



**Minutes of the Campus Curricula Committee Meeting**

**May 4, 2023**

**8:15am, Bertelsmeyer 110H**

**(For Faculty Senate Meeting on June 1, 2023)**

**Attendees:** Petra Dewitt, Katie Shannon, Michael Davis, Mark Fitch, Kyle Perry, Michael Gosnell, Cecil Eng Huang Chua, Evie Sherlock, and Jennifer Pohlsander

*The following curriculum forms were discussed and approved:*

**Course Change forms:**

File: 9.1 AERO ENG 4780 : Aerospace Systems Design I  
File: 191.3 AERO ENG 4885 : Assessment  
File: 2175.1 BIO SCI 1173 : Introduction to Environmental Sciences  
File: 4922 CIV ENG 5181 : Building Materials Physics  
File: 4980 COMP SCI 5420 : Introduction to Machine Learning  
File: 1747.8 ECON 4540 : Energy Economics  
File: 4943 ECON 5350 : Data Intelligence using Case Studies  
File: 306.4 ELEC ENG 5570 : Extra High Voltage Engineering  
File: 4966 ENV SCI 4000 : Special Problems  
File: 4968 ENV SCI 4002 : Cooperative Environmental Scientist Training  
File: 4967 ENV SCI 4010 : Seminar  
File: 4969 ENV SCI 4099 : Undergraduate Research  
File: 1066.1 MECH ENG 6657 : Laser Aided Manufacturing And Materials Processing  
File: 805.8 SYS ENG 6213 : Deep Learning  
File: 1917.5 SYS ENG 6543 : Digital Engineering  
File: 2442.3 TCH COM 5085 : Internship

**Program Change forms:**

File: 153.82 CP ENG-BS : Computer Engineering BS  
File: 38.33 ECON-BA : Economics BA  
File: 39.31 ECON-BS : Economics BS  
File: 221.4 ECON-MI : Economics Minor  
File: 44.45 ENG MG-BS : Engineering Management BS  
File: 382.20 ENV SCI-BS : Environmental Sciences BS  
File: 86.56 MC ENG-BS : Mechanical Engineering BS  
File: 399 PROPOSED : Quantitative Economics Minor  
File: 345.10 WATERSC-MS : Water Science and Engineering MS



**Experimental Course forms:**

File: 4949      CHEM ENG 5001.019 : Materials as Hard Tissue Devices  
File: 4973      CHEM ENG 5001.021 : Fermentation Technology  
File: 4977      CHEM ENG 5001.022 : Energy Engineering  
File: 4971      COMP ENG 5001.005 : Fundamentals of Data Engineering  
File: 4961      COMP SCI 6001.012 : Topics in Quantum Computing and Information  
File: 4902      GEOLOGY 2001.001 : Climate Change and Society  
File: 4981      TCH COM 6001.001 : Advanced Writing for Business

*The following Course Change forms were rolled back to be resubmitted as Experimental Course forms:*

File: 4974      CHEM 2410 : Physical Chemistry I  
File: 4975      CHEM 2420 : Physical Chemistry II

*The following Course Change forms were rolled back:*

File: 4108.4    CHEM 2459 : Accelerated Physical Chemistry Laboratory  
File: 1825.4    CHEM 3310 : Inorganic Chemistry I  
File: 4173.2    CHEM 3320 : Inorganic Chemistry II  
File: 598.4     CHEM 3329 : Inorganic Chemistry Laboratory

*The following Program Change forms were rolled back:*

File: 308.3    CAD/CAM-CT : CAD/CAM & Rapid Prdct Real CT  
File: 141.40   AE ENG-BS : Aerospace Engineering BS  
File: 16.40    CHEM-BS : Chemistry BS  
File: 261.8    FR ENG-UN : Foundational Engineering and Computing  
File: 309.2    MF SYS-CT : Manufacturing Systems CT

**New Business:**

Approved CCC calendar deadlines through August 2023.

Discussion regarding guidelines for Minors.

Discussion regarding the purpose and task of the CCC.

The meeting adjourned at 9:30 a.m.

*Petra DeWitt*

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Petra DeWitt, Chair  
Missouri S&T Campus Curricula Committee

# Course Change Request

Date Submitted: 05/05/23 4:24 pm

Viewing: **AERO ENG 4780 : Aerospace Systems Design I**

File: 9.1

Last edit: 05/05/23 4:24 pm

Changes proposed by: esdk3

Programs  
referencing this  
course [AE ENG-BS: Aerospace Engineering BS](#)

Other Courses  
referencing this  
course In The Prerequisites:  
[AERO ENG 4781 : Aerospace Systems Design II](#)

Requested [Fall 2024](#) ~~Fall 18 Prereq~~  
Effective Change ~~Attribute Update~~  
Date

Department Mechanical & Aerospace Engineering

Discipline Aerospace Engineering (AERO ENG)

Course Number 4780

Title  
Aerospace Systems Design I

Abbreviated Aerospace Systems Dsgn I  
Course Title

Catalog

Description

Consideration of the creative design process with emphasis on aeronautical-aerospace systems. Short design problems to illustrate the process. Selection of design projects for Aero Eng 4781. Information gathering for the design projects which will be completed in Aerospace Systems Design II. Fall semester.

Prerequisites

Aero Eng [3251 and Aero Eng 3361 and Aero Eng ~~3251, 3361~~](#), 3171.

In Workflow

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

Approval Path

1. 03/16/23 1:38 pm  
David Bayless (djbkqf):  
Approved for RMECHENG Chair
2. 04/03/23 11:04 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/12/23 8:51 am  
Mark Fitch (mfitch):  
Approved for Engineering DSCC

Field Trip  
Statement

Credit Hours      LEC: 3 ~~2~~      LAB: 0      IND: 0      RSD: 0  
Total: 3 ~~2~~

Required for      Yes ~~No~~  
Majors

Elective for      No  
Majors

Justification for  
change:

Changing to 3 credit hours to be consistent with the alternative first-semester senior design course AE 4790.

We expect to offer this for the first time as 3 credit hours in Fall 2024. The effective date on this CC form did not include that option, so we selected the latest available option of Spring 2024. We are submitting now to accompany the DC form that needs to be effective Fall 2023.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed  
Courses:

Course Reviewer

Comments

**jpnfd (04/03/23 8:53 am):** Updated prerequisite format.

**jpnfd (05/05/23 2:41 pm):** Rollback: Rolled back because the credit hour change to Aero Eng 4780 is an affecting change that cannot be effective for Fall 2023. The Aerospace Engineering BS DC form can be approved simultaneously with Aero Eng 4780 in Fall 2024. See email 5/5/23

Key: 9

Chair

4. 04/18/23 10:08 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
5. 05/05/23 2:41 pm  
Jennifer Pohlsander (jpnfd): Rollback to Initiator
6. 05/05/23 4:44 pm  
David Bayless (djbkqf): Approved for RMECHENG Chair
7. 05/08/23 8:15 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
8. 05/08/23 11:27 am  
Mark Fitch (mfitch): Approved for Engineering DSCC Chair
9. 05/08/23 1:23 pm  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
10. 05/08/23 3:51 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Meeting

Agenda

11. 05/08/23 4:31 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

# Course Change Request

Date Submitted: 04/12/23 10:21 am

Viewing: **AERO ENG 4885 : Assessment**

File: 191.3

Last approved: 05/06/16 3:33 am

Last edit: 04/12/23 11:43 am

Changes proposed by: nisbett

Programs [AE ENG-BS: Aerospace Engineering BS](#)  
referencing this  
course

Requested [Fall 2023 01/12/2016](#)

Effective Change  
Date

Department Mechanical & Aerospace Engineering

Discipline Aerospace Engineering (AERO ENG)

Course Number 4885

Title  
Assessment

Abbreviated Assessment  
Course Title

Catalog

Description

This course is an overview and assessment of the required aerospace engineering courses that the students took.

