Campus Curricula Committee Meeting Agenda
March 1, 2022
8:15am - 9:30am, Bertelsmeyer 110H
(For Faculty Senate Meeting of March 24, 2022)

Review of submitted Course Change forms:

File: 4851 BIO SCI 3363 : Ecophysiology
File: 1741.5 COMP SCI 6600 : Formal Methods in Computer Security
File: 4861 HISTORY 4792 : Historical Representation in Video Games
File: 4846 PET ENG 6801 : Advanced Petroleum Data Analytics
File: 1300.1 PHYSICS 4333 : Nuclear and Particle Physics
File: 4854 PHYSICS 4343 : Atomic Physics

Review of submitted Program Change forms:

File: 143.36 ARC ENG-BS : Architectural Engineering BS
File: 150.88 CH ENG-BS : Chemical Engineering BS
File: 149.28 CR ENG-BS : Ceramic Engineering BS
File: 344.23 EDUC-BS : Education BS
File: 44.34 ENG MG-BS : Engineering Management BS
File: 90.33 MT ENG-BS : Metallurgical Engineering BS
File: 115.49 PHYSIC-BS : Physics BS
File: 122.8 PRE MBA-MI : Pre MBA Minor

Review of submitted Experimental Course forms:

File: 4850 COMP SCI 5001.014 : Probability and Its Applications in Computing
File: 4852 ERP 4001.001 : Introduction to Enterprise Resource Planning (ERP) Software Development

Course Change Request

New Course Proposal

Date Submitted: 01/07/22 3:11 pm

Viewing: **BIO SCI 3363 : Ecophysiology**

File: 4851

Last edit: 01/13/22 2:15 pm

Changes proposed by: shannonk

Requested Effective Change Date	Fall 2022
Department	Biological Sciences
Discipline	Biological Sciences (BIO SCI)
Course Number	3363
Title	Ecophysiology
Abbreviated Course Title	Ecophysiology

Catalog Description

In Workflow

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

Approval Path

1. 01/07/22 3:13 pm David Duvernell (duvernelld): Approved for RBIOLSCI Chair
2. 01/13/22 2:16 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary

3. 02/11/22 1:32 pm
   Katie Shannon (shannonk): Approved for Sciences DSCC Chair

Study of physiological adaptations that improve species' fitness. We will focus on animals and discuss how selection has shaped the basic physiology of species in different niches. Although some molecular and cellular mechanisms will be addressed, the major themes of the course will be comparative, ecological, evolutionary, integrative, and organismal.

Prerequisites

Bio Sci 1113 or Bio Sci 1213, and Bio Sci 1223.

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:

Course bridges area of interest to both students with both ecology and health interests. Course has been taught twice as 3001.

Semesters previously offered as an experimental course

Spring 2019, Fall 2020

Co-Listed
Courses:

Course Reviewer
Comments

tibbettsmg (01/13/22 2:15 pm): enrollments: 15 in Spring 2019, 14 in Fall 2020. mt

Key: 4851

Preview Bridge

Course Change Request

Date Submitted: 01/10/22 9:50 am

Viewing: **COMP SCI 6600 : Formal Methods in Computer Security**

File: 1741.5

Last approved: 06/26/17 3:15 am

Last edit: 01/10/22 9:50 am

Changes proposed by: zhupe

Programs referencing this course

NET CNS-CT: Cyber Physical Systems CT

NET CNC-CT: Cyber Physical Systems CT

Requested Effective Change Date	Fall 2022 ~~01/09/2018~~
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	6600
Title	Formal Methods in Computer Security
Abbreviated Course Title	Formal Methods in CmpSec

Catalog Description

In Workflow

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

Approval Path

1. 01/10/22 10:08 am
   Samuel Frimpong (frimpong): Approved for RCOMPSCI Chair
2. 01/13/22 12:20 pm
   Marita Tibbetts (tibbettsmg):

Approved for CCC Secretary
3. 02/11/22 1:20 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair

History

1. Jun 26, 2017 by tauritzd (1741.1)

The course presents various vulnerabilities and threats to information in cyberspace and the principles and techniques for preventing and detecting threats, and recovering from attacks. The course deals with various formal models of advanced information flow security. A major project will relate theory to practice.

Prerequisites

A grade of "C" or better in both Comp Sci 4610 ~~3600~~ and Comp Sci 5200.

Field Trip Statement

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

Justification for change:

CS3600 was renumbered to CS4610 in Spring 2020. We update the prerequisite.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments

Key: 1741

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 01/26/22 3:10 pm

Viewing: **HISTORY 4792 : Historical Representation in Video Games**

File: 4861

Last edit: 01/28/22 9:27 am

Changes proposed by: bruening

Requested Effective Change Date	Fall 2022
Department	History and Political Science
Discipline	History (HISTORY)
Course Number	4792
Title	Historical Representation in Video Games
Abbreviated Course Title	Hist in Video Games

Catalog Description

In Workflow

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

Approval Path

1. 01/26/22 3:10 pm Michael Bruening (bruening): Approved for RHISTORY Chair
2. 01/28/22 9:28 am Marita Tibbetts (tibbettsmg):

Approved for CCC Secretary
3. 01/28/22 9:58 am Petra Dewitt (dewittp): Approved for Arts & Humanities DSCC Chair

This course explores video games as a medium for representing the past. By playing, watching, and analyzing a wide array of games, including popular series, students will learn core concepts in historiography and the philosophy of history. No previous gaming experience required.

Prerequisites

History 1100, History 1200, History 1300, or History 1310.

Field Trip Statement

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

Justification for new course:

Course has been taught successfully twice. Indeed, it drew a significant waitlist before the SP22 semester. It as proved a popular way to introduce students to important concepts in historical theory and practice.

Semesters previously offered as an

experimental

course

FS20

SP22

Co-Listed Courses:

Course Reviewer Comments

tibbettsmg (01/28/22 9:27 am): Enrollment FS20 was 22. Current Sp22 enrollment is 27. mt

Key: 4861

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 12/23/21 8:03 am

Viewing: **PET ENG 6801 : Advanced Petroleum Data Analytics**

File: 4846

Last edit: 12/23/21 1:58 pm

Changes proposed by: weim

Requested Effective Change Date	Fall 2022
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Petroleum Engineering (PET ENG)
Course Number	6801
Title	Advanced Petroleum Data Analytics
Abbreviated Course Title	Adv. Petro. Dt Analytics

Catalog Description

In Workflow

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

Approval Path

1. 12/17/21 12:15 pm
   Jeff Cawlfield (jdc): Approved for RGEOSENG Chair
2. 12/21/21 1:44 pm
   Marita Tibbetts (tibbettsmg):

Rollback to Initiator
3. 12/23/21 12:26 pm
   Jeff Cawlfield (jdc): Approved for RGEOSENG Chair
4. 12/23/21 1:58 pm
   Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
5. 02/11/22 1:24 pm
   Stephen Raper (sraper): Approved for Engineering DSCC Chair

This course advances the general introduction to fundamental data analytics methods with their applications in engineering disciplines, including basic statistical analysis, regression analyses, artificial intelligence methods and their implementation using python, the most popular interpreted computer coding language.

Prerequisites

Graduate standing with some coding experience.

Field Trip Statement

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

Elective for Majors	No

Justification for new course:

Data analytics is increasingly important for graduate students to be able to know techniques for data analytics and be able to carry out data analytics.

Semesters previously offered as an experimental course

Fall 2019

Fall 2021

Co-Listed Courses:

Course Reviewer Comments

tibbettsmg (12/21/21 1:44 pm): Rollback: rollback per email. mt

tibbettsmg (12/23/21 1:58 pm): Enrollment Fall 21 was 5, Fall 19 was 17. mt

Key: 4846

Preview Bridge

Course Change Request

Date Submitted: 01/19/22 3:12 pm

Viewing: **PHYSICS 4333 ~~3311~~ : Nuclear and Particle Physics ~~Modern Physics II~~**

File: 1300.1

Last edit: 01/24/22 3:05 pm

Changes proposed by: vojtat

Requested Effective Change Date	Fall 2022 ~~08/14/2018~~
Department	Physics
Discipline	Physics (PHYSICS)
Course Number	4333 ~~3311~~
Title	Nuclear and Particle Physics ~~Modern Physics II~~
Abbreviated Course Title	Nuclear & Particle Phys ~~Modern Physics II~~

Catalog 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. CAT entry
11. Peoplesoft

Approval Path

1. 01/19/22 3:15 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
2. 01/24/22 3:07 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary

3. 02/11/22 1:33 pm
Katie Shannon (shannonk): Approved for Sciences DSCC Chair

~~A continuation of Physics2311.~~An introduction to nuclear and particle physics. Topics include nuclear models, decays, and reactions, and elementary particles and fundamental forces.

Prerequisites

Physics 2305 ~~Math 3304 or 3329,~~ and Math 3304. ~~either Physics 2305 with consent of instructor or Physics 2311.~~

Field Trip Statement

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

Justification for change:

Renaming and renumbering this course and turning it into an elective is part of the restructuring of the Physics BS degree for fall 2022.

The only other degree program relying on this course is the Appl. Math BS. The Math Department has been informed of the change.

Semesters previously offered as an

experimental
course

Co-Listed
Courses:

Course Reviewer
Comments

tibbettsmg (01/24/22 3:05 pm): deadline for fall has passed, but Physics 3311 has been removed from the Fall 22 schedule and will not be added back until the renumbering to 4333 has been approved so it does not affect student schedules. MT

Key: 1300

Preview Bridge

Course Change Request

New Course Proposal

Date Submitted: 01/20/22 2:38 pm

Viewing: **PHYSICS 4343 : Atomic Physics**

File: 4854

Last edit: 01/24/22 3:09 pm

Changes proposed by: vojtat

Requested Effective Change Date	Fall 2022
Department	Physics
Discipline	Physics (PHYSICS)
Course Number	4343
Title	Atomic Physics
Abbreviated Course Title	Atomic Physics

Catalog 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. CAT entry
11. Peoplesoft

Approval Path

1. 01/19/22 1:44 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
2. 01/19/22 2:03 pm Marita Tibbetts (tibbettsmg): Rollback to Initiator

3. 01/19/22 2:09 pm Thomas Vojta (vojtat): Rollback to Initiator
4. 01/19/22 2:11 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
5. 01/19/22 3:11 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
6. 01/20/22 2:28 pm Marita Tibbetts (tibbettsmg): Rollback to Initiator
7. 01/20/22 2:39 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
8. 01/24/22 3:09 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
9. 02/11/22 1:33 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair

An introduction into the structure and dynamics of atomic and molecular systems and their interaction with light. Topics include basic theories, fine and hyperfine interaction, QED corrections, energy shifts in external fields, electron correlation effects, and spectroscopic methods (e.g., laser spectroscopy, electron spectroscopy, atomic clocks).

