MISSOURI S&T

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

Campus Curricula Committee Meeting Agenda
January 10, 2017
9:00-10:30 a.m., 216 Parker Hall
(For Faculty Senate Meeting of January 26, 2017)

Review of submitted Course Change forms:

File# 216.1	BIO SCI 1201 : Biological Sciences Freshman Seminar
File# 4141.1	BIO SCI 2243: Sleep: Function and Dysfunction
File#: 4282	CHEM ENG 3131 : Separations in Chemical and Biochemical Engineering
File#: 4285	CHEM ENG 4091 : Chemical Process Design I
File#: 862.4	CHEM ENG 4097: Chemical Process Design II
File#: 2460.4	COMP ENG 5420: Introduction to Network Security
File#: 1521.1	COMP SCI 1575: Data Structures
File#: 4367	COMP SCI 1585: Data Structures Laboratory
File#: 39.1	COMP SCI 5800: Distributed Computing
File#: 2494.1	EDUC 2203: Problems of Teaching Mathematics
File#: 2555.1	ELEC ENG 3400: Continuous Linear Systems
File#: 2556.1	ELEC ENG 3401: Continuous Linear Systems Laboratory
File#: 2388.1	ELEC ENG 3420: Communication Systems
File#: 4377	EXP ENG 5711: Explosives in Industry
File#: 4378	EXP ENG 5721: Specialty Uses of Energetic Materials
File#: 4379	EXP ENG 5914: Explosives Manufacturing
File#: 4118.4	NUC ENG 5257: Introduction to Nuclear Thermal Hydraulics
File#: 411.1	NUC ENG 6257: Advanced Nuclear Thermal Hydraulics

Review of submitted Degree Change forms:

File# 150.44	CH ENG-BS: Chemical Engineering BS
File# 64.21	GL&GPH-BS: Geology and Geophysics BS
File#: 157.17	HIST-BA: History BA
File#: 104.9	NU ENG-BS: Nuclear Engineering BS
File# 233.3	PHIL-BS: Philosophy BS

Review of submitted Experimental Course forms:

File# 4380	NUC ENG 6001.001: Advanced Interactions
File# 4386	PET ENG 6001.003: Advanced Directional Drilling and MWD
File# 4387	PET ENG 6001.004: Advanced Petroleum Offshore Technology

Review of Tabled Items:

File#:4342	ART 3100: Innovation Through Design Thinking
File#:4319	MIN ENG 6742: Integrating the National Environmental Policy Act and Project Management

Course Inventory Change Request

Date Submitted: 11/15/16 11:20 am

Viewing: **BIO SCI 1201 : Biological Sciences Freshman Seminar ~~Introduction To Biological Science~~**

File: 216.1

Last edit: 12/05/16 2:35 pm

Changes proposed by: shannonk

Programs referencing this course	BIO SC-BA: Biological Sciences BA BIO SC-BS: Biological Sciences BS CMP SC-BS: Computer Science BS
Other Courses referencing this course	In The Prerequisites: BIO SCI 2242 : Cave Biology
Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Biological Sciences
Discipline	Biological Sciences (BIO SCI)
Course Number	1201
Title	**Biological Sciences Freshman Seminar** ~~Introduction To Biological Science~~
Abbreviated Course Title	**Bio Sci Freshman Seminar** ~~Intro To Biological Sci~~
Catalog Description	

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. lshelton
11. Peoplesoft

Approval Path

1. 11/15/16 10:02 pm
   David Westenberg (djwesten): Approved for RBIOLSCI Chair
2. 12/01/16 3:42 pm
   Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/13/16 1:35 pm

Ilene Morgan (imorgan): Approved for Sciences DSCC Chair

4. 12/16/16 2:20 pm Kristy Giacomelli (kristyg): Approved for Pending CCC Agenda post

An introduction to the study of biology at Missouri S&T. Students will consider personal and professional opportunities within the various areas of biology and become acquainted with Biological Sciences faculty and departmental and campus facilities. Required of freshman Biological Sciences majors.

Prerequisites	**Biological Sciences majors only.**				
Field Trip Statement					
Credit Hours	LEC: **0** ~~1~~	LAB: 0	IND: 0	RSD: **1** ~~0~~	Total: 1
Required for Majors	**Yes** ~~No~~				
Elective for Majors	No				

Justification for change:	The course title is confusing, students often think it is an Introductory Biology course rather than an Introduction to the Department and campus. It is a seminar, not a lecture. It needs to be a majors only course, as seniors from other departments are registering for this course for a one hour easy A, which is not the purpose of this course
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**imorgan (12/05/16 2:35 pm):** Changed effective date to FS 2017 and put a period at the end of the prerequisite.

Key: 216
Preview Bridge

Course Inventory Change Request

Date Submitted: 11/03/16 3:15 pm

Viewing: **BIO SCI 2243 : Sleep: Function and Dysfunction**

File: 4141.1

Last approved: 12/01/14 3:49 am

Last edit: 12/05/16 3:12 pm

Changes proposed by: thimgan

Requested Effective Change Date	**Fall 2017** ~~01/13/2015~~
Department	Biological Sciences
Discipline	Biological Sciences (BIO SCI)
Course Number	2243
Title	Sleep: Function and Dysfunction
Abbreviated Course Title	Sleep and Behavior
Catalog Description	

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. lshelton
11. Peoplesoft

Approval Path

1. 11/03/16 11:00 pm David Westenberg (djwesten): Approved for RBIOLSCI Chair
2. 11/08/16 1:38 pm Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 12/13/16 1:36 pm

Ilene Morgan (imorgan): Approved for Sciences DSCC Chair

History

1. Dec 1, 2014 by kleb6b

Students will learn the genes, proteins, and anatomy that govern sleep regulation. The course will also cover how sleep deprivation changes the body and degrades health and performance as well as sleep disorders that may disrupt sleep.

Prerequisites	Bio Sci **1113 or Bio Sci** 1213.				
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:	Adding Bio Sci 1113 as a prerequisite to Bio Sci 1213 is sensible because these courses cover similar material and both are introductory biological courses that will prepare students for this course. In addition, many students that transfer into our department are given introductory credit as Bio 1113. These students are clearly qualified to take this class and limiting prerequisites to Bio Sci 1213 does not make sense.
Semesters previously offered as an experimental course	Sp 2013, Sp 2014
Co-Listed Courses:	

Course Reviewer	**imorgan (12/05/16 3:12 pm):** Changed effective date from SP 2017 to FS 2017.

Comments

Key: 4141

Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 04/08/16 11:43 am

Viewing: **CHEM ENG 3131 : Separations in Chemical and Biochemical Engineering**

File: 4282

Last edit: 12/07/16 11:22 am

Changes proposed by: forcinit

Programs referencing this course	CH ENG-BS: Chemical Engineering BS
Other Courses referencing this course	In The Prerequisites: CHEM ENG 4091 : Chemical Process Design I CHEM ENG 4110 : Chemical Engineering Process Dynamics And Control CHEM ENG 4130 : Chemical Engineering Laboratory II CHEM ENG 5250 : Isolation and Purification of Biologicals

Requested Effective Change Date	Fall 2017
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	3131
Title	Separations in Chemical and Biochemical Engineering
Abbreviated Course Title	Biochemical Separations
Catalog Description	

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. lshelton
11. Peoplesoft

Approval Path

1. 04/08/16 2:15 pm Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/08/16 2:18 pm kleb6b: Approved for CCC Secretary
3. 04/27/16 4:25 pm sraper: Approved for Engineering DSCC Chair

4. 07/14/16 9:27 am kleb6b: Approved for Pending CCC Agenda post
5. 08/16/16 10:05 am Shauntae Ellis (smetg6): Rollback to CCC Secretary for CCC Meeting Agenda
6. 12/01/16 3:46 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
7. 12/07/16 11:22 am sraper: Approved for Engineering DSCC Chair

Flash and column distillation. McCabe-Thiele method, plate efficiencies. Azeotropes. Batch distillation. Absorption and stripping. Washing and leaching.

Prerequisites	Chem Eng 3101, Chem Eng 3111 and Chem Eng 3120. Admitted to the Chemical Engineering Program.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				
Elective for Majors	No				

Justification for new course:	See attached DC form. When I submitted this form in December I forgot to add 3111 as a prerequisite.
Semesters	

previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**kleb6b (04/08/16 9:15 am):** Rollback: Rollback **smetg6 (08/16/16 10:05 am):** Rollback: Tabled pending degree program **sraper (12/07/16 11:22 am):** changed effective date and abbreviated course description.

Key: 4282
Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 04/08/16 11:45 am

Viewing: **CHEM ENG 4091 : Chemical Process Design I**

File: 4285

Last edit: 12/07/16 11:24 am

Changes proposed by: forcinit

Programs referencing this course	CH ENG-BS: Chemical Engineering BS
Other Courses referencing this course	In The Prerequisites: CHEM ENG 4097 : Chemical Process Design II
Requested Effective Change Date	Fall 2017
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	4091
Title	Chemical Process Design I
Abbreviated Course Title	Chem Process Design I
Catalog Description	

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. lshelton
11. Peoplesoft

Approval Path

1. 04/08/16 2:15 pm Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/08/16 2:19 pm kleb6b: Approved for CCC Secretary
3. 04/27/16 4:25 pm sraper: Approved for Engineering DSCC Chair

4. 07/14/16 9:29 am kleb6b: Approved for Pending CCC Agenda post
5. 08/16/16 10:05 am Shauntae Ellis (smetg6): Rollback to CCC Secretary for CCC Meeting Agenda
6. 12/01/16 3:46 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
7. 12/07/16 11:24 am sraper: Approved for Engineering DSCC Chair

Economic analysis of a chemical process including capital requirements, operating costs, earnings, and profits. The economic balance is applied to chemical engineering operations and processes. Optimization and scheduling techniques are applied to process evaluation. Preliminary process design and use of simulation software.

Prerequisites	Either (Chem Eng 3150, Chem Eng 3131 and Chem Eng 3141) or (Chem Eng 3150 and preceded or accompanied by Chem Eng 5250).				
Field Trip Statement					
Credit Hours	LEC: 1	LAB: 2	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				
Elective for Majors	No				

Justification for new course:	See attached DC form. I changed the title of the course to make it consistent with our Chemical Process Design 2 course

Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**kleb6b (04/08/16 9:16 am):** Rollback: Rollback **smetg6 (08/16/16 10:05 am):** Rollback: Tabled pending degree program **sraper (12/07/16 11:24 am):** Changed effective date, modified abbreviated course description, edit to description.

