Campus Curricula Committee Meeting Agenda
May 8, 2019
9:00am - 10:30am, Bertelsmeyer 110H
(For Faculty Senate Meeting of June 13, 2019)

Review of submitted Course Change forms:

File: 4406.5	BUS 5230: Financial Statement Analysis
File: 4282.12	CHEM ENG 3131: Separations in Chemical and Biochemical Engineering
File: 4618	CHEM ENG 5240: Pharmaceutical Engineering
File: 998.1	CIV ENG 3330: Engineering Fluid Mechanics
File: 1992.1	CIV ENG 3334: Water Resources Engineering
File: 841.1	CIV ENG 4448: Fundamentals Of Contracts And Construction Engineering
File: 110.6	COMP SCI 1200: Discrete Mathematics for Computer Science
File: 4616	COMP SCI 1500: Computational Problem Solving
File: 468.1	COMP SCI 1570: Introduction To C++ Programming
File: 2418.1	COMP SCI 3610_Computer Networks
File: 184.4	COMP SCI 3800: Introduction to Operating Systems
File: 4619	COMP SCI 4090: Software Engineering Capstone I
File: 4620	COMP SCI 4091: Software Engineering Capstone II
File: 637.1	COMP SCI 4610_Computer Security
File: 118.3	EDUC 2102: Educational Psychology
File: 898.6	ELEC ENG 5210: Fourier Optics
File: 2566.6	FINANCE 5160: Corporate Finance II
File: 2190.8	FINANCE 5260: Investments I
File: 1781.1	GEO ENG 3249: Fundamentals Of Computer Applications In Geological Engineering
File: 1052.1	GEO ENG 5381: Intermediate Subsurface Hydrology And Contaminant Transport Mechs
File: 1532.1	MIL AIR 1110: Air Force Heritage and Values I
File: 1390.1	MIL AIR 1120: Air Force Heritage and Values II
File: 418.1	MIL AIR 2110: Team and Leadership Fundamentals I
File: 1092.1	MIL AIR 2120: Team and Leadership Fundamentals II
File: 419.1	MIL AIR 3110: Leading People & Effective Communication I
File: 1093.1	MIL AIR 3120: Leading People & Effective Communication II
File: 420.1	MIL AIR 4110: National Security, Leadership Responsibilities & Commissioning Preparation I
File: 748.1	MIL AIR 4120: National Security, Leadership Responsibilities & Commissioning Preparation II
File: 4087.3	NUC ENG 4577: Nuclear Forensics and Radiochemistry
File: 4623	NUC ENG 5577: Advanced Nuclear Forensics and Radiochemistry
File: 4189.4	PET ENG 3320: Petrophysics
File: 1045.2	PET ENG 3330: Well Logging
File: 2614.1	PET ENG 3520: Petroleum Reservoir Engineering

File: 285.1	PET ENG 4097: Petroleum Engineering Design
File: 1671.6	PET ENG 4311: Reservoir Characterization
File: 1299.1	PET ENG 4431: Well Completion Design
File: 1266.1	PET ENG 4611: Secondary Recovery Of Petroleum
File: 919.1	PET ENG 4720: Mechanical Earth Modeling
File: 2142.1	PET ENG 4811: Offshore Petroleum Technology
File: 4175.2	PET ENG 6431: Advanced Well Completion Design
File: 79.1	PET ENG 6621: Advanced Applied Reservoir Simulation

Review of submitted Degree Change forms:

File: 142.43	AP MATH-BS: Applied Mathematics BS
File: 237.20	BIOMED-MI: Biomedical Engineering Minor
File: 28.44	CMP SC-BS: Computer Science BS
File: 29.11	CMP SC-MI: Computer Science Minor
File: 161.5	CP ENG-MS: Computer Engineering MS
File: 162.2	CP ENG-PHD: Computer Engineering PhD
File: 163.5	EL ENG-MS: Electrical Engineering MS
File: 164.2	EL ENG-PHD: Electrical Engineering PhD
File: 46.11	ENG MG-MS: Engineering Management MS
File: 58.15	FINANCE-MI: Finance Minor
File: 156.24	GE ENG-BS: Geological Engineering BS
File: 64.25	GL&GPH-BS: Geology and Geophysics BS
File: 70.4	GLBLSTD-MI: Global Studies Minor
File: 108.29	PE ENG-BS: Petroleum Engineering BS
File: 115.30	PHYSIC-BS: Physics BS
File: 172.3	PHYSIC-MS: Physics MS
File: 215.1	PHYSIC-PHD: Physics PhD
File: 192.33	PSYCH-BA: Psychology BA
File: 193.29	PSYCH-BS: Psychology BS
File: 131.13	SYS EN-PHD: Systems Engineering PhD
File: 140.8	SYS ENG-MS: Systems Engineering MS

Review of submitted Experimental Course forms:

File: 4628	CHEM ENG 5001.005: AIChE Design Competition
File: 4629	CHEM ENG 5001.006: Chemical Process Modeling and Analysis
File: 4627	CHEM ENG 5001.007: Renewable Energy Processes
File: 4621	CIV ENG 5001.003: Base Courses in Pavements
File: 4596	COMP SCI 5001.003: Game Theory for Computing
File: 4598	COMP SCI 5001.004: Introduction to Virtual Reality
File: 4597	COMP SCI 6001.003: Algorithmic Game Theory

File: 4595	COMP SCI 6001.004: Introduction to Quantum Computing
File: 4622	GEOPHYS 6001.001: Advanced Geophysical Data Analysis
File: 4626	MATH 5001.002: Introduction to Finite Element Methods
File: 4625	MATH 6001.005: Discontinuous Galerkin methods for solving partial differential equations
File: 4632	MATH 6001.006: Numerical Analysis in Computational Fluid Dynamics
File: 4630	PET ENG 4001.006: Reservoir Engineering Aspects of Unconventional Oil and Gas
File: 4631	PET ENG 6001.011: Advanced Reservoir Engineering Aspects of Unconventional Oil and Gas
File: 4617	PHYSICS 6001.001: Random Processes and Wave Coherence

Course Change Request

Date Submitted: 04/13/19 5:42 pm

Viewing: **BUS 5230 : Financial Statement Analysis**

File: 4406.5

Last approved: 05/01/17 3:14 am

Last edit: 04/15/19 8:24 am

Changes proposed by: barryf

Catalog Pages referencing this course	Business Administration
Programs referencing this course	BUS&MS-BS: Business and Mgmt Systems BS FIN TCH-MI: Minor in Financial Technology (FinTech) FINANCE-MI: Finance Minor

Requested Effective Change Date	**Fall 2019** ~~08/14/2017~~
Department	Business and Information Technology
Discipline	Business (BUS)
Course Number	5230
Title	Financial Statement Analysis
Abbreviated Course Title	Financial Stmt Analysis

Catalog Description

Analysis and interpretation of financial statements for profitability analysis, credit analysis, and other business analyses that rely on financial data. Introduces emerging roles of accounting analytics. Illustrates data analytics concepts and techniques to detect earning management, predict fraud, and to provide insights into other business strategies.

Prerequisites

Finance 2150 or equivalent basic corporate finance knowledge. ~~FINANCE 2150 or Graduate Standing.~~

Field Trip Statement

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

In Workflow

1. **RBUSADMN Chair**
2. **CCC Secretary**
3. **Social 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. 04/14/19 12:51 am siauk: Approved for RBUSADMN Chair
2. 04/15/19 8:25 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 12:43 pm Barry Flachsbart (barryf): Approved for Social Sciences DSCC Chair
4. 04/18/19 9:06 am Brittany Parnell (ershenb):

Required for Majors	No
Elective for Majors	Yes

Approved for Pending CCC Agenda post

History

1. May 1, 2017 by Barry Flachsbart (barryf)

Justification for change:

Most graduate students have not come through our undergraduate program and have not taken our course on corporate finance (2150). This clarifies that the knowledge is needed, even if the specific course has not been taken. For undergrads, FIN 2150 continues to be appropriate.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments

Key: 4406

Preview Bridge

Course Change Request

Date Submitted: 03/26/19 4:59 pm

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

File: 4282.12

Last approved: 03/06/17 3:15 am

Last edit: 04/04/19 6:29 pm

Changes proposed by: jcwang

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	**Spring 2020** ~~08/14/2017~~
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	3131
Title	Separations in Chemical and Biochemical Engineering
Abbreviated Course Title	**Process** ~~Biochemical~~ Separations

Catalog Description

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

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

Approval Path

1. 04/04/19 5:09 pm Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/04/19 6:29 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 8:53 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:22 am Brittany Parnell (ershenb):

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

Approved for Pending CCC Agenda post

History

1. Jan 10, 2017 by Daniel Forciniti (forcinit)
2. Mar 6, 2017 by kristyg (4282.11)

Justification for change:

Change the abbreviated title to avoid possible confusion with another bioseparation-related course in the same department (ChE 5250).

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments

Key: 4282

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 03/06/19 2:22 pm

Viewing: **CHEM ENG 5240 : Pharmaceutical Engineering**

File: 4618

Last edit: 03/25/19 1:55 pm

Changes proposed by: baruas

Requested Effective Change Date	Fall 2019
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5240
Title	Pharmaceutical Engineering
Abbreviated Course Title	Pharm Eng

Catalog Description

The objective of studying pharmaceutical engineering is to apply the in depth knowledge of engineering principles involved in the processing of biopharmaceuticals. With the application of basic principles of process engineering, students will be able to learn the existing pharmaceutical industry practices, cutting-edge materials and emerging technologies.

Prerequisites

Instructor approval.

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:

Industrial processing of drugs and pharmaceuticals has gained significant importance in recent years. Students from diverse engineering and science

In Workflow

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9. Registrar
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11. Peoplesoft

Approval Path

1. 03/07/19 10:49 am Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 03/07/19 3:47 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 1:55 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/18/19 9:07 am Brittany Parnell (ershenb):

backgrounds will learn the principles of process engineering in drug development, drug delivery and therapeutic efficacy. This course will cover five modules on the fundamentals of pharmaceutical engineering, pharmacokinetics and drug delivery, gene technology, instrumental analysis, and modern drug delivery systems. Such a course with an integration of engineering and pharmaceutics is missing in the existing course list. Introducing this new course would benefit a number of senior undergraduate and graduate level students preparing themselves before joining pharmaceutical industries or even medical schools.

Approved for Pending CCC Agenda post

Semesters previously offered as an experimental course	SP 18, FS 18 and SP 19 Chem Eng 6001 enrollment SP 18- 3 FS 18- 1 SP 19- 0 Chem Eng 5001 enrollment SP 18- 5 FS 18- 12 SP 19- 3
Co-Listed Courses:	MS&E 5240 - Course Not Found

Course Reviewer Comments	**ershenb (03/07/19 3:46 pm):** (FYI: MS&E 5240 is being created as a co-list to CHEM ENG 5240) **sraper (03/25/19 1:55 pm):** changed prerq according to DSCC suggestion.

Key: 4618

Preview Bridge

Course Change Request

Date Submitted: 02/07/19 10:05 am

Viewing: **CIV ENG 3330 : Engineering Fluid Mechanics**

File: 998.1

Last edit: 04/18/19 9:13 am

Changes proposed by: seelyj

Programs referencing this course	PE ENG-BS: Petroleum Engineering BS AP MATH-BS: Applied Mathematics BS ARC ENG-BS: Architectural Engineering BS CV ENG-BS: Civil Engineering BS GE ENG-BS: Geological Engineering BS EV ENG-BS: Environmental Engineering BS
Other Courses referencing this course	In The Prerequisites: ARCH ENG 4800 : Principles of HVAC I CHEM ENG 6330 : Physicochemical Operations In Environmental Engineering Systems CIV ENG 3333 : Engineering Hydrology CIV ENG 3334 : Water Resources Engineering CIV ENG 3335 : Hydraulic Engineering CIV ENG 3715 : Fundamentals of Geotechnical Engineering CIV ENG 5330 : Unsteady Flow Hydraulics CIV ENG 5331 : Hydraulics Of Open Channels CIV ENG 5332 : Transport Processes in Environmental Flows CIV ENG 5333 : Intermediate Hydraulic Engineering CIV ENG 5335 : Water Infrastructure Engineering CIV ENG 5337 : River Mechanics And Sediment Transport CIV ENG 5660 : Introduction To Air Pollution CIV ENG 5662 : Air Pollution Control Methods CIV ENG 6331 : Advanced Hydraulics And Hydraulic Engineering CIV ENG 6611 : Physicochemical Operations In Environmental Engineering Systems CIV ENG 6612 : Biological Operations In Environmental Engineering Systems ENV ENG 5660 : Introduction To Air Pollution ENV ENG 5662 : Air Pollution Control Methods ENV ENG 6611 : Physicochemical Operations In Environmental Engineering Systems ENV ENG 6612 : Biological Operations In Environmental Engineering Systems GEO ENG 5320 : Groundwater Modeling GEO ENG 5381 : Intermediate Subsurface Hydrology And

In Workflow

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

Approval Path

1. 03/13/19 5:48 am Joel Burken (burken): Approved for RCIVILEN Chair
2. 03/13/19 8:05 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 1:58 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:23 am Brittany Parnell (ershenb): Approved for

	Contaminant Transport Mechs MECH ENG 5571 : Environmental Controls MECH ENG 5575 : Mechanical Systems For Environmental Control MIN ENG 5113 : Mine Atmosphere Control MIN ENG 5912 : Mine Power and Drainage PET ENG 6811 : Advanced Offshore Petroleum Technology	Pending CCC Agenda post

Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Civil, Architectural, and Environmental Engineering
Discipline	Civil Engineering (CIV ENG)
Course Number	3330
Title	Engineering Fluid Mechanics
Abbreviated Course Title	Engineering Fluid Mechanics

Catalog Description	Study of fluids at rest and in motion. Topics include fluid properties, statics of fluids, and the control volume approach to conservation of mass, momentum and energy. Applications include flow in pipes, pipe systems, external flow, and fluid flow measurements.
Prerequisites	**A grade of "C" or better in Math 3304** ~~Mech Eng 2350 or Mech Eng 2340,~~ and **in one of Mech Eng 2340, Mech Eng 2350 or Mech 2360.** ~~MATH 3304, each 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:	All three Dynamics courses will work as a prerequisite for this class.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (03/25/19 1:58 pm):** Changed prereq as suggested by DSCC member.

Key: 998

Preview Bridge

Course Change Request

Date Submitted: 02/07/19 10:08 am

Viewing: **CIV ENG 3334 : Water Resources Engineering**

File: 1992.1

Last edit: 03/25/19 1:59 pm

Changes proposed by: seelyj

Programs referencing this course	CV ENG-BS: Civil Engineering BS EV ENG-BS: Environmental Engineering BS
Other Courses referencing this course	In The Prerequisites: CIV ENG 5338 : Hydrologic Engineering

Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Civil, Architectural, and Environmental Engineering
Discipline	Civil Engineering (CIV ENG)
Course Number	3334
Title	Water Resources Engineering
Abbreviated Course Title	Water Resources Engr

Catalog Description

An introduction to the engineering of water resources; flow in closed conduits, pumps, flow in open channels, surface water hydrology, rainfall analysis, hydrograph analysis, flow routing; and ground-water hydrology.

Prerequisites

A "C" or beter grade in Civ Eng 3330 and **in one of** Stat **3111, Stat 3113, Stat 3115, or Stat 3117.** ~~3113 with grades of "C" or better.~~

Field Trip Statement

Credit Hours	LEC: 3	LAB: 1	IND: 0	RSD: 0	Total: 4
Required for Majors	No				

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

Approval Path

1. 03/13/19 5:48 am Joel Burken (burken): Approved for RCIVILEN Chair
2. 03/13/19 8:08 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 1:59 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:24 am Brittany Parnell (ershenb): Approved for

Elective for Majors	No	Pending CCC Agenda post

Justification for change:	All four 3000 level Stat classes will work as a prerequisite for this course.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (03/25/19 1:59 pm):** Change prereq as suggested by DSCC member.

Key: 1992

Preview Bridge

Course Change Request

Date Submitted: 02/07/19 11:57 am

Viewing: **CIV ENG 4448 : Fundamentals Of Contracts And Construction Engineering**

File: 841.1

Last edit: 03/25/19 2:00 pm

Changes proposed by: seelyj

Programs referencing this course	CV ENG-BS: Civil Engineering BS EV ENG-BS: Environmental Engineering BS
Other Courses referencing this course	In The Catalog Description: ARCH ENG 4448 : Fundamentals Of Contracts And Construction Engineering In The Prerequisites: ARCH ENG 4097 : Senior Design Project ARCH ENG 5448 : Green Engineering: Analysis of Constructed Facilities CIV ENG 4097 : Senior Design Project CIV ENG 5445 : Construction Methods CIV ENG 5446 : Management Of Construction Costs CIV ENG 5448 : Green Engineering: Analysis of Constructed Facilities CIV ENG 5449 : Engineering and Construction Contract Specifications ENV ENG 4097 : Senior Design Project

Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Civil, Architectural, and Environmental Engineering
Discipline	Civil Engineering (CIV ENG)
Course Number	4448
Title	Fundamentals Of Contracts And Construction Engineering
Abbreviated Course Title	Fund Contract & Const En
Catalog Description	

In Workflow

1. **RCIVILEN Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
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8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/13/19 5:48 am Joel Burken (burken): Approved for RCIVILEN Chair
2. 03/13/19 8:08 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:00 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:24 am Brittany Parnell (ershenb): Approved for

A study of the concepts and techniques used in large construction projects for the preparation of engineer service contracts, the development of a project manual, detailed and conceptual cost estimating, and construction scheduling analysis.					Pending CCC Agenda post
Prerequisites	**Junior** ~~Senior~~ Standing.				
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:	Allow students to enroll in class earlier to allow time for upper level depth in the construction area.
Semesters previously offered as an experimental course	
Co-Listed Courses:	ARCH ENG 4448 - Fundamentals Of Contracts And Construction Engineering
Course Reviewer Comments	**sraper (03/25/19 2:00 pm):** Changed to required for major. DSCC member does not like junior standing.

Key: 841

Preview Bridge

Course Change Request

Date Submitted: 04/01/19 5:33 am

Viewing: **COMP SCI 1200 : Discrete Mathematics for Computer Science**

File: 110.6

Last approved: 02/05/18 3:29 am

Last edit: 04/01/19 5:33 am

Changes proposed by: tauritzd

Programs referencing this course	CP ENG-BS: Computer Engineering BS CMP SC-BS: Computer Science BS
Other Courses referencing this course	In The Prerequisites: COMP SCI 2200 : Theory of Computer Science COMP SCI 2500 : Algorithms COMP SCI 2889 : Introduction To Computer Organization And Assembly COMP SCI 3800 : Introduction to Operating Systems COMP SCI 5300 : Database Systems MATH 5107 : Combinatorics And Graph Theory PHILOS 3254 : Symbolic Logic in Argumentation

Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	1200
Title	Discrete Mathematics for Computer Science
Abbreviated Course Title	Discrete Math For Cmp Sc
Catalog Description	**This course provides a** ~~A~~ rigorous treatment of topics from discrete mathematics which are essential to computer science. Principal topics include: formal logic (propositional & predicate), **set theory,** proof techniques, mathematical induction, program correctness, ~~sets,~~ combinatorics, **discrete** probability, relations, functions, matrices, ~~graph theory~~ and graph **theory.** ~~algorithms.~~
Prerequisites	A grade of "C" or better in **either** ~~both~~ Comp Sci **1500 or Comp Sci** 1570 and **in** one of Math 1120, Math 1140, Math 1208, **or** ~~and~~ Math 1214.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Required for Majors	Yes
Elective for Majors	No

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 3:17 pm Bruce McMillin (ff): Rollback to Initiator
2. 04/01/19 8:09 am Bruce McMillin (ff): Approved for RCOMPSCI Chair
3. 04/01/19 4:30 pm Brittany Parnell (ershenb): Approved for CCC Secretary
4. 04/15/19 10:36 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
5. 04/23/19 11:39 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

Justification for change:	Minor update of the course description, correction of the prereqs, and addition of the new course Comp Sci 1500 as alternative prereq to Comp Sci 1570.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

1. Apr 28, 2014 by lahne (110.1)
2. Feb 5, 2018 by tauritzd (110.2)

Course Reviewer Comments	**ff (03/29/19 3:17 pm):** Rollback: can you put the removal of program correctness on hold until we discuss more - this is a specific example noted by the ACM/IEEE curriculum DS/Basic Logic. Moreover, the theory measurement of student outcomes 6 for discrete math shows that students are consistently not meeting standards, so it would appear that more application, rather than less, are needed.

Key: 110

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 03/29/19 3:49 pm

Viewing: **COMP SCI 1500 : Computational Problem Solving**

File: 4616

Last edit: 03/29/19 3:49 pm

Changes proposed by: tauritzd

Programs referencing this course	CMP SC-BS: Computer Science BS CMP SC-MI: Computer Science Minor

Requested Effective Change Date	Fall 2019
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	1500
Title	Computational Problem Solving
Abbreviated Course Title	Computational Solving
Catalog Description	This course provides a rigorous introduction to computational problem solving, thinking, and debugging, for those with little-to-no experience in computer science. Language-agnostic foundations focus on pseudo-code, flowcharts, and software-based code tracing, then build to programming in a high-level interpreted language, with a focus on data and modeling.
Prerequisites	
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:	This course is part of the new BS in CS degree program being proposed (see DC form). It provides students campus-wide with a rigorous introduction to computational problem solving in a high-level programming language, and will be the prereq for the existing core CS course Comp Sci 1570. The justification for creating this new first core course in the program is three-fold, namely: (a) This program's ABET student outcome 2 as measured by the Introductory Programming rubric in CS 1570, has been failing consistently for several years, indicating that students are not grasping programming fundamentals. The new course CS1500 addresses this by providing a significant grounding in programming fundamentals before the students cover more advanced programming topics in CS1570 and more advanced data structures in CS1575.

In Workflow

1. **RCOMPSCI Chair**
2. **CCC Secretary**
3. **Engineering DSCC Chair**
4. **Pending CCC Agenda post**
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7. FS Meeting Agenda
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9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 3:15 pm Bruce McMillin (ff): Rollback to Initiator
2. 03/29/19 3:47 pm Bruce McMillin (ff): Rollback to Initiator
3. 03/29/19 3:52 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
4. 04/01/19 4:29 pm Brittany Parnell (ershenb): Approved for CCC Secretary
5. 04/15/19 10:37 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 04/23/19 11:39 am Brittany Parnell (ershenb): Approved for

	(b) Aligning this course with one of the core goals of the First Year Experience (FYE), namely to provide all FYE students with an experience reflective of what CS is really about to help them decide whether this is the right major for them. (c) Diversifying the CS student body by attracting non-traditional majors by showcasing societal impact through computational problem solving rather than ignoring societal impact by narrowly focusing on the technicalities of low-level programming.	Pending CCC Agenda post
Semesters previously offered as an experimental course	None. We're skipping experimental status as this is a required course for the new BS in CS degree program being proposed (see DC form).	
Co-Listed Courses:		

Course Reviewer Comments	**ff (03/29/19 3:15 pm):** Rollback: This needs to be justified in terms of failing measurement of ABET student outcome 2 as measured by the Introductory Programming rubric in CS 1570 for several years, consistently. **ff (03/29/19 3:47 pm):** Rollback: Missing clause in 1500 in writeup

Key: 4616

Preview Bridge

Course Change Request

Date Submitted: 03/27/19 6:38 am

Viewing: **COMP SCI 1570 : Introduction To C++ Programming**

File: 468.1

Last edit: 04/02/19 11:45 am

Changes proposed by: tauritzd

Programs referencing this course	PHYSIC-BS: Physics BS AP MATH-BS: Applied Mathematics BS CH ENG-BS: Chemical Engineering BS CP ENG-BS: Computer Engineering BS EL ENG-BS: Electrical Engineering BS PSYCH-BS: Psychology BS CMP SC-BS: Computer Science BS CMP SC-MI: Computer Science Minor MC ENG-BS: Mechanical Engineering BS
Other Courses referencing this course	In The Prerequisites: AERO ENG 5139 : Computational Fluid Dynamics AERO ENG 5449 : Robotic Manipulators and Mechanisms AERO ENG 5830 : Applied Computational Methods BIO SCI 5323 : Bioinformatics CHEM ENG 3111 : Numerical Computing in Chemical and Biochemical Engineering COMP ENG 3150 : Introduction to Microcontrollers and Embedded System Design COMP ENG 3151 : Digital Engineering Lab II COMP SCI 1200 : Discrete Mathematics for Computer Science COMP SCI 1575 : Data Structures COMP SCI 1580 : Introduction To Programming Laboratory COMP SCI 2501 : Java and Object Oriented Design COMP SCI 5700 : Bioinformatics GEOPHYS 5251 : Introduction To Geophysical Data Analysis MECH ENG 2519 : Thermodynamics MECH ENG 3313 : Machine Dynamics MECH ENG 3411 : Modeling and Analysis of Dynamic Systems MECH ENG 3525 : Heat Transfer MECH ENG 5139 : Computational Fluid Dynamics MECH ENG 5449 : Robotic Manipulators and Mechanisms MECH ENG 5763 : Computer Aided Design: Theory and Practice MECH ENG 5830 : Applied Computational Methods

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 3:13 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 04/02/19 11:46 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 12:34 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:40 am Brittany Parnell (ershenb):

Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	1570
Title	Introduction To **C++** Programming
Abbreviated Course Title	Intro To **C++** Programming

Approved for Pending CCC Agenda post

Catalog Description	**Object-Oriented** Programming design and development **in** ~~using~~ C++. Emphasis placed on ~~problem-solving methods using~~ good programming **practices.** ~~practices and algorithm design and development.~~ Topics **include** ~~included are~~ syntax/semantics, ~~logical, relational and arithmetic~~ operators, **control flow/decision** ~~decision~~ branching, ~~loops,~~ functions, file I/O, **C-strings,** arrays, **memory management, pointers, classes, inheritance, templates, polymorphism, and exception handling.** ~~output formatting, C-strings, and an introduction to Object-Oriented Programming including the development and use of classes.~~ **This course is programming intensive.**
Prerequisites	**A grade of "C" or better in** ~~Accompanied by~~ Comp Sci **1500 and accompanied by Comp Sci** 1580.
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:	In the new BS in CS degree program being proposed (see DC form), this course becomes the second in the programming course sequence, preceded by the new Comp Sci 1500 course which provides students campus-wide with a rigorous introduction to computational problem solving in a high-level programming language. Consequently, this course will be faster paced and extend coverage to more advanced C++ programming topics. The title is being changed to emphasize the treatment of C++ as opposed to being programming language agnostic like the new Comp Sci 1500.
Semesters previously offered as an experimental course	

Co-Listed
Courses:

Course Reviewer
Comments

Key: 468

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 3:29 pm

Viewing: **COMP SCI 3610 ~~4600~~ : Computer ~~Communications And~~ Networks**

File: 2418.1

Last edit: 04/02/19 11:47 am

Changes proposed by: tauritzd

Programs referencing this course	CMP SC-BS: Computer Science BS

Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	**3610** ~~4600~~
Title	Computer ~~Communications And~~ Networks
Abbreviated Course Title	**Computer Networks** ~~Comp Comm And Networks~~

Catalog Description

This course covers general principles of computer networking, focusing primarily on internet protocols. It covers the TCP/IP stack, with the application layer first, moving down through link and physical layers. Topics include network virtualization, security, wireless, and mobile networks, with extensive live protocol analysis. Coursework is project based. ~~Network architecture model including physical protocols for data transmission and error detection/correction, data link concepts, LAN protocols, internetworking, reliable end-to-end service, security, and application services.Students will implement course concepts on an actual computer network.~~

Prerequisites

A **grade of** "C" or better ~~grade~~ in Comp Sci 3800.

Field Trip Statement

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

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 3:12 pm Bruce McMillin (ff): Rollback to Initiator
2. 03/29/19 3:31 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
3. 04/02/19 11:49 am Brittany Parnell (ershenb): Approved for CCC Secretary
4. 04/15/19 10:37 am Stephen Raper (sraper): Approved for Engineering DSCC Chair

Required for Majors	**Yes** ~~No~~
Elective for Majors	No

5. 04/23/19 11:41 am
Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Justification for change:

This course is required in the revised BS in CS (see DC form), moved to the 3000-level, and with an updated catalog description. This corrects the lack of coverage of computer networks in this program which is a Core-Tier1 requirement of the ACM/IEEE Computer Science Curricula 2013 - Curriculum Guidelines for Undergraduate Degree Programs in Computer Science.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments	**ff (03/29/19 3:12 pm):** Rollback: ACM/IEEE curriculum requires networking as part of the BS in CS.

Key: 2418

Preview Bridge

Course Change Request

Date Submitted: 03/07/19 12:35 pm

Viewing: **COMP SCI 3800 : Introduction to Operating Systems**

File: 184.4

Last approved: 06/20/18 3:40 am

Last edit: 03/07/19 12:35 pm

Changes proposed by: tauritzd

Programs referencing this course	CP ENG-BS: Computer Engineering BS CMP SC-BS: Computer Science BS
Other Courses referencing this course	In The Prerequisites: COMP ENG 5170 : Real-Time Systems COMP SCI 3601 : Digital Forensics COMP SCI 3610 : Computer Communications And Networks COMP SCI 4601 : Computer Network Concepts And Technology COMP SCI 5205 : Real-Time Systems COMP SCI 5600 : Computer Networks COMP SCI 5800 : Distributed Computing COMP SCI 5801 : The Structure Of Operating Systems COMP SCI 5802 : Introduction to Parallel Programming and Algorithms

Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	3800
Title	Introduction to Operating Systems
Abbreviated Course Title	Intro To Operating Syst
Catalog Description	This course teaches the concepts, structure, and mechanisms of Operating Systems. Topics include process management, concurrency, synchronization, deadlock, multithreading, memory management, scheduling, and internetworking. Special emphasis is given to Unix and its modern-day derivatives.
Prerequisites	A grade of "C" or better in **both** ~~all of~~ Comp Sci **1575** ~~1575, Comp Sci 1200,~~ and Comp Eng **2210.** ~~3150.~~
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Required for Majors	Yes
Elective for Majors	No

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/08/19 1:35 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 03/12/19 11:13 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:01 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:42 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Jun 20, 2018 by tauritzd (184.1)

Justification for change:	Instructor has determined that the prereq knowledge of Comp Sci 1575 and Comp Eng 2210 are sufficient for successful completion of this course.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments

Key: 184

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 03/27/19 6:44 am

Viewing: **COMP SCI 4090 : Software Engineering Capstone I**

File: 4619

Last edit: 03/27/19 10:23 am

Changes proposed by: tauritzd

Programs referencing this course	CMP SC-BS: Computer Science BS

Requested Effective Change Date	Fall 2019
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	4090
Title	Software Engineering Capstone I
Abbreviated Course Title	SE Capstone I

Catalog Description

This is the first course in the Software Engineering Capstone sequence covering the Software Life Cycle. Students will learn about software engineering, and work in teams to spec, design, prototype, implement, test, document, deploy and maintain a software system. This course is programming intensive, writing emphasized and addresses ethical considerations.