Prerequisites

Physics 2305.

Field Trip Statement

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

Justification for new course:

This is one of the new area focus courses for physics majors. Atomic physics is one of three focus areas in the physics department, together with astrophysics and solid state physics. In contrast to the other two focus areas, we do not have a dedicated atomic physics course, yet. In the revised BS program, students will need to take 2 of these area focus courses.

Note that this is a lower-level course than the 5000-level course "Introduction to Atomic, Molecular, and Optical Physics" we tried a few years ago.

Semesters previously offered as an experimental course

Co-Listed
Courses:

Course Reviewer
Comments

tibbettsmg (01/19/22 2:03 pm): Rollback: rollback per request

vojtat (01/19/22 2:09 pm): Rollback: hours

tibbettsmg (01/20/22 2:28 pm): Rollback: rollback to change to permanent course proposal. mt

tibbettsmg (01/24/22 3:09 pm): skipping EC process as required for Physics BS. mt

Key: 4854

Preview Bridge

Program Change Request

Date Submitted: 12/17/21 3:00 pm

Viewing: ARC ENG-BS : Architectural Engineering BS

File: 143.36

Last approved: 03/03/20 1:41 pm

Last edit: 02/11/22 1:25 pm

Changes proposed by: seelyj

Catalog Pages Using this Program
Architectural Engineering

Start Term
Fall 2022 ~~2020~~
Program Code
ARC ENG-BS
Department
Civil, Architectural, and Environmental Engineering
Title
Architectural Engineering BS

Program Requirements and Description

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. Evie Sherlock

Approval Path

1. 01/26/22 9:59 am Joel Burken (burken): Approved for RCIVILEN Chair
2. 01/26/22 10:59 am Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 02/11/22 1:25 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair

History

1. Sep 27, 2013 by Lahne Black (lahne)
2. Sep 27, 2013 by Lahne Black (lahne)
3. Apr 28, 2014 by Lahne Black (lahne)
4. Aug 4, 2014 by pantaleoa
5. Jan 30, 2015 by Stuart Baur (baur)

6. Sep 21, 2015 by Stuart Baur (baur)
7. Sep 15, 2016 by Crystal Wilson (wilsoncry)
8. Feb 27, 2018 by Stuart Baur (baur)
9. Jan 29, 2019 by Stuart Baur (baur)
10. Mar 3, 2020 by Brittany Parnell (ershenb)

~~Architectural Engineering Bachelor of Science Entering freshmen desiring to study Architectural Engineering will be admitted to the Foundational Engineering and ComputingProgram.They will however, be permitted, if they wish, to state an Architectural Engineering preference, which will be used as a consideration for available freshman departmentalscholarships.The focus of the Foundational Engineering and Computing 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 amajor.~~Architectural Engineering ~~For the~~

Bachelor of Science

For the Bachelor of Science degree in Architectural ~~Architectural~~ Engineering, a minimum of ~~of~~ 129 credit hours is required. These requirements are in addition to credit received for algebra, trigonometry, and basic ROTC courses. An average of at least two grade points per credit hour must be attained. An average of at least two grade points per credit hour must also be maintained in all courses taken in Architectural Engineering.

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

1. All students are required to take one American history course, one economics course, one humanities course, and ENGLISH 1120. The history course is to be selected from HISTORY 1200 (preferred), HISTORY 1300, or HISTORY 1310. The economics course may be either ECON 1100 or ECON 1200. ART 3203 is required.
2. Depth requirement.Three credit hours must be taken in humanities or social sciences at the 2000-level or above. This will be satisfied by taking the required HISTORY 2510 and HISTORY 4550. All courses taken to satisfy the depth requirement must be taken after graduating from high school.
3. The Gen Ed course chosen must meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog and may include one communications course in addition to ENGLISH 1120.
4. Special topics and special problems and honors seminars are allowed only by petition to and approval by the student's department chair.

The Architectural 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, and are presented and discussed through classroom and laboratory instruction.

Freshman Year

First Semester	Credits	Second Semester	Credits
CHEM 1100	1	MATH 1215	4
FR ENG 1100[2]	1	General Ed Elective[1]	3
MATH 1214 or 1211	4	MECH ENG 1720	3
ENGLISH 1120	3	PHYSICS 1135	4
General Ed Elective[1]	3		
CHEM 1310 & CHEM 1319	5		
	17		14

Sophomore Year

First Semester	Credits	Second Semester	Credits
CIV ENG 2200[2]	3	GEOLOGY 1110	3
MATH 2222	4	CIV ENG 2210	3
PHYSICS 2135	4	CIV ENG 2211	1
CIV ENG 2401[2]	3	ARCH ENG 2103	3
ARCH ENG 2003	3	ART 3203	3
		MATH 3304	3
		MECH ENG 2350	2
	17		18

Junior Year

First Semester	Credits	Second Semester	Credits
ARCH ENG 3201[2]	3	STAT 3113	3
CIV ENG 3330[2]	3	ARCH ENG 4800	3
MECH ENG 2527	3	CIV ENG 3116	3
ARCH ENG 3804	3	HISTORY 2510	3
ENG MGT 1210	2	ARCH ENG 3220	3
CIV ENG 3715	3		
	17		15

Senior Year

First Semester	Credits	Second Semester	Credits
ARCH ENG 4010	1	ARCH ENG 4097	3
ARCH ENG 3210	3	ARCH ENG Technical Elective[3,4]	3
ARCH ENG 4448	3	CIV ENG 4729	3
ARCH ENG Technical Elective[3,4]	3	General Education Elective[1]	3
HISTORY 4550	3	ARCH ENG Technical Elective[3,4]	3
ARCH ENG 4850	3		
	16		15
Total Credits: 129			

1

All general education electives must be approved by the student's advisor. Students must comply with the general education requirements with respect to selection and depth of study. These requirements are specified in the current catalog.

2 A grade of 'C' or better required to satisfy graduation requirements.

3 A grade of 'C' or better may be required in ARCH ENG technical elective prerequisite courses. Refer to the Missouri S&T undergraduate catalog for this prerequisite information.

4 Choose technical electives from approved lists under Emphasis Areas for Architectural Engineering Students. A maximum of 3 credits of independent study (ARCH ENG 5000 or ARCH ENG 4099) may be used as a technical elective. Additional independent study course may be taken but will not count towards the B.S. Architectural Engineering degree.

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

Emphasis Areas and Course Listings by Area for Architectural Engineering Students

Area I, Structural Engineering

ARCH ENG 5001	Special Topics	6
ARCH ENG 5203	Applied Mechanics In Structural Engineering	3
ARCH ENG 5205	Structural Analysis II	3
ARCH ENG 5260	Analysis And Design Of Wood Structures	3
ARCH ENG 5207	Computer Methods of Structural Analysis	3
ARCH ENG 5210	Advanced Steel Structures Design	3
ARCH ENG 5220	Advanced Concrete Structures Design	3
ARCH ENG 5222	Prestressed Concrete Design	3
ARCH ENG 5729	Foundation Engineering II	3
ARCH ENG 5231	Infrastructure Strengthening with Composites	3
ARCH ENG 5206	Low-Rise Building Analysis And Design	3
ARCH ENG 5208	Structural Dynamics	3

Area II, Construction Engineering and Project Management

ARCH ENG 5442	Construction Planning and Scheduling Strategies	3
ARCH ENG 5445	Construction Methods	3
ARCH ENG 5446	Management Of Construction Costs	3
ARCH ENG 5448	Green Engineering: Analysis of Constructed Facilities	3
ARCH ENG 5449	Engineering and Construction Contract Specifications	3
ENG MGT 5110	Managerial Decision Making	3
ENG MGT 5613	Value Analysis	3
ENG MGT 5711	Total Quality Management	3

Area III, Environmental Systems for Buildings

ARCH ENG 5001	Special Topics	0-6
ARCH ENG 5642	Sustainability, Population, Energy, Water, and Materials	3

ARCH ENG 5665	Indoor Air Pollution	3
ARCH ENG 5820	Building Lighting Systems	3
ARCH ENG 5850	Residential Renewable Energy Systems	3
ENG MGT 5513	Energy and Sustainability Management Engineering	3
ENG MGT 5330	Advanced Human Factors	3
~~IS&T 4780~~	~~Course IS&T 4780 Not Found~~	~~3~~
IS&T 5885	Human-Computer Interaction and User Experience	3

Mechanical Emphasis Courses

MECH ENG 5309	Engineering Acoustics I	3
MECH ENG 5566	Solar Energy Technology	3
MECH ENG 5575	Mechanical Systems For Environmental Control	3

Electrical Emphasis Courses

ELEC ENG 3340	Basic Programmable Logic Controllers	3
ELEC ENG 5150	Photovoltaic Systems Engineering	3
COMP ENG 2210 & COMP ENG 2211	Introduction to Digital Logic and Computer Engineering Laboratory	4

Area IV, Construction Materials

ARCH ENG 5203	Applied Mechanics In Structural Engineering	3
CIV ENG 5113	Composition And Properties Of Concrete	3
CIV ENG 5118	Smart Materials And Sensors	3
CIV ENG 5156	Pavement Design	3
CER ENG 5810	Principles Of Engineering Materials	3

Architectural Engineering Courses

ARCH ENG 2103	Architectural Materials And Methods Of Construction	3
ARCH ENG 3804	Architectural Design II	3
ART 3203	Architectural Design I	3
ARCH ENG 5820	Building Lighting Systems	3

Architectural Engineering Courses (cross–list with existing civil engineering courses)

ARCH ENG 2003	Engineering Communications and Computations	3
ARCH ENG 2001	Special Topics	0-6
ARCH ENG 3000	Special Problems	1-6
ARCH ENG 3001	Special Topics	0-6
ARCH ENG 2002	Cooperative Engineering Training	1
ARCH ENG 4010	Senior Seminar: Engineering In A Global Society	1
ARCH ENG 3201	Structural Analysis I	3
ARCH ENG 3210	Structural Design in Metals	3

ARCH ENG 3220	Reinforced Concrete Design	3
ARCH ENG 4447	Ethical, Legal and Professional Engineering Practice	2
ARCH ENG 4448	Fundamentals Of Contracts And Construction Engineering	3
ARCH ENG 4097	Senior Design Project	3
ARCH ENG 5000	Special Problems	6
ARCH ENG 5001	Special Topics	6
ARCH ENG 5205	Structural Analysis II	3
ARCH ENG 5260	Analysis And Design Of Wood Structures	3
ARCH ENG 5207	Computer Methods of Structural Analysis	3
ARCH ENG 5210	Advanced Steel Structures Design	3
ARCH ENG 5220	Advanced Concrete Structures Design	3
ARCH ENG 5222	Prestressed Concrete Design	3
ARCH ENG 5445	Construction Methods	3
ARCH ENG 5446	Management Of Construction Costs	3
ARCH ENG 5449	Engineering and Construction Contract Specifications	3
ARCH ENG 5231	Infrastructure Strengthening with Composites	3
ARCH ENG 4099	Undergraduate Research	6

Civil Engineering Courses (required courses, emphasis area, and/or technical electives)

CIV ENG 3715	Fundamentals of Geotechnical Engineering	3
CIV ENG 3116	Construction Materials, Properties And Testing	3
CIV ENG 4729	Foundation Engineering	3
CIV ENG 3330	Engineering Fluid Mechanics	3
CIV ENG 5113	Composition And Properties Of Concrete	3
CIV ENG 5117	Asphalt Pavement Design	3
CIV ENG 5729	Foundation Engineering II	3
CIV ENG 5441	Professional Aspects Of Engineering Practice	3
CIV ENG 5445	Construction Methods	3
CIV ENG 5446	Management Of Construction Costs	3
CIV ENG 5449	Engineering and Construction Contract Specifications	3

Justification for request

Supporting Documents

Course Reviewer Comments

tibbettsmg (01/26/22 10:58 am): updated plan of study grid formatting. mt

sraper (02/11/22 1:25 pm): Program approved removal of statement relative to FERC.