Prerequisites

Aero Eng 3171, Aero Eng 3361, Aero Eng [4253; preceded or accompanied by 4535,](#)  
Aero Eng [4535.](#) ~~4253.~~

Field Trip  
Statement

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

In Workflow

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

Approval Path

1. 04/12/23 10:37 am  
David Bayless (djbkqf):  
Approved for RMECHENG Chair
2. 04/12/23 11:43 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/18/23 9:16 am  
Mark Fitch (mfitch):  
Approved for

Total: 1

Required for  
Majors Yes

Elective for  
Majors No

Justification for  
change:

Changing Aero Eng 4535 from prerequisite to pre- or co-requisite to eliminate recurring scheduling issues for fall semester graduation.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed  
Courses:

Course Reviewer  
Comments

**jpnfd (04/12/23 11:43 am):** Added punctuation to prerequisite.

Engineering DSCC  
Chair

4. 04/18/23 10:08  
am

Jennifer

Pohlsander

(jpnfd): Approved  
for Pending CCC  
Agenda post

5. 05/08/23 3:51 pm

Jennifer

Pohlsander

(jpnfd): Approved  
for CCC Meeting  
Agenda

6. 05/08/23 4:31 pm

Petra Dewitt

(dewittp):

Approved for  
Campus Curricula  
Committee Chair

## History

1. May 6, 2016 by isaac (191.1)

Key: 191

# Course Change Request

Date Submitted: 03/20/23 1:14 pm

Viewing: **BIO SCI 1173 : Introduction to Environmental Sciences**

File: 2175.1

Last edit: 03/20/23 1:22 pm

Changes proposed by: jpnfd

Programs referencing this course	<a href="#">BIO SC-BA: Biological Sciences BA</a> <a href="#">EDUC-BS: Education BS</a> <a href="#">ECON-BA: Economics BA</a> <a href="#">ENV SCI-BS: Environmental Sciences BS</a> <a href="#">ECON-BS: Economics BS</a> <a href="#">GL&amp;GPH-BS: Geology and Geophysics BS</a>
Other Courses referencing this course	<u>In The Prerequisites:</u> <a href="#">BIO SCI 2223 : General Genetics</a>

Requested Effective Change Date	Fall <del>2018</del> <u>2023</u>
Department	Biological Sciences
Discipline	Biological Sciences (BIO SCI)
Course Number	1173
Title	Introduction to Environmental Sciences
Abbreviated Course Title	Environmental Science

## Catalog Description

An introduction to environmental science, with an emphasis on biological aspects of current environmental problems. Topics range from chemical toxicity to global climate change. Environmental challenges facing local species and ecosystems will be

## 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. 03/20/23 4:12 pm  
David Duvernell (duverneld): Approved for RBIOLSCI Chair
2. 04/03/23 11:04 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/06/23 8:55 am  
Katie Shannon (shannonk): Approved for Sciences DSCC

emphasized.

Prerequisites

Field Trip  
Statement

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

Required for      No  
Majors

Elective for      No  
Majors

Justification for  
change:

This course already exists within BIO SCI, but co-listing it with ENV SCI to increase visibility to majors and to increase the number of ENV SCI credits that a major can receive. Part of a standard list of degree options needed for the major.

This course has been offered in BIO SCI as a permanent course for many years.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed              [ENV SCI 1173 - Course Not Found](#)  
Courses:

Course Reviewer  
Comments

Chair

4. 04/18/23 10:09 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
5. 05/08/23 3:52 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Meeting Agenda
6. 05/08/23 4:31 pm  
Petra Dewitt (dewittp): Approved for Campus Curricula Committee Chair

# Course Change Request

## New Course Proposal

Date Submitted: 12/11/22 9:19 am

Viewing: **CIV ENG 5181 : Building Materials Physics**

File: 4922

Last edit: 03/07/23 11:08 am

Changes proposed by: baur

Requested Spring 2024

Effective Change

Date

Department Civil, Architectural, and Environmental Engineering

Discipline Civil Engineering (CIV ENG)

Course Number 5181

Title

Building Materials Physics

Abbreviated Bldg Matls Physics

Course Title

Catalog

Description

Examines the effects of heat, air and moisture on the building envelop through engineering methods with examples and exercises.

Prerequisites

Civ Eng 3330 or Mech Eng 2527.

Field Trip

Statement

Credit Hours

LEC: 3

LAB: 0

IND: 0

RSD: 0

Total: 3

Required for

No

Majors

Elective for

Yes

Majors

In Workflow

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

Approval Path

1. 12/11/22 11:08 am  
Joel Burken  
(burken):  
Approved for  
RCIVILEN Chair
2. 03/14/23 9:29 am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 03/22/23 12:05 pm  
Mark Fitch  
(mfitch):  
Approved for

Justification for  
new course:

This course is to be co-listed as Arch Eng 5181.

Semesters  
previously  
offered as an  
experimental  
course

Spring 2020- 7, Spring 2021-11, Spring 2022- 12

Co-Listed

Courses:

ArchE 5181 - **Course Not Found**

Course Reviewer

Comments

**jpnfd (12/19/22 2:11 pm):** Updated format for abbreviated title, prerequisites, & catalog description. Added enrollment numbers for semesters previously taught.

**jpnfd (03/07/23 11:08 am):** Updated catalog description- removed course title from beginning of description.

Key: 4922

Engineering DSCC  
Chair

4. 04/18/23 10:09  
am

Jennifer

Pohlsander

(jpnfd): Approved  
for Pending CCC

Agenda post

5. 05/08/23 3:53 pm

Jennifer

Pohlsander

(jpnfd): Approved  
for CCC Meeting

Agenda

6. 05/08/23 4:31 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

# Course Change Request

## New Course Proposal

Date Submitted: 04/08/23 9:15 am

Viewing: **COMP SCI 5420 : Introduction to Machine**

## Learning

File: 4980

Last edit: 04/13/23 3:39 pm

Changes proposed by: taylorpat

Requested            Fall 2023

Effective Change

Date

Department        Computer Science

Discipline         Computer Science (COMP SCI)

Course Number    5420

Title

Introduction to Machine Learning

Abbreviated        Machine Learning

Course Title

Catalog

Description

This course introduces foundational theories and techniques in machine learning. Topics will include basics of machine learning, learning theory, various regression and classification models, as well as unsupervised learning methods. Students will implement course concepts in intensive programming assignments and mini-projects.

Prerequisites

A grade of "C" or better in Comp Sci 2500, Math 3108, and one of Stat 3113, Stat 3115, Stat 3117 or Stat 5643.

Field Trip

Statement

Credit Hours

LEC: 3

LAB: 0

IND: 0

RSD: 0

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. 04/12/23 1:05 pm  
Stephen Gao (sgao): Approved for RCOMPSCI Chair
2. 04/13/23 3:43 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/18/23 9:16 am  
Mark Fitch (mfitch): Approved for Engineering DSCC Chair

Total: 3

Required for Majors No

Elective for Majors Yes

Justification for new course:

Machine learning (ML) is a fundamental topic in computer science. CompSci already has a data mining course, various AI courses, computer vision, and advanced ML/AI, but no introduction to ML course. The topic is in-demand with students. It has been taught two times previously.

Semesters previously offered as an experimental course

FS 2022- enrollment 29 students

FS 2017- enrollment 45 students

Co-Listed

Courses:

Course Reviewer **jpnfd (04/13/23 1:47 pm):** Added enrollment numbers to terms previously taught.

Comments

4. 04/18/23 10:09 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
5. 05/08/23 3:53 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Meeting Agenda
6. 05/08/23 4:31 pm  
Petra Dewitt (dewittp): Approved for Campus Curricula Committee Chair

# Course Change Request

Date Submitted: 04/06/23 4:39 pm

Viewing: **ECON 4540 : Energy Economics**

File: 1747.8

Last approved: 11/23/20 6:00 am

Last edit: 04/13/23 11:06 am

Changes proposed by: davismc

Programs  
referencing this  
course

[SCTCPL-MI: Science, Tech,& Politics Minor](#)  
[GS ECON-MI: Global Sustainable Economics Minor](#)  
[E/T ECN-MI: E/T Economics Minor](#)  
[SCITEC-CTU: UCT - Science, Technology, and Society](#)  
[ECON-BA: Economics BA](#)  
[ENV SCI-BS: Environmental Sciences BS](#)  
[ECON-BS: Economics BS](#)  
[PROPOSED: Energy Economics - CTU](#)  
[PROPOSED: Quantitative Economics Minor](#)  
[MC ENG-BS: Mechanical Engineering BS](#)

Requested [Fall 2023](#) ~~Spring 2021~~

Effective Change  
Date

Department Economics

Discipline Economics (ECON)

Course Number 4540

Title  
Energy Economics

Abbreviated Energy Economics  
Course Title

Catalog  
Description

For students interested in both economic and engineering issues of energy policy. Provides an assessment of economics and technology issues related to traditional and renewable energy resources. Presented in a framework that allows for analysis of the economic trade-offs between energy sources and the technologies associated

In Workflow

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

Approval Path

1. 04/06/23 4:43 pm  
Melody Lo  
(mlc2d):  
Approved for  
RECONOMI Chair
2. 04/13/23 3:27 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 04/13/23 3:47 pm  
Cecil Eng Huang  
Chua (cchua):  
Approved for  
Social Sciences  
DSCC Chair

with their use and extraction.

#### Prerequisites

Econ 1100 or Econ 1200.