Key: 4285
Preview Bridge

Course Inventory Change Request

Date Submitted: 04/08/16 11:51 am

Viewing: **CHEM ENG 4097 : Chemical Process Design II**

File: 862.4

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

Last edit: 12/08/16 1:45 pm

Changes proposed by: forcinit

Programs referencing this course	CH ENG-BS: Chemical Engineering BS
Requested Effective Change Date	**01/17/2017** ~~Fall 2015~~
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	4097
Title	Chemical Process Design **II**
Abbreviated Course Title	**Chem** Process Design **II**
Catalog Description	

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. lshelton
11. Peoplesoft

Approval Path

1. 04/08/16 2:15 pm Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/08/16 2:19 pm kleb6b: Approved for CCC Secretary
3. 04/27/16 4:25 pm sraper: Approved for Engineering DSCC Chair

4. 07/14/16 9:30 am kleb6b: Approved for Pending CCC Agenda post
5. 08/16/16 10:06 am Shauntae Ellis (smetg6): Rollback to CCC Secretary for CCC Meeting Agenda
6. 12/01/16 3:46 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
7. 12/08/16 1:45 pm sraper: Approved for Engineering DSCC Chair

History

1. May 4, 2015 by luksc (862.1)

Engineering principles involved in the design and layout of chemical process equipment. Material and energy balances, equipment selection and design, and preconstruction cost estimation are performed for a capstone design project. Communication emphasized course.

Prerequisites	Chem Eng 3130 and Chem Eng 3150; preceded or accompanied by **both** Chem Eng 4110 and Chem Eng **4096 or Chem Eng 4091.** ~~4096.~~				
Field Trip Statement					
Credit Hours	LEC: 1	LAB: 2	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				
Elective for	No				

Majors	
Justification for change:	The new prerequisite is needed to reflect the proposed new curriculum (See attached DC form). I changed the punctuation of the prerequisites to make them more clear.
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**kleb6b (12/23/15 1:38 pm):** Might want to clarify this prereq? **kleb6b (04/08/16 9:16 am):** Rollback: Rollback **smetg6 (08/16/16 10:06 am):** Changed to Spring 2017 **smetg6 (08/16/16 10:06 am):** Rollback: Rollback until Chem Process Design I is also in catalog **sraper (12/07/16 11:41 am):** Is spring term 17 appropriate? will bring notes to CCC meeting. Changed abbreviated title. **sraper (12/08/16 1:45 pm):** Awaiting clarification on prereqs. From Chem Eng: intent of prereq: must have Chem 3130 and 3150, and preceded or accompanied by either the combination of 4110 and 4096, or only chem Eng 4091.

Key: 862
Preview Bridge

Course Inventory Change Request

Date Submitted: 11/07/16 10:10 am

Viewing: **COMP ENG 5420 : Introduction to Network Security**

File: 2460.4

Last approved: 02/09/15 3:18 am

Last edit: 11/07/16 10:10 am

Changes proposed by: stanleyj

Catalog Pages referencing this course	Systems Engineering
Programs referencing this course	CP ENG-BS: Computer Engineering BS
Other Courses referencing this course	In The Prerequisites: COMP ENG 6420 : Wireless Ad hoc and Sensor Networks COMP ENG 6510 : Resilient Networks COMP SCI 6605 : Advanced Network Security ELEC ENG 6430 : Wireless Ad hoc and Sensor Networks SYS ENG 6322 : Resilient Networks SYS ENG 6324 : Wireless Ad hoc and Sensor Networks
Requested Effective Change Date	Fall **2017** ~~2015~~
Department	Electrical and Computer Engineering
Discipline	Computer Engineering (COMP ENG)
Course Number	5420
Title	Introduction to Network Security

In Workflow

1. **RELECENG 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. lshelton
11. Peoplesoft

Approval Path

1. 11/07/16 10:52 am
   Daryl Beetner (daryl): Approved for RELECENG Chair
2. 11/08/16 1:40 pm
   Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 12/07/16 11:33 am

Abbreviated Course Title	Intro Network Security
Catalog Description	

sraper: Approved for Engineering DSCC Chair

History

1. Feb 9, 2015 by stanleyj (2460.1)

This course examines basic issues in network management, testing, and security; it also discusses key encryption, key management, authentication, intrusion detection, malicious attack, and insider threats. Security of electronic mail and electronic commerce systems is also presented.

Prerequisites	Comp Eng 5410 or Comp Sci **5600.** ~~4601.~~				
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:	Comp Sci 4601 has not been offered for several years in the Computer Science department, and it appears that the course will not be offered any time soon. Comp Sci 5600 is really the more appropriate prerequisite course and is recognized in the Comp Eng program as an equivalent course to Comp Eng 5410. Comp Sci 5600 is consistently offered in the Computer Science department and, is thus, an appropriate prerequisite for Comp Eng 5420.
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	

Key: 2460
Preview Bridge

Course Inventory Change Request

Date Submitted: 11/16/16 10:29 am

Viewing: COMP SCI 1575 ~~1510~~ : Data Structures

File: 1521.1

Last edit: 11/16/16 10:29 am

Changes proposed by: tauritzd

Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	**1575** ~~1510~~
Title	Data Structures
Abbreviated Course Title	Data Structures
Catalog Description	

In Workflow

1. **RCOMPSCI 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. lshelton
11. Peoplesoft

Approval Path

1. 11/18/16 3:03 pm Sajal Das (sdas): Approved for RCOMPSCI Chair
2. 12/01/16 3:42 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:20 am sraper: Approved for Engineering

DSCC Chair

A continuation of **Object-Oriented Programming, with emphasis on** the **efficient organization** ~~development~~ of **data through Abstract Data Types** ~~structured programming concepts~~ and **Data Structures.** ~~their use in program development.~~ **Topics include Linked Lists, Vectors,** Stacks, **Queues, Trees, Hash Tables, Graphs** ~~queues, linked list, arrays, trees, sorting~~ and ~~searching will be taught together with~~ their use in ~~implementations of~~ a **variety of** ~~number of~~ algorithms. **Recursive programming techniques are also covered. This course is programming intensive.**

Prerequisites	Grade of "C" or better in Comp Sci 1570.				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	**Yes** ~~No~~				
Elective for Majors	No				

Justification for change:	The proposed course number change will make it consistent with the department's overall course numbering scheme. The proposed catalog description brings it up to date with current practice.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	

Key: 1521
Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 11/16/16 10:31 am

Viewing: **COMP SCI 1585 : Data Structures Laboratory**

File: 4367

Last edit: 11/16/16 10:31 am

Changes proposed by: tauritzd

Requested Effective Change Date	Fall 2017
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	1585
Title	Data Structures Laboratory
Abbreviated Course Title	Data Structures Lab
Catalog Description	

In Workflow

1. **RCOMPSCI 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. lshelton
11. Peoplesoft

Approval Path

1. 11/18/16 3:03 pm Sajal Das (sdas): Approved for RCOMPSCI Chair
2. 12/01/16 3:42 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:21 am sraper: Approved for Engineering

DSCC Chair

Hands-on instruction in programming development tools such as version control systems, integrated development environments, debuggers, profilers, and event-based programming environments. Exercises will complement the concepts presented in COMP SCI 1575.

Prerequisites	Preceded or accompanied by COMP SCI 1575.				
Field Trip Statement					
Credit Hours	LEC: 0	LAB: 1	IND: 0	RSD: 0	Total: 1
Required for Majors	Yes				
Elective for Majors	No				

Justification for new course:	This lab addresses a weakness identified by ABET in preparing our students to connect to application domains and use modern development methods. It has successfully run twice as an experimental course, so now we're requesting to make it permanent.
Semesters previously offered as an experimental course	SP2016, FS2016
Co-Listed Courses:	

Course Reviewer Comments

Key: 4367
Preview Bridge

Course Inventory Change Request

Date Submitted: 11/14/16 6:10 pm

Viewing: **COMP SCI 5800 : Distributed Computing ~~Operating Systems~~**

File: 39.1

Last edit: 11/14/16 6:10 pm

Changes proposed by: tauritzd

Other Courses referencing this course	In The Prerequisites: COMP SCI 6304 : Cloud Computing and Big Data Management COMP SCI 6800 : Distributed Systems Theory And Analysis
Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	5800
Title	Distributed **Computing** ~~Operating Systems~~
Abbreviated Course Title	**Distributed Computing** ~~Dist~~ ~~Operating Systems~~
Catalog Description	

In Workflow

1. **RCOMPSCI 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. lshelton
11. Peoplesoft

Approval Path

1. 11/14/16 8:28 pm Sajal Das (sdas): Approved for RCOMPSCI Chair
2. 12/01/16 3:41 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:27 am sraper: Approved for Engineering

DSCC Chair

This is **an introduction to the fundamentals** ~~a study~~ of ~~modern operating systems, particularly~~ distributed **computing.** ~~operating systems.~~ Topics include a review of **communication between** ~~network systems and interprocess communication, causality,~~ distributed **processes, causality, distributed** state maintenance, failure detection, reconfiguration and recovery, ~~load balancing, distributed file systems,~~ distributed mutual exclusion, **clock synchronization, and leader election.** ~~and stable property detection including deadlock detection.~~ **Students will implement select course concepts.** ~~A group project in Distributed Systems programming will be required.~~

Prerequisites	A "C" or better grade in both Comp Sci 3800 and Comp Sci 2500.				
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:	Over the years, the emphasis of this course has shifted from distributed operating systems to more general distributed systems, which is reflected by the proposed modified title & course description.
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	

Key: 39
Preview Bridge

Course Inventory Change Request

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

Viewing: **EDUC 2203 : Problems Of Teaching Mathematics**

File: 2494.1

Last edit: 12/12/16 12:05 pm

Changes proposed by: dewittp

Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Arts, Languages, & Philosophy
Discipline	Education (EDUC)
Course Number	2203
Title	Problems Of Teaching Mathematics
Abbreviated Course Title	Probs Of Teaching Math
Catalog Description	

In Workflow

1. **RPHILOSO Chair**
2. **CCC Secretary**
3. **Arts & Humanities 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. lshelton
11. Peoplesoft

Approval Path

1. 12/12/16 1:20 pm Audra Merfeld-Langston (audram): Approved for RPHILOSO Chair
2. 12/16/16 11:19 am Kristy Giacomelli (kristyg): Approved for CCC Secretary

3. 12/16/16 12:34 pm
Petra Dewitt (dewittp): Approved for Arts & Humanities
DSCC Chair

A study of current methodologies for teaching in area of specialization.