Prerequisites

A grade of "C" or better in all of Comp Sci 2300, Comp Sci 2500, Comp Sci 3610, and in one of Philos 3225, Philos 3235, Philos 4340, or Philos 4368.

Field Trip Statement

Credit Hours	LEC: 3	LAB: 0	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/27/19 9:42 am Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 03/28/19 3:51 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:37 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:43 am Brittany Parnell (ershenb): Approved for

Elective for Majors	No	Pending CCC Agenda post

Justification for new course:	This is the first course in the new Software Engineering Capstone sequence which is required for the revised BS in CS degree program (see DC form). This new sequence addresses concerns from stakeholders as well as accreditation feedback to ensure that all our students perform a major programming project, improve their technical writing skills, and expand their disciplinary application of ethics.
Semesters previously offered as an experimental course	This is a revamp of the existing Comp Sci 4096 capstone course. It is also a required course for the revised BS in CS degree program (see DC form), qualifying it for skipping the experimental phase.
Co-Listed Courses:	

Course Reviewer Comments

Key: 4619

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 03/27/19 6:45 am

Viewing: **COMP SCI 4091 : Software Engineering Capstone II**

File: 4620

Last edit: 03/27/19 10:26 am

Changes proposed by: tauritzd

Programs referencing this course	CMP SC-BS: Computer Science BS

Requested Effective Change Date	Fall 2019
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	4091
Title	Software Engineering Capstone II
Abbreviated Course Title	SE Capstone II
Catalog Description	This is the second course in the Software Engineering Capstone sequence covering the Software Life Cycle. Students will learn about software engineering, and work in teams to spec, design, prototype, implement, test, document, deploy and maintain a software system. This course is programming intensive, writing emphasized and addresses ethical considerations.
Prerequisites	A grade of "C" or better in both Comp Sci 4090 and Comp Sci 4610.
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:	This is the second course in the new Software Engineering Capstone sequence which is required for the revised BS in CS degree program (see DC form). This new sequence addresses concerns from stakeholders as well as accreditation feedback to ensure that all our students perform a major programming project, improve their technical writing skills, and expand their disciplinary application of ethics.
Semesters previously offered as an experimental course	This is a revamp of the existing Comp Sci 4097 capstone course. It is also a required course for the revised BS in CS degree program (see DC form), qualifying it for skipping the experimental phase.

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/27/19 9:42 am Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 03/28/19 3:51 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:38 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:44 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Co-Listed
Courses:

Course Reviewer
Comments

Key: 4620

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 3:31 pm

Viewing: **COMP SCI 4610 ~~3600~~ : ~~Introduction to~~ Computer Security**

File: 637.1

Last edit: 04/02/19 11:51 am

Changes proposed by: tauritzd

Programs referencing this course	CMP SC-BS: Computer Science BS
Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	**4610** ~~3600~~
Title	~~Introduction to~~ Computer Security
Abbreviated Course Title	~~Intro~~ Computer Security
Catalog Description	This course **covers principles of threat-modeling, trust,** ~~encompasses threats~~ and ~~vulnerabilities, trust and~~ security **policies.** ~~policies, and enforcement.~~ **Topics** ~~Specific topics~~ include **cryptography, reverse engineering, software** ~~access control, risk management, systems and applications life cycle, physical~~ security, **malware analysis, authentication, access controls, operating systems hardening, virtualization, database** ~~key management, transmission~~ security, and **network security.** ~~cryptography.~~ **This class is programming intensive and project based, with case-analyses.**
Prerequisites	A **grade of** "C" or better ~~grade~~ in **both** Comp Sci **2500 and Comp Sci 3610.** ~~2500.~~
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:	In the revised BS in CS (see DC form), this course is adding the Comp Sci 3610 - Computer Networks (see CC form) as prereq, and consequently being moved to 4000-level. The justification for computer networks as a prerequisite is that computer security requires so much networking knowledge, that a third of the class is currently taken up with remedial material.
Semesters previously offered as an experimental course	

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 3:12 pm Bruce McMillin (ff): Rollback to Initiator
2. 03/29/19 3:32 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
3. 04/02/19 11:52 am Brittany Parnell (ershenb): Approved for CCC Secretary
4. 04/15/19 10:38 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
5. 04/23/19 11:45 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Co-Listed Courses:

Course Reviewer Comments	**ff (03/29/19 3:12 pm):** Rollback: The justification for networks as a prerequisite is that computer security requires so much networking, 1/3 of the class is currently taken up with remedial material.

Key: 637

Preview Bridge

Course Change Request

Date Submitted: 03/07/19 10:20 am

Viewing: **EDUC 2102 : Educational Psychology**

File: 118.3

Last approved: 01/18/19 5:02 am

Last edit: 03/07/19 2:54 pm

Changes proposed by: murray

Catalog Pages referencing this course	Teacher Education and Certification
Programs referencing this course	PHYSIC-BS: Physics BS AP MATH-BS: Applied Mathematics BS

Requested Effective Change Date	**Spring 2020** ~~01/07/2019~~
Department	Teacher Education and Certification
Discipline	Education (EDUC)
Course Number	2102
Title	Educational Psychology
Abbreviated Course Title	Educational Psychology

Catalog Description

Principles of psychology relevant to the field of education. Course covers theoretical and applied information on such topics as human growth and development, and cognitive and behavioral views of learning and intelligence. The course also covers motivation, creation of learning environments, measurement and evaluation of learning.

Prerequisites

Psych 1101. **Must be a psychology major, or in the teacher education program, or have instructor's approval to take this class.**

Field Trip Statement

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

In Workflow

1. **REDUCATION Chair**
2. **CCC Secretary**
3. **Social 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. 03/07/19 12:15 pm
   Kelly Carter (carterke): Approved for REDUCATION Chair
2. 03/07/19 2:55 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/03/19 11:11 am
   Barry Flachsbart (barryf): Approved for Social Sciences DSCC Chair

Required for Majors	No
Elective for Majors	No

4. 04/23/19 11:48 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Justification for change:

We do not have enough faculty to offer more sections of the class. It closes every semester due to high enrollment. The majority of students are taking it as an elective. This prevents psychology majors and students in the teacher education program from being able to take the class.

This change needs to be made to both classes (psych 2300 and educ 2102).

History

1. Jan 18, 2019 by ershenb (118.1)

Semesters previously offered as an experimental course

Co-Listed Courses: PSYCH 2300 - Educational Psychology

Course Reviewer Comments

Key: 118

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 9:37 am

Viewing: **ELEC ENG 5210 : Fourier Optics**

File: 898.6

Last approved: 06/20/18 3:39 am

Last edit: 04/19/19 9:33 am

Changes proposed by: sweetk

Other Courses referencing this course	In The Catalog Description: PHYSICS 5503 : Fourier Optics
Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Electrical and Computer Engineering
Discipline	Electrical Engineering (ELEC ENG)
Course Number	5210
Title	Fourier Optics
Abbreviated Course Title	Fourier Optics
Catalog Description	Applications of Fourier analysis and linear systems theory to optics. Topics include scalar diffraction theory, Fourier transforming properties of lenses, optical information processing, and imaging systems.
Prerequisites	Both Elec Eng 3430 and Elec Eng 3600 or ~~both~~ Physics ~~2401 and Physics~~ 4211.
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:	Physics 2401 is a prerequisite for Physics 4211. Listing Physics 2401 is redundant.
Semesters previously offered as an experimental course	
Co-Listed Courses:	PHYSICS 5503 - Fourier Optics
Course Reviewer Comments	**sraper (04/19/19 9:33 am):** Elective for majors checked.

Key: 898

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. CAT entry
11. Peoplesoft

Approval Path

1. 04/06/19 7:09 pm Daryl Beetner (daryl): Approved for RELECENG Chair
2. 04/08/19 9:03 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:33 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:49 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Jun 30, 2014 by lahne (898.1)
2. Jun 20, 2018 by sweetk (898.4)

Course Change Request

Date Submitted: 04/13/19 5:42 pm

Viewing: **FINANCE 5160 : Corporate Finance II**

File: 2566.6

Last approved: 06/29/15 3:51 am

Last edit: 04/13/19 5:42 pm

Changes proposed by: barryf

Catalog Pages referencing this course	Business Administration
Programs referencing this course	BUS&MS-BS: Business and Mgmt Systems BS FIN TCH-MI: Minor in Financial Technology (FinTech) FINANCE-MI: Finance Minor
Other Courses referencing this course	In The Prerequisites: MATH 5737 : Financial Mathematics

Requested Effective Change Date	**Fall 2019** ~~01/12/2016~~
Department	Business and Information Technology
Discipline	Finance (FINANCE)
Course Number	5160
Title	Corporate Finance II
Abbreviated Course Title	Corporate Finance II
Catalog Description	This course provides a rigorous and consistent presentation of the theory of financial decisions. Capital markets are analyzed under assumptions of risk aversion and uncertainty. Models of modern portfolio theory are discussed including the CAPM and the Modigliani-Miller analysis.
Prerequisites	**Finance 2150 or equivalent basic corporate finance knowledge.** ~~Finance 2150.~~
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:	Most graduate students have not come through our undergraduate program and have not taken our course on corporate finance (2150). This clarifies that the knowledge is needed, even if the specific course has not been taken. For undergrads, FIN 2150 continues to be appropriate.

In Workflow

1. **RBUSADMN Chair**
2. **CCC Secretary**
3. **Social 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. 04/14/19 12:51 am
   siauk: Approved for RBUSADMN Chair
2. 04/15/19 11:08 am
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 12:43 pm
   Barry Flachsbart (barryf): Approved for Social Sciences DSCC Chair
4. 04/23/19 11:57 am
   Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Apr 25, 2014 by lahne (2566.1)

Semesters previously offered as an experimental course	2. Jun 29, 2015 by barryf (2566.3)
Co-Listed Courses:	
Course Reviewer Comments	

Key: 2566

Preview Bridge

Course Change Request

Date Submitted: 04/13/19 5:43 pm

Viewing: **FINANCE 5260 : Investments I**

File: 2190.8

Last approved: 06/29/15 3:51 am

Last edit: 04/13/19 5:43 pm

Changes proposed by: barryf

Catalog Pages referencing this course	Business Administration
Programs referencing this course	BUS&MS-BS: Business and Mgmt Systems BS FIN TCH-MI: Minor in Financial Technology (FinTech) PROPOSED: test FINANCE-MI: Finance Minor

Requested Effective Change Date	**Fall 2019** ~~01/12/2016~~
Department	Business and Information Technology
Discipline	Finance (FINANCE)
Course Number	5260
Title	Investments I
Abbreviated Course Title	Investments I
Catalog Description	Introduction to fundamental elements of investment analysis. Students learn financial tools and gain necessary knowledge to select among alternative financial assets. Real world experience includes stock analysis, portfolio simulations and interactions with professionals in the securities industry.
Prerequisites	**Finance 2150 or equivalent basic corporate finance knowledge.** ~~Finance 2150.~~
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:	Most graduate students have not come through our undergraduate program and have not taken our course on corporate finance (2150). This clarifies that the knowledge is needed, even if the specific course has not been taken. For undergrads, FIN 2150 continues to be appropriate.
Semesters previously offered as an	

In Workflow

1. **RBUSADMN Chair**
2. **CCC Secretary**
3. **Social 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. 04/14/19 12:51 am
   siauk: Approved for RBUSADMN Chair
2. 04/15/19 11:09 am
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 12:43 pm
   Barry Flachsbart (barryf): Approved for Social Sciences DSCC Chair
4. 04/23/19 11:59 am
   Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. May 1, 2014 by barryf (2190.1)

experimental course	2. Jun 29, 2015 by barryf (2190.5)
Co-Listed Courses:	
Course Reviewer Comments	

Key: 2190

Preview Bridge

Course Change Request

Date Submitted: 03/05/19 5:02 pm

Viewing: **GEO ENG 3249 : Fundamentals Of Computer Applications In Geological Engineering**

File: 1781.1

Last edit: 03/25/19 2:02 pm

Changes proposed by: grotekr

Programs referencing this course	GE ENG-BS: Geological Engineering BS

Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Geological Engineering (GEO ENG)
Course Number	3249
Title	Fundamentals Of Computer Applications In Geological Engineering
Abbreviated Course Title	Fund Of Comp Appl Ge Eng

Catalog Description

Applications of existing and available software packages utilizing a variety of hardware systems for geological engineering purposes. Emphasis on practical utilization of **software** ~~personal computers~~ and network operations for graphical analysis of geologic data, mapping of surface and subsurface configurations and modeling of geologic processes.

Prerequisites

Geo Eng **1150.** ~~1150, Comp Sci 1970, 1980.~~

Field Trip Statement

Credit Hours	LEC: **2**	LAB: **1**	IND: **0**	RSD: **0**	Total: **3**
Required for Majors	**Yes** ~~No~~				

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/05/19 5:03 pm David Borrok (borrokd): Approved for RGEOSENG Chair
2. 03/06/19 8:55 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:02 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 12:28 pm Brittany Parnell (ershenb): Approved for

Elective for Majors	No	Pending CCC Agenda post

Justification for change:	This course will now include introductory programming, so a programming course is no longer required as a prerequisite.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (03/25/19 2:02 pm):** Changed. to required for majors.

Key: 1781

Preview Bridge

Course Change Request

Date Submitted: 03/05/19 5:05 pm

Viewing: **GEO ENG 5381 : Intermediate Subsurface Hydrology And Contaminant Transport Mechs**

File: 1052.1

Last edit: 03/25/19 2:03 pm

Changes proposed by: grotekr

Programs referencing this course	GE ENG-BS: Geological Engineering BS GEO ENG-MS: GEOLOGICAL ENGINEERING MS
Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Geological Engineering (GEO ENG)
Course Number	5381
Title	Intermediate Subsurface Hydrology And Contaminant Transport Mechs
Abbreviated Course Title	Int Subsurface Hydrology
Catalog Description	A study of the physical/chemical properties of rocks and sediments in the subsurface environment. Emphasis is put on waterrock properties such as permeability, capillarity, and mechanical dispersion. Both microscopic and macroscopic approaches are used.
Prerequisites	**Geo Eng 5331, Geo** ~~Civ~~ Eng **5332, or Geol 4411.** ~~3330 & Geo Eng 5331.~~
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:	These prerequisites better reflect what is needed to master the material covered in this course.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/06/19 8:55 am David Borrok (borrokd): Approved for RGEOSENG Chair
2. 03/06/19 9:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:03 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 12:28 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Course Reviewer Comments	**sraper (03/25/19 2:03 pm):** checked elective for majors and modified prereqs according to DSCC member.

Key: 1052

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:19 pm

Viewing: **MIL AIR 1110 : ~~Foundations Of The U.S.~~Air Force Heritage and Values I**

File: 1532.1

Last edit: 04/09/19 10:38 am

Changes proposed by: ungerb

Other Courses referencing this course	In The Catalog Description: MIL AIR 1120 : Foundations Of The U.S. Air Force II

Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	1110
Title	~~Foundations Of The U.S.~~Air Force **Heritage and Values** I
Abbreviated Course Title	**Heritage and Values I** ~~Found U.S.Air Force I~~

Catalog Description

This ~~survey~~ course **provides an introduction** ~~is designed~~ to **the Air Force, hopefully encouraging** ~~introduce~~ students to **pursue an AF career or at least seek additional information to be better informed about the role of the USAF.** ~~the Air Force and ROTC. Topics include:~~**The course allows students** ~~military customs and courtesies, uniform wear, officership qualities, professionalism, Air Force core values, equal opportunity and treatment, officer benefits and opportunities and an introduction~~ to **examine general aspects of the Department of the Air Force, AF Leadership, Air Force benefits, and opportunities for AF officers.** ~~communication skills. Leadership Lab is mandatory for cadets planning on a career in the Air Force.~~

Prerequisites

Field Trip Statement

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

In Workflow

1. **RMILISCI 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. 04/05/19 3:42 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 11:59 am Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Required for Majors	No
Elective for Majors	No

Justification for change:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ AFROTC/DE and reflects those curriculum changes. v/r BRENT J. UNGER, Lt Col, USAF Commander, AFROTC Det 442 Missouri Univ of Science & Tech 206 Harris Hall, 500 W. 13th St. Rolla, MO 65409-1450 Phone: 573-341-6540 Fax: 573-341-6541 Email: ungerb@mst.edu Web: afrotc.mst.edu
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**ershenb (04/09/19 10:38 am):** Per the email request Lt. Col Unger, added "I" to the course title and change the effective date to SP2020.

Key: 1532

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:20 pm

Viewing: **MIL AIR 1120 : ~~Foundations Of The U.S.~~Air Force Heritage and Values II**

File: 1390.1

Last edit: 04/09/19 10:39 am

Changes proposed by: ungerb

Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	1120
Title	~~Foundations Of The U.S.~~Air Force **Heritage and Values** II
Abbreviated Course Title	**Heritage and Values II** ~~Found U.S.Air Force II~~
Catalog Description	**This course provides an introduction to the Air Force, hopefully encouraging students to pursue an AF career or at least seek additional information to be better informed about the role of the USAF.** ~~This survey course is a continuation of Mil Air 1110.Covered topics include:~~**The course allows students to examine general aspects** ~~origin~~ of the **Department** ~~Air Force, mission and organization~~ of the Air Force, **AF Leadership, Air** ~~organization of a standard Air~~ Force **benefits, and opportunities for AF officers.** ~~base, and further communication skills development. Leadership Lab is also mandatory for cadets.~~
Prerequisites	
Field Trip Statement	
Credit Hours	LEC: **1** LAB: **0** IND: **0** RSD: **0** Total: **1**
Required for Majors	No
Elective for Majors	No
Justification for change:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ AFROTC/DE and reflects those curriculum changes. v/r BRENT J. UNGER, Lt Col, USAF Commander, AFROTC Det 442 Missouri Univ of Science & Tech 206 Harris Hall, 500 W. 13th St. Rolla, MO 65409-1450 Phone: 573-341-6540 Fax: 573-341-6541

In Workflow

1. **RMILISCI 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. 04/05/19 3:43 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 11:59 am Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Email: ungerb@mst.edu
Web: afrotc.mst.edu

Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (04/09/19 10:39 am):** Per the email request Lt. Col Unger, added "II" to the course title and changed the effective date to SP2020.

Key: 1390

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:25 pm

Viewing: **MIL AIR 2110 : Team and Leadership Fundamentals I ~~The Evolution Of USAF Air And Space Power I~~**

File: 418.1

Last edit: 04/09/19 10:43 am

Changes proposed by: ungerb

Other Courses referencing this course	In The Catalog Description: MIL AIR 2120 : The Evolution Of USAF Air And Space Power II
Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	2110
Title	**Team and Leadership Fundamentals I** ~~The Evolution Of USAF Air And Space Power I~~
Abbreviated Course Title	**Ldrshp Fundamentals I** ~~Evol USAF Air &Sp Pwr I~~
Catalog Description	This course is designed to **provide a fundamental understanding** ~~examine the general aspects~~ of **both leadership** ~~air~~ and **team building.** ~~space power through a historical perspective..covering a time period from the first balloons to the beginning of the space age.~~ **It is imperative that cadets are taught from the beginning that there are many layers to leadership, including aspects that don't always jump to mind. Such things include listening, understanding themselves, being a good follower and problem solving.** ~~It provides students with a knowledge level understanding of the general elements and employment of air and space power from an institutional doctrinal and historical perspective.Examples of the importance of AF core values in historical events and in past AF leaders are pointed out.Continued development of communication skills is also emphasized.Leadership Lab is mandatory for cadets planning on a career in the Air Force.~~
Prerequisites	
Field Trip Statement	
Credit Hours	LEC: **1** LAB: **0** IND: **0** RSD: **0** Total: **1**
Required for Majors	No
Elective for Majors	No
Justification for change:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ

In Workflow

1. **RMILISCI 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. 04/05/19 3:43 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 11:59 am Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

AFROTC/DE and reflects those curriculum changes.

v/r

BRENT J. UNGER, Lt Col, USAF
Commander, AFROTC Det 442
Missouri Univ of Science & Tech
206 Harris Hall, 500 W. 13th St.
Rolla, MO 65409-1450
Phone: 573-341-6540
Fax: 573-341-6541
Email: ungerb@mst.edu
Web: afrotc.mst.edu

Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (04/09/19 10:43 am):** Per the email request Lt. Col Unger, added "I" to the course title and changed the effective date to SP2020.

Key: 418

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:27 pm

Viewing: **MIL AIR 2120 : Team and Leadership Fundamentals II ~~The Evolution Of USAF Air And Space Power II~~**

File: 1092.1

Last edit: 04/09/19 10:47 am

Changes proposed by: ungerb

Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	2120
Title	**Team and Leadership Fundamentals II** ~~The Evolution Of USAF Air And Space Power II~~
Abbreviated Course Title	**Ldrshp Fundamentals II** ~~Evol USAF Air&Sp Pwr II~~
Catalog Description	This course is **designed to provide** a **fundamental understanding** ~~continuation~~ of **both leadership and team building.** ~~Mil Air 2110.~~ **It is imperative that cadets are taught from the beginning that there are many layers to leadership, including aspects that don't always jump to mind. Such things include listening, understanding themselves, being a good follower and problem solving.** ~~It covers a time period in Air Force history from the beginning of the space age in the early 1960's to the present...with a continued emphasis on recognizing how past leaders and events have shaped our current Air Force organization and doctrine.Communication skills exercises are continued.Leadership Lab is also mandatory for cadets.~~
Prerequisites	
Field Trip Statement	
Credit Hours	LEC: **1** LAB: **0** IND: **0** RSD: **0** Total: **1**
Required for Majors	No
Elective for Majors	No
Justification for change:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ AFROTC/DE and reflects those curriculum changes. v/r BRENT J. UNGER, Lt Col, USAF Commander, AFROTC Det 442 Missouri Univ of Science & Tech 206 Harris Hall, 500 W. 13th St.

In Workflow

1. **RMILISCI 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. 04/05/19 3:43 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 12:00 pm Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Rolla, MO 65409-1450
Phone: 573-341-6540
Fax: 573-341-6541
Email: ungerb@mst.edu
Web: afrotc.mst.edu

Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (04/09/19 10:47 am):** Per the email request Lt. Col Unger, added "II" to the course title and changed the effective date to SP2020.

Key: 1092

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:30 pm

Viewing: **MIL AIR 3110 : Leading People & Effective Communication I ~~Air Force Leadership Studies I~~**

File: 419.1

Last edit: 04/09/19 10:49 am

Changes proposed by: ungerb

Programs referencing this course	CMP SC-BS: Computer Science BS MC ENG-BS: Mechanical Engineering BS
Other Courses referencing this course	In The Catalog Description: MIL AIR 3120 : Air Force Leadership Studies II

Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	3110
Title	**Leading People & Effective Communication I** ~~Air Force Leadership Studies I~~
Abbreviated Course Title	**Effective Comm I** ~~Air Force Ldrshp Stu I~~
Catalog Description	**This course is designed** ~~includes a Leadership Lab that provides the students the opportunity~~ **to build on the** ~~apply~~ **leadership fundamentals taught in AS200.** ~~**and management principles.**~~ **Cadets will have** ~~This course introduces students to~~ **the opportunity to utilize their** ~~leadership and management~~ skills **as they begin more** ~~required~~ **of a leadership role in the detachment.** ~~an Air Force junior officer.~~ **The goal is for cadets to have a more in-depth understanding of how to effectively lead people, and provide them with the tools to use in their leadership roles.** ~~Special topics include leadership ethics, the Air Force personnel and evaluation systems, and management fundamentals.Through the use of classroom tools that include case studies, Air Force leadership and management situations are examined and practical applications of studies concepts are exercised.The principles and theories of ethical behavior as well as the complete understanding of the individual responsibility and authority of an Air Force officer are stressed.This course includes a Leadership Lab that provides the students the opportunity to apply leadership and management principles.~~
Prerequisites	
Field Trip Statement	
Credit Hours	LEC: **3** LAB: **0** IND: **0** RSD: **0** Total: **3**
	No

In Workflow

1. **RMILISCI 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. 04/05/19 3:44 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 12:00 pm Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Required for Majors	
Elective for Majors	No

Justification for change:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ AFROTC/DE and reflects those curriculum changes. v/r BRENT J. UNGER, Lt Col, USAF Commander, AFROTC Det 442 Missouri Univ of Science & Tech 206 Harris Hall, 500 W. 13th St. Rolla, MO 65409-1450 Phone: 573-341-6540 Fax: 573-341-6541 Email: ungerb@mst.edu Web: afrotc.mst.edu
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**ershenb (04/09/19 10:49 am):** Per the email request Lt. Col Unger, added "I" to the course title and changed the effective date to SP2020.

Key: 419

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:32 pm

Viewing: **MIL AIR 3120 : Leading People & Effective Communication II ~~Air Force Leadership Studies II~~**

File: 1093.1

Last edit: 04/09/19 10:50 am

Changes proposed by: ungerb

Programs referencing this course	CMP SC-BS: Computer Science BS MC ENG-BS: Mechanical Engineering BS
Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	3120
Title	**Leading People & Effective Communication II** ~~Air Force Leadership Studies II~~
Abbreviated Course Title	**Effective Comm II** ~~Air Force Ldrshp Stu II~~

Catalog Description

~~This course is a continuation of Mil Air 3110.Emphasis is placed on professional knowledge, communication skills, and ethical behavior.Varied Air Force peculiar formats and situations are offered to apply learned listening, writing, and speaking skills.~~This course **is designed** ~~includes a Leadership Lab that provides the students the opportunity~~ to **build on the** ~~apply~~ leadership **fundamentals taught in AS200.** ~~and management principles.~~ **Cadets will have the opportunity to utilize their skills as they begin more of a leadership role in the detachment. The goal is for cadets to have a more in-depth understanding of how to effectively lead people, and provide them with the tools to use in their leadership roles.**

Prerequisites

Field Trip Statement

In Workflow

1. **RMILISCI 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. 04/05/19 3:44 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 12:00 pm Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

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

Justification for change:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ AFROTC/DE and reflects those curriculum changes. v/r BRENT J. UNGER, Lt Col, USAF Commander, AFROTC Det 442 Missouri Univ of Science & Tech 206 Harris Hall, 500 W. 13th St. Rolla, MO 65409-1450 Phone: 573-341-6540 Fax: 573-341-6541 Email: ungerb@mst.edu Web: afrotc.mst.edu
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**ershenb (04/09/19 10:50 am):** Per the email request Lt. Col Unger, added "II" to the course title and changed the effective date to SP2020.

Key: 1093

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:37 pm

Viewing: **MIL AIR 4110 : National Security, Leadership Responsibilities & Commissioning Preparation I ~~National Security Affairs/Preparation For Active Duty I~~**

File: 420.1

Last edit: 04/09/19 10:52 am

Changes proposed by: ungerb

Programs referencing this course	CMP SC-BS: Computer Science BS MC ENG-BS: Mechanical Engineering BS
Other Courses referencing this course	In The Catalog Description: MIL AIR 4120 : National Security Affairs/Preparation For Active Duty II

In Workflow

1. **RMILISCI 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

Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	4110
Title	**National Security, Leadership Responsibilities & Commissioning Preparation I** ~~National Security Affairs/Preparation For Active Duty I~~
Abbreviated Course Title	**Ntl Security Issues I** ~~Nsa/Prep Active Duty I~~
Catalog Description	~~This course examines national security policies, processes, and issues along with Air Force strategy and doctrine.~~**The AS400 cadet should comprehend** ~~Special topics include Air Force roles and missions,~~ the **basic elements** ~~roles~~ of **national security policy and process.** ~~various federal government departments, military organizations and functions, and the concept of joint operations.~~ **The student should comprehend the air and space power operations as well as understand selected roles of the military in society and current domestic and international issues affecting the military profession.** ~~Within this structure, continued emphasis is given to refining communication skills.This course includes a Leadership Laboratory that provides advanced leadership experiences, giving students the opportunity to apply the leadership and management principles of this course.~~
Prerequisites	
Field Trip Statement	
Credit Hours	LEC: **3** LAB: **0** IND: **0** RSD: **0** Total: **3**
Required for Majors	No
	No

Approval Path

1. 04/05/19 3:45 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 12:00 pm Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Elective for Majors	
Justification for change:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ AFROTC/DE and reflects those curriculum changes. v/r BRENT J. UNGER, Lt Col, USAF Commander, AFROTC Det 442 Missouri Univ of Science & Tech 206 Harris Hall, 500 W. 13th St. Rolla, MO 65409-1450 Phone: 573-341-6540 Fax: 573-341-6541 Email: ungerb@mst.edu Web: afrotc.mst.edu
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (04/09/19 10:52 am):** Per the email request Lt. Col Unger, added "I" to the course title and changed the effective date to SP2020.

Key: 420

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 3:39 pm

Viewing: **MIL AIR 4120 : National Security, Leadership Responsibilities & Commissioning Preparation II ~~National Security Affairs/Preparation For Active Duty II~~**

File: 748.1

Last edit: 04/09/19 10:53 am

Changes proposed by: ungerb

Programs referencing this course	EL ENG-BS: Electrical Engineering BS CMP SC-BS: Computer Science BS MC ENG-BS: Mechanical Engineering BS
Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Aerospace Studies - Air Force ROTC
Discipline	Military Science - Air Force (MIL AIR)
Course Number	4120
Title	**National Security, Leadership Responsibilities & Commissioning Preparation II** ~~National Security Affairs/Preparation For Active Duty II~~
Abbreviated Course Title	**Ntl Security Issues II** ~~Nsa/Prep Active Duty II~~
Catalog Description	**The AS400 cadet should comprehend the basic elements of national security policy and process.** ~~Continuation of Mil Air 4110.~~**The student should comprehend** ~~This final course of~~ the **air** ~~Air Force ROTC curriculum examines officership, advanced leadership ethics, military law, current Air Force issues, regional studies, core values,~~ and **space power operations as well as understand selected roles of the military in society and current domestic and international issues affecting the military profession.** ~~preparation for active duty. This course includes a Leadership Laboratory that provides leadership experiences, giving students the opportunity to apply the leadership and management principles of this course.~~
Prerequisites	
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:	HQ AFROTC/DE (Curriculum Division) has revised the course titles and course curriculum that all 145 Air Force ROTC Detachments in the country are now required to teach. The revised catalog description above comes verbatim from HQ AFROTC/DE and reflects those curriculum changes.