#### Field Trip

#### Statement

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

Total: 3

Required for  
Majors              No

Elective for  
Majors              Yes

#### Justification for change:

Economics wanted to redefine the Energy Economics curriculum.

Semesters  
previously  
offered as an  
experimental  
course

#### Co-Listed

#### Courses:

~~CHEM-ENG 4540 - Energy Economics~~

MIN ENG 4524 - Energy Economics

4. 04/18/23 10:09 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
5. 05/08/23 3:54 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Meeting Agenda
6. 05/08/23 4:31 pm  
Petra Dewitt (dewittp): Approved for Campus Curricula Committee Chair

#### History

1. Feb 25, 2019 by ershenb (1747.1)
2. Nov 21, 2019 by ershenb (1747.3)
3. Nov 23, 2020 by davismc (1747.4)

Course Reviewer      **jpnfd (04/13/23 11:06 am):** Per email 4/13/23 Dr. Christi Luks, Associate Chair in  
Comments              Chemical and Biochemical Engineering, approves of the removal of Chem Eng 4540  
as a co-listed course.

# Course Change Request

## New Course Proposal

Date Submitted: 02/13/23 3:11 pm

Viewing: **ECON 5350 : Data Intelligence using Case Studies**

File: 4943

Last edit: 05/05/23 12:53 pm

Changes proposed by: davismc

Programs referencing this course

- [ECON-BA: Economics BA](#)
- [ECON-BS: Economics BS](#)
- [PROPOSED: Decision Data Analytics - CTU](#)
- [PROPOSED: Quantitative Economics Minor](#)

Requested Date: Fall 2023

Effective Change Date:

Department: Economics

Discipline: Economics (ECON)

Course Number: 5350

Title: Data Intelligence using Case Studies

Abbreviated Course Title: Data Case Studies

Catalog Description: This course designates a corporate executive to teach students the processes of data collecting, analyzing, visualization, and statistical tests with case studies from various industries. Students will have the opportunity to do group projects showcasing their ability to apply data intelligence in real-world scenarios using Python programming.

Prerequisites: Econ 1100 and Econ 1200 and one of the following: Stat 1115, Stat 3111, Stat 3113, Stat 3115, or Stat 3117.

Field Trip:

### In Workflow

1. **RECONOMI 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. 02/15/23 5:22 pm  
Melody Lo (mlc2d):  
Approved for RECONOMI Chair
2. 03/10/23 11:53 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 03/10/23 12:13 pm  
Cecil Eng Huang Chua (cchua):  
Approved for

Statement

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

Total: 3

Required for      No  
Majors

Elective for      Yes  
Majors

Justification for  
new course:

This course is part of the new Undergraduate Certificates in Decision Data Analytics.  
It is also part of the new emphasis area of Decision Data Analytics.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed  
Courses:

Course Reviewer

Comments

- jpnfd (02/24/23 4:03 pm):** Updated prerequisite format.
- jpnfd (03/09/23 2:18 pm):** Stat 3111 added to prerequisite list.
- jpnfd (04/06/23 9:50 am):** Changed Required for Majors to "NO."
- jpnfd (04/06/23 9:51 am):** Rollback: Rolled back for catalog description revision.
- jpnfd (05/05/23 12:53 pm):** Removed Stat 3546 from prerequisite list because the course does not exist, per department chair email 5/4/23.

Key: 4943

- Social Sciences  
DSCC Chair
- 4. 03/22/23 10:05  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post
- 5. 04/06/23 9:51 am  
Jennifer  
Pohlsander  
(jpnfd): Rollback  
to RECONOMI  
Chair for CCC  
Meeting Agenda
- 6. 04/06/23 12:23  
pm  
Melody Lo  
(mlc2d):  
Approved for  
RECONOMI Chair
- 7. 04/12/23 10:49  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
- 8. 04/12/23 11:08  
am  
Cecil Eng Huang  
Chua (cchua):  
Approved for  
Social Sciences  
DSCC Chair
- 9. 04/18/23 10:09  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC

Agenda post

10. 05/08/23 3:54 pm

Jennifer

Pohlsander

(jpnfd): Approved

for CCC Meeting

Agenda

11. 05/08/23 4:32 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

# Course Change Request

Date Submitted: 03/13/23 11:03 am

Viewing: **ELEC ENG 5570 : Extra High Voltage Engineering**

File: 306.4

Last approved: 02/08/21 6:02 am

Last edit: 05/05/23 12:47 pm

Changes proposed by: ss5ddp

Programs [ELPWSY-CT: Electrical Power Sys Eng CT](#)  
referencing this  
course

Requested Fall ~~2021~~ 2023  
Effective Change  
Date  
Department Electrical and Computer Engineering  
Discipline Electrical Engineering (ELEC ENG)  
Course Number 5570  
Title  
Extra High Voltage Engineering  
Abbreviated Extra High Voltage  
Course Title Engineering

Catalog  
Description  
The physical phenomena associated with high voltage dielectric breakdown are presented. Methods of generating and measuring high voltages and currents are explained. Type-tests performed on a variety of high voltage equipment are introduced. ~~Demonstration of design and performance. Field trips to companies for laboratory testing of high voltage according to industry standards will serve as the lab part of the course.~~

Prerequisites  
Senior standing.

Field Trip

## In Workflow

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

## Approval Path

1. 03/13/23 12:02 pm  
Jonathan Kimball (kimballjw):  
Approved for RELECENG Chair
2. 03/13/23 1:44 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 03/22/23 12:05 pm  
Mark Fitch (mfitch):  
Approved for

## Statement

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

Required for      No  
Majors

Elective for      Yes  
Majors

## Justification for change:

The course no longer offers a lab that coincides with the lecture course EE 5570 for either section of the class offered.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed  
Courses:

## Course Reviewer

### Comments

**mfitch (03/21/23 2:45 pm):** Grammar issue in last sentence of description: "Some of standard testing of equipment and methods are presented."

**jpnfd (05/05/23 12:47 pm):** Updated course description per department email 5/4/23.

Engineering DSCC  
Chair

4. 04/18/23 10:09  
am

Jennifer

Pohlsander

(jpnfd): Approved

for Pending CCC

Agenda post

5. 05/08/23 3:55 pm

Jennifer

Pohlsander

(jpnfd): Approved

for CCC Meeting

Agenda

6. 05/08/23 4:32 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

## History

1. Feb 8, 2021 by  
mlr6xd (306.1)

Key: 306

[Preview Bridge](#)

# Course Change Request

## New Course Proposal

Date Submitted: 03/20/23 10:51 am

Viewing: **ENV SCI 4000 : Special Problems**

File: 4966

Last edit: 03/20/23 1:43 pm

Changes proposed by: jpnfd

Requested Fall 2023

Effective Change  
Date

Department Biological Sciences

Discipline Environmental Sciences (ENV SCI)

Course Number 4000

Title  
Special Problems

Abbreviated Special Problems  
Course Title

### In Workflow

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

### Catalog

#### Description

Problems or readings on specific subjects or projects in the program. Consent of instructor required.

#### Prerequisites

#### Field Trip

#### Statement

Credit Hours LEC: 0 LAB: 0 IND: 0-6 RSD: 0  
Total: 0-6

Required for  
Majors No

Elective for  
Majors No

### Approval Path

1. 03/20/23 10:55  
am  
David Duvernell  
(duverneld):  
Approved for  
RBIOLSCI Chair
2. 03/24/23 4:03 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 04/03/23 12:27  
pm  
Katie Shannon  
(shannonk):  
Approved for

Justification for  
new course:

Part of a standard list of degree options needed for the major.

Semesters  
previously  
offered as an  
experimental  
course

None

Co-Listed

Courses:

Course Reviewer

Comments

**jpnfd (03/20/23 1:43 pm):** Updated credit hours to 0-6 & updated catalog description per email from Dr. Duvernell 3/20/23

Key: 4966

Sciences DSCC  
Chair

4. 04/18/23 10:09  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post
5. 05/08/23 3:56 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda
6. 05/08/23 4:32 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

# Course Change Request

## New Course Proposal

Date Submitted: 03/20/23 11:28 am

Viewing: **ENV SCI 4002 : Cooperative Environmental Scientist Training**

File: 4968

Last edit: 04/03/23 9:27 am

Changes proposed by: jpnfd

Requested            Fall 2023

Effective Change

Date

Department        Biological Sciences

Discipline         Environmental Sciences (ENV SCI)

Course Number    4002

Title

Cooperative Environmental Scientist Training

Abbreviated        Cooperative Training

Course Title

Catalog

Description

On-the-job experience gained through cooperative education with industry, with credit arranged through departmental cooperative advisor. Grade received depends on quality of reports submitted and work supervisor's evaluation.