Prerequisites					
Field Trip Statement					
Credit Hours	LEC: **3** ~~2~~	LAB: 0	IND: 0	RSD: 0	Total: **3** ~~2~~
Required for Majors	No				
Elective for Majors	No				

Justification for change:	New DESE requirements turn this course into a three hour, not two hour, lecture course.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	

Key: 2494
Preview Bridge

Course Inventory Change Request

A deleted record cannot be edited

Course Deactivation Proposal

Date Submitted: 10/19/16 3:56 pm

Viewing: **ELEC ENG 3400 : Continuous Linear Systems**

File: 2555.1

Last edit: 10/19/16 3:56 pm

Changes proposed by: martins

Other Courses referencing this course	In The Prerequisites: COMP ENG 5450 : Digital Image Processing COMP ENG 5460 : Machine Vision COMP ENG 5610 : Real-Time Digital Signal Processing ELEC ENG 3401 : Continuous Linear Systems Laboratory ELEC ENG 3420 : Communication Systems ELEC ENG 5170 : Introduction To Circuit Synthesis ELEC ENG 5210 : Fourier Optics ELEC ENG 5450 : Digital Image Processing ELEC ENG 5460 : Machine Vision ELEC ENG 5600 : Interference Control in Electronic Systems PHYSICS 5503 : Fourier Optics
Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Electrical and Computer Engineering
Discipline	Electrical Engineering (ELEC ENG)
Course Number	3400
Title	Continuous Linear Systems
Abbreviated Course Title	Continuous Linear Systems

In Workflow

1. **RELECENG 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. lshelton
11. Peoplesoft

Approval Path

1. 11/07/16 2:17 pm Daryl Beetner (daryl): Approved for RELECENG Chair
2. 11/08/16 1:40 pm Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 12/07/16 11:32 am

Catalog Description	sraper: Approved for Engineering DSCC Chair

Analysis methods for continuous-time signals and systems in the time and frequency domains including signal models, Fourier transforms, and Lalace transforms. Examples of control and communication systems are included.

Prerequisites	Math 3304 with a grade of "C" or better; Elec Eng 2120 with a grade of "C" or better; passing the Elec Eng Advancement Exam II.				
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:	This course will be taught for the last time FS 2016. The EE Undergraduate Curriculum Committee approved that this course to not be taught and deleted from catalog December 12, 2013. A motion was made at the ECE Department Faculty Meeting on December 12, 2013 and approved.
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	

Key: 2555
Preview Bridge

Course Inventory Change Request

A deleted record cannot be edited

Course Deactivation Proposal

Date Submitted: 10/19/16 4:04 pm

Viewing: **ELEC ENG 3401 : Continuous Linear Systems Laboratory**

File: 2556.1

Last edit: 10/19/16 4:04 pm

Changes proposed by: martins

Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Electrical and Computer Engineering
Discipline	Electrical Engineering (ELEC ENG)
Course Number	3401
Title	Continuous Linear Systems Laboratory
Abbreviated Course Title	Continuous Linear Systs Lab
Catalog Description	

In Workflow

1. **RELECENG 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. lshelton
11. Peoplesoft

Approval Path

1. 11/07/16 2:17 pm Daryl Beetner (daryl): Approved for RELECENG Chair
2. 11/08/16 1:40 pm Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 12/07/16 11:41 am

sraper: Approved for Engineering DSCC Chair

Laboratory and software tools for the analysis of linear and non-linear systems.
Topics include spectral analysis, transforms, and applications.

Prerequisites	Math 3304 with a grade of "C" or better; Elec Eng 2120 with a grade of "C" or better; passing the Elec Eng Advancement Exam II. Preceded or accompanied by Elec Eng 3400.				
Field Trip Statement					
Credit Hours	LEC: 0	LAB: 1	IND: 0	RSD: 0	Total: 1
Required for Majors	No				
Elective for Majors	No				

Justification for change:	This lab course will be taught for the last time FS 2016. The EE Undergraduate Curriculum Committee approved that this course to not be taught and deleted from the catalog on December 12, 2013. A motion was made at the ECE Department Faculty Meeting on December 12, 2013 and approved.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments

Key: 2556
Preview Bridge

Course Inventory Change Request

A deleted record cannot be edited

Course Deactivation Proposal

Date Submitted: 10/19/16 4:09 pm

Viewing: **ELEC ENG 3420 : Communication Systems**

File: 2388.1

Last edit: 10/19/16 4:09 pm

Changes proposed by: martins

Other Courses referencing this course	In The Prerequisites: COMP ENG 5430 : Wireless Networks COMP ENG 5450 : Digital Image Processing COMP ENG 5460 : Machine Vision ELEC ENG 4096 : Electrical Engineering Senior Project I ELEC ENG 5120 : Communication Circuits ELEC ENG 5400 : Digital Signal Processing II ELEC ENG 5420 : Communications Systems II ELEC ENG 5430 : Wireless Networks ELEC ENG 5450 : Digital Image Processing ELEC ENG 5460 : Machine Vision SYS ENG 5323 : Wireless Networks
Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Electrical and Computer Engineering
Discipline	Electrical Engineering (ELEC ENG)
Course Number	3420
Title	Communication Systems
Abbreviated Course Title	Communication Systems

In Workflow

1. **RELECENG 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. lshelton
11. Peoplesoft

Approval Path

1. 11/07/16 2:18 pm Daryl Beetner (daryl): Approved for RELECENG Chair
2. 11/08/16 1:41 pm Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 12/07/16 11:21 am

Catalog Description	sraper: Approved for Engineering DSCC Chair

Signals and their spectra; signal filtering; amplitude, angle and pulse modulation; multiplexing; noise in communications systems.

Prerequisites	Elec Eng 3400 with a grade of "C" or better.				
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:	This course was taught for the last time SP 2016. The EE Undergraduate Curriculum Committee approved that this course to not be taught and deleted from the catalog on December 12, 2013. A motion was made at the ECE Department Faculty Meeting on December 12, 2013 and approved.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments

Key: 2388
Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 11/29/16 8:58 am

Viewing: **EXP ENG 5711 : Explosives in Industry**

File: 4377

Last edit: 12/07/16 11:47 am

Changes proposed by: kapqh4

Requested Effective Change Date	Fall 2017
Department	Mining & Nuclear Engineering
Discipline	Explosives Engineering (EXP ENG)
Course Number	5711
Title	Explosives in Industry
Abbreviated Course Title	Explosives in Industry

Catalog Description

In Workflow

1. **RMINNUCL 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. lshelton
11. Peoplesoft

Approval Path

1. 11/29/16 9:01 am Braden lusk (blusk): Approved for RMINNUCL Chair
2. 12/01/16 3:44 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:47 am sraper: Approved

for Engineering
DSCC Chair

Overview of how explosives are applied in various industrial settings. Focus is placed on the general application, identification, and necessity of explosives in industry. Topics include explosive use in surface and underground mining, road development, construction, utility placement, demolition, oil, gas, and underwater.

Prerequisites					
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				
Elective for Majors	Yes				

Justification for new course:	One of three courses added to accommodate a request from the ATF (Bureau of Alcohol, Tobacco, Firearms, and Explosives), our major client, who is planning on adding 60+ additional students. This course is included in a list of courses of which one is required.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (12/07/16 11:47 am):** Approved, but this would currently violate policy. Program will provide information for next meeting if a waiver can be approved.

Key: 4377
Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 11/29/16 8:59 am

Viewing: **EXP ENG 5721 : Specialty Uses of Energetic Materials**

File: 4378

Last edit: 12/07/16 11:48 am

Changes proposed by: kapqh4

Requested Effective Change Date	Fall 2017
Department	Mining & Nuclear Engineering
Discipline	Explosives Engineering (EXP ENG)
Course Number	5721
Title	Specialty Uses of Energetic Materials
Abbreviated Course Title	Specialty Uses

Catalog Description

In Workflow

1. **RMINNUCL 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. lshelton
11. Peoplesoft

Approval Path

1. 11/29/16 9:01 am Braden lusk (blusk): Approved for RMINNUCL Chair
2. 12/01/16 3:43 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:48 am sraper: Approved

for Engineering
DSCC Chair

Overview of special, less common uses of energetic materials and how they can be applied as a functional tool. Topics include the use of energetics in aerospace, explosive ordnance, oil field development, welding, pyrotechnics, theatrics, and cinematic special effects.

Prerequisites					
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				
Elective for Majors	Yes				

Justification for new course:	One of three courses added to accommodate a request from the ATF (Bureau of Alcohol, Tobacco, Firearms, and Explosives), our major client, who is planning on adding 60+ additional students. This course is included in a list of courses of which one is required.
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**sraper (12/07/16 11:48 am):** Approved, but this would currently violate policy. Program will provide information for next meeting if a waiver can be approved.

Key: 4378
Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 11/29/16 8:59 am

Viewing: **EXP ENG 5914 : Explosives Manufacturing**

File: 4379

Last edit: 12/07/16 11:48 am

Changes proposed by: kapqh4

Requested Effective Change Date	Fall 2017
Department	Mining & Nuclear Engineering
Discipline	Explosives Engineering (EXP ENG)
Course Number	5914
Title	Explosives Manufacturing
Abbreviated Course Title	Explosives Manufacturing

Catalog Description

In Workflow

1. **RMINNUCL 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. lshelton
11. Peoplesoft

Approval Path

1. 11/29/16 9:01 am Braden lusk (blusk): Approved for RMINNUCL Chair
2. 12/01/16 3:43 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:48 am sraper: Approved

for Engineering
DSCC Chair

History of industrial explosives from discovery to what is used today. Manufacturing processes for packaged and bulk explosives are explored along with specialty explosives such as detonating cord, cast boosters, detonators, shaped charges, and commercial fireworks. Field manufacturing of explosives by mixing or gassing is also covered.

Prerequisites					
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				
Elective for Majors	Yes				

Justification for new course:	One of three courses added to accommodate a request from the ATF (Bureau of Alcohol, Tobacco, Firearms, and Explosives), our major client, who is planning on adding 60+ additional students. This course is included in a list of courses of which one is required.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (12/07/16 11:48 am):** Approved, but this would currently violate policy. Program will provide information for next meeting if a waiver can be approved.