Key: 143

Program Change Request

Date Submitted: 02/07/22 10:13 am

Viewing: CH ENG-BS : Chemical Engineering BS

File: 150.88

Last approved: 05/05/21 8:29 am

Last edit: 02/07/22 11:20 am

Changes proposed by: luksc

Catalog Pages Using this Program
Chemical & Biochemical Engineering

Start Term
Fall 2022 ~~2021~~
Program Code
CH ENG-BS
Department
Chemical and Biochemical Engineering
Title
Chemical Engineering BS

Program Requirements and Description

In Workflow

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

Approval Path

1. 07/19/21 3:40 pm Hu Yang (huyang): Approved for RCHEMENG Chair
2. 08/17/21 9:35 am Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 09/08/21 3:28 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair
4. 09/13/21 2:54 pm Marita Tibbetts (tibbettsmg): Approved for Pending CCC Agenda post
5. 09/29/21 11:15 am Marita Tibbetts (tibbettsmg): Rollback to Initiator
6. 02/07/22 10:31 am Hu Yang (huyang): Approved for RCHEMENG Chair

7. 02/07/22 11:20 am Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
8. 02/11/22 1:26 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair

History

1. Mar 18, 2014 by Lahne Black (lahne)
2. May 2, 2014 by Lahne Black (lahne)
3. Jan 30, 2015 by kleb6b
4. Jul 15, 2015 by pantaleoa
5. Jul 15, 2015 by pantaleoa
6. Nov 18, 2015 by marlene
7. Mar 7, 2016 by Daniel Forciniti (forcinit)
8. Mar 27, 2017 by Daniel Forciniti (forcinit)
9. May 3, 2018 by Daniel Forciniti (forcinit)
10. May 7, 2018 by Brittany Parnell (ershenb)
11. May 7, 2018 by Brittany Parnell (ershenb)
12. May 7, 2018 by Brittany Parnell (ershenb)
13. Jul 3, 2018 by Brittany Parnell (ershenb)
14. Nov 2, 2018 by Jee C. Wang (jcwang)
15. Jan 29, 2019 by Jee C. Wang (jcwang)
16. Jan 30, 2019 by Brittany Parnell (ershenb)

17. Jan 30, 2019 by Brittany Parnell (ershenb)
18. Mar 3, 2020 by Brittany Parnell (ershenb)
19. May 5, 2021 by Christi Luks (luksc)

Bachelor of Science
Chemical Engineering

The chemical engineering program at Missouri S&T is characterized by its focus on the scientific basics of ~~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.

~~instruction.~~

~~Bachelor of Science Chemical Engineering Entering freshmen desiring to study chemical engineering will be admitted to the Foundational Engineering and ComputingProgram.They will be permitted, if they wish, to state a chemical engineering preference, which will be used as a consideration for available freshman departmentalscholarships.The focus of the Foundational Engineering and Computing 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 amajor.~~For the bachelor of science degree in chemical engineering a minimum of 128 credit hours is required. These requirements are in addition to credit received for algebra, trigonometry and basic ROTC courses. An average of at least two grade points per credit hour must be attained. At least two grade points per credit hour must also be attained in all courses taken in chemical engineering.

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

1. All students are required to take one American history course, one economics course, one humanities course, and ENGLISH 1120. The history course is to be selected from HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200. The economics course may be either ECON 1100 or ECON 1200. The humanities course must be selected and meets the requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog.
2. Depth requirement. Three credit hours must be taken in humanities or social sciences at the 1000 level or above and must be selected from the approved list. This course must have as a prerequisite one of the humanities or social sciences courses already taken. Foreign language courses numbered 1180 will be considered to satisfy this requirement. Students may receive humanities credit for foreign language courses in their native tongue only if the course is at the 3000 level or above. All courses taken to satisfy the depth requirement must be taken after graduating from high school.
3. The remaining two courses are to be chosen and meets the requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog and may include one communications course in addition to ENGLISH 1120.
4. Any specific departmental requirements in the general studies area must be satisfied and meets the 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 chairman.

Freshman Year

First Semester	Credits	Second Semester	Credits
FR ENG 1100	1	MECH ENG 1720	3
CHEM 1310	4	CHEM 1320	3
CHEM 1319	1	COMP SCI 1500	3
ENGLISH 1120	3	OR	
HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3	COMP SCI 1972 & COMP SCI 1982	
MATH 1214 or 1211[7]	4	MATH 1215[7]	4
CHEM 1100	1	PHYSICS 1135	4
	17		17

Sophomore Year

First Semester	Credits	Second Semester	Credits
CHEM ENG 2100[1]	4	CHEM ENG 2110[1]	3
~~CHEM ENG 2300~~	~~1~~	~~CHEM ENG 2310[2]~~	~~1~~
CHEM 2210	3	Science Elective[5]	4
MATH 2222	4	MATH 3304	3
PHYSICS 2135	4	STAT 3113	3
		Humanities and Social Sciences Elective[4]	3
	15		16

Junior Year

First Semester	Credits	Second Semester	Credits
CHEM ENG 3101	4	CHEM ENG 3131	3
CHEM ENG 3111	3	CHEM ENG 3141	3
CHEM ENG 3120[1]	3	CHEM ENG 3150	3
ECON 1100 or 1200	3	SP&M S 1185	3
Upper level Humanities or Social Science Elective[4]	3	ENGLISH 3560	3
	16		15

Senior Year[3]

First Semester	Credits	Second Semester	Credits
CHEM ENG 4091	3	CHEM ENG 4097[2]	3
CHEM ENG 4101[2]	3	CHEM ENG 4130[2]	3
CHEM ENG 4110	3	CHEM ENG 4311	1
CHEM ENG 4241	3	CHEM ENG 5XXX-Chem Eng Elective[6]	3
CHEM ENG 5XXX-Chem Eng Elective[6]	3	Chem Eng 5xxx --Chem Eng Elective[6]	3
CHEM ENG 4301	1	Chem Eng 5xxx --Chem Eng Elective[6]	3
	16		16
Total Credits: 128			

~~**The chemical engineering program at Missouri S&T is characterized by its focus on the scientific basics of engineering and its innovative application; indeed, the underlying theme of this educational program is the application of the scientific basics to**~~

~~engineering practice through attention to problems and needs of thepublic.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 laboratoryinstruction.~~**Note:** The minimum number of hours required for a degree in chemical engineering is 128.

A cumulative grade point average of 2.50 or better and a "C" or better in CHEM 1310, CHEM 1319, CHEM 1320, MATH 1214, MATH 1215 and PHYSICS 1135 are required to be admitted into the chemical engineering major. MATH 1208 or MATH 1210 and MATH 1211 may be substituted for MATH 1214. MATH 1221 may be substituted for MATH 1215.

1 A grade of "C" or better is required in CHEM ENG 2100 & CHEM ENG 2110 in order to enroll in Chem Eng 3120 .

2 Communications emphasized course (See bachelor of science degree, general education communications requirement).

3 Chemical engineering majors are encouraged to take the fundamentals of engineering exam prior to graduation. It is the first step toward becoming a registered professional engineer.

4 Must meet the requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog. The prerequisites for the upper level course must be completed with a passing grade.

5 CHEM 2510, or CHEM 4610 and CHEM 4619, or BIO SCI 2213 and BIO SCI 2219, or CHEM 2220 and CHEM 2219, or Bio Sci 3313 and Bio Sci 3319, or CHEM 3420 and CHEM 3459.

6 A minimum of 12 cr. hr. from any Chem Eng 5xxx or Chem Eng 4540 and any class from the approved list published on the Chemical Engineering web site but only 3 cr. hr. of CHEM ENG 4000, CHEM ENG 4099 or Chem Eng 4099H. Students may have no more than three hours from approved out-of-department electives.

7 MATH 1208 or MATH 1210 and MATH 1211 may be substituted for MATH 1214. MATH 1221 may be substituted for MATH 1215.

Chemical Engineering
Biochemical Engineering Emphasis

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
FR ENG 1100	1	MECH ENG 1720	3
CHEM 1310	4	COMP SCI 1500	3
CHEM 1319	1	OR	
ENGLISH 1120	3	COMP SCI 1972 & COMP SCI 1982	
HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3	CHEM 1320	3
MATH 1214 or 1211[6]	4	MATH 1215[6]	4
CHEM 1100	1	PHYSICS 1135	4
	17		17
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
CHEM ENG 2100[1]	4	CHEM ENG 2110[1]	3
~~CHEM ENG 2300~~	~~1~~	~~CHEM ENG 2310[2]~~	~~1~~
CHEM 2210	3	STAT 3113	3
MATH 2222	4	Science Elective[5]	4

PHYSICS 2135	4	MATH 3304	3
		ECON 1100 or 1200	3
	15		16

Junior Year

First Semester	Credits	Second Semester	Credits
CHEM ENG 3101	4	CHEM ENG 3131	3
CHEM ENG 3111	3	CHEM ENG 3141	3
CHEM ENG 3120[1]	3	CHEM ENG 3150	3
SP&M S 1185	3	Science Elective[5]	4
Science Elective[5]	4	ENGLISH 3560	3
	17		16

Senior Year[3]

First Semester	Credits	Second Semester	Credits
CHEM ENG 4091	3	CHEM ENG 4097[2]	3
CHEM ENG 4110	3	CHEM ENG 4210	3
CHEM ENG 5250	3	CHEM ENG 4220	3
CHEM ENG 4201	3	CHEM ENG 4241	3
Upper Level Humanities or Social Sciences Elective[4]	3	Humanities or Social Science Elective[4]	3
CHEM ENG 4301	1	CHEM ENG 4311	1
	16		16
Total Credits: 130			

Note: The minimum number of hours required for a degree in chemical engineering with an emphasis in biochemical engineering is 130.