Prerequisites

Field Trip

Statement

Credit Hours        LEC: 0            LAB: 0            IND: 0-6            RSD: 0

Total: 0-6

Required for        No

Majors

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. 03/20/23 4:11 pm  
David Duvernell (duverneld):  
Approved for  
RBIOLSCI Chair
2. 04/03/23 11:08 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/06/23 8:55 am  
Katie Shannon (shannonk):  
Approved for  
Sciences DSCC

Elective for            No

Majors

Justification for  
new course:

Part of a standard list of degree options needed for the major.

Semesters

previously  
offered as an  
experimental  
course

None

Co-Listed

Courses:

Course Reviewer

Comments

**jpnfd (03/20/23 1:46 pm):** Updated credit hours to 0-6 per dept. email 3/20/23.

**jpnfd (04/03/23 9:27 am):** Updated abbreviated course title from co-op to  
Cooperative Training.

Chair

4. 04/18/23 10:09  
am

Jennifer

Pohlsander

(jpnfd): Approved  
for Pending CCC

Agenda post

5. 05/08/23 3:56 pm

Jennifer

Pohlsander

(jpnfd): Approved  
for CCC Meeting

Agenda

6. 05/08/23 4:32 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

Key: 4968

[Preview Bridge](#)

# Course Change Request

## New Course Proposal

Date Submitted: 03/20/23 11:04 am

Viewing: **ENV SCI 4010 : Seminar**

File: 4967

Last edit: 03/20/23 1:45 pm

Changes proposed by: jpnfd

Requested	Fall 2023
Effective Change Date	
Department	Biological Sciences
Discipline	Environmental Sciences (ENV SCI)
Course Number	4010
Title	Seminar
Abbreviated Course Title	Seminar

Catalog Description	Students will work in groups to propose, research, develop, complete, and present service-learning projects that are related to the environmental sciences.			
Prerequisites	Senior Standing.			
Field Trip Statement				
Credit Hours	LEC: 0	LAB: 0	IND: 0	RSD: 1
Total:	1			
Required for Majors	No			
Elective for Majors	Yes			

### 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. 03/20/23 4:11 pm  
David Duvernell (duverneld):  
Approved for  
RBIOLSCI Chair
2. 03/24/23 4:00 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/06/23 8:55 am  
Katie Shannon (shannonk):  
Approved for  
Sciences DSCC  
Chair

Justification for  
new course:

Part of a standard list of degree options needed for the major.

Semesters  
previously  
offered as an  
experimental  
course

None

Co-Listed  
Courses:

Course Reviewer

Comments

**jpnfd (03/20/23 1:45 pm):** Updated prerequisite to Senior Standing. Per email from  
Dept 3/20/23.

Key: 4967

4. 04/18/23 10:10  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post
5. 05/08/23 3:56 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda
6. 05/08/23 4:32 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

# Course Change Request

## New Course Proposal

Date Submitted: 03/20/23 11:56 am

Viewing: **ENV SCI 4099 : Undergraduate Research**

File: 4969

Last edit: 03/20/23 2:40 pm

Changes proposed by: jpnfd

Requested	Fall 2023
Effective Change Date	
Department	Biological Sciences
Discipline	Environmental Sciences (ENV SCI)
Course Number	4099
Title	Undergraduate Research
Abbreviated Course Title	Undergraduate Research

### Catalog

#### Description

Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six credit hours for graduation credit. Subject and credit to be arranged with the instructor.

#### Prerequisites

Consent of instructor.

#### Field Trip

#### Statement

Credit Hours	LEC: 0	LAB: 0	IND: 0-6	RSD: 0
Total: 0-6				

Required for Majors	No
---------------------	----

Elective for	No
--------------	----

### 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. 03/20/23 4:13 pm  
David Duvernell (duvernellD):  
Approved for  
RBIOLSCI Chair
2. 04/03/23 11:09 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/03/23 12:28 pm  
Katie Shannon (shannonk):  
Approved for

## Majors

Justification for  
new course:

Part of a standard list of options for degree.

Semesters  
previously  
offered as an  
experimental  
course  
None

Co-Listed  
Courses:

Course Reviewer

Comments

**jpnfd (03/20/23 1:49 pm):** Updated to 0-6 credit hours & "consent of instructor"  
under prerequisites per dept. email 3/20/23

**jpnfd (03/20/23 2:40 pm):** Updated course description per dept. email 3/20/23.

Key: 4969

Sciences DSCC  
Chair

4. 04/18/23 10:10  
am

Jennifer

Pohlsander

(jpnfd): Approved

for Pending CCC

Agenda post

5. 05/08/23 3:56 pm

Jennifer

Pohlsander

(jpnfd): Approved

for CCC Meeting

Agenda

6. 05/08/23 4:32 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

# Course Change Request

Date Submitted: 03/23/23 3:08 pm

Viewing: **MECH ENG 6657 : Laser Aided Manufacturing  
And Materials Processing**

File: 1066.1

Last edit: 04/13/23 3:12 pm

Changes proposed by: nisbett

Requested [Spring 2024](#) ~~Fall 2014~~

Effective Change

Date

Department Mechanical & Aerospace Engineering

Discipline Mechanical Engineering (MECH ENG)

Course Number 6657

Title

Laser Aided Manufacturing And Materials Processing

Abbreviated Laser Aid Mfg&Mtrls Proc

Course Title

Catalog

Description

Fundamental studies in laser aided manufacturing and materials processing including laser principles and optics, physics of laser-materials interaction, interface responses for rapid solidification, theories on non-equilibrium synthesis, modeling of transport phenomena, optical sensing techniques, current topics and considerations for lasers in manufacturing.

Prerequisites

Mech Eng [5519](#). ~~5525~~.

Field Trip

Statement

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

Total: 3

Required for No

In Workflow

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

Approval Path

1. 04/07/23 4:25 pm  
David Bayless (djbkqf):  
Approved for RMECHENG Chair
2. 04/12/23 11:28 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/18/23 9:16 am  
Mark Fitch (mfitch):  
Approved for Engineering DSCC

Majors

Elective for Yes ~~No~~  
Majors

Justification for  
change:

Adding Aero Eng co-list since this topic is applicable to the AE manufacturing industry.

Changing the prerequisite to incorporate a course that is appropriate to the content, and regularly offered.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed  
Courses:

[AERO ENG 6657 - Course Not Found](#)

Chair

4. 04/18/23 10:10  
am

Jennifer

Pohlsander

(jpnfd): Approved  
for Pending CCC

Agenda post

5. 05/08/23 3:57 pm

Jennifer

Pohlsander

(jpnfd): Approved  
for CCC Meeting

Agenda

6. 05/08/23 4:33 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

Course Reviewer **jpnfd (04/12/23 11:22 am):** Updated catalog description. Exceeded character limit.

Comments **jpnfd (04/13/23 3:12 pm):** Updated description format.

# Course Change Request

Date Submitted: 03/12/23 2:07 pm

Viewing: **SYS ENG 6213 : Deep Learning and Advanced Neural Networks**

File: 805.8

Last approved: 11/23/17 3:31 am

Last edit: 03/13/23 1:50 pm

Changes proposed by: dagli

Programs referencing this course

- [CMPINTC-CT: Computational Intelligence CT](#)
- [CMPINTS-CT: Computational Intelligence](#)
- [GEINTEL-CT: Geoanalytics and Geointelligence Certificate](#)
- [CMPINTE-CT: Computational Intelligence CT](#)

Requested [Fall 2023 01/09/2018](#)

Effective Change Date

Department Engineering Management and Systems Engineering

Discipline Systems Engineering (SYS ENG)

Course Number 6213

Title Deep Learning ~~and Advanced Neural Networks~~

Abbreviated Course Title [Deep Learning](#) ~~Deep-Learn~~  
**Neural Nets**

Catalog

Description

Use of deep learning and advance neural networks in the design of cyber physical complex adaptive systems. Machine learning basics, deep feed forward networks, regularization for deep learning, optimization for training deep models, convolutional networks, recurrent and recursive nets, [practical](#), ~~practical~~, vision and natural language processing applications.

Prerequisites

Graduate Standing.