In Workflow

1. **RMILISCI 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. 04/05/19 3:45 pm Brent Unger (ungerb): Approved for RMILISCI Chair
2. 04/09/19 11:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/09/19 12:01 pm Krista Chambers (krista): Approved for krista
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

v/r

BRENT J. UNGER, Lt Col, USAF
Commander, AFROTC Det 442
Missouri Univ of Science & Tech
206 Harris Hall, 500 W. 13th St.
Rolla, MO 65409-1450
Phone: 573-341-6540
Fax: 573-341-6541
Email: ungerb@mst.edu
Web: afrotc.mst.edu

Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (04/09/19 10:53 am):** Per the email request Lt. Col Unger, added "II" to the course title and changed the effective date to SP2020.

Key: 748

Preview Bridge

Course Change Request

Date Submitted: 03/22/19 11:56 am

Viewing: NUC ENG 4577 ~~3377~~: Nuclear Forensics and Radiochemistry

File: 4087.3

Last approved: 06/30/14 3:55 am

Last edit: 03/28/19 3:49 pm

Changes proposed by: castanoc

Requested Effective Change Date	**Fall 2019** ~~08/01/2014~~
Department	Mining & Nuclear Engineering
Discipline	Nuclear Engineering (NUC ENG)
Course Number	**4577** ~~3377~~
Title	Nuclear Forensics and Radiochemistry
Abbreviated Course Title	Nuc Forensic & Rad Chem
Catalog Description	Learn the fundamentals of radiochemistry and its application to the broad field of Nuclear Forensics. Includes a review of nuclear science and cosmochemistry (the origin of the chemical elements), a historical review of spent fuel reprocessing techniques including solvent extraction. A broad review of the modern nuclear forensics field and its importance.
Prerequisites	**Nuc Eng** ~~NUC ENG~~ 2105 recommended.
Field Trip Statement	n/a
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Required for Majors	No
Elective for Majors	Yes
Justification for change:	This course is suitable for undergraduate seniors and we want to create a graduate version of this course which is dual-listed as Nuc Eng 5577. The course number Nuc Eng 4577 is a better description of the current course.
Semesters previously offered as an experimental course	Spring 2012, Spring 2013, Spring **2014, Fall 2016, Fall 2018** ~~2014~~
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (03/22/19 11:50 am):** Rollback: Rolled back per the request of Dr. Alajo for a number change

Key: 4087

In Workflow

1. **NUC ENG 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. 03/20/19 4:02 pm Hyoung-Koo Lee (leehk): Approved for NUC ENG Chair
2. 03/22/19 11:50 am Brittany Parnell (ershenb): Rollback to Initiator
3. 03/22/19 1:41 pm Hyoung-Koo Lee (leehk): Approved for NUC ENG Chair
4. 03/28/19 3:49 pm Brittany Parnell (ershenb): Approved for CCC Secretary
5. 04/15/19 10:21 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 04/23/19 1:23 pm Brittany Parnell

(ershenb): Approved for Pending CCC Agenda post

History

1. Jun 30, 2014 by Carlos Henry Castano (castanoc)

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 03/27/19 2:54 pm

Viewing: **NUC ENG 5577 : Advanced Nuclear Forensics and Radiochemistry**

File: 4623

Last edit: 04/15/19 10:23 am

Changes proposed by: castanoc

Requested Effective Change Date	Fall 2019
Department	Mining & Nuclear Engineering
Discipline	Nuclear Engineering (NUC ENG)
Course Number	5577
Title	Advanced Nuclear Forensics and Radiochemistry
Abbreviated Course Title	Adv Nuc Foren & RadChem
Catalog Description	Fundamentals of radiochemistry, including nuclear science, cosmochemistry, spent fuel reprocessing, with details on solvent extraction. We will review case studies in Nuclear Forensics. This advanced section also includes experiments on radiochemistry and demonstrate experimental nuclear forensics techniques. Dual listed with Nuc Eng 4577.
Prerequisites	
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 new course:	We are creating a graduate certificate in Nuclear Non-Proliferation
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (03/26/19 2:54 pm):** Rollback: Per email with Dr. Alajo, NUC 5577 needs to have "advanced" in the title with an accompanying course description (needs to differentiate with an advanced application against NUC ENG 4577(3377). **sraper (04/15/19 10:23 am):** as this is a grad certificate course and not a degree, no need for required for majors.

Key: 4623

In Workflow

1. **NUC ENG 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. 03/22/19 1:41 pm Hyoung-Koo Lee (leehk): Approved for NUC ENG Chair
2. 03/26/19 2:54 pm Brittany Parnell (ershenb): Rollback to Initiator
3. 03/28/19 12:50 pm Hyoung-Koo Lee (leehk): Approved for NUC ENG Chair
4. 03/28/19 3:50 pm Brittany Parnell (ershenb): Approved for CCC Secretary
5. 04/15/19 10:23 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 04/23/19 1:23 pm Brittany Parnell

(ershenb):
Approved for
Pending CCC
Agenda post

Preview Bridge

Course Change Request

Date Submitted: 04/05/19 11:45 am

Viewing: **PET ENG 3320 : Petrophysics**

File: 4189.4

Last approved: 10/16/17 3:27 am

Last edit: 04/08/19 8:14 am

Changes proposed by: reflori

Programs referencing this course	PE ENG-BS: Petroleum Engineering BS
Requested Effective Change Date	**Fall 2019** ~~08/17/2015~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	3320
Title	Petrophysics
Abbreviated Course Title	Petrophysics
Catalog Description	**Properties** ~~Fundamental properties~~ of petroleum reservoir rocks, including lithology, porosity, absolute permeability, pore surface area, relative and effective permeability, fluid saturations, rock wettability, capillary characteristics, acoustic properties, and electrical properties. Darcy's law for single phase linear **horizontal,** ~~horizontal and~~ tilted **and** ~~flow and~~ radial flow.
Prerequisites	Preceded or accompanied by both Pet Eng 2510 and Physics 1135.
Field Trip Statement	
Credit Hours	LEC: 2 LAB: 1 IND: 0 RSD: 0 Total: 3
Required for Majors	Yes
Elective for Majors	No
Justification for change:	When this course was created the old reservoir engineering (core) lab Pet Eng 3529 was blended into this course. These labs are now performed as part of Pet Eng 3320. Pet Eng 3529 included the communications component aspect for the degree. Hence Pet Eng 3320 should have been designated as communications emphasis. This submission is only for that change.
Semesters previously offered as an experimental course	None. This is a required course.

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 04/05/18 5:55 pm David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/06/18 2:25 pm Brittany Parnell (ershenb): Rollback to Initiator
3. 04/06/19 3:45 pm David Borrok (borrokd): Approved for RGEOSENG Chair
4. 04/08/19 8:14 am Brittany Parnell (ershenb): Approved for CCC Secretary
5. 04/19/19 9:33 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 04/23/19 1:23 pm Brittany Parnell (ershenb): Approved for

Co-Listed Courses:		Pending CCC Agenda post
Course Reviewer Comments	**ershenb (04/06/18 11:10 am):** removed "Communication emphasis" from catalog description per the request of Dr Shari Dunn-Norman. **ershenb (04/06/18 2:25 pm):** Rollback: Rollback per the request of Dr. Shari Dunn-Norman	History 1. Oct 16, 2017 by reflori

Key: 4189

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 10:51 am

Viewing: **PET ENG 3330 : Well Logging**

File: 1045.2

Last approved: 06/22/15 3:46 am

Last edit: 04/02/19 1:58 pm

Changes proposed by: reflori

Programs referencing this course	PE ENG-BS: Petroleum Engineering BS GE ENG-BS: Geological Engineering BS GL&GPH-BS: Geology and Geophysics BS
Other Courses referencing this course	In The Prerequisites: PET ENG 4441 : Well Stimulation

Requested Effective Change Date	**Spring 2020** ~~08/17/2015~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	3330
Title	Well Logging
Abbreviated Course Title	Well Logging

Catalog Description

An introduction to the electrical, nuclear, and acoustic properties of rocks: theory and interpretation of conventional well logs.

Prerequisites

Physics 2135 or 2111; Pet Eng **3320.** ~~3520.~~

Field Trip Statement

Credit Hours	LEC: 2	LAB: 1	IND: 0	RSD: 0	Total: 3
Required for Majors	Yes				

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 1:58 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:26 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:23 pm
   Brittany Parnell (ershenb):

Elective for Majors	No

Approved for Pending CCC Agenda post

Justification for change:

Pet Eng 3320 is a new course on Petrophysics designed to precede Well Logging.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments

History

1. Jun 22, 2015 by reflori (1045.1)

Key: 1045

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 10:53 am

Viewing: **PET ENG 3520 : Petroleum Reservoir Engineering**

File: 2614.1

Last edit: 04/15/19 10:27 am

Changes proposed by: reflori

Programs referencing this course	PE ENG-BS: Petroleum Engineering BS GE ENG-BS: Geological Engineering BS
Other Courses referencing this course	In The Prerequisites: PET ENG 3330 : Well Logging PET ENG 3529 : Petroleum Reservoir Laboratory PET ENG 4097 : Petroleum Engineering Design PET ENG 4311 : Reservoir Characterization PET ENG 4410 : Well Performance and Production Systems PET ENG 4431 : Well Completion Design PET ENG 4441 : Well Stimulation PET ENG 4511 : Applied Petroleum Reservoir Engineering PET ENG 4520 : Well Test Analysis PET ENG 4531 : Natural Gas Engineering PET ENG 4590 : Petroleum Economics and Asset Valuation PET ENG 4611 : Secondary Recovery Of Petroleum PET ENG 4621 : Fundamentals Of Petroleum Reservoir Simulation PET ENG 4631 : Applied Reservoir Simulation PET ENG 4710 : Finite Element Analysis with Applications in Petroleum Engineering PET ENG 6431 : Advanced Well Completion Design PET ENG 6441 : Advanced Well Stimulation PET ENG 6521 : Advanced Well Test Analysis PET ENG 6551 : Advanced Reservoir Engineering II

Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	3520

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:03 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:27 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm
   Brittany Parnell (ershenb):

Title	Petroleum Reservoir Engineering
Abbreviated Course Title	Petr Reservoir Engr

Approved for Pending CCC Agenda post

Catalog Description	Properties of reservoir formations and fluids; reservoir volumetrics, reservoir statics, reservoir dynamics. Darcy's law and the mechanics of single and multiphase fluid flow through reservoir rock, capillary phenomena, material balance, reservoir drive mechanisms.
Prerequisites	Accompanied or preceded by Pet Eng **2510, Pet Eng 3320.** ~~2510.~~
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 former lab for Pet Eng 3520 is now included in Pet Eng 3320 Petrophysics which is a new course serving as the foundation of Pet Eng 3520.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

Course Reviewer Comments	**sraper (04/15/19 10:27 am):** Changed to required for major.

Key: 2614

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 10:55 am

Viewing: **PET ENG 4097 : Petroleum Engineering Design**

File: 285.1

Last edit: 04/15/19 10:28 am

Changes proposed by: reflori

Programs referencing this course	PE ENG-BS: Petroleum Engineering BS

Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	4097
Title	Petroleum Engineering Design
Abbreviated Course Title	Petroleum Engr Design

Catalog Description

Senior capstone design project(s) based on industry data. Application of reservoir engineering: drilling and production engineering principles to evaluate and solve an industry problem such as a new field development, evaluation of an existing reservoir asset, or analysis of field re-development.

Prerequisites

Pet Eng **3520** ~~3520, Pet Eng 3410,~~ and senior standing.

Field Trip Statement

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

Required for Majors	**Yes** ~~No~~
Elective for Majors	No

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:05 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:28 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm
   Brittany Parnell (ershenb):

Justification for change:
One of the former pre-reqs, Pet Eng 3410, doesn't exist.

Approved for Pending CCC Agenda post

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments **sraper (04/15/19 10:28 am):** changed to required for major.

Key: 285

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 10:56 am

Viewing: **PET ENG 4311 : Reservoir Characterization**

File: 1671.6

Last approved: 10/21/16 3:05 pm

Last edit: 04/02/19 2:07 pm

Changes proposed by: reflori

Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	4311
Title	Reservoir Characterization
Abbreviated Course Title	Reservoir Characteriz
Catalog Description	The integration and extrapolation of Geologic, Geophysical, and Petroleum Engineering data for flow model construction.
Prerequisites	Pet Eng 3520 and Pet Eng **3330.** ~~3310.~~
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:	Pet Eng 3330 is the new number for Well Logging, not 3310.
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	

Key: 1671

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:07 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:29 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm
   Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Oct 21, 2016 by pattyr (1671.1)

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 10:58 am

Viewing: **PET ENG 4431 : Well Completion Design**

File: 1299.1

Last edit: 04/15/19 10:29 am

Changes proposed by: reflori

Other Courses referencing this course	In The Prerequisites: PET ENG 6431 : Advanced Well Completion Design

Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	4431
Title	Well Completion Design
Abbreviated Course Title	Well Completion Design

Catalog Description

An overview of the hardware, fluids and processes employed in completing oil and gas wells. Examination of types of well completions and considerations in their design. Introduction to downhole mechanics and tubing movement and stress calculations.

Prerequisites

Pet Eng **4410.** ~~3520.~~

Field Trip Statement

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

Required for Majors	No
Elective for Majors	**Yes** ~~No~~

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:15 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:29 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm
   Brittany Parnell (ershenb):

Justification for change:
Pet Eng 4410 is our Production course, a better pre-req than 3520 Reservoir Engineering.

Approved for Pending CCC Agenda post

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments **sraper (04/15/19 10:29 am):** changed to elective for major.

Key: 1299

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 10:59 am

Viewing: **PET ENG 4611 : Secondary Recovery Of Petroleum**

File: 1266.1

Last edit: 04/15/19 10:30 am

Changes proposed by: reflori

Other Courses referencing this course	In The Prerequisites: PET ENG 6631 : A Survey Of Improved Recovery Processes

Requested Effective Change Date	**Fall 2019** ~~08/14/2018~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	4611
Title	Secondary Recovery Of Petroleum
Abbreviated Course Title	Secondary Recovery **Petr** ~~Petr~~
Catalog Description	Oil recovery by water injection. Effects of wettability, capillary pressure, relative permeability, mobility ratio on displacement, sweep, and recovery efficiencies. Piston-like and Buckley-Leverett models. Fractional flow and frontal advance equation. Oil recovery prediction methods for linear and pattern waterfloods in single and multi-layered reservoirs.
Prerequisites	Pet Eng **3520.** ~~3520, Pet Eng 3529.~~
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:	Pet Eng 3520 is the only pre-req needed for this course. Drop 3529....
Semesters previously offered as an experimental course	
Co-Listed Courses:	

sraper (04/15/19 10:30 am): changed to elective for major.

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:17 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:30 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm
   Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Course Reviewer
Comments

Key: 1266

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 11:01 am

Viewing: **PET ENG 4720 : Mechanical Earth Modeling**

File: 919.1

Last edit: 04/15/19 10:31 am

Changes proposed by: reflori

Programs referencing this course	PE ENG-BS: Petroleum Engineering BS
Requested Effective Change Date	**Spring 2020** ~~08/14/2018~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	4720
Title	Mechanical Earth Modeling
Abbreviated Course Title	Mech Earth Modeling
Catalog Description	This course introduces the work process necessary to create the Mechanical Earth Model's principle components, formation in-situ stress and strength. 1-D modelign methods are reviewed and extended to 3-D; and the integration of MEM with well design is shown. An MEM model will be created and compared to actual field results.
Prerequisites	Pet Eng **3330** ~~3310~~ and Geology 3310.
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:	Pet Eng 3330 is the new number for Pet Eng 3310 Well Logging.
Semesters previously offered as an experimental course	
Co-Listed Courses:	

sraper (04/15/19 10:31 am): changed to required for majors.

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:18 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:31 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm
   Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Course Reviewer
Comments

Key: 919

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 11:02 am

Viewing: **PET ENG 4811 : Offshore Petroleum Technology**

File: 2142.1

Last edit: 04/15/19 10:32 am

Changes proposed by: reflori

Requested Effective Change Date	**Spring 2020** ~~08/01/2014~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	4811
Title	Offshore Petroleum Technology
Abbreviated Course Title	Offshore Petr Tech

Catalog Description

An introduction to the development of oil and gas fields offshore, including offshore leasing, drilling, well completions, production facilities, pipelines, and servicing. Subsea systems, and deepwater developments are also included. This course is suitable for mechanical, electrical and civil engineering students interested in ultimately working offshore.

Prerequisites

Pet Eng 3520.

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:

This course previously had no pre-req listed. It needed one, and Pet Eng 3520 is the best choice.

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:37 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:20 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:32 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm
   Brittany Parnell (ershenb):

Semesters previously offered as an experimental course	Approved for Pending CCC Agenda post
Co-Listed Courses:	

Course Reviewer Comments **sraper (04/15/19 10:32 am):** changed to elective for majors.

Key: 2142

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 11:03 am

Viewing: **PET ENG 6431 : Advanced Well Completion Design**

File: 4175.2

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

Last edit: 04/02/19 2:21 pm

Changes proposed by: reflori

Requested Effective Change Date	**Spring 2020** ~~08/17/2015~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	6431
Title	Advanced Well Completion Design
Abbreviated Course Title	Adv **Well** Compl **Design** ~~Des~~

Catalog Description	Overview of hardware, fluids and processes employed in completing oil and gas wells. Types of well completions and design considerations. Downhole mechanics, tubing movement and stress calculations. Advanced concepts in well completion design and review of well completions literature.
Prerequisites	Pet Eng **4410.** ~~3520.~~ Students may not earn credit for both Pet Eng 4431 and Pet Eng 6431.
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:	Pet Eng 4410 is our Production class which is the most appropriate pre-req for completions.
Semesters previously offered as an experimental course	Not sure, but several.
Co-Listed Courses:	

Course Reviewer Comments

Key: 4175

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:38 am David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:21 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:32 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:25 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. May 4, 2015 by reflori

Preview Bridge

Course Change Request

Date Submitted: 03/29/19 11:05 am

Viewing: **PET ENG 6621 : Advanced Applied Reservoir Simulation**

File: 79.1

Last edit: 03/29/19 11:05 am

Changes proposed by: reflori

Requested Effective Change Date	**Fall 2019** ~~08/14/2014~~
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	6621
Title	Advanced Applied Reservoir Simulation
Abbreviated Course Title	Adv Appld Reservoir Simulation
Catalog Description	Advanced simulation of actual reservoir problems using both field and individual well models to determine well spacing, production effects of secondary and enhanced recovery processes, future rate predictions and recovery, coning effects, relative permeability adjustments and other history matching techniques.
Prerequisites	Pet Eng **4621 or equivalent.** ~~5621.~~
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:	Pet Eng 5621 didn't exist. Pet Eng 4621 is the proper pre-req.
Semesters previously offered as an experimental course	
Co-Listed Courses:	
Course Reviewer Comments	

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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. CAT entry
11. Peoplesoft

Approval Path

1. 03/29/19 11:38 am
   David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/02/19 2:25 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:32 am
   Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:25 pm
   Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 79

Preview Bridge

Campus Curricula Committee Meeting Agenda
May 8, 2019
9:00am - 10:30am, Bertelsmeyer 110H
(For Faculty Senate Meeting of June 13, 2019)

Review of submitted Course Change forms:

File: 4406.5	BUS 5230: Financial Statement Analysis
File: 4282.12	CHEM ENG 3131: Separations in Chemical and Biochemical Engineering
File: 4618	CHEM ENG 5240: Pharmaceutical Engineering
File: 998.1	CIV ENG 3330: Engineering Fluid Mechanics
File: 1992.1	CIV ENG 3334: Water Resources Engineering
File: 841.1	CIV ENG 4448: Fundamentals Of Contracts And Construction Engineering
File: 110.6	COMP SCI 1200: Discrete Mathematics for Computer Science
File: 4616	COMP SCI 1500: Computational Problem Solving
File: 468.1	COMP SCI 1570: Introduction To C++ Programming
File: 2418.1	COMP SCI 3610_Computer Networks
File: 184.4	COMP SCI 3800: Introduction to Operating Systems
File: 4619	COMP SCI 4090: Software Engineering Capstone I
File: 4620	COMP SCI 4091: Software Engineering Capstone II
File: 637.1	COMP SCI 4610_Computer Security
File: 118.3	EDUC 2102: Educational Psychology
File: 898.6	ELEC ENG 5210: Fourier Optics
File: 2566.6	FINANCE 5160: Corporate Finance II
File: 2190.8	FINANCE 5260: Investments I
File: 1781.1	GEO ENG 3249: Fundamentals Of Computer Applications In Geological Engineering
File: 1052.1	GEO ENG 5381: Intermediate Subsurface Hydrology And Contaminant Transport Mechs
File: 1532.1	MIL AIR 1110: Air Force Heritage and Values I
File: 1390.1	MIL AIR 1120: Air Force Heritage and Values II
File: 418.1	MIL AIR 2110: Team and Leadership Fundamentals I
File: 1092.1	MIL AIR 2120: Team and Leadership Fundamentals II
File: 419.1	MIL AIR 3110: Leading People & Effective Communication I
File: 1093.1	MIL AIR 3120: Leading People & Effective Communication II
File: 420.1	MIL AIR 4110: National Security, Leadership Responsibilities & Commissioning Preparation I
File: 748.1	MIL AIR 4120: National Security, Leadership Responsibilities & Commissioning Preparation II
File: 4087.3	NUC ENG 4577: Nuclear Forensics and Radiochemistry
File: 4623	NUC ENG 5577: Advanced Nuclear Forensics and Radiochemistry
File: 4189.4	PET ENG 3320: Petrophysics
File: 1045.2	PET ENG 3330: Well Logging
File: 2614.1	PET ENG 3520: Petroleum Reservoir Engineering

File: 285.1	PET ENG 4097: Petroleum Engineering Design
File: 1671.6	PET ENG 4311: Reservoir Characterization
File: 1299.1	PET ENG 4431: Well Completion Design
File: 1266.1	PET ENG 4611: Secondary Recovery Of Petroleum
File: 919.1	PET ENG 4720: Mechanical Earth Modeling
File: 2142.1	PET ENG 4811: Offshore Petroleum Technology
File: 4175.2	PET ENG 6431: Advanced Well Completion Design
File: 79.1	PET ENG 6621: Advanced Applied Reservoir Simulation

Review of submitted Degree Change forms:

File: 142.43	AP MATH-BS: Applied Mathematics BS
File: 237.20	BIOMED-MI: Biomedical Engineering Minor
File: 28.44	CMP SC-BS: Computer Science BS
File: 29.11	CMP SC-MI: Computer Science Minor
File: 161.5	CP ENG-MS: Computer Engineering MS
File: 162.2	CP ENG-PHD: Computer Engineering PhD
File: 163.5	EL ENG-MS: Electrical Engineering MS
File: 164.2	EL ENG-PHD: Electrical Engineering PhD
File: 46.11	ENG MG-MS: Engineering Management MS
File: 58.15	FINANCE-MI: Finance Minor
File: 156.24	GE ENG-BS: Geological Engineering BS
File: 64.25	GL&GPH-BS: Geology and Geophysics BS
File: 70.4	GLBLSTD-MI: Global Studies Minor
File: 108.29	PE ENG-BS: Petroleum Engineering BS
File: 115.30	PHYSIC-BS: Physics BS
File: 172.3	PHYSIC-MS: Physics MS
File: 215.1	PHYSIC-PHD: Physics PhD
File: 192.33	PSYCH-BA: Psychology BA
File: 193.29	PSYCH-BS: Psychology BS
File: 131.13	SYS EN-PHD: Systems Engineering PhD
File: 140.8	SYS ENG-MS: Systems Engineering MS

Review of submitted Experimental Course forms:

File: 4628	CHEM ENG 5001.005: AIChE Design Competition
File: 4629	CHEM ENG 5001.006: Chemical Process Modeling and Analysis
File: 4627	CHEM ENG 5001.007: Renewable Energy Processes
File: 4621	CIV ENG 5001.003: Base Courses in Pavements
File: 4596	COMP SCI 5001.003: Game Theory for Computing
File: 4598	COMP SCI 5001.004: Introduction to Virtual Reality
File: 4597	COMP SCI 6001.003: Algorithmic Game Theory

File: 4595	COMP SCI 6001.004: Introduction to Quantum Computing
File: 4622	GEOPHYS 6001.001: Advanced Geophysical Data Analysis
File: 4626	MATH 5001.002: Introduction to Finite Element Methods
File: 4625	MATH 6001.005: Discontinuous Galerkin methods for solving partial differential equations
File: 4632	MATH 6001.006: Numerical Analysis in Computational Fluid Dynamics
File: 4630	PET ENG 4001.006: Reservoir Engineering Aspects of Unconventional Oil and Gas
File: 4631	PET ENG 6001.011: Advanced Reservoir Engineering Aspects of Unconventional Oil and Gas
File: 4617	PHYSICS 6001.001: Random Processes and Wave Coherence

Program Change Request

Date Submitted: 04/04/19 12:17 pm

Viewing: AP MATH-BS : Applied Mathematics BS

File: 142.43

Last approved: 08/12/16 12:03 pm

Last edit: 04/04/19 4:46 pm

Changes proposed by: prunnion

Catalog Pages Using this Program
Mathematics

Start Term
Fall 2019 ~~08/15/2016~~
Program Code
AP MATH-BS
Department
Mathematics & Statistics
Title
Applied Mathematics BS

Program Requirements and Description

In Workflow

1. **RMATHEMA 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. Kristy Giacomelli

Approval Path

1. 04/04/19 2:01 pm sclark: Approved for RMATHEMA Chair
2. 04/04/19 4:47 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 3:33 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 11:20 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Apr 28, 2014 by Ilene Morgan (imorgan)
2. Apr 28, 2014 by Lahne Black (lahne)

3. Jun 13, 2014 by pantaleoa
4. Jun 13, 2014 by pantaleoa
5. Jul 21, 2015 by pantaleoa
6. Jul 21, 2015 by pantaleoa
7. Apr 25, 2016 by Ilene Morgan (imorgan)
8. Aug 12, 2016 by cladmin-bdietzler

Bachelor of Science
Applied Mathematics

A minimum of 128 credit hours is required for a bachelor of science degree in applied mathematics. A minimum grade of "C" is required by the department in each course counted toward the math/stat requirement for the B.S. in applied mathematics. Moreover, the department requires that an average of at least two grade points per credit hour must be obtained for all courses taken within the department. These requirements for the B.S. degree are in addition to credit received for algebra, trigonometry, and basic ROTC.

The applied mathematics curriculum requires fifteen semester hours of technical electives, except where this requirement is reduced to compensate for extra requirements of emphasis areas, in addition to basic courses in chemistry or biology, physics, computer science, and economics. Two semesters of language and communication, ENGLISH 1160 or ENGLISH 3560, and either HISTORY 1300, HISTORY 1310, HISTORY 1200, or POL SCI 1200 are also required. Specific requirements for the bachelor's degree are outlined in the sample program below.

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 1101	1	MATH 1215 or 1221[1]	4
MATH 1208 or 1214[1]	4	Science Requirement[5]	5
CHEM 1100	1	COMP SCI 1570	3
ENGLISH 1120	3	**COMP SCI 1580**	**1**
Campus History Requirement[2]	3	Language and Communication Requirement[3]	3
Language and Communication Requirement[3]	3	Basic ROTC (if elected)[4]	0
Basic ROTC (if elected)[4]	0		
	15		16
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 2222[1]	4	MATH 3304[1]	3
MATH 3108[1]	3	MATH 3109[1]	3
Statistics Requirement[1,6,7]	3	ECON 1100 or 1200	3
PHYSICS 1135 or 1111 ***and*** 1119	4	PHYSICS 2135 or 2111 ***and*** 2119	4

ENGLISH 1160[8]	3	~~COMP SCI Requirement[7,8]~~	~~3~~
Basic ROTC (if elected)[4]	0	**COMP SCI 1575 or 3200[7]**	**3**
		Basic ROTC (if elected)[4]	0
	17		16

Junior Year

First Semester	Credits	Second Semester	Credits
MATH 4209[1]	3	MATH 4211[1]	3
Literature	3	Literature	3
Electives-Math or Stat[1,7,9]	3	Electives-Math or Stat[1,7,9]	3
Electives-Technical[10]	3	Electives-Technical[10]	3
Electives	3	Electives	3
	15		15

Senior Year

First Semester	Credits	Second Semester	Credits
Capstone Course[1,7,11]	3	Electives-Math or Stat[1,7,9]	3
Electives-Math or Stat[1,7,9]	3	Electives-Technical[10]	3
Electives-Technical[10]	6	Electives	10
Electives	6		
	18		16

Total Credits: 128

1. A minimum grade of “C” is required by the department in each course counted toward the math/stat requirement for the B.S. in applied mathematics. Moreover, the department requires that an average of at least two grade points per credit hour must be obtained for all courses taken within the department.
2. May be met by HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200.
3. This requirement will be satisfied by either (1) six credits of Speech and Media Studies course work; or (2) a modern language approved by the advisor with competency at the level of second semester college/university course work or, with approval of the department, by completion of Level III of a foreign language in high school.
4. Basic ROTC may be elected in the freshman and sophomore years, but is not creditable toward a degree. Up to six credit hours of advanced ROTC may be credited as free electives towards a degree.
5. May be met by CHEM 1310 and CHEM 1319 or by BIO SCI 1113 and BIO SCI 1219.
6. May be met by STAT 3113, STAT 3115, or STAT 3117.
7. No course may be used to satisfy more than one degree requirement, except as otherwise noted.
8. May also be satisfied by ENGLISH 3560.
9. The student must choose two from the following five groups and then complete six hours in each of the chosen groups
    1. MATH 5105, MATH 5106, MATH 5107, MATH 5108
    2. MATH 5105, MATH 5215, MATH 4530 orMATH 5530, MATH 5351, MATH 5585
    3. MATH 5222,MATH 5302, MATH 5325,MATH 5351, MATH 5483, MATH 5603, MATH 5604
    4. STAT 5814, STAT 5643, STAT 5644, STAT 5346, STAT 5353, STAT 5755, STAT 5756
    5. COMP SCI 3200, COMP SCI 5201, COMP SCI 5202, MATH 5603, MATH 5604, MATH 5737, STAT 5260, STAT 5346, STAT 5755, STAT 5756, STAT 5814.
10. Courses in biology, chemistry, computer science, economics, engineering, geology, mechanics, or physics approved by advisor. The general math curriculum requires 15 credit hours; actuarial science emphasis area, 12 credit hours; algebra/discrete math emphasis area, 15 credit hours; computational math emphasis area, 9 credit hours; statistics emphasis area, 12 credit hours.