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

1 A grade of "C" or better is required in CHEM ENG 2100 & CHEM ENG 2110 in order to enroll in CHEM ENG 3120.

2 Communications emphasized course (See bachelor of science degree, general education communications requirement).

3 Chemical engineering majors are encouraged to take the fundamentals of engineering exam prior to graduation. It is the first step toward becoming a registered professional engineer.

4 Must meet the requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog. The prerequisites for the upper level course must be completed with a passing grade.

5 A minimum of 12 credit hours in Science Electives are required. Select three courses from CHEM 2220 CHEM 4610, CHEM 4620, BIO SCI 2213, BIO SCI 3313, and BIO SCI 4323; and a minimum of two laboratory courses from CHEM 2229 or CHEM 2219 CHEM 4619, BIO SCI 2219, BIO SCI 3319, and BIO SCI 4329.

6 MATH 1208 or MATH 1210 and MATH 1211 may be substituted for MATH 1214. MATH 1221 may be substituted for MATH 1215.

Justification for request

1. To incorporate changes in math curriculum. Also corrects that we did not delete old footnotes from a change to the CompSci course offerings.

2. Renumbered ChemEng 2300 and 2310 to 4301 and 4311 was approved recently and is in effect beginning Sp22. This now moves those courses to the appropriate semesters.

3. Added back in the ChemEng elective that had accidentally been deleted!

4. Modification to reflect change to direct admission to CEC programs
Supporting Documents
Course Reviewer Comments
tibbettsmg (08/17/21 9:35 am): updated term to FS22 and plan of study to "Math 1214 or Math 1211"
tibbettsmg (09/01/21 9:11 am): Updated formatting and changed 2300 to 4301 and 2310 to 4311 in plan of study grid. mt
tibbettsmg (09/29/21 11:15 am): Rollback: rollback due to hrs discrepancy per SR email. mt
tibbettsmg (02/07/22 11:20 am): updated formatting. ChE 4301 and 4311 are approved courses. MT

Key: 150

Program Change Request

Date Submitted: 01/26/22 1:58 pm

Viewing: CR ENG-BS : Ceramic Engineering BS

File: 149.28

Last approved: 03/03/20 1:41 pm

Last edit: 01/26/22 1:58 pm

Changes proposed by: smiller

Catalog Pages Using this Program
Ceramic Engineering

Start Term
Fall 2022 ~~2020~~
Program Code
CR ENG-BS
Department
Materials Science & Engineering
Title
Ceramic Engineering BS

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. Evie Sherlock

Approval Path

1. 10/15/21 1:28 pm moatsm: Approved for RMATSENG Chair
2. 10/15/21 1:31 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 10/15/21 2:21 pm Marita Tibbetts (tibbettsmg): Rollback to Initiator
4. 01/26/22 2:11 pm moatsm: Approved for RMATSENG Chair
5. 01/26/22 2:15 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
6. 02/11/22 1:20 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair

History

1. Oct 10, 2013 by Lahne Black (lahne)
2. Apr 22, 2014 by Lahne Black (lahne)
3. Aug 6, 2014 by F. Scott Miller (smiller)
4. Jun 19, 2015 by F. Scott Miller (smiller)
5. Jul 15, 2015 by pantaleoa
6. Jun 28, 2017 by F. Scott Miller (smiller)
7. Mar 3, 2020 by Brittany Parnell (ershenb)

~~Bachelor of Science Ceramic Engineering Entering freshmen desiring to study ceramic engineering will be admitted to the Foundational Engineering and ComputingProgram.They will be permitted to state a ceramic engineering preference, which will be used as a consideration for available freshman departmentalscholarships.The focus of the Foundational Engineering and Computing 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 amajor.~~Bachelor ~~For the bachelor~~ of Science Ceramic Engineering

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

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

1. All students are required to take one history course and one economics course. The history course is to be selected from HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200. The economics course may be either ECON 1100 or ECON 1200.
2. Of the remaining hours, 12 credit hours must be taken in humanities or social sciences from the approved list of humanities and social science (HSS) courses posted on the undergraduate studies website (http://ugs.mst.edu/). Students may receive humanities credit for foreign language courses in their native tongue only if the course is at the 4000-level.
3. Special topics, special problems courses and honors seminars are allowed only by petition to and approval by the student's department chair.

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
FR ENG 1100	1	MATH 1215 or 1221	4
CHEM 1310	4	CHEM 1320	3

CHEM 1319	1	PHYSICS 1135	4
MATH 1214 or 1211	4	H/SS Elective	3
ENGLISH 1120	3	MECH ENG 1720	3
H/SS Elective	3		
	16		17

Sophomore Year

First Semester	Credits	Second Semester	Credits
CER ENG 2110	3	CER ENG 2120	3
~~CER ENG 2210~~	~~2~~	CER ENG 2210	2
CER ENG 2315	2	CER ENG 2325	2
CER ENG 3230	3	~~CER ENG 3230~~	~~3~~
MATH 2222	4	MATH 3304[1]	3
PHYSICS 2135	4	H/SS Elective	3
		CIV ENG 2200	3
	16		16

Junior Year

First Semester	Credits	Second Semester	Credits
CER ENG 3315	2	CER ENG 3325	2
CER ENG 3220	3	CER ENG 3410	3
CIV ENG 2210	3	PHYSICS 2305	3
CER ENG 3210	3	H/SS Elective	3
H/SS Elective	3	Advanced Chemistry Elective[3]	3
Technical Elective[2]	2	CER ENG 4410	3
	16		17

Senior Year

First Semester	Credits	Second Semester	Credits
CER ENG 4096	3	CER ENG 4097	3
CER ENG 4310	3	CER ENG 4220	3
CER ENG 4250	3	CER ENG 4240	3
Technical Elective[2]	3	Statistics Elective[1]	3
H/SS Elective	3	Technical Elective[2]	3
	15		15
Total Credits: 128			

~~Note1:Students may substitute MATH 1208 and MATH 1221 for MATH 1214 and MATH 1215,respectively.~~

1 All ceramic engineering students must take MATH 3304 and one statistics course (3000-level or higher).

2 Technical electives must be selected from upper level engineering and science courses with the advisor's approval.

3

All ceramic engineering students must select an advanced chemistry elective with the advisor's approval. The courses that can be considered are CHEM 2210, CHEM 2310, CHEM 3410, CHEM 4310, CHEM 4810, or CHEM 3420.

Specific Degree Requirements

1. Total number of hours required for a degree in ceramic engineering is 128.
2. The assumption is made that a student admitted in the department has completed 34 hours credit towards graduation. The academic program of students transferring from colleges outside Missouri S&T will be decided on a case-by-case basis.

Justification for request

Math changes and rearranging order of courses for a smoother transition towards graduation.

Supporting Documents

Course Reviewer Comments

tibbettsmg (10/15/21 2:21 pm): Rollback: rollback for additional changes after discussion with DSCC Chair. mt

Key: 149

Program Change Request

Date Submitted: 11/03/21 9:47 am

Viewing: EDUC-BS : Education BS

File: 344.23

Last approved: 08/03/21 9:51 am

Last edit: 01/26/22 11:12 am

Changes proposed by: bakm75

Catalog Pages Using this Program
Education

Start Term
Fall 2022 ~~2021~~
Program Code
EDUC-BS
Department
Teacher Education and Certification
Title
Education BS

Program Requirements and Description

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. 01/26/22 9:43 am Beth Kania-Gosche (bkaniagosche): Approved for REDUCATION Chair
2. 01/26/22 11:12 am Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 01/26/22 11:16 am Cecil Eng Huang Chua (cchua): Approved for Social Sciences DSCC Chair

History

1. Jun 10, 2021 by Beth Kania-Gosche (bkaniagosche)
2. Aug 3, 2021 by Crystal Wilson (wilsoncry)

Bachelor of Science in Education

Overview

The Department of Teacher Education and Certification offers a degree in education with options for emphases in early childhood (birth-grade 3), elementary (grades 1-6), middle school language arts, middle school mathematics, middle school science, or middle school social science.

All students take the core education curriculum; these courses include multiple field experience courses which requires them to observe and teach lessons in schools. The final semester of the program is student teaching when students are immersed full time in a school setting for 16 weeks.

The Missouri Department of Elementary and Secondary Education approves the curricula of these programs. Any substitutions must be approved by the Department of Teacher Education and Certification. Students must also pass the Missouri Content Assessment and meet the GPA requirements to be eligible for student teaching and certification.

Program Learning Outcomes

The program learning outcomes are the Missouri Teacher Standards. These are the same standards principals use to evaluate practicing teachers in Missouri. These outcomes are assessed throughout the program and in the student teaching experience; students must demonstrate evidence of satisfactory progress on each outcome.

Missouri S&T education program graduates will . . .

1. Create learning experiences that make the central concepts, structures, and tools of inquiry of the discipline(s)of subject matter meaningful and engaging for all students.

2. Provide learning opportunities that are adapted to diverse learners and support the intellectual, social, and personal development of all students.

3. Develop, implement, and evaluate curriculum based upon student, district and state standards

4. Use a variety of instructional strategies and resources to encourage students' critical thinking, problem solving, and performance skills

5. Create a learning environment that encourages active engagement in learning, positive social interaction, and self-motivation.

6. Model effective verbal, nonverbal, and media communication techniques with students, colleagues and families to foster active inquiry, collaboration, and supportive interaction in the classroom.

7. Monitor the performance of each student through formative and summative assessment strategies, and devises instruction to enable students to grow and develop, making adequate academic progress.

8. Continually assess the effects of choices and actions on others and seek out opportunities to grow professionally.

9. Have effective working relationships with students, parents, school colleagues, and community members

Core Curriculum

EDUC 1104	Teacher Field Experience I	1
EDUC 1164	Teacher Field Experience II	2
EDUC 1174	School Organization and Administration For Teachers	2
EDUC 2102	Educational Psychology	3
or PSYCH 2300	Educational Psychology	
EDUC 2310	Education Of The Exceptional Child	3
or PSYCH 4310	Psychology Of The Exceptional Child	
EDUC 3216	Instructional Literacy in the Content Area	3
EDUC 3340	Assessment of Student Learning	3
PSYCH 3310	Developmental Psychology	3
EDUC 4298	Student Teaching Seminar	1
EDUC 4299	Student Teaching	12
Total Credits		35

Emphasis Area: Early Childhood

An early childhood certificate allows students to teach children from birth through third grade in the state of Missouri.