Key: 4379
Preview Bridge

Course Inventory Change Request

Date Submitted: 10/11/16 4:28 pm

Viewing: **NUC ENG 5257 : Introduction to Nuclear Thermal Hydraulics**

File: 4118.4

Last approved: 02/09/15 3:18 am

Last edit: 12/07/16 11:46 am

Changes proposed by: schlegelj

Requested Effective Change Date	Fall **2017** ~~2015~~
Department	Mining & Nuclear Engineering
Discipline	Nuclear Engineering (NUC ENG)
Course Number	5257
Title	Introduction to Nuclear Thermal Hydraulics
Abbreviated Course Title	Intro Nuclear Therm Hydr
Catalog Description	

In Workflow

1. **RMINNUCL 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. lshelton
11. Peoplesoft

Approval Path

1. 11/02/16 10:10 am
   Braden lusk (blusk): Approved for RMINNUCL Chair
2. 11/08/16 1:42 pm
   Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 12/07/16 11:46 am

sraper: Approved for Engineering DSCC Chair

History

1. Feb 9, 2015 by Joshua Schlegel (schlegelj)

An introductory course in the application of **thermal-hydraulic principles to** ~~two-phase flow in~~ energy **systems, with emphasis on nuclear energy issues.** ~~systems.~~ **Will include the development of constitutive models and applications to power systems, fluid mechanics, and heat transfer problems (including multiphase flows).** ~~Students will be acquainted with governing equations for both single-phase and two-phase fluid flow, state-of-the-art analytical methods and various two-phase flow phenomena related to energy systems.~~ Intended for graduate student enrollment.

Prerequisites					
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:	Due to faculty expansion and the ability to offer some additional graduate courses, this course and another course, NE 6207, are being slightly modified to avoid duplicated topics and present material in a more logical order.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (12/07/16 11:46 am):** current catalog states course is intended for graduate students. Should a prereq of "grad standing" be added? will verify.

Key: 4118
Preview Bridge

Course Inventory Change Request

Date Submitted: 10/11/16 4:32 pm

Viewing: **NUC ENG 6257 ~~6207~~: Advanced Nuclear Thermal Hydraulics**

File: 411.1

Last edit: 11/08/16 1:47 pm

Changes proposed by: schlegelj

Requested Effective Change Date	Fall **2017** ~~2014~~
Department	Mining & Nuclear Engineering
Discipline	Nuclear Engineering (NUC ENG)
Course Number	**6257** ~~6207~~
Title	Advanced Nuclear Thermal Hydraulics
Abbreviated Course Title	Adv Nuc Thermal Hydraulics
Catalog Description	

In Workflow

1. **RMINNUCL 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. lshelton
11. Peoplesoft

Approval Path

1. 11/02/16 10:10 am
   Braden lusk (blusk): Approved for RMINNUCL Chair
2. 12/01/16 3:46 pm
   Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:46 am

sraper: Approved for Engineering DSCC Chair

Treatment ~~Integrated treatment~~ of **advanced topics in nuclear reactor thermal-hydraulics including analysis of fuel elements** ~~thermodynamics~~ and **fuel melting, multiphase flow dynamics** ~~advanced mass, momentum~~ and **two-fluid models, interfacial transfer of mass, momentum,** ~~energy transport in solids~~ and **energy, multiphase flow scaling,** ~~fluids; velocity~~ and **numerical applications.** ~~temperature distributions in laminar and turbulent flow; flow and thermal analysis with applications to nuclear engineering systems.~~

Prerequisites	Math 5325.				
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:	The course number is being changed to align more closely with other courses in the curriculum (NUC ENG 4207 and 5207 are courses in nuclear reactor physics, while NUC ENG 4257 and 5257 are introductory courses in thermal hydraulics) The course description has been altered because, due to expansion of the faculty and the ability to teach additional courses, the content of this course and NUC ENG 5257 is being modified to avoid overlap and present material in a more logical order.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	

Key: 411
Preview Bridge

Program Change Request

Date Submitted: 04/08/16 8:40 am

Viewing: CH ENG-BS : Chemical Engineering BS

File: 150.44

Last approved: 03/07/16 2:04 pm

Last edit: 12/07/16 11:26 am

Changes proposed by: forcinit

Catalog Pages Using this Program	Chemical & Biochemical Engineering
Start Term	**Fall 2017** ~~08/22/2016~~
Program Code	CH ENG-BS
Department	Chemical and Biochemical Engineering
Title	Chemical Engineering BS

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. kristyg

Approval Path

1. 04/08/16 2:13 pm Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/08/16 2:18 pm kleb6b: Approved for CCC Secretary
3. 04/27/16 4:24 pm sraper: Approved for Engineering DSCC Chair
4. 07/14/16 10:27 am kleb6b: Approved for Pending CCC Agenda post
5. 08/16/16 10:34 am Shauntae Ellis (smetg6): Rollback to CCC Secretary for CCC Meeting Agenda
6. 12/01/16 3:45 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
7. 12/07/16 11:26 am sraper: Approved for Engineering DSCC Chair

Program Requirements and Description

Bachelor of Science
Chemical Engineering

Entering freshmen desiring to study chemical engineering will be admitted to the Freshman Engineering Program. They will be permitted, if they wish, to state a chemical engineering preference, which will be used as a consideration for available freshman departmental scholarships. The focus of the Freshman Engineering Program is on enhanced advising and career counseling, with the goal of providing to the student the information necessary to make an informed decision regarding the choice of a major.

For the bachelor of science degree in chemical engineering a minimum of 129 credit hours is required. These requirements are in addition to credit received for algebra, trigonometry and basic ROTC courses. An average of at least two grade points per credit hour must be attained. At least two grade points per credit hour must also be attained in all courses taken in chemical engineering.

Each student's program of study must contain a minimum of 21 credit hours of course work in general education and must be chosen according to the following rules:

1. All students are required to take one American history course, one economics course, one humanities course, and ENGLISH 1120. The history course is to be selected from HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200. The economics course may be either ECON 1100 or ECON 1200. The humanities course must be selected from the approved lists for art, English, foreign languages, music, philosophy, speech and

media studies, or theater.

2. Depth requirement. Three credit hours must be taken in humanities or social sciences at the 1000 level or above and must be selected from the approved list. This course must have as a prerequisite one of the humanities or social sciences courses already taken. Foreign language courses numbered 1180 will be considered to satisfy this requirement. Students may receive humanities credit for foreign language courses in their native tongue only if the course is at the 3000 level or above. All courses taken to satisfy the depth requirement must be taken after graduating from high school.
3. The remaining two courses are to be chosen from the list of approved humanities/social sciences courses and may include one communications course in addition to ENGLISH 1120.
4. Any specific departmental requirements in the general studies area must be satisfied.
5. Special topics and special problems and honors seminars are allowed only by petition to and approval by the student's department chairman.

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

History

1. Mar 18, 2014 by Lahne Black (lahne)
2. May 2, 2014 by Lahne Black (lahne)
3. Jan 30, 2015 by kleb6b
4. Jul 15, 2015 by pantaleoa
5. Jul 15, 2015 by pantaleoa
6. Nov 18, 2015 by marlene
7. Mar 7, 2016 by Daniel Forciniti (forcinit)

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
FR ENG 1100	1	MECH ENG 1720	3
CHEM 1310	4	CHEM ENG 1100, or COMP SCI 1972 ***and*** COMP SCI 1982, or COMP SCI 1971 ***and*** COMP SCI 1981	3
CHEM 1319	1	CHEM 1320	3
ENGLISH 1120	3	MATH 1215	4
HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3	PHYSICS 1135	4
MATH 1214	4		
CHEM 1100	1		
	17		17
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
CHEM ENG 2100[1]	3	CHEM ENG 2310[2]	1
CHEM 2210	4	CHEM ENG 2110[1]	3
MATH 2222	4	Humanities and Social Sciences Elective[4]	3
PHYSICS 2135	4	Humanities and Social Sciences Elective[4]	3
CHEM ENG 2300	3	MATH 3304	3
		Science Elective[5]	4
	18		17
Junior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
CHEM ENG 3120	3	CHEM ENG 3141	2
CHEM ENG 3101	4	CHEM ENG 3131	3
CHEM ENG 3111	3	CHEM ENG 3150	3
ECON 1100 or 1200	3	STAT 3113	3
Upper level Humanities or Social Science Elective[4]	3	ENGLISH 1160 or 3560	3

	16		14
Senior Year[3]			
First Semester	**Credits**	**Second Semester**	**Credits**
CHEM ENG 4110	3	CHEM ENG 4097[2]	3
CHEM ENG 5XXX-Chem Eng Elective[6]	3	CHEM ENG 5XXX-Chem Eng Elective[6]	3
CHEM ENG 4101[2]	3	CHEM ENG 4130[2]	3
CHEM ENG 4140	3	Chem Eng 5xxx --Chem Eng Elective[6]	3
CHEM ENG 4091	3	Chem Eng 5xxx -Chem Eng Elective[6]	3
	15		15
Total Credits: 129			

Note: The minimum number of hours required for a degree in chemical engineering is 129.

A cumulative grade point average of 2.50 or better and a “C” or better in Chem 1310, Chem 1319, Chem 1320, Math 1214, Math 1215 and Physics 1135 are required to be admitted into the chemical engineering major.

1	A grade of "C" or better is required in Chem Eng 2100 & Chem Eng 2110 in order to enroll in Chem Eng 3120 .
2	Communications emphasized course (See bachelor of science degree, general education communications requirement).
3	Chemical engineering majors are encouraged to take the fundamentals of engineering exam prior to graduation. It is the first step toward becoming a registered professional engineer.
4	From approved list published on the website of Undergraduate Studies. The prerequisites for the upper level course must be completed with a passing grade.
5	CHEM 2510 (Analytical Chemistry Lec 3 Lab 1) or CHEM 4610 (Biochem. Lec 3) and CHEM 4619 (Biochem Lab 2) or BIO SCI 2213 (Cell Biology Lec 3) and BIO SCI 2219 (Cell Biology Lab 1) or CHEM 2220 (Organic Chemistry II, Lect 4) and CHEM 2289 (Lab 1) or Bio Sci 3313 (Microbiology Lec 3) and Bio Sci 3319 (Microbiology Lab 2) or CHEM 3420 (Quantum Chemistry Lec 3) and CHEM 3459 (Physical Chem. Lab).
6	Any Chem Eng 5xxx and any class from the approved list published in the Chemical Engineering web site but only 3 cr. hr of Chem. Eng. 4000, Chem Eng 4099 or Chem Eng 4099. Students may have no more than three hours from approved, out-of-department elective.