11	The capstone experience for all applied mathematics majors (other than students completing the secondary education emphasis area) consists of a course chosen from the following list: MATH 4098 (three credits), MATH 4099 or STAT 4099 (three credits), MATH 5107, MATH 5215, MATH 5603, STAT 5346, STAT 5353, STAT 5755, or STAT 5756.
~~12~~	~~COMP SCI 1570 if not transferred in will require COMP SCI 1580, requiring one extra credit hour which will count either towards technical electives or free electives.~~
~~13~~	~~May also be satisfied by ENGLISH 3560.~~

Emphasis Areas at the Bachelor of Science Level

Note: ~~10 Actuarial Science Emphasis Area 10 Required courses:~~ It ~~It~~ is not required that students complete an emphasis area to obtain the bachelor of science degree in applied mathematics. The emphasis area requirements often specify most, if not all, of the electives in mathematics, statistics and computer science as well as many technical or free electives.

Actuarial Science ~~Statistics~~ Emphasis Area ~~10~~

Required courses:

STAT 5643	Probability And Statistics	3
STAT 5644	Mathematical Statistics	3
ECON 1100	Principles Of Microeconomics	3
ECON 1200	Principles Of Macroeconomics	3
ECON 2200	Intermediate Macroeconomic Theory	3
MATH 5737	Financial Mathematics	3
And six hours from:		6
STAT 5814	Applied Time Series Analysis	3
STAT 5346	Regression Analysis	3
STAT 5353	Statistical Data Analysis	3
STAT 5755	Statistical Models in Actuarial Science	3
STAT 5756	Statistical Models for Life Contingencies	3

In addition, the student must pass the first actuarial science exam. Note that the capstone requirement is included in, not separate from, this list of courses.

When selecting a 3000-level statistics course to satisfy the major requirements, it is recommended that students pursuing an Actuarial Science emphasis select Stat 3117.

Algebra/Discrete Mathematics Emphasis Area ~~10~~

Required courses:

MATH 5105	Modern Algebra I	3
MATH 5106	Modern Algebra II	3
or MATH 6105	Finite Fields And Applications	
MATH 5107	Combinatorics And Graph Theory (Satisfies Capstone requirement)	3
MATH 5108	Linear Algebra II	3
STAT 5643	Probability And Statistics	3
Select one of the following:		3

STAT 5644	Mathematical Statistics	3
COMP SCI 2200	Theory of Computer Science	3
COMP SCI 3200	Introduction To Numerical Methods	3
COMP SCI 5200	Analysis Of Algorithms	3

Computational Mathematics Emphasis Area ~~10~~

Required courses:

STAT 5353	Statistical Data Analysis (Satisfies Capstone requirement)	3
STAT 5346	Regression Analysis	3
COMP SCI 3200	Introduction To Numerical Methods	3
Select three of the following:		
MATH 5302	Intermediate Differential Equations	3
MATH 5325	Partial Differential Equations	3
MATH 5603	Methods of Applied Mathematics	3
MATH 5604	Introduction to Numerical Methods for Differential Equations	3
Select one of the following:		3
COMP SCI 5201	Object-Oriented Numerical Modeling I	3
COMP SCI 5402	Introduction to Data Mining	3
MECH ENG 5139	Computational Fluid Dynamics	3
AERO ENG 5139	Computational Fluid Dynamics	3
MECH ENG 5212	Introduction to Finite Element Analysis	3
AERO ENG 5212	Introduction to Finite Element Analysis	3
MECH ENG 5830	Applied Computational Methods	3
AERO ENG 5830	Applied Computational Methods	3

Applied Analysis Emphasis Area

Required:

COMP SCI 3200	Introduction To Numerical Methods	3
and two of groups 3, 4, and 5 under Mathematics and Statistics electives (plus the Capstone requirement) must be satisfied,		
and choose Technical Electives and Free Electives to satisfy one of the following two options:		

Engineering Option

Required courses:

CIV ENG 2200	Statics	3
CIV ENG 2210	Mechanics Of Materials	3
Select one of the following:		
MECH ENG 2350	Engineering Mechanics-Dynamics	
MECH ENG 2360	Dynamics	3
Select three of the following:		9

Courses, which have any of the listed courses as prerequisites, may also be used to fulfill this requirement.		
AERO ENG 3613	Aerospace Mechanics I	3
AERO ENG 5313	Intermediate Dynamics of Mechanical and Aerospace Systems	3
AERO ENG 5614	Spaceflight Mechanics	3
CHEM ENG 2100	Chemical Engineering Material & Energy Balances	4
CHEM ENG 2110	Chemical Engineering Thermodynamics I	3
ELEC ENG 2800	Electrical Circuits	3
MECH ENG 3313	Machine Dynamics	3
MECH ENG 2519	Thermodynamics	3
or MECH ENG 2527	Thermal Analysis	
MECH ENG 5131	Intermediate Thermofluid Mechanics *	3
NUC ENG 3103	Interactions Of Radiation With Matter	3
NUC ENG 4203	Reactor Physics I	3
PET ENG 4621	Fundamentals Of Petroleum Reservoir Simulation	3
CIV ENG 3330	Engineering Fluid Mechanics	3
or NUC ENG 3221	Reactor Fluid Mechanics	
or MECH ENG 3131	Thermofluid Mechanics I	
CIV ENG 5207	Computer Methods of Structural Analysis	3
CIV ENG 5333	Intermediate Hydraulic Engineering	3
ELEC ENG 5370	Introduction to Neural Networks and Applications	3
MECH ENG 5307	Vibrations I	3
MECH ENG 5211	Introduction To Continuum Mechanics	3
MECH ENG 5234	Stability of Engineering Structures *	3
MECH ENG 5254	Variational Formulations Of Mechanics Problems	3
GEO ENG 4115	Statistical Methods in Geology and Engineering	3
~~GEOPHYS 3211~~	~~Course GEOPHYS 3211 Not Found~~	
GEOPHYS 3221	Potential Field Theory	3

* Courses with an asterisk (*) are co-listed in more than one department.

Physics Option

Required courses:

PHYSICS 2311	Modern Physics I	3
PHYSICS 3311	Modern Physics II	3
And take at least nine additional hours of physics courses at the 2000 level or above.		9

Note that the requirements for a minor in physics will be satisfied with this option.

Secondary Education Emphasis Area

You may earn a B.S. degree in applied mathematics from Missouri S&T and certification to teach at the secondary level in the schools of Missouri with this emphasis area program. This program can be completed in four academic **years.** ~~years and student teaching is arranged~~

~~with public schools within 30 miles of the Missouri S&T campus.~~

Students interested in this emphasis area should consult with the advisor for mathematics education majors in the mathematics and statistics department.

In order to successfully complete this emphasis area, students must maintain a cumulative GPA of at least **2.75** ~~2.75,~~ and attain at least a 3.0 GPA in all **mathematics, statistics, and education** ~~mathematics~~ courses. Current Missouri S&T or transfer students who wish to pursue this emphasis area must meet ~~both~~ these GPA requirements to be accepted into the program. Students must also meet all requirements listed under ~~the~~ teacher education ~~program~~ in the catalog. Students who do not meet all the teacher certification requirements will not be eligible for the secondary education emphasis area, even if they have completed all **coursework.** ~~course work.~~

A degree in this emphasis area requires 128 credit hours. The required courses and a sample four-year program are provided below. (A minimum grade of "C" is required by the department in all mathematics and statistics courses counted toward this degree. No course may be used to satisfy more than one degree requirement, except as otherwise noted.)

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 1101	1	MATH 1215 or 1221	4
MATH 1208 or 1214	4	BIO SCI 1113	3
CHEM 1100	1	BIO SCI 1219 (Science Lab Requirement)[1]	2
ENGLISH 1120	3	PSYCH 1101	3
HISTORY 1300 or 1310	3	EDUC 1164	2
EDUC 1040	2	EDUC 1174	2
EDUC 1104	2		
	16		16
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 2222	4	MATH 3304	3
MATH 3108	3	MATH 3109	3
PHYSICS 1135 or 1111 ***and*** 1119	4	ENGLISH 1160	3
COMP SCI 1570, or 1970 ***and*** 1980, or 1971 ***and*** 1981, or 1972 ***and*** 1982[5]	3	PHYSICS 2135 or 2111 ***and*** 2119	4
SP&M S 1185	3	~~PSYCH 3311~~	~~3~~
		PSYCH 3310	**3**
	17		16
Junior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 4209	3	MATH 4211	3
~~STAT 3115, or 3117, or 5643~~	~~3~~	MATH 4530	3
STAT 3113, or 3115, or 3117	**3**	EDUC 3280	6
ECON 1100 or 1200	3	Fine Art Elective[2]	3
~~EDUC 2216~~	~~3~~	PSYCH 2300 or EDUC 2102	3
ENGLISH 3170	3		

EDUC 3216	3		
	15		18

Senior Year

First Semester	Credits	Second Semester	Credits
Electives-Math or Stat[4]	6	EDUC 4298 & EDUC 4299[3]	13
PSYCH 4310 or EDUC 4310	3		
POL SCI 1200	3		
Literature	3		
Electives	2		
	17		13
Total Credits: 128			

1 May be met by BIO SCI 1219 or CHEM 1319, but if CHEM 1319 is used, one extra hour must be attained in any elective area to fulfill the 128 total hour requirement.

2 Any three-hour course from the areas of foreign language, music, theater, philosophy or art.

3 Student Teaching satisfies the capstone requirement for students completing this emphasis area.

4 Any two three-hour courses from the following list with the approval of the mathematics education advisor. MATH 5105, MATH 5106, MATH 5107, MATH 5108, MATH 5215, MATH 5222, MATH 5302, MATH 5325, MATH 5351, MATH 5483, MATH 5585, STAT 5643, STAT 5644, STAT 5346, STAT 5353, COMP SCI 3200, COMP SCI 5201, COMP SCI 5202, MATH 5737.

5 COMP SCI 1570 if not transferred in will require COMP SCI 1580, requiring one extra credit hour which will count either towards technical electives or free electives.

Statistics Emphasis Area

Required courses:

STAT 5643	Probability And Statistics	3
STAT 5644	Mathematical Statistics	3
STAT 5346	Regression Analysis	3
STAT 5353	Statistical Data Analysis (Satisfies Capstone requirement)	3
Select two of the following:		6
BIO SCI 2223	General Genetics	3
COMP SCI 3200	Introduction To Numerical Methods	3
COMP SCI 5402	Introduction to Data Mining	3
STAT 5260	Statistical Data Analysis Using SAS	3
STAT 5814	Applied Time Series Analysis	3
And complete either A or B:		6
(A) Complete the following 2 courses:		
MATH 5215	Introduction To Real Analysis	3
MATH 5351	Introduction To Complex Variables	3
(B) Complete 6 hours from:		

MATH 5107	Combinatorics And Graph Theory	3
MATH 5108	Linear Algebra II	3
MATH 5603	Methods of Applied Mathematics	3

~~Statistics Emphasis Area 10 Required courses:Note:It is not required that students complete an emphasis area to obtain the bachelor of science degree in applied mathematics.The emphasis area requirements often specify most, if not all, of the electives in mathematics, statistics and computer science as well as many technical or free electives.~~

Justification for request

Change to Statistics Requirement (all majors):

Removing Stat 5643 from this list (in Footnote 6) will clean up issues with degree audits for emphasis areas in Actuarial Science, Algebra/Discrete, and Statistics. While, in most cases, it makes sense for students to take a 3000-level statistics course prior to Stat 5643, this will not preclude us from allowing a student to go directly to Stat 5643 in appropriate cases, and the waiver paperwork in that case should be more limited (and more straightforward) than the paperwork currently being processed when a student starts directly in Stat 5643 and pursues one of these emphasis areas. Additionally, adding Stat 3113 to the list of acceptable options will increase flexibility, particularly for dual majors.

Change to Computer Science Requirement (all majors except Secondary Education):

We want to encourage students to take more programming courses. If students start with a non-majors introductory course, they cannot move on to take additional programming courses, so by requiring CS 1570 (with the corequisite CS 1580 lab), this gives all of our majors the necessary prerequisite to take a second programming course (and hopefully more, as technical electives). We have retained CS 3200 as an option for the second course to accommodate those students who really don't want to take a second programming course, but in practice, we will advise most students to take CS 1575 as the second course. Since the secondary education emphasis only has room for one CS course, we are not changing that requirement at this time (and will continue to allow non-majors introductory courses for those students), but it is likely that we may want to explore some changes to that requirement in the future.

Change to Secondary Education emphasis:

These changes were requested by the Teacher Education Department.

Change to allowable technical electives:

We are adding biology to the list of allowable technical electives to reflect the growing importance of collaboration between biologists, mathematicians, and statisticians.

Supporting Documents

Course Reviewer Comments

ershenb (04/04/19 4:46 pm): formatting

Key: 142

Program Change Request

Date Submitted: 03/19/19 1:47 pm

Viewing: BIOMED-MI : Biomedical Engineering Minor

File: 237.20

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

Last edit: 04/18/19 8:56 am

Changes proposed by: smiller

Catalog Pages Using this Program
Materials Science and Engineering

Start Term
Fall 2019 ~~08/22/2016~~
Program Code
BIOMED-MI
Department
Materials Science & Engineering
Title
Biomedical Engineering Minor

Program Requirements and 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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. Kristy Giacomelli

Approval Path

1. 03/19/19 2:03 pm Greg Hilmas (ghilmas): Approved for RMATSENG Chair
2. 03/20/19 4:28 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:12 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/18/19 9:06 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Oct 27, 2014 by rahaman
2. Nov 18, 2014 by kleb6b

3. Jan 23, 2015 by pantaleoa
4. Jan 23, 2015 by pantaleoa
5. Jun 19, 2015 by pantaleoa
6. Jul 21, 2015 by pantaleoa
7. Oct 15, 2015 by F. Scott Miller (smiller)
8. Mar 7, 2016 by F. Scott Miller (smiller)

Biomedical Engineering Minor

Minimum number of credit hours: 15 hours, consisting of **one** ~~1~~ required course, **CER ENG 3110**: ~~Cer Eng 3110:~~ Introduction to Biomedical Engineering , plus at least **four** ~~4~~ courses from an approved list. At least **two** ~~2~~ of the elective courses will be at or above the 4000 level. Core courses used toward a student's major degree requirements cannot be used for the minor degree program in BME. Elective courses used toward a student's major degree requirements or another minor degree program cannot be used unless they are approved by the biomedical engineering program committee.

Elective courses:

BIO SCI 2213	Cell Biology	3
BIO SCI 2219	Cell Biology Laboratory	1
BIO SCI 2223	General Genetics	3
BIO SCI 3313	Microbiology	3
BIO SCI 3319	Microbiology Lab	2
BIO SCI 3333	Human Anatomy and Physiology I	3
BIO SCI 3339	Human Anatomy Physiology I Lab	1
BIO SCI 3343	Human Anatomy and Physiology II	3
BIO SCI 3349	Human Anatomy and Physiology II Laboratory	1
BIO SCI 3483	Biomedical Problems	3
CHEM ENG 4210	Biochemical Reactors	3
BIO SCI 4323	Molecular Genetics	3
BIO SCI 4353	Cancer Cell Biology	3
BIO SCI 4383	Toxicology	3
CHEM 4610	General Biochemistry	3
CHEM 4620	Metabolism	3
BIO SCI 5001	Special Topics	0-6
BIO SCI 5240/MS&E 5210	Tissue Engineering	3
BIO SCI 4666	**Nanobiotechnology**	**3**
BIO SCI 6666	**Advanced Nanotechnology in Biomedicine**	**3**

MS&E 5310/BIO SCI 5210/CHEM ENG 5200	Biomaterials I	3
CHEM ENG 5320	Introduction to Nanomaterials	3
BIO SCI 5323	Bioinformatics	3
STAT 5425	Introduction to Biostatistics	4
ENG MGT 5511	Technical Entrepreneurship	3
MET ENG 4099	Undergraduate Research [1]	0-6

[1] Undergraduate Research may be taken in any science or engineering discipline.

Justification for request

Addition of two omitted courses (Bio Sci 4666 & 6666)

Supporting Documents

Course Reviewer Comments

ershenb (03/20/19 4:28 pm): updated start term to Fall 2019

sraper (04/15/19 10:12 am): spelled out numbers that were less than 10.

ershenb (04/18/19 8:56 am): formatting

Key: 237

Program Change Request

Date Submitted: 03/29/19 4:14 pm

Viewing: CMP SC-BS : Computer Science BS

File: 28.44

Last approved: 06/28/17 10:13 am

Last edit: 03/29/19 4:14 pm

Changes proposed by: tauritzd

Catalog Pages Using this Program

Computer Science

Start Term

Fall 2019 ~~08/14/2017~~

Program Code

CMP SC-BS

Department

Computer Science

Title

Computer Science BS

Program Requirements and 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. Kristy Giacomelli

Approval Path

1. 03/29/19 2:31 pm Kristy Giacomelli (kristyg): Rollback to Initiator
2. 03/29/19 4:12 pm Bruce McMillin (ff): Rollback to Initiator
3. 03/29/19 4:15 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
4. 04/01/19 4:27 pm Brittany Parnell (ershenb): Approved for CCC Secretary
5. 04/15/19 12:34 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 04/23/19 11:27 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Aug 5, 2014 by Daniel Tauritz (tauritzd)
2. Aug 13, 2014 by pantaleoa
3. Jun 19, 2015 by Daniel Tauritz (tauritzd)
4. Jul 15, 2015 by pantaleoa
5. Jun 28, 2017 by Daniel Tauritz (tauritzd)

Bachelor of Science
Computer Science

Entering first year students desiring to study ~~A minimum of 128 credit hours is required for a Bachelor of Science degree in~~ computer science **will** ~~and an average of at least two grade points per credit hour must~~ be **admitted to the First Year Experience program.** ~~obtained.~~ **They will, however, be permitted, if they wish, to state a computer science preference, which will be used as a consideration for available first year departmental scholarships. The focus of the First Year Experience 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 Computer Science, a minimum of 128 credit hours is required. ~~These requirements for the B.S.~~**This requirement is** ~~degree are~~ in addition to credit received for algebra, trigonometry, and basic **ROTC courses.** ~~ROTC.~~ **An average of at least two grade points per credit hour must be attained.** ~~The computer science curriculum requires twelve semester hours in humanities, exclusive of foreign language, and must include ENGLISH 1160 or ENGLISH 3560.A minimum of nine semester hours is required in social sciences, including either HISTORY 1300, HISTORY 1310, HISTORY 1200, or POL SCI 1200.Specific requirements for the bachelor degree are outlined in the sample program listed below.~~ **A "C"** ~~All computer science majors must earn a "C"~~ or better grade **must be earned** in **each computer science course** ~~all COMP SCI courses~~ used to fulfill B.S. in computer science degree requirements as well as **in COMP ENG 2210, COMP ENG 3150,** ~~in COMP ENG 2210, COMP ENG 3150,~~ and the required ethics elective.

The computer science curriculum requires twelve semester hours in humanities, exclusive of foreign language, and must include ENGLISH 1160 or ENGLISH 3560. A minimum of nine semester hours is required in social sciences, including either HISTORY 1300, HISTORY 1310, HISTORY 1200, or POL SCI 1200. Specific requirements for the bachelor degree are outlined in the sample program listed below.

Sample Course of Study

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
~~COMP SCI 1010~~[~~14~~]	~~4~~	COMP SCI 1200	3
~~COMP SCI 1570~~	~~3~~	~~COMP SCI 1575~~	~~3~~
~~COMP SCI 1580~~	~~1~~	~~COMP SCI 1585~~	~~1~~
FR ENG 1100	**1**	**COMP SCI 1570**	**3**

COMP SCI 1500[1]	3	COMP SCI 1580	1
Laboratory Science Elective[2]	5	MATH 1215[4]	4
MATH 1214[3]	4	ENGLISH 1160 or 3560	3
ENGLISH 1120	3	~~SP&M S 1185~~[4]	~~3~~
~~Humanities Elective~~[5]	~~3~~	Humanities / Social Science Elective[5]	3
	16		17

Sophomore Year

First Semester	Credits	Second Semester	Credits
~~COMP SCI 2200~~	~~3~~	~~COMP SCI 2300~~	~~3~~
~~COMP SCI 2500~~	~~3~~	~~COMP ENG 2210~~[12]	~~3~~
COMP SCI 1575	3	COMP SCI 2200	3
COMP SCI 1585	1	COMP SCI 2500	3
COMP ENG 2210[6]	3	PHYSICS 2135[9]	4
PHYSICS 1135[7]	4	~~MATH 3108~~[7]	~~3~~
Statistics Elective[8]	3	COMP ENG 3150[6]	3
~~Social Science Elective~~[2]	~~3~~	Literature Elective[10]	3
Humanities / Social Science Elective[5]	3		
	17		16

Junior Year

First Semester	Credits	Second Semester	Credits
~~COMP SCI 3100~~	~~3~~	~~COMP SCI 3600~~	~~3~~
~~COMP SCI 3500~~	~~3~~	~~COMP SCI 3800~~	~~3~~
~~COMP ENG 3150~~	~~3~~	~~Laboratory Science~~[1]	~~5~~
~~History Elective~~[2]	~~3~~	COMP SCI 3500	3
COMP SCI 2300	3	COMP SCI 3610	3
COMP SCI 3800	3	Cmp Sc Elective[12]	3
MATH 3108	3	Sci/Eng Elective[13]	3
Humanities / Social Science Elective[5]	3	~~Social Science Elective~~[2]	~~3~~
Ethics Elective[11]	3	SP&M S 1185[14]	3
	15		15

Senior Year

First Semester	Credits	Second Semester	Credits
~~COMP SCI 4096~~	~~3~~	~~Cmp Sc Electives~~[9]	~~9~~
COMP SCI 4090	3	~~Sci/Eng Elective~~[10]	~~3~~
COMP SCI 4610	3	~~Free Elective~~[8]	~~5~~
Cmp Sc Electives[12]	6	COMP SCI 4091	3
Sci/Eng Elective[13]	3	Cmp Sc Electives[12]	3
~~Free Elective~~[8]	~~3~~	Humanities / Social Science Elective[5]	3
		Free Elective[15]	8

	15	17
Total Credits: 128		

1	May be waived in lieu of a score of 4 or 5 on the AP Computer Science A exam.
2	An approved science lecture-laboratory course pair totaling at least four credit hours. The laboratory is mandatory in all cases. The approved course pairs are: CHEM 1310 and CHEM 1319; PHYSICS 1505 and PHYSICS 1509; PHYSICS 1605 and PHYSICS 1609; GEOLOGY 1110 and GEOLOGY 1119; GEOLOGY 1120 and GEOLOGY 1129; BIO SCI 1113 and BIO SCI 1219; BIO SCI 1223 and BIO SCI 1229; BIO SCI 2213 and BIO SCI 2219; BIO SCI 2353 and BIO SCI 2359; BIO SCI 2383 and BIO SCI 2389.
3	Or MATH 1208.
4	Or MATH 1221.
5	Any nine credit hours of social science courses and three credit hours of humanities courses on the approved lists maintained on the computer science website. One course must satisfy the Missouri and U.S. Constitution requirement. COMP SCI 4700 may be counted as a Social Science elective.
6	Laboratory not required.
7	Or both PHYSICS 1111 and PHYSICS 1119.
8	One of STAT 3113, STAT 3115, STAT 3117, or STAT 5643.
9	Or both PHYSICS 2111 and PHYSICS 2119.
10	One literature course on the approved list maintained on the computer science website.
11	One of PHILOS 3225, PHILOS 3235, PHILOS 4340, or PHILOS 4368.
12	Twelve hours of elective COMP SCI courses excluding COMP SCI 2002, COMP SCI 4700, COMP SCI 2001 - Domain Exploration and Innovation Methods, COMP SCI 3001 - Skill Development for Entrepreneurs and Innovators, COMP SCI 4001 - Advanced Domain Exploration and Innovation Methods, COMP SCI 4001 - Interpersonal Dynamics for Entrepreneurs and Innovators, and all COMP SCI x9xx courses. At least nine hours must be 5000-level or higher. At least nine hours must be lecture courses.
13	Any six hours chosen from departments that offer a degree associated with either the Discipline Specific Curricula Committee for Sciences or the Discipline Specific Curricula Committee for Engineering, excluding Computer Science. The following courses are also excluded: all 1000-level MATH courses, all STAT courses below 4000-level, all 1000-level Physics courses, PHYSICS 2111, PHYSICS 2119, PHYSICS 2135, and PHYSICS 2145.
14	SP&M S 1185 or SP&M S 3245 or THEATRE 3245 or one of the two complete four-course sequences in Advanced ROTC (MIL ARMY 3250, MIL ARMY 3500, MIL ARMY 4250, and MIL ARMY 4500; or MIL AIR 3110, MIL AIR 3120, MIL AIR 4110 and MIL AIR 4120).
15	**Courses chosen from any discipline so that 128 hours are completed. These and only these courses may be taken pass/fail and only one course may be taken pass/fail each semester. The following courses are excluded: all 1000-level MATH courses, all STAT courses below 4000-level, all 1000-level Physics courses, PHYSICS 2111, PHYSICS 2119, PHYSICS 2135, PHYSICS 2145, any COMP SCI x9xx courses, and the first two years of ROTC.**

Justification for request

The proposed changes were approved by the faculty members of the CS department at their March 5th 2019 faculty meeting. Collectively the changes accomplish the following:

(1) Update the BS in CS degree program to meet the latest ACM/IEEE curriculum recommendations.

(2) Address concerns regarding the technical writing abilities of our majors, and the rigor and applicability of the ethics training we provide our majors. These issues were discussed at the CS department retreat on August 13th & 14th 2018, and referred to the department's undergraduate committee, which specifically means to address them through the revised program proposed in this DC form.
(3) ABET's requirement for a major programming project for our majors.
(4) Changing from direct degree program admits to S&T's First Year Experience program admits.
(5) Introduction of a new introductory programming course to precede the existing one (CS1570) in order to focus the first CS course on acquiring skill in high-level computational problem solving rather than the syntax and semantics of a low-level programming language. This has several purposes, including:
(a) This program's ABET student outcome 2 as measured by the Introductory Programming rubric in CS 1570, has been failing consistently for several years, indicating that students are not grasping programming fundamentals. The new course CS1500 addresses this by providing a significant grounding in programming fundamentals before the students cover more advanced programming topics in CS1570 and more advanced data structures in CS1575.
(b) Aligning this course with one of the core goals of the First Year Experience (FYE), namely to provide all FYE students with an experience reflective of what CS is really about to help them decide whether this is the right major for them.
(c) Diversifying the CS student body by attracting non-traditional majors by showcasing societal impact through computational problem solving rather than ignoring societal impact by narrowly focusing on the technicalities of low-level programming.
Supporting Documents
Course Reviewer Comments
kristyg (03/29/19 2:31 pm): Rollback: Rollback per Dr. Tauritz request
ff (03/29/19 4:12 pm): Rollback: typo

Key: 28

Program Change Request

Date Submitted: 04/02/19 4:22 pm

Viewing: CMP SC-MI : Computer Science Minor

File: 29.11

Last approved: 06/28/17 10:13 am

Last edit: 04/02/19 4:22 pm

Changes proposed by: tauritzd

Catalog Pages Using this Program
Computer Science

Start Term
Fall 2019 ~~08/14/2017~~
Program Code
CMP SC-MI
Department
Computer Science
Title
Computer Science Minor

Program Requirements and 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. Kristy Giacomelli

Approval Path

1. 04/02/19 4:23 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 04/03/19 10:31 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:35 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:38 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Apr 28, 2014 by Daniel Tauritz (tauritzd)
2. Aug 14, 2014 by Lahne Black (lahne)

3. Jul 15, 2015 by pantaleoa
4. Jun 28, 2017 by Daniel Tauritz (tauritzd)

Computer Science Minor Curriculum

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

1. **A "C" or better grade in ~~at least 9 credit hours of COMP SCI courses at~~ the following core courses: ~~2000 or higher level.~~ COMP SCI 1500, COMP SCI 1570, COMP SCI 1575, COMP SCI 1580, and COMP SCI 1585. Note that COMP SCI 1500 will ~~At most 6 of the 18 credit hours can~~ be waived in lieu of ~~transfer credits and transfer classes must show~~ a score of 4 ~~"C"~~ or 5 on the AP Computer Science A exam and no additional credit hours will be required. ~~better grade.~~**
2. A "C" or better grade in **at least 9** ~~at least 18~~ credit hours of COMP SCI **courses in addition to the above listed core** courses, **excluding:** ~~excluding x9xx courses.~~
    a. ***COMP SCI 2001 – Domain Exploration and Innovation Methods***
    b. ***COMP SCI 3001 – Skill Development for Entrepreneurs and Innovators***
    c. ***COMP SCI 4001 – Advanced Domain Exploration and Innovation Methods***
    d. ***COMP SCI 4001 – Interpersonal Dynamics for Entrepreneurs and Innovators***
    e. ***COMP SCI 4700***
    f. **all COMP SCI x9xx courses.**
3. **At most 6 credit hours can be transfer credits and transfer classes must show a "C" or better grade.**

~~A "C" or better grade in at least 9 credit hours of COMP SCI courses at the 2000 or higher level.A "C" or better grade in two of the following courses: COMP SCI 3100, COMP SCI 2200, COMP SCI 3200, COMP SCI 2300, COMP SCI 2500, COMP SCI 3500 and COMP SCI 3800.At most 6 of the 18 credit hours can be transfer credits and transfer classes must show a "C" or better grade.~~

Justification for request

This update of the Computer Science minor reflects the recent update of the Computer Science Bachelors degree program, and provides increased flexibility in choice of courses.