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/12/23 4:42 pm  
David Enke  
(enke): Approved for RENG MNGT Chair
2. 03/13/23 4:27 pm  
Jennifer Pohlsander  
(jpnfd): Approved for CCC Secretary
3. 03/22/23 12:05 pm  
Mark Fitch  
(mfitch): Approved for

Field Trip  
Statement

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

Total: 3

Required for      No  
Majors

Elective for      No  
Majors

Justification for  
change:

Modified title represents what is being covered in the course much better.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed  
Courses:

Course Reviewer

Comments

**jpnfd (03/13/23 1:49 pm):** Updated term to Fall 2023

**jpnfd (03/13/23 1:50 pm):** Removed extra space after "practical" in description.

Engineering DSCC  
Chair

4. 04/18/23 10:10  
am

Jennifer

Pohlsander

(jpnfd): Approved  
for Pending CCC

Agenda post

5. 05/08/23 4:00 pm

Jennifer

Pohlsander

(jpnfd): Approved  
for CCC Meeting

Agenda

6. 05/08/23 4:33 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

History

1. Nov 23, 2017 by  
dagli (805.1)

Key: 805

[Preview Bridge](#)

# Course Change Request

Date Submitted: 04/03/23 12:53 pm

Viewing: **SYS ENG 6543 ~~6541~~ : Digital Engineering**

File: 1917.5

Last approved: 11/28/22 6:01 am

Last edit: 05/04/23 1:27 pm

Changes proposed by: dagli

Requested Spring 2024 ~~Fall-2023~~

Effective Change

Date

Department Engineering Management and Systems Engineering

Discipline Systems Engineering (SYS ENG)

Course Number 6543 ~~6541~~

Title

Digital Engineering

Abbreviated Digital Engineering

Course Title

Catalog

Description

This course discusses issues related to distributed systems architecting, modeling, analysis and representation, with specific focus on the digital system engineering domain. Distributed modeling techniques and other model decomposition methods using simulation modeling and scalability issues will also be addressed.

Prerequisites

Sys Eng 6542.

Field Trip

Statement

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

Total: 3

Required for No

Majors

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. CAT entry
11. Peoplesoft

Approval Path

1. 03/12/23 6:55 pm  
David Enke  
(enke): Approved  
for RENG MNGT  
Chair
2. 03/13/23 4:23 pm  
Jennifer  
Pohlsander  
(jpnfd): Rollback  
to Initiator
3. 03/14/23 12:49  
pm  
David Enke  
(enke): Approved  
for RENG MNGT

Elective for Majors No

Justification for change:

SysEng 6541 Digital Engineering course builds on the knowledge gained in SysEng 6542 Model Based Engineering course. Hence, SysEng 6542 needs to be added as a prerequisite for SysEng 6541 and the number needs to change to SysEng 6543 to reflect the sequence of taking these two courses.

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer Comments

**jpnfd (03/13/23 4:23 pm):** Rollback: Course numbers cannot be switched or reused. Please resubmit form with a new unique course number.

**jpnfd (03/30/23 1:22 pm):** Updated prerequisite format.

**jpnfd (04/03/23 10:47 am):** Rollback: Rollback to department for new course number creation.

**jpnfd (04/03/23 12:47 pm):** Rollback: Update course number

**jpnfd (05/04/23 1:27 pm):** Effective date updated to Spring 2024 because course renumbering is an affecting change.

Key: 1917

Chair

4. 04/03/23 10:47 am  
Jennifer Pohlsander (jpnfd): Rollback to RENGMNGT Chair for CCC Secretary
5. 04/03/23 12:47 pm  
Jennifer Pohlsander (jpnfd): Rollback to Initiator
6. 04/03/23 1:06 pm  
David Enke (enke): Approved for RENGMNGT Chair
7. 04/03/23 2:25 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
8. 04/12/23 8:52 am  
Mark Fitch (mfitch): Approved for Engineering DSCC Chair
9. 04/18/23 10:10 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
10. 05/08/23 4:00 pm  
Jennifer Pohlsander

(jpnfd): Approved  
for CCC Meeting  
Agenda

11. 05/08/23 4:33 pm

Petra Dewitt

(dewittp):

Approved for

Campus Curricula

Committee Chair

## History

1. Nov 28, 2022 by  
dagli (1917.1)

# Course Change Request

Date Submitted: 03/15/23 11:18 am

Viewing: **TCH COM 5085 ~~4085~~ : Internship**

File: 2442.3

Last approved: 10/19/15 3:34 am

Last edit: 05/04/23 1:59 pm

Changes proposed by: kswenson

Requested Spring 2024 ~~01/12/2016~~

Effective Change

Date

Department English and Technical Communication

Discipline Technical Communication (TCH COM)

Course Number 5085 ~~4085~~

Title

Internship

Abbreviated Internship

Course Title

Catalog

Description

Internship will involve students applying critical thinking skills and discipline specific knowledge in a work setting based on a project designed by the advisor and employee. Activities will vary depending on the student's background and the setting. The course may be taken for undergraduate credit and/or graduate credit for up to 6 hours total.

Prerequisites

Must have completed 24 hours in the major core curriculum.

Field Trip

Statement

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

Total: 0-6

Required for No

Majors

In Workflow

1. **REGLISH 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. 03/15/23 11:32 am  
Kristine Swenson (kswenson):  
Approved for  
REGLISH Chair
2. 04/03/23 11:10 am  
Jennifer Pohlsander (jpnfd): Approved for  
CCC Secretary
3. 04/03/23 11:17 am  
Petra Dewitt

Elective for Yes ~~No~~  
Majors

Justification for  
change:

This course is largely taken by graduate students rather than undergraduates. A 5000-level designation is more accurate and will not require special permission paperwork for graduate students.

Semesters  
previously  
offered as an  
experimental  
course

Co-Listed  
Courses:

Course Reviewer  
Comments

**dewittp (04/03/23 11:17 am):** Changed to Yes for Elective for Majors.

Key: 2442

(dewittp):  
Approved for Arts  
& Humanities  
DSCC Chair  
4. 04/18/23 10:10  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post  
5. 05/08/23 4:00 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda  
6. 05/08/23 4:33 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

## History

1. Oct 19, 2015 by  
kswenson  
(2442.1)

## Program Change Request

Date Submitted: 04/06/23 12:20 pm

Viewing: **CP ENG-BS : Computer Engineering BS**

File: 153.82

Last approved: 09/26/22 8:20 am

Last edit: 04/13/23 3:57 pm

Changes proposed by: stanleyj

Catalog Pages Using this Program

[Computer Engineering](#)

Start Term

Fall 2023

Program Code

CP ENG-BS

Department

Electrical and Computer Engineering

Title

Computer Engineering BS

### Program Requirements and Description

### In Workflow

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

### Approval Path

1. 11/11/22 7:29 pm  
Jonathan Kimball (kimballjw):  
Approved for RELECENG Chair
2. 02/07/23 3:15 pm  
Jennifer Pohlsander (jpnfd): Rollback to RELECENG Chair for CCC Secretary
3. 04/05/23 11:43 am  
Jonathan Kimball (kimballjw):  
Rollback to Initiator
4. 04/06/23 12:21 pm  
Jonathan Kimball (kimballjw):  
Approved for RELECENG Chair
5. 04/13/23 3:59 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
6. 04/18/23 9:16 am  
Mark Fitch (mfitch):  
Approved for Engineering DSCC Chair
7. 04/18/23 10:09 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
8. 05/08/23 3:54 pm  
Jennifer Pohlsander (jpnfd): Approved

for CCC Meeting  
Agenda  
9. 05/08/23 4:31 pm  
Petra Dewitt  
(dewittp): Approved  
for Campus  
Curricula  
Committee Chair

## History

1. Aug 6, 2014 by Stanley (stanleyj)
2. Aug 13, 2014 by pantaleoa
3. Sep 21, 2015 by kleb6b
4. Apr 25, 2016 by Stanley (stanleyj)
5. Dec 1, 2016 by Stanley (stanleyj)
6. Sep 19, 2017 by Stanley (stanleyj)
7. Jun 18, 2018 by Stanley (stanleyj)
8. Nov 2, 2018 by Stanley (stanleyj)
9. May 2, 2019 by Stanley (stanleyj)
10. May 14, 2019 by ershenb
11. Mar 3, 2020 by Stanley (stanleyj)
12. May 2, 2022 by Stanley (stanleyj)
13. Sep 26, 2022 by Stanley (stanleyj)

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## Bachelor of Science Computer Engineering<sup>1</sup>

For the Bachelor of Science degree in Computer 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 Computer Engineering.

Electrical and Computer Engineering degree programs will require a minimum of 21 credit hours of humanities/social-sciences as specified below:

- [ENGLISH 1120](#)
- [HISTORY 1200](#) or [HISTORY 1300](#) or [HISTORY 1310](#) or [POL SCI 1200](#)
- [ECON 1100](#) or [ECON 1200](#)
- Technical Communication Elective: [ENGLISH 1160](#) or [ENGLISH 3560](#)
- [SP&M S 1185](#)
- The remaining minimum of 6 additional credit hours must be three-credit hour lecture courses offered in disciplines in the humanities and social sciences. Humanities courses are defined as those in: Art, English and Technical Communication, Etymology, Foreign Languages, Music, Philosophy, Speech and Media Studies, and Theatre. Social Sciences courses are defined as those in: Economics, History, Political Science, and Psychology. Study abroad courses may count as H/SS courses. H/SS courses numbered 2001, 3001, and 4001 (experimental courses) may also be used to complete these elective requirements.