EDUC 1055	Introduction to Early Childhood Education	3
EDUC 1221	Health, Nutrition, and Safety in Early Childhood Education	3
EDUC 1820	Early Childhood Program Management	3
EDUC 2401	School, Family, and Community Partnerships	3
EDUC 2440	Observation and Assessment of Young Children	3
EDUC 3203	Introduction to STEM Education	3
EDUC 3215	Teaching Reading in Elementary and Early Childhood Settings	3
EDUC 3217	Analysis and Correction of Reading Difficulties	3
EDUC 3218	Language Arts for Elementary and Early Childhood Teachers	3
EDUC 3220	Teaching Science in the Elementary and Early Childhood Classroom	3
EDUC 3221	Methods of Teaching Math	3
EDUC 3430	Diverse Literature for Children	3
EDUC 3530	Teaching Integrated Social Studies and Humanities	3
EDUC 3211	Child Development	3
Total Credits		42

~~Elementary An elementary certificate allows students to teach grades 1-6 in the state ofMissouri.~~ Students must take the following general education courses. Substitutions must be approved by the department chair.

ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
PHILOS 1105	Self and World: Introduction To Philosophy	3
PSYCH 1101	General Psychology	3

MATH 1120	College Algebra	5
or MATH 1140	College Algebra	
POL SCI 1200	American Government	3
HISTORY 2110	World Regional Geography	3
HISTORY 1300	American History To 1877	3
or HISTORY 1310	American History Since 1877	
BIO SCI 1113	General Biology	3
BIO SCI 1219	General Biology Lab	1
PHYSICS 1145	College Physics I	3-4
or PHYSICS 1505	Introductory Astronomy	
GEOLOGY 1110	Physical And Environmental Geology	3
or GEOLOGY 1120	Evolution Of The Earth	
CHEM 1100	Introduction To Laboratory Safety & Hazardous Materials	1
Total Credits		40-41

Students must also take a literature course.

Emphasis Area: Elementary

An elementary certificate allows students to teach grades 1-6 in the state of Missouri.

EDUC 3215	Teaching Reading in Elementary and Early Childhood Settings	3
EDUC 3217	Analysis and Correction of Reading Difficulties	3
EDUC 3218	Language Arts for Elementary and Early Childhood Teachers	3
EDUC 3220	Teaching Science in the Elementary and Early Childhood Classroom	3
EDUC 3221	Methods of Teaching Math	3
EDUC 3222	Geometric Concepts for Elementary Teachers	3
EDUC 3203	Introduction to STEM Education	3
EDUC 3430	Diverse Literature for Children	3
EDUC 3530	Teaching Integrated Social Studies and Humanities	3
Total Credits		27

Students must take the following general education courses. Substitutions must be approved by the department chair.

ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
ART 1180	Art Appreciation	3
or MUSIC 1150	Music Understanding And Appreciation	
or THEATRE 1190	Theatre via Video	
HISTORY 1300	American History To 1877	3
or HISTORY 1310	American History Since 1877	
PHILOS 1105	Self and World: Introduction To Philosophy	3

PSYCH 1101	General Psychology	3
ECON 1100	Principles Of Microeconomics	3
or ECON 1200	Principles Of Macroeconomics	
HISTORY 2110	World Regional Geography	3
POL SCI 1200	American Government	3
HISTORY 1100	Early Western Civilization	3
HISTORY 1200	Modern Western Civilization	3
MATH 1103	Fundamentals Of Algebra	3
or MATH 1120	College Algebra	
PHYSICS 1505	Introductory Astronomy	3
or PHYSICS 1145	College Physics I	
BIO SCI 1223	Biodiversity	3
BIO SCI 1229	Biodiversity Lab	1
MATH 1140	College Algebra	3
or MATH 1160	Trigonometry	
GEOLOGY 1110	Physical And Environmental Geology	3
or CHEM 1310 & CHEM 1319	General Chemistry I and General Chemistry Laboratory	
Total Credits		52

Emphasis Area: Middle School Language Arts

An middle school certificate allows graduates to teach grades 5-9 in the designated subject area.

EDUC 3215	Teaching Reading in Elementary and Early Childhood Settings	3
EDUC 3280	Instructional Strategies in the Content Area	3
EDUC 3335	Curriculum And Instruction Of The Middle School	3
ENGLISH 3170	Teaching And Supervising Reading and Writing	3
ENGLISH 2171	Fiction Writing	3
or ENGLISH 2172	Creative Nonfiction Writing	
ENGLISH 3302	History And Structure Of The English Language	3
ENGLISH 3303	The Grammatical Structure of English	3
or ENGLISH 3301	A Linguistic Study Of Modern English	
ENGLISH 1170	Creative Writing	3
EDUC 3298	Teacher Field Experience III	1
Total Credits		25

Students must also take four literature electives, of which three must be 2000 or 3000 level. Students in this program are eligible for both a literature minor and a creative writing minor.

Students must take the following general education courses.

ENGLISH 1120	Exposition And Argumentation	3

ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
ART 1180	Art Appreciation	3
or MUSIC 1150	Music Understanding And Appreciation	
or THEATRE 1190	Theatre via Video	
ENGLISH 1221	American Literature: 1600 To 1865	3
or ENGLISH 1222	American Literature: 1865 To Present	
PHILOS 1105	Self and World: Introduction To Philosophy	3
or PHILOS 1115	Logic and Reasoning: An Introduction	
HISTORY 1100	Early Western Civilization	3
or HISTORY 1200	Modern Western Civilization	
or HISTORY 1300	American History To 1877	
or HISTORY 1310	American History Since 1877	
POL SCI 1200	American Government	3
ECON 1200	Principles Of Macroeconomics	3
or ECON 1100	Principles Of Microeconomics	
MATH 1103	Fundamentals Of Algebra	3
BIO SCI 1113	General Biology	3
BIO SCI 1219	General Biology Lab	1
GEOLOGY 1110	Physical And Environmental Geology	3
or GEOLOGY 1120	Evolution Of The Earth	
or PHYSICS 1505	Introductory Astronomy	
or PHYSICS 1605	Environmental Physics I	
or CHEM 1310	General Chemistry I	
IS&T 1551	Implementing Information Systems: User Perspective	3
or COMP SCI 1500	Computational Problem Solving	
Total Credits		40

Students must also take an additional humanity elective and three free elective hours.

Emphasis Area: ~~EmphasisArea:~~Middle School Mathematics

An middle school certificate allows graduates to teach grades 5-9 in the designated subject area.

ENGLISH 3170	Teaching And Supervising Reading and Writing	3
EDUC 3280	Instructional Strategies in the Content Area	3
EDUC 3335	Curriculum And Instruction Of The Middle School	3
EDUC 3298	Teacher Field Experience III	1
EDUC 3203	Introduction to STEM Education	3
EDUC 3222	Geometric Concepts for Elementary Teachers	3
MATH 1103	Fundamentals Of Algebra	3

MATH 1120	College Algebra	5
or MATH 1140	College Algebra	
MATH 1160	Trigonometry	2
MATH 1208	Calculus With Analytic Geometry I	5
or MATH 1214	Calculus I	
or MATH 1210	Calculus I-A	
MATH 1215	Calculus II	4
or MATH 1221	Calculus With Analytic Geometry II	
or MATH 1211	Calculus I-B	
or MATH 1212	Survey of Calculus	
COMP SCI 1500	Computational Problem Solving	3
or IS&T 1551	Implementing Information Systems: User Perspective	
STAT 1115	Statistics For The Social Sciences I	3
or STAT 3113	Applied Engineering Statistics	
or STAT 3115	Engineering Statistics	
Total Credits		41

Students must take the following general education courses.

ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
ART 1180	Art Appreciation	3
or MUSIC 1150	Music Understanding And Appreciation	
or THEATRE 1190	Theatre via Video	
ENGLISH 1221	American Literature: 1600 To 1865	3
or ENGLISH 1222	American Literature: 1865 To Present	
PHILOS 1105	Self and World: Introduction To Philosophy	3
or PHILOS 1115	Logic and Reasoning: An Introduction	
HISTORY 1100	Early Western Civilization	3
or HISTORY 1200	Modern Western Civilization	
or HISTORY 1300	American History To 1877	
or HISTORY 1310	American History Since 1877	
POL SCI 1200	American Government	3
ECON 1200	Principles Of Macroeconomics	3
or ECON 1100	Principles Of Microeconomics	
BIO SCI 1219	General Biology Lab	1
BIO SCI 1113	General Biology	3
GEOLOGY 1110	Physical And Environmental Geology	3
or GEOLOGY 1120	Evolution Of The Earth	

PHYSICS 1505	Introductory Astronomy	3
or PHYSICS 1145	College Physics I	
or CHEM 1310	General Chemistry I	
Total Credits		37

Emphasis Area: ~~EmphasisArea:~~Middle School Science

An middle school certificate allows graduates to teach grades 5-9 in the designated subject area.

ENGLISH 3170	Teaching And Supervising Reading and Writing	3
EDUC 3280	Instructional Strategies in the Content Area	3
EDUC 3335	Curriculum And Instruction Of The Middle School	3
EDUC 3203	Introduction to STEM Education	3
EDUC 3220	Teaching Science in the Elementary and Early Childhood Classroom	3
EDUC 3298	Teacher Field Experience III	1
BIO SCI 1113	General Biology	3
or BIO SCI 1213	Principles of Biology	
BIO SCI 1219	General Biology Lab	1
BIO SCI 1173	Introduction to Environmental Sciences	3
PHYSICS 1505	Introductory Astronomy	3
or PHYSICS 1145	College Physics I	
GEOLOGY 1110	Physical And Environmental Geology	3
GEOLOGY 1120	Evolution Of The Earth	3
HISTORY 3530	History of Science	3
or PHILOS 4345	Philosophy Of Science	
CHEM 1310	General Chemistry I	4
CHEM 1319	General Chemistry Laboratory	1
BIO SCI 2223	General Genetics	3
Total Credits		43

Students must also take the following general education courses.

ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
ART 1180	Art Appreciation	3
or MUSIC 1150	Music Understanding And Appreciation	
or THEATRE 1190	Theatre via Video	
ENGLISH 1221	American Literature: 1600 To 1865	3
or ENGLISH 1222	American Literature: 1865 To Present	
PHILOS 1105	Self and World: Introduction To Philosophy	3
or PHILOS 1115	Logic and Reasoning: An Introduction	

HISTORY 1100	Early Western Civilization	3
or HISTORY 1200	Modern Western Civilization	
or HISTORY 1300	American History To 1877	
or HISTORY 1310	American History Since 1877	
POL SCI 1200	American Government	3
ECON 1200	Principles Of Macroeconomics	3
or ECON 1100	Principles Of Microeconomics	
MATH 1103	Fundamentals Of Algebra	3
or MATH 1120	College Algebra	
or MATH 1140	College Algebra	
STAT 1115	Statistics For The Social Sciences I	3
or STAT 3113	Applied Engineering Statistics	
or STAT 3115	Engineering Statistics	
Total Credits		33

Students will also take three hours of humanities elective and three hours of free electives.