Supporting Documents

Course Reviewer Comments

Key: 29

Program Change Request

Date Submitted: 04/05/19 11:44 am

Viewing: CP ENG-MS : Computer Engineering MS

File: 161.5

Last approved: 07/22/15 1:58 pm

Last edit: 04/15/19 8:20 am

Changes proposed by: sweetk

Catalog Pages Using this Program
Computer Engineering

Start Term
Fall 2019 ~~08/17/2015~~
Program Code
CP ENG-MS
Department
Electrical and Computer Engineering
Title
Computer Engineering MS

Program Requirements and 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. Kristy Giacomelli

Approval Path

1. 04/04/19 3:31 pm Kristy Giacomelli (kristyg): Rollback to Initiator
2. 04/13/19 3:57 pm Daryl Beetner (daryl): Approved for RELECENG Chair
3. 04/15/19 8:21 am Brittany Parnell (ershenb): Approved for CCC Secretary
4. 04/19/19 9:32 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
5. 04/23/19 11:48 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Aug 5, 2014 by pantaleoa
2. Jun 9, 2015 by pantaleoa
3. Jul 22, 2015 by pantaleoa

~~An~~

M.S. ~~Program Requirements Additional departmental requirements beyond those stated in the section on Admission and Program Procedures are as follows.~~Degree Requirements

Thesis option M.S. programs of study require a minimum of 21 credit hours of **coursework** ~~course work~~ exclusive of credit hours earned for thesis **research.** ~~research (courses numbered 5099).~~ **The thesis option degree is based on a combination of coursework and research. This option requires the student to find a faculty member willing to serve as advisor.** ~~A limited number of credit hours for 3000 level courses may be counted towards the fulfillment of an M.S.~~**This should be done as soon as possible so** ~~program of study, provided~~ that the **student** ~~courses are taken outside of the electrical~~ and **advisor will be able to formulate both a plan of coursework** ~~computer engineering department~~ and **a research project.** ~~that the courses are pre-requisites for at least one 5000 or 6000 level course also included in the program of study.~~

Non-thesis option M.S. program is based entirely on coursework. This option requires a minimum of 30 credit hours of coursework. Non-thesis students are assigned an initial advisor by the department, typically the associate chair for graduate studies. M.S. degree students, both thesis and non-thesis option, may change this degree option and advisors at any time with the consent of their current and new advisors.

M.S. Communication Requirements

A M.S. student is required to fulfill a zero credit hour communications requirement to demonstrate a sufficient communications capability to operate effectively at an advanced level in the professional engineering and scientific community. To fulfill this requirement, ~~The doctoral program of study, for~~ the **advisor will monitor the student's capability through one of the following exemplary activities during the program of study:** ~~Ph.D.~~

1. **Authoring at least one accepted publication (major contribution to communication aspects)**
2. **Taking/transferring one graduate-level communication course**
3. **Possessing industrial or other professional experiences**
4. **Having completed example(s) listed above or equivalent before enrolling in the program**
5. **Other equivalent qualifications as identified by the advisor**

~~degree or the D.E.degree, should include 90 credit hours beyond the B.S.degree or 60 credit hours beyond the M.S.degree.An M.S.or doctoral student's advisory committee may impose additional requirements or restrictions as it sees fit.~~

Justification for request

ECE Graduate Committee proposed this change and the Faculty voted for it during the Feb. 2019 ECE Department Faculty Meeting.

Supporting Documents

Course Reviewer Comments

kristyg (04/04/19 3:31 pm): Rollback: Requested per Kelly

ershenb (04/15/19 8:20 am): formatting

Key: 161

Program Change Request

Date Submitted: 04/05/19 11:44 am

Viewing: CP ENG-PHD : Computer Engineering PhD

File: 162.2

Last approved: 07/22/15 1:58 pm

Last edit: 04/15/19 8:22 am

Changes proposed by: sweetk

Catalog Pages Using this Program
Computer Engineering

Start Term
Fall 2019 ~~08/17/2015~~
Program Code
CP ENG-PHD
Department
Electrical and Computer Engineering
Title
Computer Engineering PhD

Program Requirements and 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. Kristy Giacomelli

Approval Path

1. 04/04/19 3:31 pm Kristy Giacomelli (kristyg): Rollback to Initiator
2. 04/13/19 3:57 pm Daryl Beetner (daryl): Approved for RELECENG Chair
3. 04/15/19 8:23 am Brittany Parnell (ershenb): Approved for CCC Secretary
4. 04/19/19 9:32 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
5. 04/23/19 11:47 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Jul 22, 2015 by pantaleoa

Ph.D. Degree Requirements

The two types of doctoral degrees offered by this department are the Doctor of Philosophy (Ph.D.) and the Doctor of Engineering (D.E.) with a strong emphasis on research with advisor. The primary difference between these two doctoral degrees is that the research portion of the D.E .degree is conducted as an internship with an industrial concern or government laboratory and is jointly supervised by an internship advisor employed by the cooperating organization and a faculty advisor employed by S&T. In contrast, the research portion of the Ph.D. degree is generally conducted on campus.

The doctoral program of study, for the Ph.D. degree or the D.E. degree, should include 90 credit hours (minimum 48 hours coursework and minimum 42 hours research) beyond the B.S. degree or 60 credit hours (minimum 24 hours coursework and minimum 36 hours research) beyond the M.S. degree.

Ph.D Communication Requirement

A doctoral student is required to fulfill a zero credit hour communications requirement to demonstrate a sufficient communications capability to operate effectively at an advanced level in the professional engineering and scientific community. To fulfill this requirement, the advisor will monitor the student's capability through one of the following exemplary activities during the program of study:

1. **Authoring at least one accepted publication (major contribution to communication aspects)**
2. **Taking/transferring one graduate-level communication course**
3. **Possessing industrial or other professional experiences**
4. **Having completed example(s) listed above or equivalent before enrolling in the program**
5. **Other equivalent qualifications as identified by the advisor**

~~Language Requirement As a computer engineering Ph.D.student, you are not required to satisfy a language requirement.However, you may have language requirements included in your plan of study if your advisory committee feels that this inclusion would be useful or necessary for your research.~~

Justification for request

ECE Graduate Committee proposed this change and the Faculty voted for it during the Feb. 2019 ECE Department Faculty Meeting.

Supporting Documents

Course Reviewer Comments

kristyg (04/04/19 3:31 pm): Rollback: Request per Kelly

ershenb (04/15/19 8:22 am): formatting

Key: 162

Program Change Request

Date Submitted: 04/05/19 11:43 am

Viewing: EL ENG-MS : Electrical Engineering MS

File: 163.5

Last approved: 06/18/18 12:29 pm

Last edit: 04/15/19 10:48 am

Changes proposed by: sweetk

Catalog Pages Using this Program
Electrical Engineering

Start Term
Fall 2019 ~~08/13/2018~~
Program Code
EL ENG-MS
Department
Electrical and Computer Engineering
Title
Electrical Engineering MS

Program Requirements and 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. Kristy Giacomelli

Approval Path

1. 04/04/19 3:31 pm Kristy Giacomelli (kristyg): Rollback to Initiator
2. 04/13/19 3:57 pm Daryl Beetner (daryl): Approved for RELECENG Chair
3. 04/15/19 10:50 am Brittany Parnell (ershenb): Approved for CCC Secretary
4. 04/19/19 9:32 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
5. 04/23/19 11:49 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Jul 23, 2015 by pantaleoa
2. Jun 18, 2018 by Kelly Venus (sweetk)

~~Thesis option~~

~~Program Requirements Additional departmental requirements beyond those stated in the section on Admission and Program Procedures are as follows.~~M.S. Degree Requirements

Thesis option M.S. programs of study require a minimum of 21 credit hours of **coursework** ~~course work~~ exclusive of credit hours earned for thesis **research.** ~~research (courses numbered 5099).~~ **The thesis option degree is based on a combination of coursework and research. This option requires the student to find a faculty member willing to serve as advisor. This should be done as soon as possible so that the student and advisor will be able to formulate both a plan of coursework and a research project.**

Non-thesis option M.S. program is based entirely on coursework. This option requires a minimum ~~A limited number~~ of **30** credit hours ~~for 3000 level courses may be counted towards the fulfillment~~ of **coursework.** ~~a M.S.~~ **Non-thesis students are assigned an initial advisor by the department, typically the associate chair for graduate studies. M.S. degree students, both thesis and non-thesis option, may change this degree option and advisors at any time with the consent of their current and new advisors.**

M.S. Communication Requirements

A M.S student is required to fulfill a zero credit hour communications requirement to demonstrate a sufficient communications capability to operate effectively at an advanced level in the professional engineering and scientific community. To fulfill this requirement, the advisor will monitor the student's capability through one of the following exemplary activities during the program of study:

1. **Authoring at least one accepted publication (major contribution to communication aspects)**
2. **Taking/transferring one graduate-level communication course**
3. **Possessing industrial or other professional experiences**
4. **Having completed example(s) listed above or equivalent before enrolling in the program**
5. **Other equivalent qualifications as identified by the advisor**

~~program of study, provided that the courses are taken outside of the electrical and computer engineering department and that the courses are pre-requisites for at least one 5000 or 6000 level course also included in the program of study. An M.S. advisory committee may impose additional requirements or restrictions as it sees fit.~~

Justification for request
ECE Graduate Committee proposed this change and the Faculty voted for it during the Feb. 2019 ECE Department Faculty Meeting.
Supporting Documents
Course Reviewer Comments
kristyg (04/04/19 3:31 pm): Rollback: Request per Kelly
ershenb (04/15/19 10:48 am): formatting

Key: 163

Program Change Request

Date Submitted: 04/05/19 11:43 am

Viewing: EL ENG-PHD : Electrical Engineering PhD

File: 164.2

Last approved: 07/23/15 9:05 am

Last edit: 04/15/19 10:50 am

Changes proposed by: sweetk

Catalog Pages Using this Program
Electrical Engineering

Start Term
Fall 2019 ~~08/17/2015~~
Program Code
EL ENG-PHD
Department
Electrical and Computer Engineering
Title
Electrical Engineering PhD

Program Requirements and 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. Kristy Giacomelli

Approval Path

1. 04/04/19 3:31 pm Kristy Giacomelli (kristyg): Rollback to Initiator
2. 04/13/19 3:57 pm Daryl Beetner (daryl): Approved for RELECENG Chair
3. 04/15/19 10:50 am Brittany Parnell (ershenb): Approved for CCC Secretary
4. 04/19/19 9:32 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
5. 04/23/19 11:49 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Jul 23, 2015 by pantaleoa

Ph.D. Degree Requirements

The two types of doctoral degrees offered by this department are the Doctor of Philosophy (Ph.D.) and the Doctor of Engineering (D.E.) with a strong emphasis on research with advisor. The primary difference between these two doctoral degrees is that the research portion of the D.E .degree is conducted as an internship with an industrial concern or government laboratory and is jointly supervised by an internship advisor employed by the cooperating organization and a faculty advisor employed by S&T. In contrast, the research portion of the Ph.D. degree is generally conducted on campus.

The doctoral program of study, for the Ph.D. degree or the D.E. degree, should include 90 credit hours (minimum 48 hours coursework and minimum 42 hours research) beyond the B.S. degree or 60 credit hours (minimum 24 hours coursework and minimum 36 hours research) beyond the M.S. degree.

Ph.D Communication Requirement

A doctoral student is required to fulfill a zero credit hour communications requirement to demonstrate a sufficient communications capability to operate effectively at an advanced level in the professional engineering and scientific community. To fulfill this requirement, the advisor will monitor the student's capability through one of the following exemplary activities during the program of study:

1. **Authoring at least one accepted publication (major contribution to communication aspects)**
2. **Taking/transferring one graduate-level communication course**
3. **Possessing industrial or other professional experiences**
4. **Having completed example(s) listed above or equivalent before enrolling in the program**
5. **Other equivalent qualifications as identified by the advisor**

~~Language Requirement As an electrical engineering Ph.D.student, you are not required to satisfy a language requirement.However, you may have language requirements included in your plan of study if your advisory committee feels that this inclusion would be useful or necessary for your research.~~

Justification for request

ECE Graduate Committee proposed this change and the Faculty voted for it during the Feb. 2019 ECE Department Faculty Meeting.

Supporting Documents

Course Reviewer Comments

kristyg (04/04/19 3:31 pm): Rollback: Request per Kelly

ershenb (04/15/19 10:50 am): formatting

Key: 164

Program Change Request

Date Submitted: 03/29/19 12:56 pm

Viewing: ENG MG-MS : Engineering Management MS

File: 46.11

Last approved: 06/18/18 12:29 pm

Last edit: 04/15/19 10:14 am

Changes proposed by: johsarah

Catalog Pages Using this Program
Engineering Management

Start Term
Fall 2019 ~~08/13/2018~~
Program Code
ENG MG-MS
Department
Engineering Management and Systems Engineering
Title
Engineering Management MS

Program Requirements and Description

In Workflow

1. **RENGMNGT 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. Kristy Giacomelli

Approval Path

1. 03/29/19 1:23 pm Suzanna Long (longsuz): Approved for RENGMNGT Chair
2. 04/02/19 1:57 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:14 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:50 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Jun 12, 2014 by pantaleoa
2. Jun 19, 2015 by Stephen Raper

(sraper)
3. Jul 23, 2015 by pantaleoa
4. Apr 19, 2016 by pantaleoa
5. Jun 18, 2018 by Sarah Johnson (johsarah)

The M.S. degree program is offered on the Rolla campus and several locations including the Missouri S&T Global - St. Louis, Fort Leonard Wood (restricted to Engineer Captain's Career Course), and by distance education throughout the United States and selected international locations. Distance course lectures are archived upon completion of the lecture and all lectures are available to students through streaming video during the semester for review. These courses can be reached from anywhere at any time. It is feasible to obtain a Missouri S&T non-thesis M.S. degree regardless of your location.

The M.S. non-thesis program requires completion of at least 10 three-credit hour courses approved by the academic advisor. The M.S. with thesis option requires **30** ~~thirty~~ credit hours including the thesis. All students are required to take the following:

Core Courses

ENG MGT 5111	Management for Engineers and Scientists
ENG MGT 5320	Project Management
ENG MGT 5412	Operations Management Science
ENG MGT 6211	Advanced Financial Management

Students are then encouraged to identify an emphasis area depending on their interests and to choose available courses from the selected area. However, courses can be chosen from more than one emphasis area. Students have the option to take up to two out-of-department elective courses.

Students must submit a typed Form I to the EMSE graduate office by the beginning of the semester of their 15th credit hour. Links to forms are available at: ~~http://emgt.mst.edu/currentstudents/formsdeadlines.html~~ **https://grad.mst.edu/currentstudents/forms/. Thesis** ~~Thesis~~ students cannot register for Graduate Research (ENG MGT 6099) until their Form I is on file. If students vary from Form I, they must file a Form I-A. Non-thesis students must take three 6000-level courses. Thesis students must take two 6000-level courses (in addition to ENG MGT 6099). Students must meet all requirements for graduation as specified in the Graduate Catalog for engineering management. A graduate student already holding or completing a master's degree may obtain a second M.S. in engineering management by completing at least an additional 24 credit hours of work.

Some recent master thesis titles include:

- Impacting Co-Worker Trust Toward Persons with Disabilities
- Intelligent Technical Analysis Using Neural Networks and Fuzzy Logic
- Applying the Six Sigma Methodology to Improve the Admissions Process at Missouri S&T
- Strategic Inventory Allocation for Vehicle Rental Agencies
- Design and Development of an Interactive Web-Integrated Flexible Manufacturing Cell Control System
- Investigations in the Design of Products and Factories for End-of-Life Disassembly
- Warranty Cost Prediction Using Mahalanobis Distance
- Automotive Braking System Simulation and Optimization

Justification for request

Supporting Documents

Course Reviewer Comments

sraper (04/15/19 10:14 am): changed thirty to 30.

Key: 46

Program Change Request

Date Submitted: 03/13/19 3:34 pm

Viewing: FINANCE-MI : Finance Minor

File: 58.15

Last approved: 07/14/15 3:40 pm

Last edit: 03/13/19 3:34 pm

Changes proposed by: barryf

Catalog Pages Using this Program
Business and Management Systems
Information Science and Technology

Start Term
Fall 2019 ~~08/17/2015~~
Program Code
FINANCE-MI
Department
Business and Information Technology
Title
Finance Minor

Program Requirements and Description

In Workflow

1. **RINFSCTE Chair**
2. **CCC Secretary**
3. **Social 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. Kristy Giacomelli

Approval Path

1. 04/03/19 4:34 pm siauk: Approved for RINFSCTE Chair
2. 04/03/19 10:33 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/04/19 11:53 am Barry Flachsbart (barryf): Approved for Social Sciences DSCC Chair
4. 04/23/19 11:59 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Apr 28, 2014 by Barry Flachsbart (barryf)
2. Jan 30, 2015 by Barry Flachsbart (barryf)

3. Jul 14, 2015 by pantaleoa
4. Jul 14, 2015 by pantaleoa

Minor in Finance

The minor in finance requires the following 15 hours of coursework:

ECON 1100	Principles Of Microeconomics	3
or ECON 1200	Principles Of Macroeconomics	
FINANCE 2150	Corporate Finance I	3
and three courses from the following:		9
BUS 5230	**Financial Statement Analysis**	
FINANCE 5160	**Corporate Finance II**	
FINANCE 5260	**Investments I**	
FINANCE 5310	**Financial Technology and Analytics**	
Total Credits		15

Justification for request

Making the elective courses more specific..

Supporting Documents

Course Reviewer Comments

Key: 58

Program Change Request

Date Submitted: 03/26/19 10:51 pm

Viewing: GE ENG-BS : Geological Engineering BS

File: 156.24

Last approved: 06/18/18 12:29 pm

Last edit: 04/23/19 12:27 pm

Changes proposed by: grotekr

Catalog Pages Using this Program
Geological Engineering

Start Term
Fall 2019 ~~08/13/2018~~
Program Code
GE ENG-BS
Department
Geosciences and Geological and Petroleum Engineering
Title
Geological Engineering BS

Program Requirements and 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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. Kristy Giacomelli

Approval Path

1. 03/28/19 9:14 am David Borrok (borrokd): Approved for RGEOSENG Chair
2. 03/28/19 9:50 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 10:20 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 12:28 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Mar 18, 2014 by Lahne Black (lahne)
2. Nov 18, 2014 by pantaleoa

3. Nov 18, 2014 by pantaleoa
4. Jul 20, 2015 by pantaleoa
5. Feb 27, 2018 by Katherine Grote (grotekr)
6. Jun 18, 2018 by Katherine Grote (grotekr)

Bachelor of Science
Geological Engineering

Entering freshmen desiring to study geological engineering will be admitted to the Freshman Engineering Program. They will, however, be permitted, if they wish, to state a geological 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 geological 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 at least two grade points per credit hour for all courses taken in the student's major department, and an average of at least two grade points per credit hour must be maintained in geological engineering.

The geological engineering curriculum contains a required number of hours in humanities and social sciences. 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. Some disciplines require one humanities course to be selected for art, English, foreign languages, music, philosophy, speech and media studies, or theater.
2. Of the remaining hours, six credit hours must be taken in humanities or social sciences at the 2000 level or above and must meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog. Each 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 3000 level.)
3. Some departments list specific requirements; e.g. a psychology course, a literature course, and /or a second semester of economics. Selections should be made to ensure that these requirements are met.
4. Special topics, special problems courses and honors seminars are allowed only by petition to and approval by the student's program head.

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

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**

MATH 1214	4	MATH 1215	4
CHEM 1310	4	MECH ENG 1720	3
CHEM 1100	1	PHYSICS 1135	4
CHEM 1319	1	GEO ENG 1150	3
ENGLISH 1120	3	Humanities/Soc Sci Elective[a]	3
FR ENG 1100	1		
Humanities/Soc Sci Elective[a]	3		
	17		17

Sophomore Year

First Semester	Credits	Second Semester	Credits
MATH 2222	4	MATH 3304	3
PHYSICS 2135	4	CIV ENG 2200	3
GEO ENG 3148	3	GEO ENG 2110	1
GEO ENG 3249	3	GEOLOGY 2611	3
		GEO ENG 3175	3
		Humanities/Soc Sci Elective[a]	3
	14		16

Junior Year

First Semester	Credits	Second Semester	Credits
MECH ENG 2350	2	CIV ENG 3330	3
CIV ENG 2210	3	GEO ENG 5443	3
GEO ENG 5331	3	ENGLISH 3560	3
Economics Elective[b]	3	Humanities/Soc Sci Elective[a]	3
GEOLOGY 3310	3	~~Chemistry/Geochemistry Elective~~[e]	~~3~~
Humanities/Soc Sci Elective[a]	3	**Chemistry/Geochemistry Elective[c]**	**3**
GEOLOGY 3319	1		
	18		15

Senior Year

First Semester	Credits	Second Semester	Credits
Geophysics Elective[d]	3	GEO ENG 5174	3
GEO ENG 4010	0.5	GEO ENG 4010	0.5
GEO ENG 5441	3	Earth Mechanics Elective[f]	3
GEO ENG 5090 or 5092[e]	3	Technical Electives[g]	6
CIV ENG 3715 or MIN ENG 5823	3	Eng Econ Elective[h]	3
GEO ENG 4115	3		
	15.5		15.5
Total Credits: 128			

a The sequence of course selection must provide both breadth and depth of content and must meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog. A total of 18 hours of humanities and social

	science credit is required.
b	The Economics Elective must be selected from ECON 1100 or ECON 1200.
c	The chemistry/geochemistry elective must be selected from chemistry, geochemistry or biology courses as approved by your advisor.
d	The Geophysics elective can be selected from GEO ENG 5736, GEO ENG 5761, or GEO ENG 5782.
e	Students may take GEO ENG 5090 or GEO ENG 5092 for senior design credit.
f	To be selected from GEO ENG 5471, GEO ENG 5381, GEO ENG 5556, MIN ENG 5823, PET ENG 2510, PET ENG 3520, CIV ENG 3715, CIV ENG 4729, or CIV ENG 5715.
g	To be selected from advanced courses in geological, mining, petroleum or civil engineering, geology or other courses with approval of your advisor. Must contain design content and must be approved by your advisor.
h	To be selected from ENG MGT 5210, MIN ENG 3512, or PET ENG 4590 or both ENG MGT 1100 and ENG MGT 1210.

All GE students must take the Fundamentals of Engineering Examination prior to graduation. A passing grade is not required; however, it is the first step toward becoming a registered professional engineer. This requirement is part of the Missouri S&T assessment process.

Geological engineering students must earn the grade of "C" or better in all geological engineering courses to receive credit toward graduation. The total number of credit hours required for a degree in Geological Engineering is 128. The assumption is made that a student admitted to the Department has completed 34 hours toward graduation to fulfill the requirements of the Freshman Engineering program.

Geological Engineering Emphasis Areas

Electives are selected by the student with advisor approval. Some appropriate electives are listed for each emphasis area.

Engineering Geology and Geotechnics

GEO ENG 5471	**Rock Engineering**	**3**
CIV ENG 3715	**Fundamentals of Geotechnical Engineering**	**3**
CIV ENG 4729	**Foundation Engineering**	**3**
MIN ENG 5823	**Rock Mechanics**	**3**
GEO ENG 5146	**Applications Of Geographic Information Systems**	**3**
GEO ENG 5441	**Engineering Geology And Geotechnics**	**3**

Groundwater Hydrology and Environmental Protection

GEO ENG 5381	Intermediate Subsurface Hydrology And Contaminant Transport Mechs	3
GEO ENG 5233	Risk Assessment In Environmental Studies	3
~~GEO ENG 5174~~	~~Geological Engineering Field Methods~~	~~3~~
~~GEO ENG 5331~~	~~Subsurface Hydrology~~	~~3~~
~~GEO ENG 4115~~	~~Statistical Methods in Geology and Engineering~~	~~3~~
~~GEO ENG 5441~~	~~Engineering Geology And Geotechnics~~	~~3~~
~~CIV ENG 3715~~	~~Fundamentals of Geotechnical Engineering~~	~~3~~
GEO ENG 5235	**Environmental Geological Engineering**	**3**
GEO ENG 5320	**Groundwater Modeling**	**3**
GEO ENG 5237	**Geological Aspects Of Hazardous Waste Management**	**3**
CIV ENG 5640	**Environmental Law And Regulations**	**3**

GEO ENG 4276	**Environmental Aspects Of Mining**	**3**
PET ENG 3330	Well Logging	3

Dual Professional Registration as a Geologist

GEOLOGY 2096	**Field Geology**	**3**
GEOLOGY 3620	**Stratigraphy And Sedimentation**	**3**
GEOLOGY 4097	**Advanced Field Geology**	**3**
GEOLOGY 4841	**Geological Field Studies**	**3**
GEOLOGY 3410	**Introduction To Geochemistry**	**3**
GEOLOGY 4310	**Remote Sensing Technology**	**3**
GEOLOGY 4431	**Methods Of Karst Hydrogeology**	**3**

Environmental and Engineering Geophysics

GEO ENG 5736	**Geophysical Field Methods**	**3**
GEO ENG 5761	**Transportation Applications of Geophysics**	**3**
GEO ENG 5782	**Environmental and Engineering Geophysics**	**3**
GEO ENG 5144	**Remote Sensing Technology**	**3**
GEOPHYS 4241	**Electrical Methods In Geophysics**	**3**
GEOPHYS 4261	**Geophysical Instrumentation**	**1**
GEOPHYS 5231	**Seismic Data Processing**	**3**

Renewable and Conventional Energy Resources

GEO ENG 5556	**Renewable Energy Systems**	**3**
PET ENG 3520	Petroleum Reservoir Engineering	3
~~MIN ENG 4823~~	~~Course MIN ENG 4823 Not Found~~	~~3~~
GEO ENG 5146	Applications Of Geographic Information Systems	3
MIN ENG 5823	**Rock Mechanics**	**3**
GEO ENG 5381	Intermediate Subsurface Hydrology And Contaminant Transport Mechs	3
GEOLOGY 5511	Applied Petroleum Geology	3
PET ENG 2510	Properties Of Hydrocarbon Fluids	3
PET ENG 1110	Introduction to Petroleum Engineering	1
PET ENG 3330	Well Logging	3
PET ENG 4520	Well Test Analysis	3

Quarry and Mining Engineering

~~MIN ENG 4823~~	~~Course MIN ENG 4823 Not Found~~	~~3~~
GEO ENG 5575	Aggregates And Quarrying	3
MIN ENG 5823	**Rock Mechanics**	**3**
CIV ENG 3116	Construction Materials, Properties And Testing	3
GEO ENG 5471	Rock Engineering	3

GEO ENG 4276	Environmental Aspects Of Mining	3
MIN ENG 3913	Mineral Identification and Exploration	3
MIN ENG 5612	Principles of Explosives Engineering	3
MIN ENG 5822	Strata Control	3

Accelerated BS/MS Geological Engineering Program Option for Geological Engineering Majors

Geological Engineering undergraduates at Missouri S&T may opt to apply for an accelerated BS/MS program where a student can achieve both the BS and MS degrees in Geological Engineering faster than if pursuing the degrees separately. The degrees awarded will be a BS & MS in Geological Engineering.

The benefits for undergraduate students admitted to the program are:

- **Undergraduate and graduate courses may be chosen with greater flexibility,**
- **Up to six hours of 5000-level or above Geo Eng coursework may apply to both the BS and MS requirements,**
- **The classes taken for shared BS/MS credit may be taken at the lower undergraduate tuition rate,**
- **The GRE is not required for admission,**
- **Other graduate courses can be taken any time after entering the program as a dual enrolled student,**
- **Work on a thesis project may begin before the BS requirements are completed.**

To be eligible for the accelerated BS/MS Geo Eng program, a Geo Eng undergraduate must be at or beyond the junior level standing with a minimum of 48 credit hours, have successfully completed the Chemistry and Math requirements, and have completed 18 credit hours of Geo Eng courses at Missouri S&T with at least a 3.2 GPA in the Geo Eng courses. To be admitted, the student must complete the program application and must have the recommendation of a Geo Eng faculty member. All other MS degree requirements remain the same. The program may be combined with existing honors research, emphasis areas, and certificate options. Admitted students will have both undergraduate and graduate records in the Registrar's Office.

The Accelerated Program application must be completed within one semester after all shared-credit courses are completed. Courses taken for shared credit will be identified on the application form. These courses will also be listed on the student's Graduate Form 1 to be submitted after the student enters the graduate program. The six hours of shared-credit coursework, to be taken as undergraduate credit, must be approved by the academic advisor and may not be undergraduate research, special problems, or transfer courses. An additional six credit hours of coursework for graduate credit (beyond the shared BS/MS credits) can be taken while in the undergraduate program by applying for dual undergraduate/graduate enrollment. Taking additional courses for graduate credit as a dual enrolled student will require formal application to the graduate program. Acceptance to the Geo Eng MS degree program from the Accelerated Program is automatic so long as the student remains in good standing (GPA above 3.0 and B's or better in all graduate courses) within the program. To remain in the Accelerated Program, the student must meet Geological Engineering graduate student academic performance requirements and must maintain continuous enrollment at Missouri S&T. If the student exits the program before completion of the MS degree requirements, or fails to maintain continuous enrollment at Missouri S&T, the shared-credit courses may not apply toward graduate requirements in the event of future readmission.

It is the student's responsibility to check how dual-enrollment status and graduate coursework would affect scholarships and other financial aid. Graduate students are not eligible for Federal Pell Grants, though they are eligible for Federal Financial Aid, as well as fellowships and teaching/research assistantships. It is international student's responsibility to check with the International Affairs Office during completion of an accelerated BS/MS to ensure immigration status is properly maintained throughout the program.