Courses in business, education, information science and technology, or any other discipline not listed above will **not** satisfy the humanities/social

sciences elective requirement, although such courses may count toward general education requirements. Transfer credits from other universities in sociology and general humanities may count as humanities or social science electives.

The Computer 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. These interrelations are presented and discussed through classroom and laboratory instruction.

## Free Electives Footnote:

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.

<b>Freshman Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">FR ENG 1100</a> <sup>2</sup>	1	<a href="#">COMP SCI 1500</a>	3
<a href="#">MATH 1214</a> or <a href="#">1211</a> <sup>3,21</sup>	4	<a href="#">MATH 1215</a> <sup>3</sup>	4
<a href="#">CHEM 1310</a>	4	<a href="#">PHYSICS 1135</a> <sup>3,4</sup>	4
<a href="#">CHEM 1319</a>	1	<a href="#">ECON 1100</a> or <a href="#">1200</a>	3
<a href="#">HISTORY 1200</a> , or <a href="#">1300</a> , or <a href="#">1310</a> , or <a href="#">POL SCI 1200</a>	3	Elective-Hum or Soc (any level) <sup>5</sup>	3
<a href="#">ENGLISH 1120</a>	3		
	16		17
<b>Sophomore Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">ELEC ENG 2100</a> <sup>3,6,7</sup>	3	<a href="#">COMP ENG 2210</a> <sup>3,6,8</sup>	3
<a href="#">ELEC ENG 2101</a> <sup>3,6</sup>	1	<a href="#">COMP ENG 2211</a> <sup>3,6</sup>	1
<a href="#">MATH 2222</a> <sup>3</sup>	4	<a href="#">ELEC ENG 2120</a> <sup>3,7,9</sup>	3
<a href="#">COMP SCI 1570</a> <sup>3</sup>	3	<a href="#">MATH 3304</a> <sup>3</sup>	3
<a href="#">COMP SCI 1580</a> <sup>3</sup>	1	<a href="#">COMP SCI 1200</a> <sup>3</sup>	3
<a href="#">PHYSICS 2135</a> <sup>3,4</sup>	4	<a href="#">COMP SCI 1575</a>	3
	16		16
<b>Junior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">COMP ENG 3110</a> <sup>3,8</sup>	3	COMP ENG Elective A <sup>3,14</sup>	3
<a href="#">COMP ENG 3150</a> <sup>3,6,8</sup>	3	<a href="#">ELEC ENG 3410</a> <sup>3,6,9</sup>	3
<a href="#">COMP ENG 3151</a> <sup>3,6,8</sup>	1	<a href="#">COMP SCI 3800</a> or <a href="#">2500</a> <sup>3</sup>	3
<a href="#">ELEC ENG 2200</a> <sup>3,6,7</sup>	3	<a href="#">STAT 3117</a> <sup>12</sup>	3
<a href="#">ELEC ENG 2201</a> <sup>3,6,7</sup>	1	Communication Elective <sup>13</sup>	3
Mathematics Elective <sup>10</sup>	3		
<a href="#">SP&amp;M S 1185</a> <sup>13</sup>	3		
	17		15
<b>Senior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">COMP ENG 5410</a> <sup>3</sup>	3	COMP ENG Elective D <sup>3,15,16</sup>	3
COMP ENG Elective C <sup>3,19</sup>	3	COMP ENG Elective E <sup>3,15,16</sup>	3

<a href="#">COMP ENG 4096</a> <sup>3,17</sup>	1	<a href="#">COMP ENG 4097</a> <sup>3,17</sup>	3
Elective-Hum or Soc (any level) <sup>5</sup>	3	Professional Development Elective <sup>20</sup>	3
Engineering Science Elective <sup>11</sup>	3	Free Elective <sup>18</sup>	3
COMP ENG Elective B <sup>3,14</sup>	3		
	16		15
Total Credits: 128			

1

The minimum number of hours required for a degree in Computer Engineering is 128.

2

Students that transfer to Missouri S&T after their freshman year are not required to enroll in Foundational Engineering and Computing Seminars.

3

A minimum grade of "C" must be attained in [MATH 1214](#) or [MATH 1211](#), [MATH 1215](#), [MATH 2222](#), and [MATH 3304](#), [PHYSICS 1135](#) and [PHYSICS 2135](#) (or their equivalents), [COMP SCI 1570](#), [COMP SCI 1580](#), [COMP SCI 1575](#), [COMP SCI 1200](#), [COMP SCI 2500](#) or [COMP SCI 3800](#), [COMP ENG 2210](#), [COMP ENG 2211](#), [COMP ENG 3150](#), [COMP ENG 3151](#), [COMP ENG 3110](#), [COMP ENG 5410](#), [COMP ENG 4096](#), and [ELEC ENG 2100](#), [ELEC ENG 2101](#), [ELEC ENG 2120](#), [ELEC ENG 2200](#), [ELEC ENG 2201](#), and [ELEC ENG 3410](#) and the COMP ENG electives A, B, C, D and E. Also, students may not enroll in other courses that use these courses as prerequisites until the minimum grade of "C" is attained.

4

Students may take [PHYSICS 1111](#) and [PHYSICS 1119](#) in place of [PHYSICS 1135](#). Students may take [PHYSICS 2111](#) and [PHYSICS 2119](#) in place of [PHYSICS 2135](#).

5

All 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.

6

Students who drop a lecture course prior to the deadline to drop a class must also drop the corequisite lab course.

7

Students must earn a passing grade on the ELEC ENG Advancement Exam I (associated with [ELEC ENG 2100](#)) before they enroll in [ELEC ENG 2120](#) or [ELEC ENG 2200](#) and [ELEC ENG 2201](#).

8

Students must earn a passing grade on the COMP ENG Advancement Exam (associated with [COMP ENG 2210](#)) before they enroll in any course with [COMP ENG 2210](#) and [COMP ENG 2211](#) as prerequisites.

9

Students must earn a passing grade on the ELEC ENG Advancement Exam II (associated with [ELEC ENG 2120](#)) before they enroll in [ELEC ENG 3410](#).

10

Students must take one of the following courses:

[MATH 3108](#), [MATH 3109](#), [MATH 5302](#), [MATH 5603](#), [MATH 5105](#), [MATH 5106](#), [MATH 5107](#), [MATH 5108](#), [MATH 4209](#), [MATH 4211](#), [MATH 5215](#), [MATH 5222](#), [MATH 5325](#), [MATH 4530](#), [MATH 5737](#), [MATH 5351](#), [MATH 5154](#), [MATH 4096](#), [MATH 5483](#), [MATH 5585](#), [STAT 5644](#), [STAT 5346](#), [STAT 5353](#).

11

Students must take one of [MECH ENG 2340](#), [MECH ENG 2519](#), [MECH ENG 2527](#), [PHYSICS 2311](#), [PHYSICS 2401](#), [CHEM 2210](#), [BIO SCI 2213](#), [BIO SCI 2223](#), [CIV ENG 2200](#), [MECH ENG 2350](#), [PHYSICS 2305](#), [PHYSICS 4311](#), [CER ENG 4240](#), or [NUC ENG 3205](#).

12

Students may replace [STAT 3117](#) with [STAT 3115](#) or [STAT 5643](#).

13

Student must take [ENGLISH 3560](#) or [ENGLISH 1160](#). Students may replace [SP&M S 1185](#) with the ROTC sequence of [MIL ARMY 4250](#) and [MIL ARMY 4500](#) or [MIL AIR 4110](#) and [MIL AIR 4120](#)

14

Comp Eng Senior Electives A and B, respectively, must be selected from 4xxx or 5xxx courses in Comp Eng, except Comp Eng 4000, 4099, 4096, 4097, 5000, and 5099. The two courses selected for electives A and B, respectively, should be from two different Comp Eng emphasis areas. The emphasis areas, with course number options, are as follows:

Integrated Circuits and Logic Design: 42xx/52xx

Computational Intelligence 53xx

Computer Architecture and Embedded Systems: 41xx/51xx, 45xx/55xx, 46xx/56xx

Networking, Security, and Reliability: 44xx/54xx, except Comp Eng 5410

Students admitted to the Accelerated BS/MS program must satisfy Comp Eng Electives A and B with 5000 or 6000-level courses with a minimum grade of B.

15

Comp Eng Senior Electives D and E must be selected from an approved list that contains most 3xxx, 4xxx and 5xxx courses in science, mathematics, and engineering except required courses in Comp Eng, Elec Eng, and Comp Sci and except COMP SCI 3610 and COMP SCI 5600.