Chemical Engineering
Biochemical Engineering Emphasis

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
FR ENG 1100	1	MECH ENG 1720	3
CHEM 1310	4	CHEM ENG 1100, or COMP SCI 1972 ***and*** COMP SCI 1982, or COMP SCI 1971 ***and*** COMP SCI 1981	3
CHEM 1319	1	CHEM 1320	3
ENGLISH 1120	3	MATH 1215	4
HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3	PHYSICS 1135	4
MATH 1214	4		
CHEM 1100	1		
	17		17
Sophomore Year			

First Semester	Credits	Second Semester	Credits
CHEM ENG 2100[1]	3	CHEM ENG 2110[1]	3
CHEM 2210	4	STAT 3113	3
MATH 2222	4	CHEM ENG 2310[2]	1
PHYSICS 2135	4	Science Elective[5]	4
CHEM ENG 2300	3	MATH 3304	3
	18		14

Junior Year

First Semester	Credits	Second Semester	Credits
CHEM ENG 3120	3	ECON 1100 or 1200	3
CHEM ENG 3101	4	Science Elective[5]	4
Humanities or Social Sciences Elective[4]	3	CHEM ENG 3141	2
Science Elective[5]	4	CHEM ENG 3131	3
CHEM ENG 3111	3	ENGLISH 1160 (or English 3560)	3
		CHEM ENG 3150	3
	17		18

Senior Year[3]

First Semester	Credits	Second Semester	Credits
CHEM ENG 4110	3	CHEM ENG 4210	3
Upper Levrel Humanities or Social Sciences Elective[4]	3	CHEM ENG 4097[2]	3
CHEM ENG 4091	3	Humanities or Social Science Elective[4]	3
CHEM ENG 4220[2]	3	CHEM ENG 4201[2]	3
CHEM ENG 5250	3	CHEM ENG 4241	3
	15		15
Total Credits: 131			

Note: The minimum number of hours required for a degree in chemical engineering with an emphasis in biochemical engineering is 131.

A cumulative grade point average of 2.50 or better and a “C” or better in Chem 1310, Chem 1319, Chem 1320, Math 1214, Math 1215 and Physics 1135 are required to be admitted into the chemical engineering major.

1	A grade of "C" or better is required in Chem Eng 2100 & Chem Eng 2110 in order to enroll in Chem Eng 3120.
2	Communications emphasized course (See bachelor of science degree, general education communications requirement).
3	Chemical engineering majors are encouraged to take the fundamentals of engineering exam prior to graduation. It is the first step toward becoming a registered professional engineer.
4	From approved list published on the website of Undergraduate Studies. The prerequisites for the upper level course must be completed with a passing grade.
5	A minimum of 12 credit hours in Science Electives are required. Select three courses from Chem 2220 (Organic Chemistry 2 Lec 4) , Chem 4610 (General Biochemistry Lec 3), Chem 4620 (Metabolism Lec 3), BioSci 2213 (Cell Biology Lec 3), BioSci 3313 (Microbiology Lec 3), and BioSci 4323 (Molecular Genetics Lec 3); and a minimum of two laboratory courses from Chem 2229 (Organic Chemistry 2 Lab 1) or Chem 2289 (Organic Chemistry Lab 1), Chem 4619 (General Biochemistry Lab 2), BioSci 2219 (Cell Biology Lab 1), BioSci 3319 (Microbiology Lab 2), and BioSci 4329 (Molecular Genetics Lab 2).

Justification for request	Computer Science 1972/1982 are a better match for our students' needs than Computer Science 1970/1980 The Chem. Eng. Faculty decided not to require our students to take the FE exam anymore. Chemistry 3459 is a better match for our students' needs than Chem 3419. The names of the classes in footnote 5 (emphasis program) for completeness.
Supporting Documents	~~new curriculum justification.docx~~
Course Reviewer Comments	**kleb6b (04/08/16 6:45 am):** Update effective term **kleb6b (04/08/16 8:12 am):** Rollback: Rollback **kleb6b (07/11/16 3:02 pm):** Update Effective Term **smetg6 (08/16/16 10:34 am):** Rollback: Tabled until degree program has necessary paper. Courses 3101,3141, & 4101 do not have necessary forms at this time. **sraper (12/07/16 11:26 am):** It is suggested to remove course titles in foot note 5.

Key: 150
Preview Bridge

Program Change Request

Date Submitted: 09/15/16 9:58 pm

Viewing: GL&GPH-BS : Geology and Geophysics BS

File: 64.21

Last approved: 04/24/15 3:34 pm

Last edit: 10/03/16 8:21 am

Changes proposed by: liukh

Catalog Pages Using this Program	Geology and Geophysics

Start Term	Fall **2017** ~~2015~~
Program Code	GL&GPH-BS
Department	Geosciences and Geological and Petroleum Engineering

Title

Geology and Geophysics BS

Program Requirements and Description

Bachelor of Science
Geology and Geophysics

A minimum of 127 credit hours is required for a Bachelor of Science degree in Geology and Geophysics. Students must average at least two grade points per credit hour and must obtain a letter grade of "C" or better in all Geology and Geophysics courses.

The Geology and Geophysics curriculum must include ENGLISH 1120 and ENGLISH 1160 , ECON 1100 or ECON 1200 , either HISTORY 1200 , HISTORY 1300 , HISTORY 1310 or POL SCI 1200 , and nine elective hours in humanities/social sciences. Specific requirements for the bachelor degree program are outlined in the sample program below

In Workflow

1. **RGEOSENG Chair**
2. **CCC Secretary**
3. **Sciences DSCC Chair**
4. **Engineering 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. kristyg

Approval Path

1. 09/30/16 2:32 pm Francisca Oboh-Ikuenobe (ikuenobe): Approved for RGEOSENG Chair
2. 10/03/16 8:21 am Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 11/08/16 6:24 pm Ilene Morgan (imorgan): Approved for Sciences DSCC Chair
4. 12/07/16 11:24 am sraper: Approved for Engineering DSCC Chair

History

1. May 6, 2014 by Francisca Oboh-Ikuenobe (ikuenobe)
2. Apr 24, 2015 by wronk

Freshman Year					
First Semester	**Credits**	**Second Semester**	**Credits**		
GEOLOGY 1110	3	GEOLOGY 1120[1]	3		
GEOLOGY 1119	1	GEOLOGY 1129[1]	1		
ENGLISH 1120	3	MATH 1208[2]	5		
CHEM 1310	4	Elective (Science & Eng)[3]	3		
CHEM 1319	1	Humanities/Social Science Elective	3		
CHEM 1100	1				
	13		15		
Sophomore Year					
First Semester	**Credits**	**Second Semester**	**Credits**	**Summer Semester**	**Credits**
GEOLOGY 2610	4	GEOLOGY 2620[1]	4	GEOLOGY 2096	3
GEOPHYS 3210	3	GEOLOGY 3410	3		
MATH 1221[2]	5	ENGLISH 1160 or 3560	3		
COMP SCI 1970 & COMP SCI 1980 (or COMP SCI 1971 & COMP SCI 1981)	3	ECON 1100 or 1200	3		
		HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3		
	15		16		3
Junior Year					
First Semester	**Credits**	**Second Semester**	**Credits**	**Summer Semester**	**Credits**
GEOLOGY 3310	3	GEOLOGY 3620	3	GEOLOGY 4097	3
GEOLOGY 3319	1	GEOLOGY 3629	1		
PHYSICS 1135[4]	4	PHYSICS 2135[4]	4		
STAT 3113, or 3115, or 3117, or GEO ENG 4115	3	Elective (Geo & Geop)[5]	6		
Elective (Geo & Geop)[5]	3	Humanities/Social Sciences Elective	3		
	14		17		3
Senior Year					
First Semester	**Credits**	**Second Semester**	**Credits**		
GEOLOGY 4010	1	~~GEOPHYS 4096[1]~~	~~3~~		
Humanities/Social Sciences Elective	3	GEOLOGY 4310	3		
Elective (Science & Eng)[3]	6	**GEOPHYS 5096**	**3**		
Elective (Geo & Geop)[5]	6	Elective (Science & Eng)[3]	6		
		Free Elective[6]	3		
	16		15		
Total Credits: 127					

[1] Communications Emphasized (CE) courses

2	Students may substitute MATH 1214 for MATH 1208; MATH 1215 for MATH 1221.
3	All Geology/Geophysics students must complete at least 15 hours of elective course work in science (which may include additional Geology/Geophysics courses), mathematics, and/or engineering, courses required for the basic program. 12 hours of this course work must be numbered 2000 or above.
4	Students may substitute PHYSICS 1111 and PHYSICS 1119 for PHYSICS 1135; PHYSICS 2111 and PHYSICS 2119 for PHYSICS 2135.
5	All Geology and Geophysics students must complete at least 15 hours of elective course work numbered 2000 or above in the Department of Geology and Geophysics, in addition to the required core curriculum.
6	Free elective hours may be taken in any combination of credit hours (1, 2, 3, etc.) and can include any course offerings at the University.