~~Environmental Protection and Hazardous Waste Management Groundwater Hydrology and Contaminant Transport Engineering Geology and Geotechnics Petroleum, Energy and Natural Resources Quarry Engineering~~

~~GEO ENG 5471~~	~~Rock Engineering~~	~~3~~
~~CIV ENG 3715~~	~~Fundamentals of Geotechnical Engineering~~	~~3~~
~~MIN ENG 4823~~	~~Course MIN ENG 4823 Not Found~~	~~3~~
~~CIV ENG 4729~~	~~Foundation Engineering~~	~~3~~
~~GEO ENG 5146~~	~~Applications Of Geographic Information Systems~~	~~3~~
~~GEO ENG 5441~~	~~Engineering Geology And Geotechnics~~	~~3~~
~~GEO ENG 4115~~	~~Statistical Methods in Geology and Engineering~~	~~3~~

~~GEO ENG 5235~~	~~Environmental Geological Engineering~~	~~3~~
~~GEO ENG 5237~~	~~Geological Aspects Of Hazardous Waste Management~~	~~3~~
~~GEO ENG 5381~~	~~Intermediate Subsurface Hydrology And Contaminant Transport Mechs~~	~~3~~
~~GEO ENG 5331~~	~~Subsurface Hydrology~~	~~3~~
~~GEO ENG 4115~~	~~Statistical Methods in Geology and Engineering~~	~~3~~
~~GEO ENG 4276~~	~~Environmental Aspects Of Mining~~	~~3~~
~~GEO ENG 5233~~	~~Risk Assessment In Environmental Studies~~	~~3~~
~~CIV ENG 3715~~	~~Fundamentals of Geotechnical Engineering~~	~~3~~

Justification for request

Emphasis area Changes: Changes to the emphasis area better reflect current job opportunities for geological engineering students as well as emphasis areas of current faculty. Also, course numbers which have changed since the last update have been corrected.

Accelerated MS Program: The accelerated MS program has been added in accordance with university goals of higher MS student enrollment and following guidelines set by graduate student administrators.

Supporting Documents

~~curriculum changes spring 2018.docx~~

Course Reviewer Comments

ershenb (03/28/19 9:48 am): formatting

sraper (04/15/19 10:20 am): Changed statement to be consistent with previous (ECE and Comp Eng) accelerated program statements.

ershenb (04/23/19 12:27 pm): formatting

Key: 156

Program Change Request

Date Submitted: 04/03/19 11:36 am

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

File: 64.25

Last approved: 06/18/18 12:29 pm

Last edit: 04/08/19 8:50 am

Changes proposed by: sbrower

Catalog Pages Using this Program
Geology and Geophysics

Start Term
Fall 2019 ~~08/13/2018~~
Program Code
GL&GPH-BS
Department
Geosciences and Geological and Petroleum Engineering
Title
Geology and Geophysics BS

Program Requirements and Description

In Workflow

1. RGEOSENG 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. Kristy Giacomelli

Approval Path

1. 02/25/19 4:27 pm David Borrok (borrokd): Approved for RGEOSENG Chair
2. 03/05/19 11:15 am Brittany Parnell (ershenb): Rollback to Initiator
3. 04/02/19 9:06 am Brittany Parnell (ershenb): Rollback to Initiator
4. 04/03/19 11:32 am David Borrok (borrokd): Rollback to Initiator
5. 04/03/19 11:37 am David Borrok (borrokd): Approved for RGEOSENG Chair
6. 04/08/19 8:50 am Brittany Parnell (ershenb): Approved for CCC Secretary
7. 04/15/19 3:34 pm Katie Shannon

(shannonk): Approved for Sciences DSCC Chair
8. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. May 6, 2014 by Francisca Oboh-Ikuenobe (ikuenobe)
2. Apr 24, 2015 by wronk
3. Mar 27, 2017 by Kelly Liu (liukh)
4. Jun 18, 2018 by Kelly Liu (liukh)

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

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)[2]	3
CHEM 1319	1	Humanities/Social Science Elective	3
CHEM 1100	1	**MATH 1214**	**4**
Humanities/Social Science Elective	**3**		
	15		14

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		
MATH 1215	**4**	HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3		
	14		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[3]	4	PHYSICS 2135[3]	4		
STAT 3113, or 3115, or 3117, or GEO ENG 4115	3	Elective (Geo & Geop)[4]	6		
Elective (Geo & Geop)[4]	3	Humanities/Social Sciences Elective	3		
	14		17		3

Senior Year

First Semester	Credits	Second Semester	Credits
GEOLOGY 4010	0.5	GEOPHYS 5096	3
~~Humanities/Social Sciences Elective~~	~~3~~	Elective (Science & Eng)[2]	9
Elective (Science & Eng)[2]	6	Free Elective[5]	3
~~Elective (Geo & Geop)[5]~~	~~6~~	**GEOLOGY 4010**	**.5**
Elective (Geo & Geop)[4]	**9**		
	15.5		15.5

Total Credits: 127

1	Communications Emphasized (CE) courses
2	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.
3	Students may substitute PHYSICS 1111 and PHYSICS 1119 for PHYSICS 1135; PHYSICS 2111 and PHYSICS 2119 for PHYSICS 2135.
4	All Geology and Geophysics students must complete at least 18 hours of elective course work numbered 2000 or above in the Department of Geology and Geophysics, in addition to the required core curriculum.
5	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.

~~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	0.5
GEOLOGY 2096	Field Geology	3
GEOLOGY 4097	Advanced Field Geology	3
GEOPHYS 3210	Introduction to Geophysics	3
GEOPHYS 5096	Global Tectonics	3
Total Credits		38.5

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~~	~~Course GEOLOGY 3631 Not Found~~	~~3~~
GEOLOGY 4630	**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
GEOLOGY 4310	Remote Sensing Technology	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~~	~~Course GEOLOGY 3631 Not Found~~	~~3~~
GEOLOGY 4630	**Systematic Paleontology**	**3**
GEOLOGY 5311	Depositional Systems	3
GEOLOGY 5513	Petroleum Geology	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
GEOLOGY 4310	Remote Sensing Technology	3

Accelerated BS/MS Program Option for Geology and Geophysics Majors

Geology and Geophysics undergraduates in G&G at Missouri S&T may opt to apply for an accelerated BS/MS G&G program where a student can achieve both the BS and MS degrees in G&G faster than if pursuing the degrees separately. The degrees awarded will be a BS & MS in Geology and Geophysics.

The benefits for undergraduate students admitted to the program are:

- **Undergraduate and graduate courses may be chosen with greater flexibility,**
- **Up to nine hours of 4000 or 5000-level or above G&G coursework may apply to both the BS and MS requirements,**
- **The classes taken for shared BS/MS credit may be taken at the lower undergraduate tuition rate,**
- **The GRE is not required for admission,**
- **Other graduate courses can be taken any time after entering the program as a dual enrolled student,**
- **Work on a thesis project may begin before the BS requirements are completed.**

To be eligible for the accelerated BS/MS G&G program, a G&G undergraduate must be at or beyond the junior level standing with a minimum of 48 credit hours. They must have successfully completed the Chemistry and Math requirements and have completed 21 credit hours of G&G courses at Missouri S&T with at least a 3.2 GPA in the G&G courses. To be admitted, the student must complete the program application and must have the recommendation of a G&G faculty member who agrees to serve as the graduate thesis advisor. All other MS degree requirements remain the same. The program may be combined with existing honors research, emphasis areas, and certificate options. Admitted students will have both undergraduate and graduate records in the Registrar's Office.

The Accelerated Program application must be completed within one semester after shared-credit courses are completed. Courses taken for shared credit will be identified on the application form. These courses will also be listed on the student's Graduate Form 1 to be submitted after the student enters the graduate program. The six hours of shared-credit coursework, to be taken as undergraduate credit, must be approved by the academic advisor, and may not be undergraduate research, special problems, or transfer courses. An additional six credit hours of coursework for graduate credit (beyond the shared BS/MS credits) can be taken while in the undergraduate program by applying for dual undergraduate/graduate enrollment. Taking additional courses for graduate credit as a dual enrolled student will require formal application to the graduate program. Acceptance to the G&G MS

degree from the Accelerated Program is automatic so long as the student remains in good standing (GPA above 3.0 and B's or better in all graduate courses) within the program. To remain in the Accelerated Program, the student must maintain good standing within the undergraduate G&G program and must maintain continuous enrollment at Missouri S&T. If the student exits the program before completion of the MS degree requirements, or fails to maintain continuous enrollment at Missouri S&T, the shared-credit courses may not apply toward graduate requirements in the event of future readmission.

It is the student's responsibility to check on how dual-enrollment status and graduate coursework affects scholarships and other financial aid. As a graduate student, you are not eligible for Federal Pell Grants. You are still eligible for Federal Financial Aid. You may be eligible for fellowships and teaching/research assistantships. It is the International student's responsibility to check with international affairs during completion of an accelerated BS/MS to ensure immigration status will be maintained throughout the program.

Justification for request

The MS degree in Geology and Geophysics provides student with an increasing more competitive advantage in pursuing Geoscience careers outside of academia as well as continuing on for a Ph.D. The opportunity for motivated and academically talented undergraduate students to pursue an accelerated path to earning both a BS and an MS in Geology and Geophysics will help with recruitment and retention of talented students to Missouri S&T. In addition, students that have completed this program will attract the attention of industry in need of a well-trained, tech-savvy, and highly motivated work force.

Supporting Documents

Course Reviewer Comments

ershenb (02/26/19 8:36 am): corrected course hours for GEOLOGY 4010 (0.5 hrs)

ershenb (03/05/19 11:15 am): Rollback: Rollback for correct total credit hours per email with Dr. Hogan and Sharon Lauck.

ershenb (04/02/19 9:06 am): Rollback: Rollback per request of Sharon Lauck

borrokd (04/03/19 11:32 am): Rollback: just because

ershenb (04/08/19 8:49 am): updated GEOLOGY 4010 credit hours

ershenb (04/08/19 8:50 am): .

Key: 64

Program Change Request

Date Submitted: 03/08/19 9:39 am

Viewing: GLBLSTD-MI : Global Studies Minor

File: 70.4

Last approved: 07/21/15 9:48 am

Last edit: 04/04/19 6:29 pm

Changes proposed by: dolankc

Catalog Pages Using this Program
Global Studies

Start Term
Fall 2019 ~~08/17/2015~~
Program Code
GLBLSTD-MI
Department
RACADSPT ~~RPHYSEDU~~
Title
Global Studies Minor

Program Requirements and Description

In Workflow

1. **RACADSPT 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. Kristy Giacomelli

Approval Path

1. 04/04/19 2:27 pm Jeff Cawlfield (jdc): Approved for RACADSPT Chair
2. 04/04/19 6:30 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/05/19 7:53 am Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Aug 5, 2014 by pantaleoa
2. Jul 21, 2015 by pantaleoa

Global Studies Minor

Global studies is a multi-disciplinary undergraduate minor program designed to aid in the preparation of Missouri S&T students to be successful in an increasingly global workforce. Students who complete the global studies minor will have an increased awareness of the society, culture, technical issues, and/or language of at least one country other than the United States prior to the completion of their Missouri S&T undergraduate experience. Any Missouri S&T student enrolled in an undergraduate degree program is eligible for the Global Studies minor program, which consists of 12 credit hours from an approved list of classes and at least 2 weeks (14 days) of experience in a foreign country acquired during an approved Missouri S&T class or research project, Missouri S&T extracurricular activity, and/or Missouri S&T study abroad activity.

Courses must be selected from the list of approved courses maintained by the Global Studies Advisory Committee. At least one three hour course must focus on the society, culture, and/or language of a foreign country. Approved courses that meet this criterion are from the arts, languages, humanities, or social sciences. **In addition,** ~~The other nine hours comes from approved courses that include~~ at least **one three hour course and no more than nine hours/three courses must come from approved courses that include at least** 25 percent international studies content. “International studies content” is defined as course content addressing countries or regions outside of the United States. “International studies content” does not include content that is universal but rather that which addresses specific countries or regions outside of the United States. To satisfy the multi-disciplinary aspect of the minor, no more than six hours may be taken from a single Missouri S&T degree program.

The minor requires personal experience in a foreign country. Students will participate in one or more approved Missouri S&T-sponsored trips to a foreign country for no less than 14 days total. Examples of approved trips include, but are not limited to, those that may be a part of Missouri S&T classes and/or an OURE project-related trip, an extracurricular activity including Missouri S&T’s Engineers Without Borders field trips, and/or Missouri S&T sanctioned study abroad. The list of approved activities is maintained by the Global Studies Advisory Committee.

The curricula criteria, including course lists and the list of approved activities for foreign country experience, are maintained by the Global Studies Advisory Committee and are available on the quick links section of the Missouri **S&T Academic Support website** ~~S&T undergraduate studies website~~ at ***https://academicsupport.mst.edu/*** ~~*http://ugs.mst.edu*~~.

Justification for request

Updating minor

Supporting Documents

Course Reviewer Comments

ershenb (03/15/19 11:48 am): updated undergraduate studies to academic support.

ershenb (04/04/19 6:29 pm): changed start term to fall 2019

Key: 70

Program Change Request

Date Submitted: 03/28/19 1:43 pm

Viewing: PE ENG-BS : Petroleum Engineering BS

File: 108.29

Last approved: 06/18/18 12:29 pm

Last edit: 04/15/19 10:25 am

Changes proposed by: sbrower

Catalog Pages Using this Program
Petroleum Engineering

Start Term
Fall 2019 ~~08/13/2018~~
Program Code
PE ENG-BS
Department
Geosciences and Geological and Petroleum Engineering
Title
Petroleum Engineering BS

Program Requirements and 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. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. Kristy Giacomelli

Approval Path

1. 03/28/19 9:15 am David Borrok (borrokd): Approved for RGEOSENG Chair
2. 03/28/19 10:49 am Brittany Parnell (ershenb): Rollback to Initiator
3. 03/29/19 8:56 am David Borrok (borrokd): Approved for RGEOSENG Chair
4. 04/02/19 1:56 pm Brittany Parnell (ershenb): Approved for CCC Secretary
5. 04/15/19 10:25 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 04/23/19 1:23 pm Brittany Parnell (ershenb): Approved for

Pending CCC Agenda post

History

1. Sep 21, 2015 by reflori
2. Jun 18, 2018 by Shari Dunn-Norman (caolila)

Bachelor of Science
Petroleum Engineering

Entering freshmen desiring to study Petroleum Engineering will be admitted to the Freshman Engineering Program. They will, however, be permitted, if they wish, to state a Petroleum 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. A grade point average of 2.80 or higher is required to enter the Petroleum Engineering program from the Freshman Engineering Program.

For the Bachelor of Science degree in Petroleum Engineering a minimum of **128** ~~129~~ credit hours is required. These requirements are in addition to credit received for algebra, trigonometry, and basic ROTC courses. A student must maintain at least two grade points per credit hour for all courses taken in Petroleum 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. Six credit hours of English: All students are required to take ENGLISH 1120 and either ENGLISH 3560 (preferred) or ENGLISH 1160 or ENGLISH 1600.
2. Nine credit hours of basic humanities and social sciences: All students are required to take one history course, one economics course and one humanities 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 . The humanities course selected must meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog.
3. Three credit hours as a depth requirement. Three credit hours must be taken in humanities or social sciences at the 2000-level or above and meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog. 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 4000-level. All courses taken to satisfy the depth requirement must be taken after graduating from high school.
4. Three credit hours of elective humanities and social sciences must meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog..
5. Special topics and special problems and honors seminars are allowed only by petition to and approval by the student's department chair.

The Petroleum Engineering program at Missouri S&T consists of a strong foundation in math, sciences and engineering fundamentals, plus strong content in the traditional Petroleum Engineering core areas of drilling, production and reservoir engineering. Two unique features of the curriculum are a strong sequence of courses in Geology and Geophysics, plus a two course sequence in finite element analysis and mechanical earth modeling. S&T Petroleum Engineering students are prepared to solve today’s problems and tomorrow’s. Students learn theory, have ample hands-on experiences in laboratories, and they learn many modern software packages used by the petroleum industry.

Students planning on majoring in petroleum engineering should take the following courses.

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
FR ENG 1100	1	MATH 1215	4
CHEM 1310	4	PHYSICS 1135	4
CHEM 1319	1	MECH ENG 1720	3
MATH 1214	4	GEO ENG 1150 or GEOLOGY 1110	3
HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3	PET ENG 2510	3
ENGLISH 1120	3		
	16		17
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 2222	4	MATH 3304	3
PHYSICS 2135	4	PET ENG 3520	3
GEOLOGY 3310 (Geol 3319 lab optional)	3	MECH ENG 2350	2
PET ENG 3320	3	CIV ENG 2210	3
CIV ENG 2200	3	GEOLOGY 3620	3
		ECON 1100 or 1200	3
	17		17
Junior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
GEOLOGY 5513	3	PET ENG 3330	3
GEOPHYS 4231	3	PET ENG 4410	3
CIV ENG 3330	3	PET ENG 4590	3
PET ENG Elective[4]	3	PET ENG 4710	3
PET ENG 4210	3	Humanities/Social Sci Elective[2]	3
	15		15
Senior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
PET ENG 4010[3]	1	PET ENG 4097	3
MECH ENG 2527	3	GEO ENG 4115	3
PET ENG 4520	3	Hum/Soc Sci Elective[2]	3
PET ENG 4720	3	PET ENG Elective[4]	3
PET ENG Elective[4]	3	~~ENGLISH 3560~~[6]	~~3~~
Humanities/Social Sci Elective[2]	3	**ENGLISH 1600**[5]	**3**
	16		15
Total Credits: 128			

1 All freshmen Petroleum Engineering students must enroll in CHEM 1100 (Intro to Lab Safety and Haz Mat).

2 Humanities/Social Science electives are to be selected from a list of approved courses to be taken in accordance with the

	University policy. Petroleum Engineering students are especially encouraged to study foreign languages
3	All Petroleum 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 to becoming a registered professional engineer. This requirement is part of Missouri S&T assessment process as described in Assessment Requirements found elsewhere in this catalog. Students must sign a release form giving the University access to their Fundamentals of Engineering Examination score.
4	Select Petroleum Engineering electives in accordance with interest area. Students interested in reservoir engineering select from topics in advanced reservoir engineering, simulation, natural gas engineering, and formation characterization. Students interested in drilling/completions and production select petroleum electives such as advanced drilling, well completions, stimulation. Other general interest petroleum electives may be selected as available.
5	Students may also select ENGLISH 1160 or ENGLISH 3560.
~~6~~	~~Students may also select ENGLISH 1160 or ENGLISH 1600.~~
~~7~~	~~Communications emphasis courses.~~

The total number of credit hours required for a degree in Petroleum Engineering is **128.** ~~129.~~

Petroleum Engineering students must earn the grade of "C" or better in all Petroleum Engineering courses to receive credit toward graduation.

Accelerated BS/MS Program Option for Petroleum Engineering Majors

Missouri S&T Petroleum Engineering undergraduate students may opt to apply for an accelerated BS/MS program where a student can earn both the BS and MS degrees in Petroleum Engineering faster than if pursuing the degrees separately. The degrees awarded will be a BS & MS in Petroleum Engineering.

The benefits for undergraduate students admitted to the program are:

- **Undergraduate and graduate courses may be chosen with greater flexibility,**
- **Up to six hours of 5000-level or above Petroleum Engineering coursework may apply to both the BS and MS requirements,**
- **The classes taken for shared BS/MS credit may be taken at the lower undergraduate tuition rate,**
- **The GRE is not required for admission,**
- **Other graduate courses can be taken any time after entering the program as a dual enrolled student,**
- **Work on a thesis project may begin before the BS requirements are completed.**

To be eligible for the accelerated BS/MS Petroleum Engineering program, a Petroleum Engineering undergraduate must be at or beyond the junior level standing with a minimum of 48 credit hours. They must have successfully completed the Chemistry and Math requirements and have completed 21 credit hours of Petroleum Engineering courses at Missouri S&T with at least a 3.2 GPA in the Petroleum Engineering courses. To be admitted, the student must complete the program application and must have the recommendation of a Petroleum Engineering faculty member who agrees to serve as the graduate thesis advisor. All other MS degree requirements remain the same. The program may be combined with existing honors research, emphasis areas, and certificate options. Admitted students will have both undergraduate and graduate records in the Registrar's Office.

The Accelerated Program application must be completed within one semester after shared-credit courses are completed. Courses taken for shared credit will be identified on the application form. These courses will also be listed on the student's Graduate Form 1 to be submitted after the student enters the graduate program. The six hours of shared-credit coursework, to be taken as undergraduate credit, must be approved by the academic advisor, and may not be undergraduate research, special problems, or transfer courses. An additional six credit hours of coursework for graduate credit (beyond the shared BS/MS credits) can be taken while in the undergraduate program by applying for dual undergraduate/graduate enrollment. Taking additional courses for graduate credit as a dual enrolled student will require formal application to the graduate program. Acceptance to the Petroleum

Engineering MS degree from the Accelerated Program is automatic so long as the student remains in good standing (GPA above 3.0 and B's or better in all graduate courses) within the program. To remain in the Accelerated Program, the student must meet Petroleum Engineering graduate student academic performance requirements and must maintain continuous enrollment at Missouri S&T. If the student exits the program before completion of the MS degree requirements, or fails to maintain continuous enrollment at Missouri S&T, the shared-credit courses may not apply toward graduate requirements in the event of future readmission.

It is the student's responsibility to check on how dual-enrollment status and graduate coursework affects scholarships and other financial aid. As a graduate student, you are not eligible for Federal Pell Grants. You are still eligible for Federal Financial Aid. You may be eligible for fellowships and teaching/research assistantships. It is the International student's responsibility to check with international affairs during completion of an accelerated BS/MS to ensure immigration status will be maintained throughout the program.

Justification for request

The MS degree in Petroleum Engineering provides student with an increasing more competitive advantage in pursuing careers outside of academia as well as continuing on for a Ph.D. The opportunity for motivated and academically talented undergraduate students to pursue an accelerated path to earning both a BS and an MS in Petroleum Engineering will help with recruitment and retention of talented students to Missouri S&T. In addition, students that have completed this program will attract the attention of industry in need graduates with advanced education and higher level skills.

Supporting Documents

~~Curriculum Petroleum(2018-19) for comm emphasis.xls~~

Course Reviewer Comments

ershenb (03/28/19 10:49 am): Rollback: Per email with Sharon and Dr. Flori (Geology 1119 being deactivated).

ershenb (04/02/19 1:56 pm): .

sraper (04/15/19 10:25 am): Changed wording to be consistent with ECE and Comp Eng accelerated program statements approved previously.

Key: 108

Program Change Request

Date Submitted: 03/07/19 5:45 pm

Viewing: PHYSIC-BS : Physics BS

File: 115.30

Last approved: 06/26/18 9:45 am

Last edit: 03/08/19 8:25 am

Changes proposed by: vojtat

Catalog Pages Using this Program
Physics

Start Term
Fall 2019 ~~08/13/2018~~
Program Code
PHYSIC-BS
Department
Physics
Title
Physics BS

Program Requirements and Description

In Workflow

1. **RPHYSICS 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. Kristy Giacomelli

Approval Path

1. 03/07/19 5:46 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
2. 03/08/19 8:26 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/08/19 12:24 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 1:25 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. May 6, 2014 by waddill

2. Jul 21, 2015 by pantaleoa
3. Jun 27, 2016 by waddill
4. Jun 18, 2018 by Pamela Crabtree (crabtree)
5. Jun 26, 2018 by Crystal Wilson (wilsoncry)

Bachelor of Science
Physics

A minimum of 128 credit hours is required for a bachelor of science degree in physics and an average of at least two grade points per credit hour must be obtained. These requirements for the B.S. degree are in addition to credit received for algebra, trigonometry, and basic ROTC.

The physics curriculum requires twelve semester hours in humanities, exclusive of foreign language, and must include ENGLISH 1160 or ENGLISH 3560. A minimum of nine semester hours is required in social sciences, including either HISTORY 1300, HISTORY 1310, HISTORY 1200, or POL SCI 1200. Specific requirements for the bachelor degree are outlined in the sample program listed below

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
CHEM 1310	4	CHEM 1320	3
CHEM 1319	1	HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3
CHEM 1100	1	~~MATH 1221~~[6]	~~5~~
ENGLISH 1120	3	~~PHYSICS 1111 & PHYSICS 1119~~[7]	~~5~~
~~MATH 1208~~[5]	~~5~~	**PHYSICS 1135**	**4**
PHYSICS 1101	1	**MATH 1215**	**4**
MATH 1214	**4**	**Electives**[1]	**2**
	14		16
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENGLISH 1160	3	MATH 3304	3
MATH 2222	4	PHYSICS 2311	3
~~PHYSICS 2111 & PHYSICS 2119~~[8]	~~5~~	PHYSICS 2129	3
COMP SCI 1570 & COMP SCI 1580[4]	4	PHYSICS 2401	3
Elective[1]	3	Elective[1]	3
PHYSICS 2135	**4**		
	18		15

Junior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
PHYSICS 3201	3	PHYSICS 3211	3
PHYSICS 3119	3	PHYSICS 3129	3
PHYSICS 3311	3	Math/Stat Elective[2]	3
Math/Stat Elective[2]	3	Electives[1]	7
Electives[1]	6		
	18		16

Senior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
PHYSICS 4211	3	PHYSICS 4311	3
PHYSICS 4301	3	Elective-Humanities (3000 level)[1]	3
Physics Elective[3]	3	Physics Elective[3]	3
Electives[1]	7	Electives[1]	6
	16		15
Total Credits: 128			

Note: The minimum credit hours required for a bachelor of science in physics is 128 hours. No more than two of the required physics and mathematics courses with a grade of "D" may be used to meet graduation requirements. Upon petition to and approval by the physics faculty, three semester hours of advanced ROTC (military science or aerospace credit studies) credit can be counted as elective credit to meet requirements for graduation.

1	Electives, in addition to the math/stat electives[2] and Physics electives[3], shall include six hours of social studies and nine hours of humanities, at least three of which must be literature and at least three of which must be at the 3000 level or above not including Special Problems courses (PHILOS 4345 recommended). 19 hours of free electives may be used to develop an emphasis area. 18 hours of elective credit shall be in courses at the 3000 level or above.
2	Six hours of mathematics or statistics beyond MATH 3304 are required. MATH 3108, MATH 5222, MATH 5325, or MATH 5351 are recommended.
3	In addition to the specific physics courses listed (PHYSICS 3311, PHYSICS 3201, PHYSICS 4311, PHYSICS 4211, PHYSICS 3119, PHYSICS 3129, and PHYSICS 4301) two other physics 3000 level or higher courses are required.
4	Alternatively students may substitute the combination COMP SCI 1970 & COMP SCI 1980 or the combination COMP SCI 1971 & COMP SCI 1981 for COMP SCI 1570 & COMP SCI 1580; note that this will require one less credit hour than the option listed in the sample schedule.
~~5~~	~~Alternatively students may substitute Math 1214 for Math 1208. Note that this is one less credit hour than Math 1208.~~
~~6~~	~~Alternatively students may substitute Math 1215 for Math 1221. Note that this is one less credit hour than Math 1221.~~
~~7~~	~~Alternatively students may substitute Physics 1135 for the combination of Physics 1111 and 1119. Note that this is one less credit hour than Physics 1111/1119.~~
~~8~~	~~Alternatively students may substitute Physics 2135 for the combination of Physics 2111 and 2119. Note that this is one less credit hour than Physics 2111/2119.~~

Emphasis ~~EMPHASIS~~ in Secondary Education ~~SECONDARY EDUCATION~~

Students may develop an emphasis area in secondary education that will allow them to teach physics in grades 9-12 in Missouri. Please contact the Department of Teacher **Education** ~~Education~~ for a complete list of requirements.

a. Professional requirements courses:

EDUC 1040	Perspectives In Education	2
EDUC 1174	School Organization & Adm For Elementary & Secondary Teachers	2
EDUC 3216	Teaching Reading in Content Area	3
ENGLISH 3170	Teaching And Supervising Reading and Writing	3
EDUC 3280	Teaching Methods and Skills in Content Areas	6
EDUC 4298	Student Teaching Seminar	1
PSYCH 2300	Educational Psychology	3
or EDUC 2102	Educational Psychology	
PSYCH 3310	Developmental Psychology	3
PSYCH 4310	Psychology Of The Exceptional Child	3
or EDUC 4310	Psychology Of The Exceptional Child	
Fifteen of these credit hours may be used to substitute for six hours of mathematics electives, six hours of physics electives, and three hours of computer science courses.		

b. Clinical experience courses:

EDUC 1104	Teacher Field Experience	2
EDUC 1164	Aiding Elementary, Middle And Secondary Schools	2
EDUC 4299	Student Teaching	12

c. Take these additional courses:

SP&M S 1185	Principles Of Speech	3
POL SCI 1200	American Government	3
PSYCH 1101	General Psychology	3
BIO SCI 1113	General Biology	3
PHYSICS 1605	Environmental Physics I	3
HISTORY 3530	History of Science	3
A 3 hour Art/Music/Theater elective		3

d. Complete the requirements for teacher certification listed in this catalog.

Justification for request

Sample schedule has been updated by removing classes that are no longer offered on a regular basis (Math 1208, Math 1221, Physics 1111 and Physics 2111) with classes that are actually offered (Math 1214, Math 1215, Physics 1135, Physics 2135).

As these new classes have slightly different numbers of credit hours, the elective hours were adjusted to keep the total program at 128 hours.

Supporting Documents

Course Reviewer Comments

ershenb (03/08/19 8:24 am): formatting

ershenb (03/08/19 8:25 am): .

Key: 115

Program Change Request

Date Submitted: 03/28/19 2:14 pm

Viewing: PHYSIC-MS : Physics MS

File: 172.3

Last approved: 07/24/15 5:18 pm

Last edit: 03/28/19 2:14 pm

Changes proposed by: vojtat

Catalog Pages Using this Program
Physics

Start Term
Fall 2019 ~~08/17/2015~~
Program Code
PHYSIC-MS
Department
Physics
Title
Physics MS

Program Requirements and Description

In Workflow

1. **RPHYSICS 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. Kristy Giacomelli

Approval Path

1. 03/28/19 2:21 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
2. 03/28/19 3:46 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/08/19 12:32 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 1:25 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Apr 14, 2015 by pantaleoa

2. Jul 24, 2015 by pantaleoa

The department of physics offers programs leading to both the master of science and doctor of philosophy degrees. The master's degree can be earned with either a thesis or non-thesis option.