Emphasis Area: ~~EmphasisArea:~~Middle School Social Science

An middle school certificate allows graduates to teach grades 5-9 in the designated subject area.

ENGLISH 3170	Teaching And Supervising Reading and Writing	3
EDUC 3280	Instructional Strategies in the Content Area	3
EDUC 3335	Curriculum And Instruction Of The Middle School	3
EDUC 3530	Teaching Integrated Social Studies and Humanities	3
EDUC 3350	Social Studies In The Elementary School	3
EDUC 3298	Teacher Field Experience III	1
HISTORY 1100	Early Western Civilization	3
or HISTORY 1200	Modern Western Civilization	
HISTORY 1300	American History To 1877	3
or HISTORY 1310	American History Since 1877	
PSYCH 4600	Social Psychology	3
Total Credits		25

Students will also take a DESE-approved American history elective, two DESE-approved world history electives, and one history elective. Students in this program may be eligible for both a history minor and a psychology minor.

ENGLISH 1120	Exposition And Argumentation	3
ENGLISH 1160	Writing And Research	3
SP&M S 1185	Principles Of Speech	3
ART 1180	Art Appreciation	3
or MUSIC 1150	Music Understanding And Appreciation	
or THEATRE 1190	Theatre via Video	

ENGLISH 1221	American Literature: 1600 To 1865	3
or ENGLISH 1222	American Literature: 1865 To Present	
PHILOS 1105	Self and World: Introduction To Philosophy	3
or PHILOS 1115	Logic and Reasoning: An Introduction	
HISTORY 1100	Early Western Civilization	3
or HISTORY 1200	Modern Western Civilization	
or HISTORY 1300	American History To 1877	
or HISTORY 1310	American History Since 1877	
POL SCI 1200	American Government	3
ECON 1200	Principles Of Macroeconomics	3
or ECON 1100	Principles Of Microeconomics	
MATH 1103	Fundamentals Of Algebra	3
or MATH 1120	College Algebra	
or MATH 1140	College Algebra	
BIO SCI 1113	General Biology	3
BIO SCI 1219	General Biology Lab	1
GEOLOGY 1110	Physical And Environmental Geology	3
or GEOLOGY 1120	Evolution Of The Earth	
or PHYSICS 1505	Introductory Astronomy	
or PHYSICS 1605	Environmental Physics I	
or CHEM 1310	General Chemistry I	
IS&T 1551	Implementing Information Systems: User Perspective	3
or COMP SCI 1500	Computational Problem Solving	
Total Credits		40

Students will also take three hours of humanities elective and three hours of free electives.

Justification for request

There is a shortage of qualified early childhood teachers in the state and particularly in this region. The S&T Child Development Center offers an opportunity to train teachers in a high quality, licensed child care environment. There is some overlap between early childhood (birth-grade 3) and elementary (grades 1-6) certification requirements, so we are able to offer this emphasis efficiently. This emphasis area was designed to articulate with area community colleges that offer early childhood programs.

Supporting Documents

MST PC October 2021.pdf

Course Reviewer Comments

tibbettsmg (01/26/22 11:12 am): updated effective term to FS22. mt

Key: 344

Program Change Request

Date Submitted: 01/26/22 3:50 pm

Viewing: ENG MG-BS : Engineering Management BS

File: 44.34

Last approved: 03/03/20 1:41 pm

Last edit: 02/11/22 1:23 pm

Changes proposed by: sraper

Catalog Pages Using this Program
Engineering Management

Start Term
Fall 2022 ~~2020~~
Program Code
ENG MG-BS
Department
Engineering Management and Systems Engineering
Title
Engineering Management BS

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. kristyg

Approval Path

1. 01/26/22 3:51 pm Suzanna Long (longsuz): Approved for RENGMNGT Chair
2. 01/27/22 1:23 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 02/11/22 1:23 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair

History

1. Sep 24, 2013 by Lahne Black (lahne)
2. Apr 28, 2014 by Stephen Raper (sraper)
3. Jun 12, 2014 by pantaleoa
4. Nov 18, 2014 by kleb6b

5. Jan 30, 2015 by Stephen Raper (sraper)
6. Jul 20, 2015 by pantaleoa
7. Jun 27, 2016 by Stephen Raper (sraper)
8. Jun 18, 2018 by Stephen Raper (sraper)
9. Mar 3, 2020 by Brittany Parnell (ershenb)

Bachelor of Science
Engineering Management

The engineering management program at Missouri S&T is characterized by its focus on the scientific basics of ~~of~~ engineering and its innovative application; indeed, the underlying theme of ~~of~~ this educational program is the application of the ~~of the~~ scientific basics to engineering practice through attention to problems and needs of the ~~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.

~~Bachelor of Science Engineering Management Entering freshmen intending to study engineering management are admitted to the Foundational Engineering and ComputingProgram.They may, however, state an engineering management preference, which will be used as a consideration for available freshman departmentalscholarships.The focus of the Foundational Engineering and Computing 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 amajor.~~The bachelor of science degree in engineering management requires a minimum of 128 credit hours. These requirements are in addition to credit received for algebra, trigonometry, and basic ROTC courses. An average of at least two grade points per credit hour must be attained. At least two grade points per credit hour must also be attained in all courses taken in engineering management.

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

1. All students are required to take one American history course, one economics course, and ENGLISH 1120. The history course is to be selected from HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200. The economics course may be either ECON 1100 or ECON 1200. All students must choose one additional humanities or social science course that meets requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog.
2. Depth requirement. Three credit hours must be taken in humanities or social sciences at the 2000-level or above and meets 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 or above. All courses taken to satisfy the depth requirement must be taken after graduating from high school.
3. The remaining two courses are to be chosen and meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog and may include one communications course in addition to ENGLISH 1120.
4. Any specific departmental requirements in the general studies area must be satisfied.

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

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
FR ENG 1100	1	MECH ENG 1720	3
CHEM 1310[1]	4	MATH 1215[1]	4
CHEM 1319	1	PHYSICS 1135[1]	4
CHEM 1100	1	ECON 1100 or 1200	3
MATH 1214 or 1211[1]	4	COMP SCI 1972, or 1570, or 1971[1, 6]	2
ENGLISH 1120	3	COMP SCI 1982 or 1981[6]	1
HISTORY 1200, or 1300, or 1310, or POL SCI 1200	3		
	17		17
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MATH 2222[1]	4	MATH 3304[1]	3
PHYSICS 2135[1]	4	STAT 3115 or 3117[1]	3
CIV ENG 2200[1]	3	ENG MGT 2110[1]	3
ENG MGT 1210[1]	2	ENG MGT 2211[1]	3
ENG MGT 2310[1]	3	MECH ENG 2350	2
		PSYCH 1101	3
	16		17
Junior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENG MGT 3310[1]	3	ENG MGT 4710[1]	3
CIV ENG 2210	3	MECH ENG 2527	3
CIV ENG 2211	1	ELEC ENG 2800	3
ENG MGT 3510[1]	3	ENGLISH 3560 or 1160	3
SP&M S 1185	3	ENG MGT 3320[1]	3
Humanities and Social Sciences[2]	3		
	16		15
Senior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
Emphasis Area Required Course	3	ENG MGT Technical Elective	3
Emphasis Area Required Course	3	ENG MGT Technical Elective	3
Emphasis Area Required Course	3	ENG MGT 4907[1]	3
ENG MGT 4110[1]	3	Upper Level Hum/SS[2]	3
ENG MGT Technical Elective	3	Free Elective[3]	3
	15		15
Total Credits: 128			

~~The engineering management 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 thepublic.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 laboratoryinstruction.Free ElectivesFootnote:Freeelectives.Each student is required to take three hours of free electives in consultation with his/her academicadvisor.Credits which do not count towards this requirement are deficiency courses (such as algebra and trigonometry), and extra credits in requiredcourses.Any courses outside of engineering and science must be at least three credithours.~~

Example Emphasis Area Programs for Engineering Management Students

One unique aspect of the engineering management degree is the student's ability to select an established emphasis area or create a specialized emphasis. Two examples of established emphasis areas are shown below.

Management of Technology

ENG MGT 5511	Technical Entrepreneurship	3
ENG MGT 5512	Legal Environment	3
ENG MGT 5410	Industrial System Simulation	3
ENG MGT 5614	Supply Chain Management Systems	3
ENG MGT Technical Electives (in consultation with your advisor)		6

Industrial Engineering

ENG MGT 4310	Materials Handling and Plant Layout	3
ENG MGT 4330	Human Factors	3
ENG MGT 5410	Industrial System Simulation	3
ENG MGT 5414	Introduction To Operations Research	3
ENG MGT Technical Electives (in consultation with your advisor)		6

General

Engineering Area Courses (Engineering Discipline)	15
ENG MGT-Technical Elective (in consultation with your advisor)	3

Note: All electives must be chosen in consultation with the student's advisor. Students must satisfy the common freshman year academic requirements in addition to the sophomore, junior, and senior year requirements listed above with a minimum of 128 hours.

1 Must have a grade of "C" or better in these courses for graduation. MATH 1208 or MATH 1211 and MATH 1221 may be substituted for MATH 1214 and MATH 1215, respectively.

2 Humanities and social science electives must be approved by the student's advisor. Students must comply with the general education requirements with respect to selection and depth of study. These requirements are specified in the current catalog.

3 Each student is required to take three hours of free electives in consultation with his/her academic advisor. Credits which do not count towards this requirement are deficiency courses (such as algebra and trigonometry), and extra credits in required courses. Any courses outside of engineering and science must be at least three credit hours.

4 Students are required to select an emphasis area and maintain a minimum 2.0 GPA for these courses.

5 All engineering management students must take the fundamentals of engineering (FE) exam prior to graduation. A passing grade on this examination is not required to earn a B.S. degree. This requirement is part of the Missouri S&T assessment process as described in assessment requirements found elsewhere in this catalog.

6 The programming elective consists of a lecture and lab combination, and may be selected from COMP SCI 1970/COMP SCI 1980, COMP SCI 1971/COMP SCI 1981, COMP SCI 1972/COMP SCI 1982, or COMP SCI 1570/COMP SCI 1580. Note that COMP SCI 1570/COMP SCI 1580 requires one more credit hour than the other options. The lecture component must be completed with a grade of "C" or better.