Core Curriculum

Taken by all students in Geology & Geophysics.		
GEOLOGY 1110	Physical And Environmental Geology	3
GEOLOGY 1119	Physical and Environmental Geology Laboratory	1
GEOLOGY 1120	Evolution Of The Earth	3
GEOLOGY 1129	Evolution of the Earth Laboratory [5]	1
GEOLOGY 2610	Mineralogy And Crystallography	4
GEOLOGY 2620	Igneous And Metamorphic Petrology	4
GEOLOGY 3310	Structural Geology	3
GEOLOGY 3319	Structural Geology Lab	1
GEOLOGY 3410	Introduction To Geochemistry	3
GEOLOGY 3620	Stratigraphy And Sedimentation	3
GEOLOGY 3629	Stratigraphy Lab	1
GEOLOGY 4010	Seminar	1
GEOLOGY 4310	Remote Sensing Technology	3
GEOLOGY 2096	Field Geology	3
GEOLOGY 4097	Advanced Field Geology	3
GEOPHYS 3210	Introduction to Geophysics	3
~~GEOPHYS 4096~~	~~Course GEOPHYS 4096 Not Found~~	~~3~~
GEOPHYS 5096	**Global Tectonics**	**3**
Total Credits		43

Geology and Geophysics Focus Areas

Geochemistry

Students should complete at least 5 courses (15 hours minimum) from the list. Students may also choose additional courses to be selected from an approval list and with guidance from student's advisor.		
GEOLOGY 3511	Introduction to Mineral Deposits	3
GEOLOGY 4451	Aqueous Geochemistry	3
GEOLOGY 4461	Isotope Geochemistry	3
GEOLOGY 4631	Advanced Igneous and Metamorphic Petrology	4
GEOLOGY 4841	Geological Field Studies	3

GEOLOGY 5611	Granites And Rhyolites	4
GEOLOGY 5671	Clay Mineralogy	3
CER ENG 2110	Atomic Structure Of Crystalline Ceramics	3
CER ENG 3220	Phase Equilibria	3

General Geology

Students should complete at least 5 courses (15 hours minimum) from the list. Students may also choose additional courses to be selected from an approval list and with guidance from student's advisor.		
GEOLOGY 3511	Introduction to Mineral Deposits	3
GEOLOGY 3631	Systematic Paleontology	3
GEOLOGY 3811	Fundamentals Of Geographic Information Systems	3
GEOLOGY 4631	Advanced Igneous and Metamorphic Petrology	4
GEOLOGY 4711	Paleoclimatology and Paleoecology	3
GEOLOGY 4841	Geological Field Studies	3
GEOLOGY 5513	Petroleum Geology	3
GEOLOGY 5611	Granites And Rhyolites	4
GEOLOGY 5741	Micropaleontology	3
GEOLOGY 6311	Advanced Structural Geology	3
GEO ENG 3175	Geomorphology And Terrain Analysis	3

Geophysics

Students must choose 1 math and 3 geophysics courses from the list. Students should also choose at least one additional course to be selected from an approved list and with guidance from student's advisor.		
MATH 2222	Calculus with Analytic Geometry III	4
MATH 3304	Elementary Differential Equations	3
MATH 3108	Linear Algebra I	3
MATH 5325	Partial Differential Equations	3
GEOPHYS 4231	Seismic Interpretation	3
GEOPHYS 5202	Exploration and Development Seismology	3
GEOPHYS 5231	Seismic Data Processing	3
GEOPHYS 5261	Computational Geophysics	3
GEOPHYS 5736	Geophysical Field Methods	3

Groundwater and Environmental Geochemistry

Students should complete at least 5 courses (15 hours minimum) from the list. Students may also choose additional courses to be selected from an approval list and with guidance from student's advisor.		
GEOLOGY 4411	Hydrogeology	3
GEOLOGY 4431	Methods Of Karst Hydrogeology	3
GEOLOGY 4451	Aqueous Geochemistry	3
GEOLOGY 4711	Paleoclimatology and Paleoecology	3
GEOPHYS 5782	Environmental and Engineering Geophysics	3

BIO SCI 1173	Introduction to Environmental Sciences	3
ENV ENG 2601	Fundamentals of Environmental Engineering and Science	3
ENV ENG 5640	Environmental Law And Regulations	3
GEO ENG 5237	Geological Aspects Of Hazardous Waste Management	3
GEO ENG 5331	Subsurface Hydrology	3

Petroleum Geology

Students should complete at least 5 courses (15 hours minimum) from the list. Students may also choose additional courses to be selected from an approval list and with guidance from student's advisor.		
GEOLOGY 3631	Systematic Paleontology	3
GEOLOGY 5311	Depositional Systems	3
GEOLOGY 5513	Petroleum Geology	3
~~GEOLOGY 5621~~	~~Course GEOLOGY 5621 Not Found~~	~~3~~
GEOLOGY 5661	**Advanced Stratigraphy and Basin Evolution**	**3**
GEOLOGY 5741	Micropaleontology	3
GEOPHYS 5202	Exploration and Development Seismology	3
PET ENG 3330	Well Logging	3

Justification for request	Geophys 4096 and Geology 5621 were renumbered to Geophys 5096 and Geology 5661.
Supporting Documents	
Course Reviewer Comments	**smetg6 (10/03/16 8:21 am):** Changed to Fall 2017

Key: 64
Preview Bridge

Program Change Request

Date Submitted: 12/09/16 10:22 am

Viewing: HIST-BA : History BA

File: 157.17

Last approved: 06/27/16 9:25 am

Last edit: 12/09/16 10:22 am

Changes proposed by: dewittp

Catalog Pages Using this Program	History
Start Term	Fall **2017** ~~2016~~
Program Code	HIST-BA
Department	History and Political Science
Title	History BA

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. kristyg

Approval Path

1. 12/09/16 10:32 am sfogg: Approved for RHISTORY Chair
2. 12/16/16 11:19 am Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/16/16 12:33 pm Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair

History

1. Aug 6, 2014 by Lahne Black (lahne)
2. Jul 21, 2015 by pantaleoa
3. Jun 27, 2016 by Petra Dewitt (dewittp)

Program Requirements and Description

Bachelor of Arts
History

(In addition to general requirements for bachelor of arts degree.)

HISTORY 1790	Introduction to History	1
HISTORY 1300	American History To 1877	3
HISTORY 1310	American History Since 1877	3
HISTORY 2790	Historiography	3
2 American History Electives		6
2 European History Electives		6

3 History Electives	9
Total Credits	31

Note: History majors are also required to complete HISTORY 1100 and HISTORY 1200 as part of the general education requirements for the B.A. In addition, 9 hours of the 31 major hours must be taken at the 3000 or 4000 level.

Note: History majors interested in graduate or professional school should take HISTORY 4097 as independent research under the guidance of a faculty member in a short period (one semester).

Note: History majors must complete an experiential learning requirement. They can meet this requirement by taking HISTORY 4085 or HISTORY 4097 or study abroad, among other options, in consultation with their advisor.

Note: Entering students will normally take ENGLISH 1120 either semester of the first year.

Secondary Education Emphasis Area

You may earn a B.A. degree in history from Missouri S&T and certification to teach in the schools of Missouri. This program may be completed in four academic years and student teaching is arranged with public schools within 30 miles of the Rolla campus.

Students interested in the certification program should consult with the advisor for history/education majors in the department of history and political science for requirements particular to those interested in this degree. Students should process a change of major form to designate history with an emphasis area of secondary education.

History students must complete **128** ~~124~~ credit hours, including the requirements of the teacher education program listed in this catalog. A minimum grade of “C” is required by the department in all history and political science courses counted towards this degree. Students must take the following courses:

Communication Skills: 9 hours		
ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
Humanities: 12 hours with at least one course from the first three areas		
Art or Music or Theater Appreciation		
Philosophy		
Literature		
Foreign Language		
ETYM 4306	Introduction To Etymology	3
Social Sciences: 18 hours		
POL SCI 1200	American Government	3
POL SCI 3763	Contemporary Political Thought	3
or POL SCI 3211	American Political Parties	
ECON 1100	Principles Of Microeconomics	3
or ECON 1200	Principles Of Macroeconomics	
PSYCH 1101	General Psychology	3
PSYCH 4600	**Social Psychology**	**3**
HISTORY 2110	World Regional Geography	3
Natural Sciences: 7 hours = 2 courses and 1 lab		
One course in Physics or Chemistry or Geology and one course in Biology		

One laboratory in any of the above science courses		
Mathematics: 3 hours		
MATH 1120	College Algebra (or higher)	3-5
or MATH 1103	Fundamentals Of Algebra	
or MATH 1140	College Algebra	
Clinical Experience: 16 hours		
EDUC 1104	Teacher Field Experience	2
EDUC 1164	Aiding Elementary, Middle And Secondary Schools	2
EDUC 4299	Student Teaching	12
Professional Requirements: 26 hours		
EDUC 1040	Perspectives In Education	2
EDUC 1174	School Organization & Adm For Elementary & Secondary Teachers	2
~~EDUC 2216~~	~~Course EDUC 2216 Not Found~~	~~3~~
ENGLISH 3170	Teaching And Supervising Reading and Writing	3
EDUC 3216	**Teaching Reading in Content Area**	**3**
EDUC 3280	Teaching Methods And Skills In The Content Areas	6
EDUC 4298	Student Teaching Seminar	1
PSYCH 2300/EDUC 2102	Educational Psychology	3
~~PSYCH 3311~~	~~Psychological & Educational Development Of The Adolescent~~	~~3~~
PSYCH 4310/EDUC 4310	Psychology Of The Exceptional Child	3
PSYCH 3310	**Developmental Psychology**	**3**
History Requirements: 37 hours		
HISTORY 1790	Introduction to History	1
HISTORY 1100	Early Western Civilization	3
HISTORY 1200	Modern Western Civilization	3
HISTORY 1300	American History To 1877	3
HISTORY 1310	American History Since 1877	3
HISTORY 2790	Historiography	3
American History Electives		6
European History Electives		6
History Electives		9

Justification for request	New Mandate from Department of Elementary and Secondary Education requires Social Psychology (4600) as added Social Science requirement and requires replacement of Adolescent Psychology (3311) with Developmental Psychology (3310). These requirements also add 3 hours to the degree.
Supporting Documents	
Course Reviewer Comments	

Key: 157
Preview Bridge

Program Change Request

Date Submitted: 04/07/16 3:31 pm

Viewing: NU ENG-BS : Nuclear Engineering BS

File: 104.9

Last approved: 07/21/15 12:11 pm

Last edit: 12/07/16 11:28 am

Changes proposed by: leehk

Catalog Pages Using this Program	Nuclear Engineering
Start Term	Fall **2017** ~~2015~~
Program Code	NU ENG-BS
Department	Mining & Nuclear Engineering
Title	Nuclear Engineering BS

In Workflow

1. **RMINNUCL 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. kristyg

Approval Path

1. 08/25/16 9:03 am Braden lusk (blusk): Approved for RMINNUCL Chair
2. 08/31/16 1:33 pm Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 09/22/16 1:54 pm sraper: Approved for Engineering DSCC Chair
4. 10/06/16 10:08 am Shauntae Ellis (smetg6): Approved for Pending CCC Agenda post
5. 11/03/16 9:39 am Shauntae Ellis (smetg6): Rollback to CCC Secretary for CCC Meeting Agenda
6. 12/01/16 3:46 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
7. 12/07/16 11:28 am sraper: Approved for Engineering DSCC Chair

Program Requirements and Description

Bachelor of Science
Nuclear Engineering

Entering freshmen desiring to study nuclear engineering will be admitted to the Freshman Engineering Program. They will, however, be permitted, to state a nuclear engineering preference, which will be used as a consideration for available departmental scholarships.