Most physics graduate students are supported by ~~either~~ teaching or research assistantships, although some fellowships are available for exceptionally promising students. Most **new** ~~entering~~ graduate students **start as** ~~are supported on~~ teaching **assistants** ~~assistantships, and teach~~ in the introductory physics laboratory. **Later,** ~~Thereafter,~~ they are **often** ~~usually~~ supported as research assistants on external research grants. Entering graduate students usually have a physics undergraduate degree; however inquiries from students with other technical degrees and a good mathematics background are encouraged, since the program allows minor background deficiencies to be made up.

Each student's graduate degree program is designed around a set of core graduate courses (classical mechanics, electrodynamics, quantum mechanics, and statistical mechanics) and ~~graduate~~ two **graduate** physics electives. After their second year, Ph.D. students must take a qualifying examination based on the material taken from the undergraduate courses and the graduate core courses. Details of the program and course offerings **can** ~~may~~ be **found on** ~~obtained by calling 573-341-4702, or emailing~~ the **department's web page** ~~department chairman~~ at **http://physics.mst.edu/ or requested via email to physics@mst.edu.** ~~physics@mst.edu .~~

~~Additional information may also be found on the department's web page at http://physics.mst.edu/ .~~The department's research emphasis includes ~~both fundamental and applied studies in~~ three areas of physics: condensed **matter** ~~matter, solid state,~~ and materials physics; **atomic, molecular, and optical** ~~cloud, aerosol and environmental~~ physics; **as well as astrophysics.** ~~and atomic, molecular, and optical physics.~~ Experimental and theoretical research opportunities are available ~~for study~~ in each of these areas. **Graduate** ~~Following their core coursework, graduate~~ students in the department ~~are able to~~ work with faculty on a wide range of problems, including the characterization of magnetic materials, predicting the properties of quantum and classical phase transitions, **investigating electrical** ~~establishing the structure~~ and **thermal transport,** ~~properties of atmospheric aerosols, investigating electron transport in polymers,~~ determining electron-atom scattering events, ~~characterizing the particulate in rocket engine exhaust, exploring the structural properties of thin magnetic films,~~ computing the electronic structure of new materials, measuring and imaging ion-atom collisions, ~~investigating water and sulfuric acid cluster interactions, analyzing and characterizing nanostructures on surfaces, ascertaining the properties of charged particles and atoms, studying the nucleation of vapors into droplets,~~ growing and characterizing exotic **quantum** materials, studying wave propagation in complex media, **exploring quantum** ~~and exploring quantum~~ electrodynamics' descriptions of few-electron atoms and **ions, studying gravitational waves emitted by black holes and neutron stars; and exploring the expansion history of the universe.** ~~ions.~~

Most research **is performed** ~~facilities are~~ in the Physics Building, but several research studies are ~~being~~ carried out in **the Materials Research Center on campus as well as in national** ~~cloud and aerosol~~ laboratories **and other national facilities such as LIGO, the Laser Interferometer Gravitational-Wave Observatory.** ~~housed in Schrenk Hall. Several faculty working on condensed matter projects make use of extensive instrumentation and materials characterization facilities available in the Materials Research Center.~~Special **instrumentation in the physics department includes** ~~facilities include~~ a unique ion-atom accelerator and energy-loss spectrometer, **an optical atom trap,** custom **ultra-high vacuum systems,** ~~UHV systems for preparing and characterizing in situ spin properties of magnetic films, state-of-the-art cloud simulation chambers developed to study nucleation of vapors and droplets,~~ Auger and XPS surface characterization **spectrometers, facilities for the** ~~spectrometers, specially developed instrumentation for use in aircraft to study rocket and aircraft exhaust characteristics, high performance computer systems for computational physics studies, facilities for the~~ growth of exotic materials, ~~and~~ low temperature transport measurement **instruments, and high-performance computer systems for modelling and simulation.**

~~instruments.~~

Justification for request

Text updated to reflect changes in research focus due to retirements as well as new faculty.

Supporting Documents

Course Reviewer Comments

Key: 172

Program Change Request

Date Submitted: 03/28/19 2:16 pm

Viewing: PHYSIC-PHD : Physics PhD

File: 215.1

Last edit: 03/28/19 2:16 pm

Changes proposed by: vojtat

Start Term

Fall 2019

Program Code

PHYSIC-PHD

Department

Physics ~~Psychological Science~~

Title

Physics PhD

Program Requirements and Description

In Workflow

1. **RPHYSICS 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. Kristy Giacomelli

Approval Path

1. 04/04/19 8:32 am Thomas Vojta (vojtat): Approved for RPHYSICS Chair
2. 04/04/19 6:30 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/08/19 12:33 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 1:25 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

The department of physics offers programs leading to both the master of science and doctor of philosophy degrees. The master's degree can be earned with either a thesis or non-thesis option.

Most physics graduate students are supported by teaching or research assistantships, although some fellowships are available for exceptionally promising students. Most new graduate students start as teaching assistants in the introductory physics laboratory. Later, they are often supported as research assistants on external research grants. Entering graduate students usually have a physics undergraduate degree; however inquiries from students with other technical degrees and a good mathematics background are encouraged, since the program allows minor background deficiencies to be made up.

Each student's graduate degree program is designed around a set of core graduate courses (classical mechanics, electrodynamics, quantum mechanics, and statistical mechanics) and two graduate physics electives. After their second year, Ph.D. students must take a qualifying examination based on the material taken from the undergraduate courses and the graduate core courses. Details of the program and course offerings can be found on the department's web page at http://physics.mst.edu/ or requested via email to physics@mst.edu.

The department's research emphasis includes three areas of physics: condensed matter and materials physics; atomic, molecular, and optical physics; as well as astrophysics. Experimental and theoretical research opportunities are available in each of these areas. Graduate students in the department work with faculty on a wide range of problems, including the characterization of magnetic materials, predicting the properties of quantum and classical phase transitions, investigating electrical and thermal transport, determining electron-atom scattering events, computing the electronic structure of new materials, measuring and imaging ion-atom collisions, growing and characterizing exotic quantum materials, studying wave propagation in complex media, exploring quantum electrodynamics' descriptions of few-electron atoms and ions, studying gravitational waves emitted by black holes and neutron stars; and exploring the expansion history of the universe.

Most research is performed in the Physics Building, but several research studies are carried out in the Materials Research Center on campus as well as in national laboratories and other national facilities such as LIGO, the Laser Interferometer Gravitational-Wave Observatory. Special instrumentation in the physics department includes a unique ion-atom accelerator and energy-loss spectrometer, an optical atom trap, custom ultra-high vacuum systems, Auger and XPS surface characterization spectrometers, facilities for the growth of exotic materials, low temperature transport measurement instruments, and high-performance computer systems for modelling and simulation.

Justification for request

Text modified to reflect changes in research focus due to new faculty and retirements.

Supporting Documents

Course Reviewer Comments

Key: 215

Program Change Request

Date Submitted: 04/04/19 10:06 am

Viewing: PSYCH-BA : Psychology BA

File: 192.33

Last approved: 06/28/17 10:13 am

Last edit: 04/04/19 12:56 pm

Changes proposed by: murray

Catalog Pages Using this Program
Psychology_

Start Term
Fall 2019 ~~08/14/2017~~
Program Code
PSYCH-BA
Department
Psychological Science
Title
Psychology BA

Program Requirements and Description

In Workflow

1. **RPSYCHOL Chair**
2. **CCC Secretary**
3. **Social 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. Kristy Giacomelli

Approval Path

1. 04/04/19 1:26 pm Susan Murray (murray): Approved for RPSYCHOL Chair
2. 04/04/19 4:55 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/05/19 3:11 pm Barry Flachsbart (barryf): Approved for Social Sciences DSCC Chair
4. 04/23/19 1:26 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Aug 4, 2014 by nstone
2. Mar 20, 2015 by nstone

3. Jun 19, 2015 by nstone
4. Jul 21, 2015 by pantaleoa
5. Jun 28, 2017 by Nathan Weidner (weidnern)

Bachelor of Arts
Psychology

A minimum of 120 credit hours is required for a bachelor of arts degree in psychology and an average of at least two grade points per credit hour must be obtained. The psychology B.A. curriculum requires 23 hours of basic skills and concepts. That is, 6 hours of English Composition, 6 hours of western civilization, and 11-16 hours of foreign language. 12 semester hours in humanities must be taken with at least one course taken in each of the three areas of literature (English and American), philosophy, and fine arts (art, music and theater), but not to include studio and performance offerings. A minimum of 12 semester hours is required in social sciences in at least two of the following three areas: economics, political science, and history. A minimum of 12 hours of math and science are required and a minimum of 34 hours are required in psychology. Up to 12 credit hours of advanced ROTC may be credited toward the degree. Specific requirements for the bachelor of arts degree are outlined in the sample program listed below.

1. ENGLISH 1120 and one additional three hour composition course (6 hours).
2. Western civilization (HISTORY 1100 and HISTORY 1200) (6 hours).
3. Foreign languages for at least 3 semesters of basic study in French, German, Russian, Spanish or an approved substitute; or one year of basic study in a foreign language in either French, German, Russian, Spanish, or an approved substitute , and a humanities or social sciences course taught in a foreign country and employing the language of that country; or one year of basic study in each of two of the foreign languages of French, German, Russian or Spanish or an approved substitute (11-16 hours).
4. Sciences. At least one course taken in biological (biological sciences) and physical (chemistry, geology and geophysics, physics) sciences. At least one statistics course. A laboratory course is required (and a lab offered in engineering also may count at the discretion of the student's major advisor) toward the total requirement (12 hours).
5. Humanities and fine arts. Courses used to satisfy this requirement must include one course in each of the three areas of literature (English or American), philosophy, and fine arts (art, music or theater), but not to include studio and performance offerings (12 hours).
6. Social Sciences. At least two of the following social science areas are to be included: economics, political science, or history (12 hours).
7.

Psychology Courses (34 hours)		
Required:*		
General Skills Courses:		
PSYCH 1100	Introduction to Psychology	1
PSYCH 1101	General Psychology	3
PSYCH 2200	Research Methods	4
Content Courses:		
PSYCH 3310	Developmental Psychology	3
PSYCH 4400	Cognitive Psychology	3
PSYCH 4501	Abnormal Psychology	3
PSYCH 4600	Social Psychology	3

And one of the following 2 courses:		
PSYCH 4410	Neuroscience	3
PSYCH 4411	Sensation and Perception	3
Capstone Course:		
Select three credit hours from the Capstone courses:		
~~PSYCH 3110~~	~~Course PSYCH 3110 Not Found~~	~~3~~
PSYCH 4010	Seminar	0-6
PSYCH 4099	Undergraduate Research	0-6
PSYCH 4200	Tests and Measurements	3
PSYCH 4590	Health Psychology	3
PSYCH 4994	Psychology in Media	3
PSYCH 4992	Cross-Cultural Psychology	3
PSYCH 4993	Psychology of Gender	3
PSYCH 4990	Internship	0-6
*These required courses total 26 hours.		
Elective Courses:		
Select an additional 8 hours of psychology electives to complete the 34 hour degree requirement.		

8. Major-field requirements: A cumulative grade point average of 2.0 must be earned in all course work taken in the major field. Upper-class (3000-4000-level) courses completed with grades of "D" may not be included in the course work for the major field without the approval of the chair of the department. At least nine hours of upper-class work in the major field must be completed in residence at Missouri S&T.
9. Minor: A minor will be selected from any discipline other than the major with the approval of the student's 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. A cumulative grade point average of 2.0 must be earned in all course work required in the minor field. At least six hours of work in the minor field must be completed in residence at Missouri S&T.
10. Basic ROTC may be elected in the freshman and sophomore years, but is not creditable toward a degree. Up to 12 credit hours of advanced ROTC may be credited toward a degree.
11. Elective Credits: In consultation with his/her advisor, each student will elect sufficient additional courses to complete a minimum of 120 credit hours.

Emphasis Areas

Note: The following areas identify courses from which a student may opt to develop an emphasis area. It is not required that students obtain an emphasis specialty within psychology.

Human Resources/Personnel		
PSYCH 4700	Industrial Psychology	3
PSYCH 4600	Social Psychology	3
PSYCH 4601	Group Dynamics	3
PSYCH 4602	Organizational Psychology	3
Human Services		
PSYCH 3311	Psychological & Educational Development Of The Adolescent	3
or PSYCH 3310	Developmental Psychology	
PSYCH 4501	Abnormal Psychology	3

PSYCH 4500	Personality Theory	3
PSYCH 4510	Clinical Psychology	3
Cognitive Neuroscience		
PSYCH 4411	Sensation and Perception	3
PSYCH 3400	Theories Of Learning	3
or PSYCH 4501	Abnormal Psychology	
PSYCH 4400	Cognitive Psychology	3
PSYCH 4410	Neuroscience	3
Usability of Technology		
PSYCH 2300	Educational Psychology	3
~~PSYCH 3720~~	~~Course PSYCH 3720 Not Found~~	~~3~~
PSYCH 4710	Human Factors	3
PSYCH 4720	Psychology of Social Technology	3
Psychology of Leadership		
PSYCH 4600	Social Psychology	3
or PSYCH 4603	Social Influence: Science and Practice	
PSYCH 4610	Psychology of Leadership in Organizations	3
PSYCH 4993	Psychology of Gender	3
or PSYCH 4601	Group Dynamics	
PSYCH 4602	Organizational Psychology	3

Bachelor of Arts Psychology (Secondary Education Emphasis Area)

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

Students interested in this emphasis area should consult with the advisor for the secondary education emphasis area in the department of psychological science.

In order to successfully complete this emphasis area, students must have at least 22 on the ACT, maintain a cumulative GPA of at least 2.5, and attain at least a 2.5 GPA in psychology courses taken. Current Missouri S&T or transfer students who wish to pursue this emphasis area must meet both of these GPA requirements to be accepted into the program. Students must also meet all requirements listed under the teacher education program in this catalog. Students who do not meet all the teacher certification requirements will not be eligible for the secondary education emphasis area, even if they have completed all course work.

A degree with this emphasis area requires 128 credit hours. The required courses are provided below.

Communications Skills: 9 semester hours		
ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
Humanities: 12 semester hours		

Art, Music, or Theatre course		3
Philosophy course		3
Literature course		3
One additional humanities from the above course groups, Foreign Language, or Etymology		3
Social Sciences: 18 semester hours		
HISTORY 1300	American History To 1877	3
or HISTORY 1310	American History Since 1877	
POL SCI 1200	American Government	3
POL SCI 3211	American Political Parties	3
or POL SCI 3300	Principles Of Public Policy	
or POL SCI 3760	The American Presidency	
or POL SCI 3763	Contemporary Political Thought	
PSYCH 1101	General Psychology	3
ECON 1100	Principles Of Microeconomics	3
or ECON 1200	Principles Of Macroeconomics	
Geography		3
Natural Science/Mathematics: 13 semester hours		
One course in Physics, Chemistry or Geology		3-4
Mathematics		3
BIO SCI 1113	General Biology	3
STAT 1115	Statistics For The Social Sciences I	3
Professional Requirements: 26 semester hours		
EDUC 1040	Perspectives In Education	2
EDUC 1174	School Organization & Adm For Elementary & Secondary Teachers	2
EDUC 2251	Historical Foundation Of American Education	3
EDUC 3216	Teaching Reading in Content Area	3
EDUC 3280	Teaching Methods and Skills in Content Areas	6
EDUC 4298	Student Teaching Seminar	1
PSYCH 2300	Educational Psychology	3
PSYCH 3311	Psychological & Educational Development Of The Adolescent	3
PSYCH 4310	Psychology Of The Exceptional Child	3
Clinical Experience: 16 semester hours		
EDUC 1104	Teacher Field Experience	2
EDUC 1164	Aiding Elementary, Middle And Secondary Schools	2
EDUC 4299	Student Teaching	12
Psychology Degree Requirements: 17 semester hours		
PSYCH 1100	Introduction to Psychology	1
PSYCH 2200	Research Methods	4
PSYCH 3400	Theories Of Learning	3

PSYCH 3310	Developmental Psychology	3
PSYCH 4501	Abnormal Psychology	3
or PSYCH 4500	Personality Theory	
PSYCH 4600	Social Psychology	3
Certification: 17 semester hours		
9 hours of American History from the following:		
HISTORY 3320	Colonial America	
HISTORY 3325	Revolutionary America, 1754-1789	
HISTORY 3340	Age Of Jefferson And Jackson	
HISTORY 3345	Civil War And Reconstruction	
HISTORY 3360	Recent United States History	
HISTORY 3425	History Of The Old South	
HISTORY 3426	History Of The Modern South	
HISTORY 3480	History Of Baseball	
HISTORY 3440	20th Century Americans In Combat	
HISTORY 3442	The United States in Vietnam	
HISTORY 3761	U.S. Diplomatic History to World War II	
HISTORY 4435	History of the American West	
8 hours of World History from the following:		
HISTORY 1100	Early Western Civilization	
HISTORY 1200	Modern Western Civilization	
HISTORY 2220	Making Of Modern Britain	
HISTORY 2222	The Making Of Modern France	
HISTORY 2224	Making Of Modern Russia	
~~HISTORY 2210~~	~~Course HISTORY 2210 Not Found~~	
~~HISTORY 3120~~	~~Course HISTORY 3120 Not Found~~	
HISTORY 3130	Medieval History I	
HISTORY 3135	Medieval History II	
HISTORY 3140	History Of Renaissance Thought	
HISTORY 3230	Europe In The Age Of The French Revolution And Napoleon	
HISTORY 3235	Foundations Of Contemporary Europe 1815-1914	
HISTORY 3240	Contemporary Europe	
HISTORY 3660	Modern East Asia	

Justification for request

Please remove the "not found" classes including History 2210, 3120 and Psychology 3720

I also find Courseleaf the worst software to edit EVER!!

Supporting Documents

Course Reviewer Comments

ershenb (04/04/19 12:51 pm): Per the request of Dr. Murray, removed PSYCH 3110, PSYCH 3720, HISTORY 2210, and HISTORY 3120.

ershenb (04/04/19 12:56 pm): edited start term to Fall 2019

Key: 192

Program Change Request

Date Submitted: 03/07/19 10:29 am

Viewing: PSYCH-BS : Psychology BS

File: 193.29

Last approved: 06/28/17 10:14 am

Last edit: 04/04/19 5:37 pm

Changes proposed by: murray

Catalog Pages Using this Program

Psychology_

Start Term

Fall 2019 ~~08/14/2017~~

Program Code

PSYCH-BS

Department

Psychological Science

Title

Psychology BS

Program Requirements and Description

In Workflow

1. **RPSYCHOL Chair**
2. **CCC Secretary**
3. **Social 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. Kristy Giacomelli

Approval Path

1. 04/04/19 9:55 am Susan Murray (murray): Approved for RPSYCHOL Chair
2. 04/04/19 4:54 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/05/19 3:11 pm Barry Flachsbart (barryf): Approved for Social Sciences DSCC Chair
4. 04/23/19 1:26 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. May 6, 2014 by nstone
2. Jul 8, 2014 by pantaleoa

3. Jul 8, 2014 by pantaleoa
4. Mar 20, 2015 by nstone
5. Jun 19, 2015 by nstone
6. Jul 21, 2015 by pantaleoa
7. Jun 28, 2017 by Nathan Weidner (weidnern)

Bachelor of Science
Psychology

A minimum of **120** ~~124~~ credit hours is required for a bachelor of science degree in psychology and a cumulative grade point average of 2.0 must be obtained. These requirements for the B.S. degree are in addition to credit received for basic ROTC.

The psychology bachelor of science curriculum requires six hours of English composition; 23 hours of math, science and computer science; and twelve semester hours in humanities. Specific requirements for the bachelor degree are outlined in the sample program listed below.

1. ENGLISH 1120 and ENGLISH 1160 (entering students will normally take ENGLISH 1120 either semester of the first year.) (6 hours)
2. A total of **20** ~~23~~ hours in biological, physical, (chemistry, geology and geophysics, and physics), and mathematical (mathematics/statistics and computer science or information science & technology) sciences, to **include** ~~include COMP SCI 1570 and COMP SCI 1580; or COMP SCI 1970 and COMP SCI 1980; or COMP SCI 1971 and COMP SCI 1981; or COMP SCI 1972 and COMP SCI 1982;or IS&T 1551 and~~ at least one course taken in the biological and one in the physical sciences. Of the biological and physical science offerings, at least one must be a laboratory course. Engineering courses may, at the discretion of the student's major advisor, also count toward this total requirement. **(20** ~~(23~~ hours)
3. 12 hours in humanities and fine arts (literature, philosophy, art, music, or theater). Foreign language courses may count toward fulfilling this requirement. Courses used to satisfy this requirement must be taken in at least two humanities areas. (12 hours)
4. 12 hours in at least two social sciences fields outside the major area (economics or history or political science). A course in Modern Western Civilization (HISTORY 1200), American History To 1877 (HISTORY 1300) or American History Since 1877 (HISTORY 1310), or American Government (POL SCI 1200) must be taken to satisfy the requirement of the state of Missouri (the "Williams Law"), and this course may count toward fulfilling the social sciences requirement. (12 hours)
5. Minor: A minor will be selected from any discipline other than the major with the approval of the student's 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.
6. Basic ROTC may be elected in the freshman and sophomore years, but is not creditable toward a degree. Six credit hours of advanced ROTC may be credited toward a degree.
7. Elective Credits: In consultation with his/her advisor, each student will elect sufficient additional courses to complete a minimum of **120** ~~124~~ credit hours which may include MATH 1160 and one of MATH 1120 or MATH 1140 .
8.

Psychology Courses (34 hours)		
Required:*		
General Skills Courses:		
PSYCH 1100	Introduction to Psychology	1
PSYCH 1101	General Psychology	3
PSYCH 2200	Research Methods	4

Content Courses:		
PSYCH 3310	Developmental Psychology	3
PSYCH 4400	Cognitive Psychology	3
PSYCH 4501	Abnormal Psychology	3
PSYCH 4600	Social Psychology	3
And one of the following 2 courses:		
PSYCH 4410	Neuroscience	3
PSYCH 4411	Sensation and Perception	3
Capstone Course:		
Select three credit hours from the following Capstone courses:		
~~PSYCH 3110~~	~~Course PSYCH 3110 Not Found~~	~~3~~
PSYCH 4010	Seminar	0-6
PSYCH 4099	Undergraduate Research	0-6
PSYCH 4200	Tests and Measurements	3
PSYCH 4590	Health Psychology	3
PSYCH 4994	Psychology in Media	3
PSYCH 4992	Cross-Cultural Psychology	3
PSYCH 4993	Psychology of Gender	3
PSYCH 4990	Internship	0-6
*These required courses total 26 hours.		
Elective Courses:		
Select an additional 8 hours of psychology electives to complete the 34 hour degree requirement.		

9. A cumulative grade point average of 2.0 must be earned in all course work taken in the major field. Upper class (3000-level and above) courses completed with grades of “D” may not be included in the course work for the major field without the approval of the advisor and the chair of the department concerned.

Emphasis Areas

Note: The following areas identify courses from which a student may opt to develop an emphasis area. It is not required that students obtain an emphasis specialty within psychology.

Human Resources/Personnel		
PSYCH 4700	Industrial Psychology	3
PSYCH 4600	Social Psychology	3
PSYCH 4601	Group Dynamics	3
PSYCH 4602	Organizational Psychology	3
Human Services		
PSYCH 3311	Psychological & Educational Development Of The Adolescent	3
or PSYCH 3310	Developmental Psychology	
PSYCH 4501	Abnormal Psychology	3
PSYCH 4500	Personality Theory	3
PSYCH 4510	Clinical Psychology	3

Cognitive Neuroscience		
PSYCH 4411	Sensation and Perception	3
PSYCH 3400	Theories Of Learning	3
or PSYCH 4501	Abnormal Psychology	
PSYCH 4400	Cognitive Psychology	3
PSYCH 4410	Neuroscience	3
Usability of Technology		
PSYCH 2300	Educational Psychology	3
~~PSYCH 3720~~	~~Course PSYCH 3720 Not Found~~	~~3~~
PSYCH 4710	Human Factors	3
PSYCH 4720	Psychology of Social Technology	3
Psychology of Leadership		
PSYCH 4600	Social Psychology	3
or PSYCH 4603	Social Influence: Science and Practice	
PSYCH 4610	Psychology of Leadership in Organizations	3
PSYCH 4993	Psychology of Gender	3
or PSYCH 4601	Group Dynamics	
PSYCH 4602	Organizational Psychology	3

Bachelor of Science Psychology (Secondary Education Emphasis Area)

You may earn a B.S. degree in psychology from Missouri S&T and certification to teach at the secondary level in the schools of Missouri with the secondary education emphasis area program. This program can be completed in four academic years and student teaching is arranged with public schools within 30 miles of the Rolla campus.

Students interested in this emphasis area should consult with the advisor for the secondary education emphasis area in the department of psychological science.

In order to successfully complete this emphasis area, students must have at least 22 on the ACT, maintain a cumulative GPA of at least 2.5, and attain at least a 2.5 GPA in psychology courses taken. Current Missouri S&T or transfer students who wish to pursue this emphasis area must meet both of these GPA requirements to be accepted into the program. Students must also meet all requirements listed under the teacher education program in this catalog. Students who do not meet all the teacher certification requirements will not be eligible for the secondary education emphasis area, even if they have completed all course work.

A degree in this emphasis area requires 136 credit hours. The required courses are provided below.

Communications Skills: 9 semester hours		
ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
Humanities: 12 semester hours		
Art, Music, or Theatre course		3
Philosophy course		3

Literature course		3
One additional humanities from the above course groups, Foreign Language, or Etymology		3-4
Social Sciences: 18 semester hours		
HISTORY 1300	American History To 1877	3
or HISTORY 1310	American History Since 1877	
POL SCI 1200	American Government	3
POL SCI 3211	American Political Parties	3
or POL SCI 3300	Principles Of Public Policy	
or POL SCI 3760	The American Presidency	
or POL SCI 3763	Contemporary Political Thought	
PSYCH 1101	General Psychology	3
ECON 1100	Principles Of Microeconomics	3
or ECON 1200	Principles Of Macroeconomics	
HISTORY 2110	World Regional Geography	3
Natural Sciences/Mathematics: 21 semester hours		
One course in Physics, Chemistry or Geology		3-4
Mathematics		3
BIO SCI 1113	General Biology	3
STAT 1115	Statistics For The Social Sciences I	3
COMP SCI 1570 & COMP SCI 1580	Introduction To Programming and Introduction To Programming Laboratory	3-4
or COMP SCI 1970 & COMP SCI 1980	Basic Scientific Programming and Computer Programming Laboratory	
or COMP SCI 1971 & COMP SCI 1981	Introduction To Programming Methodology and Programming Methodology Laboratory	
or COMP SCI 1972 & COMP SCI 1982	Introduction to MATLAB Programming and MATLAB Programming Laboratory	
5-6 additional hours of Math &/or Science courses		5-6
Professional Requirements: 26 semester hours		
EDUC 1040	Perspectives In Education	2
EDUC 1174	School Organization & Adm For Elementary & Secondary Teachers	2
EDUC 2251	Historical Foundation Of American Education	3
EDUC 3216	Teaching Reading in Content Area	3
EDUC 3280	Teaching Methods and Skills in Content Areas	6
EDUC 4298	Student Teaching Seminar	1
PSYCH 2300	Educational Psychology	3
PSYCH 3311	Psychological & Educational Development Of The Adolescent	3
PSYCH 4310	Psychology Of The Exceptional Child	3
Clinical Experience: 16 semester hours		
EDUC 1104	Teacher Field Experience	2

EDUC 1164	Aiding Elementary, Middle And Secondary Schools	2
EDUC 4299	Student Teaching	12
Psychology Degree Requirements: 17 semester hours		
PSYCH 1100	Introduction to Psychology	1
PSYCH 2200	Research Methods	4
PSYCH 3400	Theories Of Learning	3
PSYCH 3310	Developmental Psychology	3
PSYCH 4501	Abnormal Psychology	3
or PSYCH 4500	Personality Theory	
PSYCH 4600	Social Psychology	3
Certification: 17 semester hours		
9 hours of American History from the following:		
HISTORY 3320	Colonial America	
HISTORY 3325	Revolutionary America, 1754-1789	
HISTORY 3340	Age Of Jefferson And Jackson	
HISTORY 3345	Civil War And Reconstruction	
HISTORY 3360	Recent United States History	
HISTORY 3425	History Of The Old South	
HISTORY 3426	History Of The Modern South	
HISTORY 3480	History Of Baseball	
HISTORY 3440	20th Century Americans In Combat	
HISTORY 3442	The United States in Vietnam	
HISTORY 3761	U.S. Diplomatic History to World War II	
HISTORY 4435	History of the American West	
8 hours of World History from the following:		
HISTORY 1100	Early Western Civilization	
HISTORY 1200	Modern Western Civilization	
HISTORY 2220	Making Of Modern Britain	
HISTORY 2222	The Making Of Modern France	
HISTORY 2224	Making Of Modern Russia	
~~HISTORY 2210~~	~~Course HISTORY 2210 Not Found~~	
~~HISTORY 3120~~	~~Course HISTORY 3120 Not Found~~	
HISTORY 3130	Medieval History I	
HISTORY 3135	Medieval History II	
HISTORY 3140	History Of Renaissance Thought	
HISTORY 3230	Europe In The Age Of The French Revolution And Napoleon	
HISTORY 3235	Foundations Of Contemporary Europe 1815-1914	
HISTORY 3240	Contemporary Europe	
HISTORY 3660	Modern East Asia	

Justification for request

We are removing the CS requirement to have the total number of hours required the same as the BA degree (120 hours).

Supporting Documents

Course Reviewer Comments

ershenb (04/04/19 4:54 pm): Per the request of Dr. Murray, removed PSYCH 3110, PSYCH 3720, HISTORY 2210, and HISTORY 3120.

ershenb (04/04/19 5:37 pm): Per the request of Dr. Murray, edited the hours to say "a minimum of 120 hours."

