property development in cementitious materials.
Prerequisites	Graduate Standing.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	need for a computational cementitious materials course co-listed with CIV ENG 6001 (co-listed course is listed in the justification section per the EC workflow process)
Semester(s) previously taught	none
Co-Listed Courses:	
Course Reviewer Comments	ershenb (07/18/19 10:23 am) : added the co-list CIV ENG 6001 per the request of Dr. Raper. sraper (07/18/19 10:25 am) : Rollback: request to add Civ Eng as co-list.

In Workflow

1. **RMATSENG Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
5. **CCC Meeting Agenda**
6. Campus Curricula Committee Chair
7. CAT entry
8. Registrar

Approval Path

1. 07/12/19 1:09 pm
Greg Hilmas (ghilmas):
Approved for
RMATSENG Chair
2. 07/16/19 4:19 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
3. 07/18/19 10:25 am
Stephen Raper (sraper): Rollback to CCC Secretary for Engineering DSCC Chair
4. 07/18/19 1:12 pm
Brittany Parnell (ershenb):
Approved for CCC Secretary
5. 07/19/19 12:16 pm
Stephen Raper (sraper):
Approved for Engineering DSCC Chair
6. 07/30/19 2:09 pm
Brittany Parnell (ershenb):
Approved for Pending CCC Agenda post

Key: 4649

[Preview Bridge](#)

Course Change Request

New Experimental Course Proposal

Date Submitted: 05/07/19 3:47 pm

Viewing: **POL SCI 3001.003 : Policy for Science, Technology, and Innovation**

File: 4635

Last edit: 07/30/19 1:41 pm

Changes proposed by: krolikowskia

Requested	Spring 2020
Effective Change Date	
Department	History and Political Science
Discipline	Political Science (POL SCI)
Course Number	3001
Topic ID	003
Experimental Title	Policy for Science, Technology, and Innovation
Experimental Abbreviated Course Title	Policy for Sc and Tech
Instructors	Alanna Krolikowski

Experimental Catalog Description

Do Google, Airbus, and Samsung owe their success to the wisdom and foresight of government actors? This course explores whether and how public policy can foster the advancement of science, technology, and innovation. The course analyzes and compares how national innovation systems have evolved and function in the United States, Europe, and Asia.

Prerequisites

Pol Sci 1200 or History 1200 or History 1310.

Field Trip Statement

Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
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In Workflow

1. RHISTORY Chair
2. CCC Secretary
3. Arts & Humanities DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. CAT entry
8. Registrar

Approval Path

1. 05/07/19 7:24 pm
Shannon Fogg (sfogg): Approved for RHISTORY Chair
2. 05/14/19 10:37 am
Brittany Parnell (ershenb): Approved for CCC Secretary
3. 05/14/19 12:58 pm
Petra Dewitt (dewittp): Rollback to CCC Secretary for Arts & Humanities DSCC Chair
4. 05/14/19 1:25 pm
Brittany Parnell (ershenb): Approved for CCC Secretary

Justification for

new course:

This course fills a gap in existing campus-wide course offerings, providing students with training in the comparative analysis of international public policies and programs designed to support scientific and technical activities and innovation. This course also complements the STEM degree orientation of most majors on campus, introducing students to the political and social aspects of scientific and technical work. Finally, this course is helpful preparation for students envisaging careers in government or technology-intensive industries.

Semester(s)

previously taught

Spring 2018

Co-Listed

Courses:

5. 05/14/19 2:19 pm

Petra Dewitt

(dewittp):

Approved for Arts
& Humanities

DSCC Chair

6. 07/30/19 2:10 pm

Brittany Parnell

(ershenb):

Approved for

Pending CCC

Agenda post

Course Reviewer **dewittp (05/14/19 12:58 pm)**: Rollback: There is no need for a second EC form if the course is being taught a second time within a five year time frame.

Comments **ershenb (05/14/19 2:37 pm)**: EC was originally approved with an effective date of Spring 2018 with no prerequisite; it is going through the CCC again as it now has a prerequisite of Pol Sci 1200 or History 1200 or History 1310.

Key: 4635

[Preview Bridge](#)