For the bachelor of science degree in nuclear engineering a minimum of 128 credit hours is required. These requirements are in addition to credit received for algebra, trigonometry, and basic ROTC courses. A student must maintain an average of at least two grade points overall and for all courses taken in nuclear engineering.

Each student's program of study must contain a minimum of 18 credit hours of course work from the humanities and the social sciences areas and should be chosen according to the following rules:

1. All students are required to take one American history course and one economics course. The history course is to be selected from HISTORY 1200, HISTORY 1300, HISTORY 1310,or POL SCI 1200. The economics course may be either ECON 1100 or ECON 1200.
2. Students must take ENGLISH 1120. Students are also required to take one humanities course to be selected from "The Approved List of Humanities and Social Science Courses for Engineering Degrees" maintained by the office of undergraduate studies.
3. Of the remaining hours, six credit hours must be taken in humanities or social sciences at the 1000 level or above and must be selected from "The Approved List of Humanities and Social Science Courses for Engineering

Degrees" maintained by the office of undergraduate studies. One of these courses must have as a prerequisite one of the humanities or social sciences courses already taken. Foreign language courses numbered 1180 can be considered to be one of these courses. (Students may receive humanities credit for foreign language courses in their native tongue only if the course is at the 4000 level.)

4. Skill courses are not allowed to meet humanities and social sciences requirements except in foreign languages. Students who select the foreign language option are urged to take more than one course.
5. Special topics, special problems courses and honors seminars are allowed only by petition to and approval by the student's department chair.

History

1. Aug 6, 2014 by Lahne Black (lahne)
2. Jul 21, 2015 by pantaleoa

The nuclear engineering program at Missouri S&T is characterized by its focus on the scientific basics of engineering and its innovative application. The necessary interrelations among the various topics, the engineering disciplines, and the other professions as they naturally come together in the solution of real world problems are emphasized as research, analysis, synthesis, and design are presented and discussed through classroom and laboratory instruction.

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
Freshman Chemistry Requirement[1]	5	Elective-Hum or Soc Sci[3]	3
ENGLISH 1120	3	HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3
FR ENG 1100	1	PHYSICS 1135	4
MATH 1214	4	MECH ENG 1720	3
NUC ENG 1105[2]	1	MATH 1215	4
	14		17
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
CIV ENG 2200	3	STAT 3111, or 3113, or 3115, or 3117	3
Elective[6]	3	ECON 1100 or 1200	3
MATH 2222	4	NUC ENG 2406	1
NUC ENG 2105	2	CIV ENG 2210	3
PHYSICS 2135	4	MATH 3304	3
		PHYSICS 2305	3
	16		16
Junior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
Elective-Hum or Soc Sci[3]	3	ENGLISH 1160 or 3560	3
COMP SCI 3200 (or any 3000-level MATH or 5000-level STAT)	3	NUC ENG 4312	3
MET ENG 2110	3	NUC ENG 3223	3
NUC ENG 3205	3	NUC ENG 4203	3
NUC ENG 3221	3	NUC ENG 4229	3
		Technical Electives-3000 or 4000 level[5]	3
	15		18
Senior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
Elective-Hum or Soc Sc[3]	3	Elective-Hum or Soc Sci[3]	3
NUC ENG 4428	2	Technical Elective-4000 level[5]	3

NUC ENG 4207	3	Free Elective[4]	6
Elective-4000 level MATH	3	NUC ENG 4438	2
NUC ENG 4496	1	NUC ENG 4497	3
NUC ENG 4241	3		
	15		17
Total Credits: 128			

Note: Minimum credit hours for graduation is 128.

1	CHEM 1310 and CHEM 1319 or CHEM 1351 and CHEM 1100 or an equivalent training program approved by Missouri S&T.
2	Nuclear Engineering students are expected to take Nuclear Technology Applications (NUC ENG 1105) during their Freshman year. However, transfer students are exempt.
3	Humanities and Social Science to be taken in accordance with the policy described above.
4	Courses which do not count towards this requirement are remedial courses such as algebra and trigonometry, physical education courses, extra credits in required courses, and basic Air Force and Army ROTC courses (courses taught in the first two years of the ROTC program).
5	Any Math, Science, or Engineering courses.
6	The programming elective consists of a lecture and lab combination, and may be selected from COMP SCI 1970 and COMP SCI 1980, or COMP SCI 1971 and COMP SCI 1981, or COMP SCI 1972 and COMP SCI 1982, or COMP SCI 1570 and COMP SCI 1580. Note that COMP SCI 1570 and COMP SCI 1580 requires one more credit hour than the other options.

Fundamentals of Engineering Exam: All nuclear engineering students must take the Fundamentals of Engineering Examination prior to graduation. A passing grade on this examination is not required to earn a B.S. degree, however, it is the first step toward becoming a registered professional engineer. This requirement is part of the Missouri S&T assessment process as described in assessment requirements found elsewhere in this catalog.

Justification for request	Comp Sci 1972 and Comp Sci 1982 are classes in Matlab programming methods, which are useful for engineering problem solving. By including these classes as alternatives to the recommended programming electives, nuclear engineering students are being provided with the opportunity to take classes relevant and useful to their degree program and engineering career.
Supporting Documents	
Course Reviewer Comments	**smetg6 (08/31/16 1:33 pm):** Changed start to Fall 2017 **sraper (09/22/16 1:54 pm):** This is a tentative approval as there were questions concerning Foot note 1 "Chem 1100 or equivalent training program. This should be discussed at the CCC meeting and whether that foot note should be modified. Email comments will be brought to the meeting. **smetg6 (11/03/16 9:39 am):** Rollback: Tabled **sraper (12/07/16 11:28 am):** Chemistry requirement of 5 hours is consistent with at least two other engineering programs. (Chem 1100 not a part of DC),

Key: 104
Preview Bridge

Program Change Request

Date Submitted: 04/25/16 3:19 pm

Viewing: PHIL-BS : Philosophy BS

File: 233.3

Last approved: 07/21/15 12:22 pm

Last edit: 10/05/16 10:00 am

Changes proposed by: dittmerj

Catalog Pages Using this Program	Philosophy
Start Term	Fall **2017** ~~2015~~
Program Code	PHIL-BS
Department	Arts, Languages, & Philosophy
Title	Philosophy BS

In Workflow

1. **RPHILOSO Chair**
2. **CCC Secretary**
3. **Arts & Humanities 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. kristyg

Approval Path

1. 08/25/16 9:01 am Audra Merfeld-Langston (audram): Approved for RPHILOSO Chair
2. 08/31/16 1:34 pm Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 08/31/16 2:00 pm Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair
4. 10/05/16 10:00 am Shauntae Ellis (smetg6): Rollback to CCC Secretary for Pending CCC Agenda post
5. 12/01/16 3:46 pm Kristy Giacomelli (kristyg): Approved for CCC Secretary
6. 12/02/16 9:41 am Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair

Program Requirements and Description

Bachelor of Science
Philosophy

A minimum of 120 credit hours is required for a bachelor of science degree in philosophy, and a grade point average of 2.0 must be obtained. These requirements for the B.S. are in addition to credit received for basic ROTC.

The B.S. in philosophy degree requires the following:

1. **ENGLISH 1120** ~~ENGLISH 1120~~ (entering students will normally take **ENGLISH 1120** ~~ENGLISH 1120~~ within their first year of study.) (3 hours)

2. Sciences. A total of 24 hours in biological, physical (chemistry, geology, and physics), and mathematical (mathematics, statistics, computer science, and information science and technology) sciences is required. A course from each of the biological and physical sciences is required. Students have to take two math or statistics courses; both must be at the level of college algebra or higher. At least one hour of lab coursework is required. Students may count up to 12 hours of engineering courses, at the discretion of the major advisor. Also, students may count up to 3 hours from the following list, but which may not be used to satisfy another requirement: History of science and technology classes (**HISTORY 2510**, **HISTORY 3510**, ~~HISTORY 2510, HISTORY 3510,~~ and **HISTORY 2530**), **PHILOS 4345**, ~~HISTORY 2530), PHILOS 4345,~~ or **PHILOS 3254** ~~PHILOS 3254~~ (24 hours)

3. Social Sciences. A total of 15 hours in social sciences is required. At least one course from two of the four areas

must be taken: economics, sociology/anthropology, history/political science, and psychology. Six (6) hours from the biological, physical, and mathematical science, as well as engineering, not already used for the science requirement, may be substituted for 3 hours of social sciences; this substitution is only permitted once, unless allowed at the discretion of the major advisor. (15 hours)

4. Humanities. A total of 12 hours in humanities other than philosophy is required. Courses may be taken in literature, foreign/modern languages, speech and media studies, art, music, or theater. Three (3) hours from history not used for the social science requirement, and not **HISTORY 1300** ~~HISTORY 1300~~ or **HISTORY 1310,** ~~HISTORY 1310,~~ may be used to fulfill this requirement. (12 hours)

5. Two (2) Communication Intensive courses are required; waiving and substitutions are at the discretion of the student's advisor.

6. Minor: A minor will be selected from any discipline other than the major with approval of the major advisor. A total of at least 15 hours is required for the minor, but may include courses which also satisfy other requirements. At least nine hours must be beyond the introductory level.

7. Basic ROTC may be elected in the freshman and sophomore years, but is not creditable toward the B.S. in philosophy degree. Six credit hours of advanced ROTC may be credited toward this degree.

8. Elective Credits: In consultation with her/his advisor, each student will elect sufficient additional courses to complete a minimum of 120 credit hours which may include **MATH 1120** ~~MATH 1120~~ or **MATH 1140** ~~MATH 1140~~ and **MATH 1160.** ~~MATH 1160.~~

9. Philosophy: A total of at least 30 hours of philosophy courses is required. This is to include **PHILOS 1105, PHILOS 1115,** ~~PHILOS 1105,~~ ~~PHILOS 1115,~~ and at least 12 hours at the 4000-level, although substitutions may be permitted at the discretion of the major advisor. All philosophy work must accumulate to at least a 2.0 grade point average.