Key: 193

Program Change Request

Date Submitted: 04/05/19 10:34 am

Viewing: SYS EN-PHD : Systems Engineering PhD

File: 131.13

Last approved: 06/18/18 12:29 pm

Last edit: 04/08/19 8:47 am

Changes proposed by: johsarah

Catalog Pages Using this Program
Systems Engineering

Start Term
Fall 2019 ~~08/13/2018~~
Program Code
SYS EN-PHD
Department
Engineering Management and Systems Engineering
Title
Systems Engineering PhD

Program Requirements and Description

In Workflow

1. **RENGMNGT 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. Kristy Giacomelli

Approval Path

1. 04/05/19 10:35 am Suzanna Long (longsuz): Approved for RENGMNGT Chair
2. 04/08/19 8:48 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:34 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:26 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

History

1. Jun 12, 2014 by pantaleoa
2. Mar 13, 2015 by pantaleoa

3. Jun 19, 2015 by Stephen Raper (sraper)
4. Jul 24, 2015 by pantaleoa
5. Apr 19, 2016 by pantaleoa
6. Apr 19, 2016 by pantaleoa
7. Jun 18, 2018 by Sarah Johnson (johsarah)

Doctor of Philosophy Admission Standards

- B.S. in engineering, or a physical science
- Undergraduate courses: Calculus Series (I, II, III), Differential Equations, Statistics, Physics (I, II) or Chemistry, Engineering Economy
- GPA: M.S. GPA = 3.5
- Graduate Record Exam (GRE): All students must submit current GRE scores. V+Q≥ 1100, A≥ 4.0 (former scoring) or V≥ 155, Q≥ 148, A≥ 4.0
- TOEFL: All international applicants must submit a current TOEFL score, regardless of prior academic experience or place of study.
- Regular status: 580/237/92 (TOEFL)
- Statement of Purpose: All applicants must submit a statement of purpose.
- Three reference letters

A candidate for the Ph.D. in systems engineering must complete the equivalent of at least three years of full time work beyond the bachelor's degree. The content of all Ph.D. programs are individually structured by the student in consultation with and approved by the student's advisory committee. All requirements for the degree must normally be completed within an eight year period. At appropriate points in their program, Ph.D. students must pass both a Qualifying Exam and Comprehensive Exam. Off-campus students are expected to complete all requirements listed in the Missouri S&T Graduate Catalog under the section entitled Doctor of Philosophy Degree and follow all procedures listed under the Procedures for Ph.D. Candidates.

The total credit requirements for graduation are a minimum of **54** ~~60~~ credit hours after the successful completion of M.S. degree in systems engineering. Actual courses taken will be determined by the candidate's committee and his/her plan of study. The student is expected to complete all requirements.

~~Residency Requirements All students are expected to follow the Missouri S&T graduate student residency requirements.Off campus students can meet the 2 year residency requirement with the following requirements:~~For Off-Campus Students

The ~~the~~ qualifying exam must be taken on campus within the first 5 semesters of enrollment; the student will have at minimum **one virtual conference** ~~two video conferences~~ per month with his/her research advisor; the **student is expected to meet with the** Ph.D. ~~committee will include one person from the student's professional work location, the appointment committee member must have a Ph.D.and be familiar with the chosen research; the student is expected to meet with the Ph.D.~~committee on a regular basis with at least two meetings per semester; the Ph.D. comprehensive exam must be taken on campus; the student has the option of conducting research that is beneficial to the student's professional work; and the defense of dissertation must take place on campus.

Major Requirements

After B.S. ~~May be taken during M.S.~~ **degree in Engineering**

Core Curriculum		24
SYS ENG 6412	**Mathematical Programming**	**3**
SYS ENG 6110	**Optimization under Uncertainty**	**3**
SYS ENG 6101	**Advanced Research Methodology in Engineering Management**	**3**
SYS ENG 6104	Systems Architecting	3
~~SYS ENG 6196~~	~~Systems Engineering Capstone~~	
SYS ENG 5101	System Engineering and Analysis	3
~~SYS ENG 6102~~	~~Information Based Design~~	
~~SYS ENG 6103~~	~~Systems Life Cycle Costing~~	
SYS ENG 6542	Model Based Systems Engineering	3
SYS ENG 6321	Modeling Complex Systems	3
SYS ENG 6239	Smart Engineering System Design	3
Research		30
SYS ENG 6099	Research	1-15
Electives		36
Systems Eng Process Tools, Optimization & Statics - 12 credit hours		
Research Specialization Areas - 24 credit hours		

~~degree~~Requirements for Thesis

Students will conduct original research demonstrated by journal or referred proceedings, publication under the supervision of a doctoral advisor, and communicate their findings, write a dissertation on research conducted, and provide satisfactory defense of their dissertation in a final oral examination. Students will be required to sign up for one hour of SYS ENG 6099 under their research **advisor. Students are required to publish** ~~advisor and attend systems engineering seminars every fall and spring semester during~~ their **work in approved journals and referred proceedings.** ~~study. These courses may be included as fulfilling research credit requirements.Students are required to publish their work in approved journals and referred proceedings.~~A minimum of three articles is expected.

Qualifying Exam

The objective of the systems engineering Ph.D. qualifying exam is to test the knowledge and understanding of the graduate student on systems engineering fundamentals and ~~assess the~~ student's **research capability.**

~~level of knowledge in engineering statistics and optimization.~~

~~The qualifying exam is a two day exam consisting of a written and oral part.For more information, contact the department graduate staff.~~It is expected that the graduate student has a clear understanding of the research issues in the student's area of interest, its implications in industrial applications primarily in the industrial domain the student is working, possible impact of successful research contributions to systems engineering research and **literature. For more information, contact the department graduate staff.** ~~literature and should be able to identify up to five journals in this area.~~

~~Prior to the oral exam, copies of the written exams prepared by the systems engineering faculty will be provided to all faculty for each student.The oral exam is restricted to the areas of research specialization selected by each student and will~~

~~continue until there is a consensus not to ask further questions by the faculty.~~

Comprehensive Exam

The student's advisory committee will administer the comprehensive examination after the student has completed seventy-five percent of the coursework for the Ph.D. program and one published refereed conference proceeding or journal paper. The examination is written and oral. Upon successful completion of the written examination, the student will be orally examined by the advisory committee.

Dissertation

The dissertation, embodying the results of an original investigation, must be written upon a subject mutually agreed upon between the student and the advisor.

Research Areas

Cyber Physical Systems, Modeling and Simulation, Model Based Systems Engineering , System of Systems Architecting, Complex Adaptive Systems, Human System Integration, Infrastructure Systems.

Justification for request
Supporting Documents
Course Reviewer Comments
ershenb (04/08/19 8:47 am): formatting

Key: 131

Program Change Request

Date Submitted: 04/05/19 10:01 am

Viewing: SYS ENG-MS : Systems Engineering MS

File: 140.8

Last approved: 05/16/16 3:20 pm

Last edit: 04/08/19 9:01 am

Changes proposed by: johsarah

Catalog Pages Using this Program
Systems Engineering

Start Term
Fall 2019 ~~08/15/2016~~
Program Code
SYS ENG-MS
Department
Engineering Management and Systems Engineering
Title
Systems Engineering MS

Program Requirements and Description

In Workflow

1. **RENGMNGT 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. Kristy Giacomelli

Approval Path

1. 02/06/18 1:04 pm Suzanna Long (longsuz): Approved for RENGMNGT Chair
2. 02/07/18 9:18 am Brittany Parnell (ershenb): Rollback to Initiator
3. 04/05/19 10:32 am Suzanna Long (longsuz): Approved for RENGMNGT Chair
4. 04/08/19 9:02 am Brittany Parnell (ershenb): Approved for CCC Secretary
5. 04/19/19 9:35 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
6. 04/23/19 1:26 pm Brittany Parnell (ershenb): Approved for

Pending CCC Agenda post

History

1. Jun 12, 2014 by pantaleoa
2. Jul 21, 2014 by pantaleoa
3. Jun 19, 2015 by Stephen Raper (sraper)
4. Jul 24, 2015 by pantaleoa
5. Apr 19, 2016 by pantaleoa
6. May 16, 2016 by pantaleoa

The M.S. degree program is offered on the Rolla campus and several locations including the Missouri S&T Global - St. Louis, and by distance education throughout the United States and selected international locations. Distance course lectures are archived upon completion of the lecture and all lectures are available to students through streaming video during the semester for review. These courses can be reached from anywhere at any time. It is feasible to obtain a Missouri S&T non-thesis M.S. degree regardless of your location.

The M.S. non-thesis program requires completion of at least 10 three-credit hour courses approved by the academic advisor. The M.S. with thesis option requires 36 credit hours including the thesis. All students are required to take the following:

CORE Courses

SYS ENG 5101	System Engineering and Analysis	3
SYS ENG 6102	Information Based Design	3
SYS ENG 6103	Systems Life Cycle Costing	3
SYS ENG 6104	Systems Architecting	3
~~SYS ENG 6105~~	~~Complex Engineering Systems Project Management~~	
SYS ENG 6196	Systems Engineering Capstone	3
SYS ENG 6542	**Model Based Systems Engineering**	**3**

Specialization Courses

Specialization courses provides students with the ability to address his/her technology needs in the context of the overall Systems Engineering program. These graduate courses can be selected from engineering or the physical science department as long as they are approved by the program director.

One of the graduate certificates may be substituted for a specialization track with the permission of the program director.

~~Choose 4 courses in an area or combination of areas.(Please refer to the engineering management and systems engineering department for course information in each area.)Civil and Environmental Contemporary Structural Engineering Geoenvironmental Engineering Geotechnical Earthquake~~

~~Engineering Infrastructure RenewalComputer Science Big Data Management & Analytics Big Data Management & Security Computational Intelligence Information Assurance & Security Officer Essentials Multimedia & Information Systems Software Design & Development Systems and Software Architecture Wireless Networks and Mobile SystemsElectrical Engineering Computation Intelligence Electric Machines and Drives Electric Power Systems Engineering Information Assurance & Security Officer Essentials Network Centric SystemsEngineering Management Engineering Management Financial Engineering Human Systems Integration Leadership in Engineering Organizations Lean Six Sigma Project ManagementManufacturing Engineering CAD/CAM & Rapid Product Realization Manufacturing SystemsMechanical and Aerospace Engineering Composite Materials and Structures Control Systems Energy Conversion & Transport Engineering Mechanics Manufacturing Automation~~

Justification for request

Core Course Sys Eng 6105 Complex Engineering Systems Project Management is being removed from the core courses and is being included in the list of elective courses for the program. The course is being replaced by SysEng 6542 Model Based Systems Engineering as new core course for the program to reflect current practices of system engineering in practice and research today. This change is approved by the faculty of Engineering management and Systems Engineering.

Supporting Documents

Course Reviewer Comments

ershenb (02/07/18 9:18 am): Rollback: All Master's programs are approved through the Office of Graduate Studies.

ershenb (04/08/19 9:01 am): formatting

Key: 140

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/09/19 4:39 pm

Viewing: **CHEM ENG 5001.005 : AIChE Design Competition**

File: 4628

Last edit: 04/23/19 1:28 pm

Changes proposed by: luksc

Requested Effective Change Date	Spring 2020
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	005
Experimental Title	AIChE Design Competition
Experimental Abbreviated Course Title	AIChE Design Competition
Instructors	Christi Luks
Experimental Catalog Description	This course is for students who wish to compete in the AIChE design competition under competition rules. Students may participate as an individual or as a team of up to three undergraduates. The project must be completed in 30 days. See AIChE.org for a more complete description of competition rules.
Prerequisites	ChemEng 4091.
Field Trip Statement	
Credit Hours	LEC: 0 LAB: 1 IND: 0 RSD: 0 Total: 1
Justification for new course:	This course will encourage our students to participate in this global competition as they further develop their process design skills.
Semester(s) previously taught	None
Co-Listed Courses:	
Course Reviewer Comments	**sraper (04/19/19 9:17 am):** Some DSCC members are concerned that a 5001 is only 1 credit hour.

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. 04/10/19 11:09 am Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/12/19 2:20 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:27 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:27 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4628

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/09/19 4:43 pm

Viewing: **CHEM ENG 5001.006 : Chemical Process Modeling and Analysis**

File: 4629

Last edit: 04/23/19 1:29 pm

Changes proposed by: luksc

Requested Effective Change Date	Spring 2020
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	006
Experimental Title	Chemical Process Modeling and Analysis
Experimental Abbreviated Course Title	Process Analysis
Instructors	Christi Luks

Experimental Catalog Description

This course is a continuation of ChemEng 3111 (Numerical Computing for Chemical Engineers). Students will consider more advanced problems in which they create and analyze models of chemical processes.

Prerequisites

ChemEng 3111; ChemEng 3150; ChemEng 3140.

Field Trip Statement

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

Justification for new course:

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. 04/10/19 11:10 am Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/12/19 2:23 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:28 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:28 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

This course expands on the basic knowledge of ChemEng 3111 with emphasis on skills that will be particularly useful for students who are considering graduate studies or careers in research and design.

Semester(s) previously taught	None
Co-Listed Courses:	
Course Reviewer Comments	**sraper (04/19/19 9:28 am):** DSCC members are concerned a 5001 course is only 1 credit hour.

Key: 4629

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/09/19 4:36 pm

Viewing: **CHEM ENG 5001.007 : Renewable Energy Processes**

File: 4627

Last edit: 04/23/19 1:30 pm

Changes proposed by: luksc

Requested Effective Change Date	Spring 2020
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	007
Experimental Title	Renewable Energy Processes
Experimental Abbreviated Course Title	Renewable Energy
Instructors	Christi Luks and Joseph Smith
Experimental Catalog Description	This course will consider energy alternatives such as bio-fuels, wind power, solar power, batteries, and fuel cells. The students will explore the energy analysis, manufacturing techniques, safety considerations, life-cycle analysis, and economics of these options.
Prerequisites	Chem Eng 3120.
Field Trip Statement	
Credit Hours	LEC: 1 LAB: 0 IND: 0 RSD: 0 Total: 1
Justification for new course:	This survey course will teach students the skills needed to compare traditional and renewable energy alternatives in light of current environmental and societal needs.
Semester(s) previously taught	None
Co-Listed Courses:	
Course Reviewer Comments	**ershenb (04/12/19 3:00 pm):** corrected the prerequisite to Chem Eng 3120, per the request of Christi Luks. **sraper (04/15/19 11:36 am):** fixed prerrq. **sraper (04/19/19 9:29 am):** DSCC members are concerned a 5001 coursed s only 1 credit hour.

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. 04/10/19 11:10 am Muthanna Al-Dahhan (aldahhanm): Approved for RCHEMENG Chair
2. 04/12/19 3:00 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:29 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:28 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4627

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 03/11/19 1:20 pm

Viewing: **CIV ENG 5001.003 : Base Courses in Pavements**

File: 4621

Last edit: 04/23/19 1:32 pm

Changes proposed by: seelyj

Requested Effective Change Date	Fall 2019
Department	Civil, Architectural, and Environmental Engineering
Discipline	Civil Engineering (CIV ENG)
Course Number	5001
Topic ID	003
Experimental Title	Base Courses in Pavements
Experimental Abbreviated Course Title	B C in Pavements
Instructors	Liu, Jenny
Experimental Catalog Description	Production, properties, behavior and application of base course materials in pavements for rational and sustainable pavement design and construction.
Prerequisites	Civ Eng 3116.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	The course is included in the Advanced Materials for Sustainable Infrastructure certificate program and is needed for graduate student research.
Semester(s) previously taught	
Co-Listed Courses:	
Course Reviewer Comments	**sraper (04/19/19 9:31 am):** Removed preq statements beyond stated course. DSCC members objections.

Key: 4621

Preview Bridge

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. CAT entry
8. Registrar

Approval Path

1. 04/04/19 6:02 am Joel Burken (burken): Approved for RCIVILEN Chair
2. 04/04/19 4:47 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:31 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:24 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Course Change Request

New Experimental Course Proposal

Date Submitted: 03/08/19 3:42 pm

Viewing: **COMP SCI 5001.003 : Game Theory for Computing**

File: 4596

Last edit: 04/23/19 1:33 pm

Changes proposed by: tauritzd

Requested Effective Change Date	Fall 2019
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	5001
Topic ID	003
Experimental Title	Game Theory for Computing
Experimental Abbreviated Course Title	Game Theory for CS
Instructors	Venkata Nadendla
Experimental Catalog Description	This course introduces the mathematical and computational foundations of game theory, and its applications in computer science. Topics include rationality, non-cooperative (such as adversarial) games, dynamic games (temporal dynamics), Bayesian games (information asymmetry), and cooperative game theory (alliances and strategic teaming).
Prerequisites	A grade of "C" or better in both Comp Sci 2500 and Math 3108, and in one of Stat 3113, Stat 3115, Stat 3117, or Stat 5643.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	Game theory is quickly gaining significance in modeling strategic interactions between competing entities in various real-world applications such as cyber-security, robotics and networking. This course fills a void in the CS department's offerings to cover this important field.
Semester(s) previously taught	None
Co-Listed Courses:	
Course Reviewer Comments	

Key: 4596

Preview Bridge

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. CAT entry
8. Registrar

Approval Path

1. 03/11/19 2:43 am Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 03/12/19 11:14 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:01 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:46 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Course Change Request

New Experimental Course Proposal

Date Submitted: 03/08/19 3:41 pm

Viewing: **COMP SCI 5001.004 : Introduction to Virtual Reality**

File: 4598

Last edit: 04/23/19 1:34 pm

Changes proposed by: tauritzd

Requested Effective Change Date	Fall 2019
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	5001
Topic ID	004
Experimental Title	Introduction to Virtual Reality
Experimental Abbreviated Course Title	Intro to Virtual Reality
Instructors	Chaman Sabharwal
Experimental Catalog Description	Covers virtual reality fundamentals: user interface (parameter pane, construction pane, network panes), application design facets (networks of nodes, navigation of networks for design and interactive visualization exploiting geometric transformations, digital assets, lights, cameras, animation), and simple applications to particles, dynamics, and fluids.
Prerequisites	A grade of "C" or better in both Comp Sci 3200 and Math 3108.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	Virtual Reality (VR) is becoming increasingly popular for real-world use in everything ranging from entertainment to emergency & military personnel training to telemedicine. This course fills a void in the CS curriculum to provide the technical foundation for building future VR systems.
Semester(s) previously taught	None
Co-Listed Courses:	
Course Reviewer Comments	

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. CAT entry
8. Registrar

Approval Path

1. 03/11/19 2:44 am Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 03/12/19 11:16 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:01 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:47 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4598

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 03/08/19 3:42 pm

Viewing: **COMP SCI 6001.003 : Algorithmic Game Theory**

File: 4597

Last edit: 04/23/19 1:39 pm

Changes proposed by: tauritzd

Requested Effective Change Date	Fall 2019
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	6001
Topic ID	003
Experimental Title	Algorithmic Game Theory
Experimental Abbreviated Course Title	Algorithmic Game Theory
Instructors	Venkata Nadendla
Experimental Catalog Description	This course covers aggregation of social preferences and mechanism design, with emphasis on computational complexity/efficiency and robustness in the context of real-world applications. Case studies on wireless spectrum auctions, matching markets, network routing, and security applications will be presented. Students will conduct a major term project.
Prerequisites	A grade of "C" or better in Comp Sci 5200 and in one of Comp Sci 5400, Comp Sci 5401, or Comp Sci 5001 - Game Theory for Computing.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	Algorithmic Game Theory is increasingly employed to design mechanisms under complex (potentially adversarial) interactions in various real-world application domains such as economics, cyber security, and critical infrastructure protection. This course fills a void in the CS department's offering to cover this important field.
Semester(s) previously taught	None
Co-Listed Courses:	
Course Reviewer Comments	

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. CAT entry
8. Registrar

Approval Path

1. 03/11/19 2:44 am Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 03/12/19 11:18 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:01 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:47 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4597

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 02/25/19 10:46 am

Viewing: **COMP SCI 6001.004 : Introduction to Quantum Computing**

File: 4595

Last edit: 04/23/19 1:40 pm

Changes proposed by: tauritzd

Requested Effective Change Date	Fall 2019
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	6001
Topic ID	004
Experimental Title	Introduction to Quantum Computing
Experimental Abbreviated Course Title	Quantum Computing
Instructors	George Markowsky
Experimental Catalog Description	This course provides an introduction to the emerging field of quantum computation. The course will cover such topics as complex numbers and Hilbert space, basic quantum mechanics, quantum gates, Deutsch's algorithm, Shor's algorithm, Grover's algorithm, quantum programming, theoretical foundations of quantum computing, and open problems in quantum computing.
Prerequisites	A grade of "C" or better in Comp Sci 5200.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	Quantum computing is a very significant area of research in computer science at the present time, and has the potential to revolutionize the field. It is important that we offer students the possibility of learning about this emerging field.
Semester(s) previously taught	None
Co-Listed Courses:	
Course Reviewer Comments	

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. CAT entry
8. Registrar

Approval Path

1. 03/04/19 5:04 pm Bruce McMillin (ff): Approved for RCOMPSCI Chair
2. 03/05/19 8:15 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 03/25/19 2:01 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 11:48 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4595

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 03/18/19 1:38 pm

Viewing: **GEOPHYS 6001.001 : Advanced Geophysical Data Analysis**

File: 4622

Last edit: 04/23/19 1:43 pm

Changes proposed by: liukh

Requested Effective Change Date	Summer 2019
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Geophysics (GEOPHYS)
Course Number	6001
Topic ID	001
Experimental Title	Advanced Geophysical Data Analysis
Experimental Abbreviated Course Title	Adv Geophys Data Analys
Instructors	Kelly Liu
Experimental Catalog Description	Applications of advanced time series and spatial series analysis techniques to geophysical data. Topics covered include digitization and aliasing of geophysical signals, frequency and wavenumber spectra, digital filtering and linear systems theory. Hands-on data processing exercises will provide theoretical knowledge as applied to geophysical investigations
Prerequisites	Comp Sci 1970 and Comp Sci 1980 or equivalents.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	This course will teach the fundamental knowledge of data analysis to provide the foundation to the students for advanced real-world data-driven discovery.
Semester(s) previously taught	Summer, 2019
Co-Listed Courses:	
Course Reviewer Comments	

In Workflow

1. **RGEOSENG 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. 03/18/19 1:59 pm David Borrok (borrokd): Approved for RGEOSENG Chair
2. 03/22/19 2:51 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/08/19 12:22 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 12:30 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4622

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/04/19 11:08 am

Viewing: **MATH 5001.002 : Introduction to Finite Element Methods**

File: 4626

Last edit: 04/23/19 1:47 pm

Changes proposed by: prunnion

Requested Effective Change Date	Fall 2019
Department	Mathematics & Statistics
Discipline	Mathematics (MATH)
Course Number	5001
Topic ID	002
Experimental Title	Introduction to Finite Element Methods
Experimental Abbreviated Course Title	Intro to FEM
Instructors	Xiaoming He
Experimental Catalog Description	Introduction to finite element methods for the approximate solution of partial differential equations. Construction and implementation of finite element basis functions, finite element interpolation, and finite element approximations for basic elliptic and parabolic equations.
Prerequisites	Any instructor approved 4000 or higher level course with a significant computational component.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	Our previous finite elements course, Math 6602, was proving an insufficient introduction to the topic, especially for non-majors. This 5000-level course is intended to provide a far less theoretical introduction for both non-majors and majors alike. We anticipate that this new course may lead to changes in the existing 6000-level course to allow us to increase the amount of theory covered at the 6000-level, since the 5000-level is far less theoretical.
Semester(s) previously taught	
Co-Listed Courses:	
Course Reviewer Comments	

In Workflow

1. **RMATHEMA 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. 04/04/19 11:25 am
   sclark: Approved for RMATHEMA Chair
2. 04/04/19 6:31 pm
   Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 3:35 pm
   Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 1:22 pm
   Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4626

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/04/19 11:01 am

Viewing: **MATH 6001.005 : Discontinuous Galerkin methods for solving partial differential equations**

File: 4625

Last edit: 04/23/19 1:51 pm

Changes proposed by: prunnion

Requested Effective Change Date	Spring 2020
Department	Mathematics & Statistics
Discipline	Mathematics (MATH)
Course Number	6001
Topic ID	005
Experimental Title	Discontinuous Galerkin methods for solving partial differential equations
Experimental Abbreviated Course Title	DG Methods for PDEs
Instructors	Daozhi Han, John Singler, Yanzhi Zhang
Experimental Catalog Description	Design, implementation, and analysis of discontinuous Galerkin methods for approximating solutions of partial differential equations.
Prerequisites	Math 5325, Math 5604, or approval of instructor.
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	This course leverages the expertise of new faculty members in the department to expand our computational mathematics offerings at the graduate level.
Semester(s) previously taught	
Co-Listed Courses:	
Course Reviewer Comments	

In Workflow

1. **RMATHEMA 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. 04/04/19 11:25 am sclark: Approved for RMATHEMA Chair
2. 04/04/19 6:32 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/15/19 3:35 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 1:22 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Key: 4625

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/16/19 2:08 pm

Viewing: **MATH 6001.006 : Numerical Analysis in Computational Fluid Dynamics**

File: 4632

Last edit: 04/24/19 9:45 am

Changes proposed by: prunnion

Requested Effective Change Date	Fall 2019
Department	Mathematics & Statistics
Discipline	Mathematics (MATH)
Course Number	6001
Topic ID	006
Experimental Title	Numerical Analysis in Computational Fluid Dynamics
Experimental Abbreviated Course Title	Num Analysis in CFD
Instructors	Nan Jiang

Experimental Catalog Description

Numerical analysis in finite element computational fluid dynamics. Topics include continuous inf-sup condition and its discrete analogue, stability of the discrete pressure, properties of the solutions, time-stepping schemes, and stability and convergence of the finite element methods for the time-dependent Navier-Stokes equations.

Prerequisites

Math 5325.

Field Trip Statement

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

In Workflow

1. **RMATHEMA 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. 04/16/19 2:24 pm sclark: Approved for RMATHEMA Chair
2. 04/16/19 3:39 pm Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/23/19 3:53 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/24/19 9:43 am Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

Justification for new course:	This course leverages the expertise of our faculty to grow our graduate offerings in an expanding area of mathematics.
Semester(s) previously taught	None
Co-Listed Courses:	

Course Reviewer Comments

Key: 4632

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/12/19 3:03 pm

Viewing: **PET ENG 4001.006 : Reservoir Engineering Aspects of Unconventional Oil and Gas**

File: 4630

Last edit: 04/23/19 1:54 pm

Changes proposed by: reflori

Requested Effective Change Date	Fall 2019
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	4001
Topic ID	006
Experimental Title	Reservoir Engineering Aspects of Unconventional Oil and Gas
Experimental Abbreviated Course Title	Res Eng Aspects Unconv
Instructors	Abdulmohsin Imqam

Experimental Catalog Description

Review of fundamentals of formation evaluation and reservoir characterization of source rock reservoirs, stimulation of unconventional reservoirs, current advanced recovery methods, and flow assurance.

Prerequisites

Pet Eng 3520.

Field Trip Statement

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

Justification for new course:	Production of oil and gas from unconventional reservoirs is a major component of current oil industry practice. This is an important class which addresses the many

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. CAT entry
8. Registrar

Approval Path

1. 04/12/19 3:20 pm David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/15/19 10:58 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:34 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

	unique features of unconventional plays which are different than traditional oil and gas reservoirs.
Semester(s) previously taught	Not previously taught.
Co-Listed Courses:	

Course Reviewer Comments

Key: 4630

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 04/12/19 3:08 pm

Viewing: **PET ENG 6001.011 : Advanced Reservoir Engineering Aspects of Unconventional Oil and Gas**

File: 4631

Last edit: 04/23/19 1:57 pm

Changes proposed by: reflori

Requested Effective Change Date	Summer 2019
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	6001
Topic ID	011
Experimental Title	Advanced Reservoir Engineering Aspects of Unconventional Oil and Gas
Experimental Abbreviated Course Title	Advanced Aspects Unconv
Instructors	Abdulmohsin Imqam

Experimental Catalog Description

Overview of advanced concepts of formation evaluation and reservoir characterization of source rock reservoirs, stimulation of unconventional reservoirs, current advanced recovery methods, and flow assurance.

Prerequisites

Pet Eng 3520.

Field Trip Statement

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

Justification for new course:	Production of oil and gas from unconventional reservoirs is a major component of current oil industry practice. This is an important class which addresses the many

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. CAT entry
8. Registrar

Approval Path

1. 04/12/19 3:20 pm David Borrok (borrokd): Approved for RGEOSENG Chair
2. 04/15/19 11:01 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/19/19 9:34 am Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 04/23/19 1:24 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post

	unique features of unconventional plays which are different than traditional oil and gas reservoirs.
Semester(s) previously taught	Not previously taught.
Co-Listed Courses:	

Course Reviewer Comments

Key: 4631

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 03/05/19 4:06 pm

Viewing: **PHYSICS 6001.001 : Random Processes and Wave Coherence**

File: 4617

Last edit: 04/23/19 2:23 pm

Changes proposed by: yamilov

Requested Effective Change Date	Fall 2019
Department	Physics
Discipline	Physics (PHYSICS)
Course Number	6001
Topic ID	001
Experimental Title	Random Processes and Wave Coherence
Experimental Abbreviated Course Title	Wave Coherence
Instructors	Alexey Yamilov
Experimental Catalog Description	The course will review key concepts of theory of probability and random processes, which will be used as models for statistical treatment of propagation, interference and detection of partially coherent waves. Statistical approach to temporal and spatial coherence will be introduced with emphasis on the propagation of coherence under various conditions.
Prerequisites	
Field Trip Statement	
Credit Hours	LEC: 3 LAB: 0 IND: 0 RSD: 0 Total: 3
Justification for new course:	Physics department core research areas (atomic and molecular optics, condensed matter physics, astrophysics) all employ concepts of coherence in wave propagation. This course will introduce graduate students to the powerful mathematical approach to treating these phenomena. This graduate elective course will also help graduate students meet their degree requirement.
Semester(s) previously taught	na
Co-Listed Courses:	
Course Reviewer Comments	

Key: 4617

Preview Bridge

In Workflow

1. **RPHYSICS 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. 03/05/19 4:09 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
2. 03/06/19 9:07 am Brittany Parnell (ershenb): Approved for CCC Secretary
3. 04/08/19 12:31 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 04/23/19 1:25 pm Brittany Parnell (ershenb): Approved for Pending CCC Agenda post