Accelerated BS/MS Program Option for Engineering Management

Undergraduates currently majoring in Engineering Management at Missouri S&T may opt to apply for a Graduate Track Pathway, which allows students to transfer nine credit hours from their Missouri S&T Engineering Management bachelor's degree to their Engineering Management or Systems Engineering master's degree. In this pathway, a student can achieve both degrees faster than if pursuing the degrees separately. The benefits of the pathway for admitted students include:

1. Nine hours of 5000-level or above EMSE coursework maybe transferred from their Missouri S&T bachelor's degree to their EMSE master's degree,
2. The classes taken for shared BS/MS credit may be taken at the lower undergraduate tuition rate,
3. The GRE is not required for admission into the master's degree, and
4. Work on a thesis project may begin before the bachelor's degree requirements are completed (if thesis option is chosen)

No M.S. degree requirements are changed. The MS degree may be either a thesis or non-thesis option. To be admitted, the student must complete the Grad Track Pathway Admission and Course Approval Form. To be admitted to the student must have approval of their EMSE academic advisor. The program may be combined with existing honors research and emphasis area options. Admitted students will only have an undergraduate record in the Registrar's Office. Once they complete the bachelor's degree, and apply and are admitted into the master's degree then they will have a graduate record in the Registrar’s Office. The Grad Track Pathway Admission and Course Approval Form must be completed when the student has one year left in the bachelor's program. Courses to be transferred will be identified on this form,and on Graduate Form 1, which is submitted after the student has been accepted to the master's program. Students must apply for admission to the master’s program but will not be fully accepted until meeting all undergraduate degree requirements and earning their bachelor’s degree. The nine hours of transferred coursework that will be taken as undergraduate credit must be approved by the student's academic advisor, and may not be undergraduate research, special problems, or courses transferred to the bachelor’s degree.

To be eligible for the Grad Track Pathway, an EMSE undergraduate student must be:

•One year from graduation of their bachelor’s degree (excluding the semester they are currently enrolled)

•Have at least a 3.50 GPA in all EMSE courses taken at Missouri S&T,

•Have a 3.0 cumulative GPA.

Students will be admitted into the master's degree, so long as they meet EMSE graduate student academic performance requirements: To remain in the pathway, the student must maintain good standing within the undergraduate EMSE program, and must maintain continuous enrollment at Missouri S&T. Students must maintain a cumulative GPA of at least 3.00 until they receive their bachelor’s degree.Students must receive grades of B or better in the graduate courses they enroll in as part of the pathway course sequence. The semester admit term for the master’s degree immediately follows the semester that the bachelor’s degree is awarded. If the student exits the pathway before completion of the MS degree requirements, or fails to maintain continuous enrollment at Missouri S&T, the courses taken as part of the pathway may not apply toward graduate requirements in the event of future readmission. Credits earned in graduate-level courses will be posted according to established registrar procedures to the undergraduate transcript and will apply toward the student’s undergraduate degree hours as needed to obtain the undergraduate degree and thus ensure all stated degree requirements are met. Once the bachelor’s

degree is awarded, the student is fully admitted to the master's program, Form 1 is approved, the courses from the pathway will be included on the student's graduate degree audit

Graduate Courses being placed in the pathway:

For general:

SYSENG 5101 Systems Engineering and Analysis

EMGT 5412 Operations Management Science

EMGT 5511 Technical Entrepreneurship

EMGT 5512 Legal Environment

SYSENG 6103 Systems Life-Cycle Costing

SYSENG 6104 Systems Architecting

The student applicant is responsible for checking on how graduate coursework will affect scholarships and other financial aid. Once a student becomes a graduate student, they are not eligible for Federal Pell Grants, though are still eligible for Federal Financial Aid, and will be eligible for fellowships and teaching/research assistantships. International students should check with international affairs during completion of a Grad Track Pathway, to ensure immigration status will be maintained throughout the program.

Justification for request

Elimination of FECP due to change to Direct Admissions. Adding Math 1211. Adding Accelerated BS/MS Program Option description and requirements.

Supporting Documents

Course Reviewer Comments

tibbettsmg (01/27/22 1:21 pm): updated formatting. mt

tibbettsmg (01/27/22 1:22 pm): corrected grammatical error. mt

sraper (02/11/22 1:23 pm): CCC asked to consider this statement from DSCC member: First, I think the EMgt footnote #1 is hard to parse correctly. Is now: "MATH 1208 or MATH 1211 and MATH 1221 may be substituted for MATH 1214 and MATH 1215, respectively." One might read it as Math 1208 may be substituted for 1214 + 1215, or 1211 + 1221 for 1214 + 1215? The respectively makes it moderately clear, but… someone might in the future reasonably try parse it as Math 1208 or (Math 1211 and Math 1221). Math 1208 is not being taught anymore (says other Prof. Fitch), so I suggest delete Math 1208 at this point, or else "MATH 1208 or MATH 1221 may be substituted for MATH 1214. MATH 1221 may be substituted for MATH 1215."

Key: 44

Program Change Request

Date Submitted: 01/26/22 2:02 pm

Viewing: MT ENG-BS : Metallurgical Engineering BS

File: 90.33

Last approved: 09/15/20 9:45 am

Last edit: 01/26/22 2:02 pm

Changes proposed by: smiller

Catalog Pages Using this Program
Metallurgical Engineering

Start Term
Fall 2022 ~~2020~~
Program Code
MT ENG-BS
Department
Materials Science & Engineering
Title
Metallurgical Engineering BS

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. Evie Sherlock

Approval Path

1. 10/15/21 1:30 pm moatsm: Approved for RMATSENG Chair
2. 10/15/21 2:20 pm Marita Tibbetts (tibbettsmg): Rollback to Initiator
3. 01/26/22 2:16 pm moatsm: Approved for RMATSENG Chair
4. 01/26/22 2:18 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
5. 02/11/22 1:23 pm Stephen Raper (sraper): Approved for Engineering DSCC Chair

History

1. Oct 8, 2013 by Lahne Black (lahne)

2. Apr 28, 2014 by Lahne Black (lahne)
3. Aug 14, 2014 by Lahne Black (lahne)
4. Aug 20, 2014 by pantaleoa
5. Aug 20, 2014 by pantaleoa
6. Aug 20, 2014 by pantaleoa
7. Jul 21, 2015 by pantaleoa
8. Mar 7, 2016 by F. Scott Miller (smiller)
9. Mar 27, 2017 by F. Scott Miller (smiller)
10. Jun 28, 2017 by F. Scott Miller (smiller)
11. Mar 3, 2020 by Brittany Parnell (ershenb)
12. Sep 15, 2020 by Crystal Wilson (wilsoncry)

~~Bachelor of Science Metallurgical Engineering Entering freshmen desiring to study metallurgical engineering will be admitted to the Foundational Engineering and ComputingProgram.They will be permitted to state a metallurgical engineering preference, which will be used as a consideration for available freshman departmentalscholarships.The focus of the Foundational Engineering and Computing 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 amajor.~~Bachelor ~~For the bachelor~~ of Science Metallurgical Engineering

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

~~The metallurgical engineering curriculum contains a required number of hours in humanities and social sciences as specified by the Engineering Accreditation Commission ofABET.~~Each student's program of study must contain a minimum of 18 credit hours of course work from the humanities and the social sciences areas and should be chosen according to the following rules:

1. All students are required to take one American history course and one economics course. The history course is to be selected from HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200. The economics course may be either ECON 1100 or ECON 1200.
2. Of the remaining hours, six credit hours must be taken in humanities or social sciences. ~~sciences from the approved list of humanities and social science (HSS) courses.~~ Students may receive humanities credit for foreign language courses in their native tongue only if the course is at the 4000 level. ~~level.)~~

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

Freshman Year			
First Semester	**Credits**	**Second Semester**	**Credits**
FR ENG 1100	1	MET ENG 2110	3
CHEM 1310	4	CHEM 1320	3
CHEM 1319	1	MATH 1215 or 1221	4
MATH 1214 or 1211	4	PHYSICS 1135	4
ENGLISH 1120	3	~~Hum/Soc Sci Elective~~[4]	~~3~~
Hum/Soc Sci Elective[1]	3	MECH ENG 1720	3
	16		17
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
~~PHYSICS 2135~~	~~4~~	~~CER ENG 3230~~	~~3~~
MET ENG 3130	3	MET ENG 3420	3
MET ENG 2125	2	MET ENG 3425	1
CER ENG 3230	3	PHYSICS 2135	4
MATH 2222	4	CIV ENG 2210	3
~~MET ENG 2110~~	~~3~~	~~MET ENG 2125~~	~~2~~
CIV ENG 2200	3	~~MET ENG 3130~~	~~3~~
~~Hum/Soc Sci Elective~~[1]	~~3~~	Hum/Soc Sci Elective[1]	3
		Communication Elective[1]	3
	15		17
Junior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MET ENG 3320	3	MET ENG 3220	3
MET ENG 3120	3	MET ENG 3225	1
MET ENG 3125	2	CER ENG 3410	3
~~MET ENG 4420~~	~~3~~	~~Core Elective~~ [4]	~~3~~
MATH 3304[2]	3	Out of Department Technical Elective[3]	3
Out of Program Technical Elective	3	Statistics Course[2]	3
Hum/Soc Sci Elective[1]	3	Hum/Soc Sci Elective[1]	3
	17		16
Senior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
MET ENG 4096	3	MET ENG 4097	3
~~Statistics Course~~[2]	~~3~~	Met Technical Elective[5]	3
MET ENG 4350	3	Met Technical Elective[5]	3
MET ENG 4420	3	Free Elective[6]	3

MET ENG 4637	3	~~Core Elective[4]~~	~~3~~
Steel Elective[4]	3	Hum/Soc Sci Elective[1]	3
~~Technical Elective[5]~~	~~3~~		
	15		15
Total Credits: 128			

1 Eighteen hours of required H/SS electives of which three hours must be history (HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200), three hours of economics (ECON 1100 or ECON 1200) and three hours communications (ENGLISH 1160, ENGLISH 3560, or SP&M S 1185)

2 All metallurgical engineering students must take MATH 3304 and one statistics course (STAT 3113 or STAT 3115)

3 CHEM ENG 5320, CHEM 2210 or CHEM 2310 or CHEM 3410 or CHEM 4810, ELEC ENG 2100 & ELEC ENG 2101 or ELEC ENG 2800, GEOLOGY 2610, MATH 5603 or MATH 5325, MECH ENG 5212 or MECH ENG 5220 or MECH ENG 5229 or MECH ENG 5236 or MECH ENG 5238 or MECH ENG 5282, MIN ENG 2412, PHYSICS 2305 or PHYSICS 2311, STAT 5120 or STAT 5346 or STAT 5353.