16

COMP ENG Electives D and E cannot include more than three hours of Comp Eng/Elec Eng 3002, Comp Eng/Elec Eng/Comp Sci 4000 or 4099.

17

Students pursuing dual degrees in COMP ENG and ELEC ENG may take either [COMP ENG 4096](#) or [ELEC ENG 4096](#) and [COMP ENG 4097](#) or [ELEC ENG 4097](#). Students may not receive credit for both [COMP ENG 4096](#) and [ELEC ENG 4096](#) or [COMP ENG 4097](#) and [ELEC ENG 4097](#) in the same degree program.

18

Students are required to take at least three credit hours. [ELEC ENG 2800](#) level, [ELEC ENG 4096](#), [ELEC ENG 4097](#), [COMP ENG 4096](#) and [COMP ENG 4097](#) may not be used for free electives. No more than one credit hour of [COMP ENG 3002](#) or [ELEC ENG 3002](#) may be applied to the BS degree for free electives.

19

Comp Eng Senior Elective C must be selected from 3xxx, 4xxx or 5xxx courses in Comp Eng, Elec Eng, or Comp Sci, except Comp Eng/Elec Eng/Comp Sci 3000, 4000, 4096, 4097, 4099, 5000, and 5099 and Comp Sci 4010, 3610 and 5600.

20

Students must take one of the following courses: [BUS 5980](#), [ECON 4430](#), [ECON 5337](#), [ENG MGT 2310](#), [ENG MGT 3320](#), [ENG MGT 4110](#), [ENG MGT 5514](#), [PHILOS 3225](#).

21

The course combination [MATH 1210](#) and [MATH 1211](#) may be taken in place of [MATH 1214](#).

An accelerated BS/MS program is optional.

## Emphasis Areas for Computer Engineering

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

### Computational Intelligence

Highly Recommended		
<a href="#">COMP ENG 5310</a>	Computational Intelligence	3
Suggested		
<a href="#">ELEC ENG 5330</a>	Fuzzy Logic Control	3
<a href="#">COMP ENG 5450</a>	Digital Image Processing	3
<a href="#">COMP ENG 5460</a>	Machine Vision	3

### Computer Architecture and Embedded Systems

Highly Recommended		
<a href="#">COMP ENG 5110</a>	Principles of Computer Architecture	3
<a href="#">COMP ENG 5120</a>	Digital Computer Design	3
<a href="#">COMP ENG 5151</a>	Digital Systems Design Laboratory	3
<a href="#">COMP ENG 5160</a>	Embedded Processor System Design	3
<a href="#">COMP ENG 5170</a>	Real-Time Systems	3
Suggested		
<a href="#">COMP ENG 5610</a>	Real-Time Digital Signal Processing	3
<a href="#">COMP ENG 5130</a>	Advanced Microcomputer System Design	3
<a href="#">ELEC ENG 3100</a>	Electronics I	3
<a href="#">COMP SCI 3100</a>	Software Engineering I	3

### Integrated Circuits and Logic Design

Highly Recommended		
<a href="#">COMP ENG 2210</a>	Introduction to Digital Logic	3
<a href="#">COMP ENG 5210</a>	Introduction To VLSI Design	3
<a href="#">COMP ENG 5220</a>	Digital System Modeling	3

Suggested		
<a href="#">ELEC ENG 3100</a>	Electronics I	3
<a href="#">COMP ENG 5110</a>	Principles of Computer Architecture	3
<a href="#">COMP ENG 5151</a>	Digital Systems Design Laboratory	3
<a href="#">COMP ENG 5120</a>	Digital Computer Design	3
<a href="#">COMP ENG 5130</a>	Advanced Microcomputer System Design	3
<a href="#">COMP ENG 5510</a>	Fault-Tolerant Digital Systems	3

## Networking, Security, and Dependability

Highly Recommended		
<a href="#">COMP ENG 5420</a>	Introduction to Network Security	3
<a href="#">COMP ENG 5430</a>	Wireless Networks	3
Suggested		
<a href="#">COMP ENG 5510</a>	Fault-Tolerant Digital Systems	3

## Accelerated BS/MS Program Option for EE and CpE Majors

Electrical engineering or computer engineering undergraduates in ECE at Missouri S&T may opt to apply for an accelerated BS/MS ECE program where a student can achieve both degrees faster than if pursuing the degrees separately. The degrees may be BS EE and MS EE, BS CpE and MS CpE, BS EE and MS CpE, or BS CpE and MS EE. The benefits of the program for admitted students are:

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

To be eligible for the accelerated BS/MS ECE program, an EE or CpE undergraduate must be at or beyond the junior level with a minimum of 60 credit hours and must have completed 18 credit hours of EE and/or CpE courses at Missouri S&T with at least a 3.50 GPA in the ECE courses. To be admitted, the student must complete the program application and must have the recommendation of an ECE faculty member who agrees to serve as the graduate thesis advisor. No other MS degree requirements are changed. The MS degree must be for the thesis option. The program may be combined with existing honors research and emphasis area options. Admitted students will have both undergraduate and graduate records in the Registrar's Office.

The Accelerated program application must be completed within one semester after the shared-credit courses are completed. Courses taken for shared credit will be identified on this application form and on Graduate Form 1, which is submitted after the student enters the graduate program. The nine hours of shared-credit coursework will be taken as undergraduate credit, and may not be undergraduate research, special problems, or transfer courses (a co-listed course can only apply for these undergraduate requirements if it is under an EE or CpE registration. Note that the choice of EE or CpE registration may affect how a course can apply within an MS program.) An additional nine credit hours of coursework for graduate credit (beyond the shared BS/MS credits) can be taken while in the undergraduate program by applying for dual undergraduate/graduate enrollment. Taking additional courses for graduate credit will require formal application to the graduate program. Acceptance to the MS degree from the Accelerated Program is automatic so long as the student meets ECE graduate student academic performance requirements. To remain in the program, the student must maintain good standing within the undergraduate EE or CpE program and must maintain continuous enrollment at Missouri S&T. If the student exits the program before completion of the MS degree requirements or fails to maintain continuous enrollment at Missouri S&T, the shared-credit courses may not apply toward graduate requirements in the event of future readmission.

The student is responsible for checking on how dual-enrollment status and graduate coursework will affect scholarships and other financial aid. Once you become a graduate student, you **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 an accelerated BS/MS to ensure immigration status will be maintained throughout the program.

### Justification for request

The Electrical and Computer Engineering faculty approved (4/5/23) changes to the Computer Engineering BS degree program Senior Electives. Senior Electives A and B require students to take Comp Eng 4xxx or 5xxx courses in two

different emphasis areas (see footnote 14) with course number ranges specified for each emphasis area. This change is made to promote Computer Engineering BS students to obtain greater breadth of knowledge in core computer engineering emphasis areas. Senior Electives CDE match up with the previous Senior Electives A, D, and E. Wording changes in the new Senior Electives CDE have been made to accommodate for Comp Sci course number changes and to include Comp Eng/Elec Eng 3002 options and credit hour restrictions (3) toward Senior Electives D and E.

Footnote 14 has also been updated to specify Senior Elective requirements (A and B) toward the Accelerated BS/MS program.

Supporting Documents

Course Reviewer Comments

**jpnfd (02/07/23 3:15 pm):** Rollback: Rolled back for further review by the department and to update the justification.