History

1. Apr 16, 2014 by Lahne Black (lahne)
2. Oct 20, 2014 by pantaleoa
3. Jul 21, 2015 by pantaleoa

Justification for request	See attached document for requested change, as well as for justification. (Justification: The current required course is no longer offered by our faculty; suitable and more appropriate alternative courses are offered regularly.)
Supporting Documents	
Course Reviewer Comments	**smetg6 (08/31/16 1:34 pm):** Changed Start Term to Fall 2017 from 2015 **smetg6 (10/05/16 10:00 am):** Rollback: Tabled per finding attachment

Key: 233
Preview Bridge

Course Inventory Change Request

New Experimental Course Proposal

Date Submitted: 11/30/16 12:49 pm

Viewing: **NUC ENG 6001.001 : Advanced Interactions**

File: 4380

Last edit: 12/16/16 2:48 pm

Changes proposed by: grahamjose

Requested Effective Change Date	Fall 2017
Department	Mining & Nuclear Engineering
Discipline	Nuclear Engineering (NUC ENG)
Course Number	6001
Topic ID	001
Experimental Title	Advanced Interactions
Experimental Abbreviated Course Title	Adv. Int.
Instructors	Joseph Graham

Experimental Catalog Description

Introduction to classical and quantum scattering theories and their use in modeling interactions of radiations with atoms, nuclei and quasiparticles. Topics covered

In Workflow

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

Approval Path

1. 11/30/16 12:50 pm
   Braden lusk (blusk): Approved for RMINNUCL Chair
2. 12/01/16 3:45 pm
   Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/07/16 11:43 am
   sraper: Approved for Engineering DSCC Chair

include: cross sections; stopping power; scattering kernels; preparation of cross section libraries; neutron scattering and diffraction; experimental techniques.

Prerequisites	Graduate standing				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3

Justification for new course:	The interaction of radiation with atoms, nuclei and matter is fundamental to all areas of nuclear engineering. This course seeks to familiarize nuclear engineering graduate students with some of the deeper theories of scattering, nuclear reactions, and energy deposition and also teach them how to use standard computer codes to prepare usable cross section libraries from evaluated nuclear data files. These skills and pieces of knowledge will be useful in many areas of graduate student research.
Semester(s) previously taught	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (12/07/16 11:43 am):** suggested course title change to "Advanced Particle Interactions". will verify with program. added period to end of course description.

Key: 4380
Preview Bridge

Course Inventory Change Request

New Experimental Course Proposal

Date Submitted: 12/15/16 3:36 pm

Viewing: **PET ENG 6001.003 : Advanced Directional Drilling and MWD**

File: 4386

Last edit: 12/22/16 2:33 pm

Changes proposed by: caolila

Requested Effective Change Date	Spring 2017
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	6001
Topic ID	003
Experimental Title	Advanced Directional Drilling and MWD
Experimental Abbreviated Course Title	Adv Drlg Engr
Instructors	Dr. Rickey Hendrix

Experimental Catalog Description

In Workflow

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

Approval Path

1. 12/15/16 10:31 pm
   Francisca Oboh-Ikuenobe (ikuenobe): Approved for RGEOSENG Chair
2. 12/16/16 11:19 am
   Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/20/16 11:40 am
   sraper: Approved for Engineering DSCC Chair
4. 12/22/16 2:51 pm

Kristy Giacomelli (kristyg): Approved for Pending CCC Agenda post

In-depth study of directional well planning and drilling. The course covers the bottom hole assembles and operational techniques used in directional drilling as well as the limiting factors and hole problems related to horizontal wells. Advanced research topics and well design in directional drilling.

Prerequisites	PET ENG 4210				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3

Justification for new course:	No upper level graduate courses currently exist in the area of well drilling. Students have requested faculty offer such courses.
Semester(s) previously taught	
Co-Listed Courses:	
Course Reviewer Comments	

Key: 4386
Preview Bridge

Course Inventory Change Request

New Experimental Course Proposal

Date Submitted: 12/15/16 3:55 pm

Viewing: **PET ENG 6001.004 : Advanced Petroleum Offshore Technology**

File: 4387

Last edit: 12/22/16 2:34 pm

Changes proposed by: caolila

Requested Effective Change Date	Spring 2017
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	6001
Topic ID	004
Experimental Title	Advanced Petroleum Offshore Technology
Experimental Abbreviated Course Title	Adv Petr Offsh Tech
Instructors	Dr. Rickey Hendrix

Experimental Catalog Description

In Workflow

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

Approval Path

1. 12/15/16 10:31 pm
   Francisca Oboh-Ikuenobe (ikuenobe): Approved for RGEOSENG Chair
2. 12/16/16 11:20 am
   Kristy Giacomelli (kristyg): Approved for CCC Secretary
3. 12/20/16 11:40 am
   sraper: Approved for Engineering DSCC Chair
4. 12/22/16 2:51 pm

Kristy Giacomelli (kristyg): Approved for Pending CCC Agenda post

A study of factors affecting offshore structural design and operation. Focus is on mobile offshore drilling units (MODUs). Subsea well systems and offshore pipelines are covered. Advanced topics in system design.

Prerequisites	Pet Eng 4210, Civ Eng 3330, Civ Eng 2210				
Field Trip Statement					
Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Justification for new course:	No upper level graduate courses currently exist in deepwater drilling and engineering. Students have requested faculty offer such a course.				
Semester(s) previously taught					
Co-Listed Courses:					
Course Reviewer Comments					

Key: 4387
Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 10/17/16 3:33 pm

Viewing: **ART 3100 : Innovation Through Design Thinking**

File: 4342

Last edit: 11/11/16 4:45 pm

Changes proposed by: bartonch

Requested Effective Change Date	Summer 2017
Department	Arts, Languages, & Philosophy
Discipline	Art (ART)
Course Number	3100
Title	Innovation Through Design Thinking
Abbreviated Course Title	Design Thinking

Catalog Description

In Workflow

1. RPHILOSO Chair
2. CCC Secretary
3. Arts & Humanities 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. lshelton
11. Peoplesoft

Approval Path

1. 10/25/16 8:39 am Audra Merfeld-Langston (audram): Approved for RPHILOSO Chair
2. 10/25/16 4:03 pm Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 10/26/16 9:52 am

Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair

4. 11/08/16 11:58 am
Shauntae Ellis (smetg6): Approved for Pending CCC Agenda post

Design Thinking is a human-centered approach to innovation. Students will investigate and uniquely address a variety of identified problems through group collaboration, creative problem-solving, and prototyping. This course will help students gain new perspectives on life challenges.

Prerequisites	none				
Field Trip Statement					
Credit Hours	LEC: 0	LAB: 3	IND: 0	RSD: 0	Total: 3
Required for Majors	No				
Elective for Majors	No				

Justification for new course:	The course has been successful in the past as "Digital Art Through Design Thinking" and the department would like to continue to offer it with a permanent course number.
Semesters previously offered as an experimental course	Spring 2014 and Fall 2014
Co-Listed Courses:	

Course Reviewer Comments	**audram (09/24/16 8:15 am):** This sentence in the description is too vague and unclear: "This course will demonstrate a new perspective to life challenges and the possibility for intervention." Perhaps instead: "This course will help students gain new perspectives on life challenges." ?? It is unclear what the "intervention" part is. **audram (09/24/16 8:22 am):** We need to come up with a different course number other than 3001. Please consult with Irina for suggestions on course numbering. Thank you. **audram (09/24/16 8:26 am):** Rollback: Part of the course description is unclear (see my comments on the form). We will work with Laurie to make sure we understand what she wants it to say and that the description is clear. I will help you with this if you need help. **dewittp (10/26/16 9:52 am):** Updated effective date

Key: 4342
Preview Bridge

Course Inventory Change Request

New Course Proposal

Date Submitted: 10/10/16 10:08 am

Viewing: **MIN ENG 6742 : Integrating the National Environmental Policy Act and Project Management**

File: 4319

Last edit: 11/14/16 1:39 pm

Changes proposed by: smetg6

Requested Effective Change Date	Fall 2017
Department	Mining & Nuclear Engineering
Discipline	Mining Engineering (MIN ENG)
Course Number	6742
Title	Integrating the National Environmental Policy Act and Project Management
Abbreviated Course Title	Integrat NEPA with Poj

Catalog Description

In Workflow

1. **RMINNUCL 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. lshelton
11. Peoplesoft

Approval Path

1. 10/10/16 12:18 pm
   Braden lusk (blusk): Approved for RMINNUCL Chair
2. 10/10/16 1:08 pm
   Shauntae Ellis (smetg6): Approved for CCC Secretary
3. 10/18/16 4:27 pm
   sraper: Approved

for Engineering DSCC Chair
4. 11/08/16 12:57 pm Shauntae Ellis (smetg6): Approved for Pending CCC Agenda post

Any new construction projects, plant expansions or or other proposed significant activities can impact the environment, and public health and safety. Regulatory approval of a proposed action requires compliance with the National Environmental Policy Act (NEPA). The student will learn to integrate NEPA into Project Management processes.

Prerequisites	Min Eng 4742 or an equivalent course.				
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:	Requesting permanent number after two successful offerings.
Semesters previously offered as an experimental course	Offered as an experimental course SP 2015 and SP 2016
Co-Listed Courses:	

Course Reviewer Comments	**sraper (09/07/16 9:59 am):** Rollback: Current course title does not match to previous EC forms. Also, why 6000 level? What is the justification? Finally, should there be consideration for co-list given PM is in the title?

smetg6 (09/07/16 11:21 am): Rollback: Rollback per the Engineering DSCC Chairs comments

btlf7c (09/07/16 2:51 pm): Rollback: Judy See the comments below about the reason for them sending it back to me. I'm not sure of the history of this, so i can't provide documentation or justification.

smetg6 (10/10/16 1:08 pm): I was given this information as to why this course is proposed the way it is. The EC form went through with the title Mineral Industry Environmental Considerations. It was file 4136 The reason for the 6000 level was of the Request from the past Chair of the Department Dr. Samuel Frimpong Prerequisites: MIN Eng 4742 Environmental Aspects of Mining , or an equivalent course. Graduate Standing, Approval of the instructor.

kristyg (11/14/16 1:39 pm): Change to Fall 2017, it missed the Spring 2017 deadline.

Key: 4319
Preview Bridge