4 Steel Elective - Steelmaking (MET ENG 4450) or Steels And Their Treatment (MET ENG 4320)

5 Technical Electives (MET ENG or approved listing)

6 Free Electives (3 hours)-algebra, trigonometry, basic ROTC, and courses considered remedial excluded

Justification for request

Math changes and rearranging order of courses for a smoother transition towards graduation. Removed FEP info

Supporting Documents

Course Reviewer Comments

tibbettsmg (10/15/21 2:20 pm): Rollback: rollback for additional changes after discussion with DSCC Chair. mt

Key: 90

Program Change Request

Date Submitted: 01/19/22 4:47 pm

Viewing: PHYSIC-BS : Physics BS

File: 115.49

Last approved: 10/28/21 10:37 am

Last edit: 02/01/22 5:16 pm

Changes proposed by: vojtat

Catalog Pages Using this Program

Physics

Start Term

Fall 2022

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. Evie Sherlock

Approval Path

1. 01/19/22 4:52 pm Thomas Vojta (vojtat): Approved for RPHYSICS Chair
2. 01/24/22 3:12 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 02/11/22 1:33 pm Katie Shannon (shannonk): Approved for Sciences DSCC Chair

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)
6. Jun 14, 2019 by Thomas Vojta (vojtat)
7. Jan 30, 2020 by Thomas Vojta (vojtat)
8. Jun 10, 2021 by Thomas Vojta (vojtat)
9. Oct 28, 2021 by Thomas Vojta (vojtat)

Bachelor of Science
Physics

A minimum of 120 ~~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	PHYSICS 1135	4
ENGLISH 1120	3	MATH 1215	4
PHYSICS 1101	1	~~Electives~~[1]	~~2~~
MATH 1214 or 1211	4		
	14		14
Sophomore Year			
First Semester	**Credits**	**Second Semester**	**Credits**
ENGLISH 1160	3	MATH 3304	3
MATH 2222	4	~~PHYSICS 2311 or 2305~~	~~3~~
COMP SCI 1500 or 1972 ***and*** 1982	3	PHYSICS 2129	3
PHYSICS 2135	4	PHYSICS 2305	3
Elective[1]	3	PHYSICS 2401	3
		Elective[1]	3

	17		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
Physics Area Focus Course[4]	3	Electives[1]	6
Math/Stat Elective[2]	3		
Electives[1]	3		
	15		15
Senior Year			
First Semester	**Credits**	**Second Semester**	**Credits**
PHYSICS 4211	3	PHYSICS 4311	3
PHYSICS 4301	3	~~Elective-Humanities (3000 level)~~[4]	~~3~~
~~Physics Elective~~[3]	~~3~~	Physics Elective[3]	3
Physics Area Focus Course[4]	3	Electives[1]	9
Electives[1]	6		
	15		15
Total Credits: 120			

Note: The minimum credit hours required for a bachelor of science in physics is 120 ~~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 30 hours of electives are required in addition to the math/stat electives[2], physics electives[3], and physics area focus courses[4]. These electives shall include six hours of social studies and nine hours of humanities. At least three of the humanity hours must be literature and at least three must be at the 3000 level or above not including Special Problems courses (PHILOS 4345 recommended). 15 hours of free electives may be used to develop an emphasis area. At least 15 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 3000 and 4000 level physics courses listed (PHYSICS 3119, PHYSICS 3129, PHYSICS 3201, PHYSICS 3211, PHYSICS 4211, PHYSICS 4301, PHYSICS 4311), and in addition to the two physics area focus courses[4], one other physics 3000 level or higher course is required.

4 Two physics area focus courses are required. Students can pick from PHYSICS 4323, PHYSICS 4553, Physics 4333, and Physics 4343- Atomic Physics.

Emphasis in 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 for a complete list of requirements.

In addition to maintaining a 3.0 content and professional requirement GPA, students must pass the appropriate content assessment to be eligible for student teaching. Missouri S&T allows students to choose their student teaching placement, if the district agrees and a qualified cooperating teacher is available. This program is approved by the Missouri Department of Elementary and Secondary Education for initial

teacher certification. Students intending to teach in other states are responsible for investigating the reciprocity agreement of that state agency.

a. Professional requirements courses:

EDUC 1040	Perspectives In Education	2
EDUC 1174	School Organization and Administration For Teachers	2
PSYCH 2300	Educational Psychology	3
or EDUC 2102	Educational Psychology	
ENGLISH 3170	Teaching And Supervising Reading and Writing	3
EDUC 2310	Education Of The Exceptional Child	3
EDUC 3216	Instructional Literacy in the Content Area	3
EDUC 3280	Instructional Strategies in the Content Area	3
EDUC 3340	Assessment of Student Learning	3
PSYCH 3310	Developmental Psychology	3
EDUC 4298	Student Teaching Seminar	1
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 I	1
EDUC 1164	Teacher Field Experience II	2
EDUC 3298	Teacher Field Experience III	1
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

Physics is reducing the total hours in the Physics BS program to 120. In addition, we are reorganizing the electives.

These changes go together with renaming and renumbering Physics 3311 - Modern Physics 2 into Physics 4333 - Nuclear and Particle Physics and changing it from required to one of the area focus classes (footnote 4). A separate CC form has been submitted

In addition, we are creating a new 4000 level course Atomic Physics (EC form submitted). This course will also be an area focus course (footnote 4). Should it get a permanent course number right away?

Supporting Documents
Course Reviewer Comments
shannonk (02/01/22 5:16 pm): Changed course number for Atomic Physics to 4343 from 4001

Key: 115

Program Change Request

Date Submitted: 01/13/22 4:00 pm

Viewing: PRE MBA-MI : Pre MBA Minor

File: 122.8

Last approved: 07/15/15 9:06 am

Last edit: 01/24/22 3:18 pm

Changes proposed by: cecq8z

Catalog Pages Using this Program
Business and Management Systems

Start Term
Fall 2022 ~~08/17/2015~~
Program Code
PRE MBA-MI
Department
Business and Information Technology
Title
Pre MBA 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. Evie Sherlock

Approval Path

1. 01/23/22 4:31 pm Cassie Elrod (cassa): Approved for RINFSCTE Chair
2. 01/24/22 3:19 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 01/24/22 3:36 pm Cecil Eng Huang Chua (cchua): Approved for Social Sciences DSCC Chair

History

1. Jul 23, 2014 by Barry Flachsbart (barryf)
2. Jul 14, 2015 by pantaleoa
3. Jul 15, 2015 by pantaleoa

Pre MBA Minor

The minor in pre MBA will prepare students to enter an accredited MBA program at Missouri S&T or elsewhere. This minor requires the following 36 ~~39~~ hours of coursework:

PSYCH 1101	General Psychology	3
~~MATH 1208~~	~~Calculus With Analytic Geometry I~~	~~5~~
~~or MATH 1212~~	~~Survey of Calculus~~	
~~or MATH 1214~~	~~Calculus I~~	
ECON 1300/STAT 1111	Business And Economic Statistics I	3
or STAT 1115	Statistics For The Social Sciences I	
or STAT 3111	Statistical Tools For Decision Making	
or STAT 3113	Applied Engineering Statistics	
or STAT 3115	Engineering Statistics	
or STAT 3117	Introduction To Probability And Statistics	
ECON 1100	Principles Of Microeconomics	3
ECON 1200	Principles Of Macroeconomics	3
BUS 1110	Introduction to Management and Entrepreneurship	3
BUS 1210	Financial Accounting	3
BUS 3220	Managerial Accounting	3
BUS 2910	Business Law	3
BUS 5360	Business Operations	3
MKT 3110	Marketing	3
FINANCE 2150	Corporate Finance I	3
IS&T 1750	Introduction to Management Information Systems	3

Justification for request

Handle changes to the MATH curriculum

Supporting Documents

Course Reviewer Comments

tibbettsmg (01/24/22 3:18 pm): updated effective term to FS22. mt

Key: 122

Course Change Request

New Experimental Course Proposal

Date Submitted: 01/10/22 9:52 am

Viewing: **COMP SCI 5001.014 : Probability and Its Applications in Computing**

File: 4850

Last edit: 01/13/22 12:18 pm

Changes proposed by: zhupe

Requested Effective Change Date	Fall 2022
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	5001
Topic ID	014
Experimental Title	Probability and Its Applications in Computing
Experimental Abbreviated Course Title	Probability
Instructors	Ardhendu Tripathy

Experimental Catalog Description

In Workflow

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

Approval Path

1. 01/10/22 10:08 am
   Samuel Frimpong (frimpong): Approved for RCOMPSCI Chair
2. 01/13/22 12:18 pm
   Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 02/11/22 1:20 pm
   Stephen Raper (sraper):

Approved for Engineering DSCC Chair

This course covers fundamentals of probability and random processes with applications to computing and data analysis. Topics discussed will span five modules: Fundamentals, Concentration of measure, Convergence of random processes, Markov Chains, and Martingales.

Prerequisites

A grade of "C" or better in Comp Sci 2500 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:

Probability has been applied in various computing areas, for example, randomized algorithms, probabilistic data structures, large-scale graph algorithms such as Google PageRank. With the increasing use of Artificial Intelligence and Machine Learning, which heavily rely on probability, it is critical that students possess a good knowledge of its concepts and techniques. The current curriculum does not offer such a course and the proposed course will fill this gap.

Semester(s) previously taught

Co-Listed Courses:

Course Reviewer Comments

Key: 4850

Preview Bridge

Course Change Request

New Experimental Course Proposal

Date Submitted: 01/11/22 12:16 pm

Viewing: **ERP 4001.001 : Introduction to Enterprise Resource Planning (ERP) Software Development**

File: 4852

Last edit: 01/24/22 3:28 pm

Changes proposed by: cecq8z

Requested Effective Change Date	Fall 2022
Department	Business and Information Technology
Discipline	Enterprise Resource Planning (ERP)
Course Number	4001
Topic ID	001
Experimental Title	Introduction to Enterprise Resource Planning (ERP) Software Development
Experimental Abbreviated Course Title	ERP Software Dev
Instructors	Lea Bih-Ru

Experimental Catalog

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. CAT entry
8. Registrar

Approval Path

1. 01/23/22 4:30 pm Cassie Elrod (cassa): Approved for RBUSADMN Chair
2. 01/24/22 3:29 pm Marita Tibbetts (tibbettsmg): Approved for CCC Secretary
3. 01/24/22 3:36 pm Cecil Eng Huang Chua (cchua): Approved for

Social Sciences
DSCC Chair

Description

The course provides knowledge and skills in design and program business processes to implement an Enterprise Resource Planning (ERP) software system. The software system will integrate Financial accounting, logistics, production, and management accounting information systems with a mobile-enabled user interface. SAP S/4HANA or similar ERP systems are used.

Prerequisites

ERP 2110.

Field Trip Statement

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

Total: 3

Justification for new course:

This is the undergraduate version of ERP 6120

Semester(s) previously taught

Co-Listed Courses:

Course Reviewer Comments

Key: 4852

Preview Bridge