**kimballjw (04/05/23 11:43 am):** Rollback: Need to update per recent department vote.

**jpnfd (04/13/23 3:50 pm):** Updated footnote format.

**jpnfd (04/13/23 3:57 pm):** Updated course format in footnotes.

## Program Change Request

Date Submitted: 03/02/23 3:02 pm

Viewing: **ECON-BA : Economics BA**

File: 38.33

Last approved: 06/10/21 4:07 pm

Last edit: 04/14/23 10:41 am

Changes proposed by: davismc

Catalog Pages Using this Program

[Economics](#)

Start Term

Fall ~~2023~~ 2024

Program Code

ECON-BA

Department

Economics

Title

Economics BA

### Program Requirements and Description

### In Workflow

1. RECONOMI 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

### Approval Path

1. 03/03/23 10:16 pm  
Melody Lo (mlc2d):  
Approved for  
RECONOMI Chair
2. 03/10/23 11:54 am  
Jennifer Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 03/10/23 12:12 pm  
Cecil Eng Huang  
Chua (cchua):  
Approved for Social  
Sciences DSCC  
Chair
4. 03/22/23 10:05 am  
Jennifer Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post
5. 04/06/23 9:51 am  
Jennifer Pohlsander  
(jpnfd): Rollback to  
RECONOMI Chair  
for CCC Meeting  
Agenda
6. 04/06/23 4:43 pm  
Melody Lo (mlc2d):  
Approved for  
RECONOMI Chair
7. 04/10/23 12:03 pm  
Jennifer Pohlsander  
(jpnfd): Rollback to  
RECONOMI Chair  
for CCC Secretary
8. 04/12/23 12:24 pm  
Melody Lo (mlc2d):

- Approved for  
RECONOMI Chair
- 9. 04/14/23 10:55 am  
Jennifer Pohlsander  
(jpnfd): Approved  
for CCC Secretary
- 10. 04/14/23 11:57 am  
Cecil Eng Huang  
Chua (cchua):  
Approved for Social  
Sciences DSCC  
Chair
- 11. 04/18/23 10:09 am  
Jennifer Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post
- 12. 05/08/23 3:55 pm  
Jennifer Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda
- 13. 05/08/23 4:32 pm  
Petra Dewitt  
(dewittp): Approved  
for Campus  
Curricula  
Committee Chair

## History

1. Aug 14, 2014 by  
Lahne Black (lahne)
2. Jul 20, 2015 by  
pantaleoa
3. Nov 18, 2015 by  
Marcy Scott  
(marcys)
4. Aug 14, 2017 by  
Crystal Wilson  
(wilsoncry)
5. Jun 18, 2018 by  
Marcy Scott  
(marcys)
6. Jun 10, 2021 by  
Michael Davis  
(davismc)

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## Bachelor of Arts Economics

In addition to the general university requirements for a bachelor of arts degree, a student must complete:

1. [ECON 1100](#), [ECON 1200](#), [ECON 2100](#), [ECON 2200](#), [ECON 3300](#) ~~ECON-2100~~ and [ECON 3333](#) ~~ECON-2200~~ with a minimum grade of "C" in each.
2. At least ~~12~~ **18** additional hours of economics electives, at or above the 2000 level, with a minimum grade of "C" in each.
3. [BUS 1210](#); and [STAT 3111](#), ~~STAT-1115~~ or ~~ECON-1300~~; and ~~ECON-4300~~.

[Specific requirements for the Bachelor of Arts degree are outlined in the sample program listed below.](#)

<b>Freshman Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<u>ECON 1100<sup>1</sup></u>	<u>3</u>	<u>ECON 1200<sup>1</sup></u>	<u>3</u>
<u>BIO SCI 1113, or 1173, or 1223, or 1943</u>	<u>3</u>	<u>HISTORY 1100</u>	<u>3</u>
<u>ENGLISH 1120</u>	<u>3</u>	<u>MATH 1212</u>	<u>4</u>
<u>MATH 1140</u>	<u>3</u>	<u>Social Sciences (Political Science, Psychology or Sociology)</u>	<u>3</u>
		<u>COMP SCI 1972</u>	<u>2</u>
		<u>COMP SCI 1982</u>	<u>1</u>
	12		16
<b>Sophomore Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<u>ECON 2100<sup>1</sup></u>	<u>3</u>	<u>ECON 2200<sup>1</sup></u>	<u>3</u>
<u>ENGLISH 1211, or 1212, or 1221, or 1222, or 1223, or 1231, or 2230</u>	<u>3</u>	<u>Chemistry, Geology, Geophysics or Physics</u>	<u>3</u>
<u>HISTORY 1200</u>	<u>3</u>	<u>ART 1180, or 1185, or MUSIC 1150, or THEATRE 1190</u>	<u>3</u>
<u>Foreign Language</u>	<u>4</u>	<u>FOREIGN LANGUAGE</u>	<u>4</u>
<u>STAT 3111</u>	<u>3</u>	<u>BUS 1210</u>	<u>3</u>
	16		16
<b>Junior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<u>ECON 3300<sup>1</sup></u>	<u>3</u>	<u>ECON 3333<sup>1</sup></u>	<u>3</u>
<u>Any Philosophy</u>	<u>3</u>	<u>Social Sciences (Political Science, Psychology or Sociology)</u>	<u>3</u>
<u>Social Sciences (Political Science, Psychology or Sociology)</u>	<u>3</u>	<u>Economics Elective<sup>2</sup></u>	<u>3</u>
<u>Economics Elective<sup>2</sup></u>	<u>3</u>	<u>Any course in Literature, Philosophy or Arts</u>	<u>3</u>
<u>Free Elective</u>	<u>4</u>	<u>FOREIGN LANGUAGE</u>	<u>4</u>
	16		16
<b>Senior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<u>Economics Elective<sup>2</sup></u>	<u>3</u>	<u>Economics Elective<sup>2</sup></u>	<u>3</u>
<u>Social Sciences (Political Science, Psychology or Sociology)</u>	<u>3</u>	<u>Free Elective</u>	<u>10</u>
<u>Free Electives</u>	<u>9</u>		
	15		13
Total Credits: 120			

<sup>1</sup>  
= A grade of C or better is required for ECON 1100, ECON 1200, ECON 2100, ECON 2200, ECON 3300 and ECON 3333.

<sup>2</sup>  
= Must be 2000 level or higher, with a minimum grade of C.

### Decision Data Analytics Emphasis

<u>Junior and Senior Years</u>			
<u>ECON 5350</u>	<u>Course ECON 5350 Not Found</u>		<u>3</u>

[ECON 5360](#)

[Course ECON 5360 Not Found](#)

3

**Financial Bachelor of Arts Economics and Technology Emphasis**

Junior and Senior Years

[ECON 4383](#)

[Course ECON 4383 Not Found](#)

3

[ECON 5337](#)

[Financial Mathematics](#)

3

[ECON 5360](#)

[Course ECON 5360 Not Found](#)

3

**Energy Economics Emphasis**

Junior and Senior Years

[ECON 4440](#)

[Environmental And Natural Resource Economics](#)

3

[ECON 4540](#)

[Energy Economics](#)

3

Choose one of the following courses:

[ECON 3512](#)

[Mining Industry Economics](#)

3

[ECON 5532](#)

[Advanced Mining Economics](#)

3

Choose one of the following courses:

[ENG MGT 5513](#)

[Energy and Sustainability Management Engineering](#)

3

[CIV ENG 5642](#)

[Sustainability, Population, Energy, Water, and Materials](#)

3

**Bachelor of Arts Economics (Secondary Education Emphasis Emphasis Area)**

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

Students interested in this emphasis area should consult with the minor advisor in the economics department.

In order to successfully complete this emphasis area, students must attain at least a 3.0 GPA in content courses and professional education courses. Students must also meet all requirements listed under the teacher education section of this catalog. Students who do not meet all the teacher certification requirements will not be eligible for the secondary education emphasis area, even if they have completed all course work.

A degree in this emphasis area requires 135-137 credit hours. The required courses are provided below. A minimum grade of "C" is required by the department in all mathematics and statistics courses counted toward this degree.

Communications Skills: 9 semester hours		
<a href="#">ENGLISH 1120</a>	Exposition And Argumentation	3
<a href="#">ENGLISH 1160</a>	Writing And Research	3
or <a href="#">ENGLISH 3560</a>	Technical Writing	
<a href="#">SP&amp;M S 1185</a>	Principles Of Speech	3
Humanities: 9 semester hours		
Must include 9 hours from each of the following 3 areas: Art, Music or Theatre, Philosophy, Literature		9
Social Sciences: 21 semester hours		
<a href="#">HISTORY 1300</a>	American History To 1877	3
<a href="#">HISTORY 1310</a>	American History Since 1877	3
<a href="#">HISTORY 2110</a>	World Regional Geography	3
<a href="#">HISTORY 4435</a>	History of the American West	3
<a href="#">POL SCI 1200</a>	American Government	3
<a href="#">PSYCH 1101</a>	General Psychology	3
<a href="#">PSYCH 4600</a>	Social Psychology	3

Natural Sciences: 7 semester hours (including 1 lab)		
Physics or Geology w/Lab		4
<a href="#">BIO SCI 1113</a>	General Biology	3
Mathematics: 3 semester hours		
<a href="#">MATH 1120</a>	College Algebra	3-5
or <a href="#">MATH 1140</a>	College Algebra	
or higher		
Professional Requirements: 23 semester hours		
<a href="#">EDUC 1040</a>	Perspectives In Education	2
<a href="#">EDUC 1174</a>	School Organization and Administration For Teachers	2
<a href="#">EDUC 3216</a>	Instructional Literacy in the Content Area	3
<a href="#">EDUC 3280</a>	Instructional Strategies in the Content Area	3
<a href="#">EDUC 4298</a>	Student Teaching Seminar	1
<a href="#">ENGLISH 3170</a>	Teaching And Supervising Reading and Writing	3
<a href="#">PSYCH 2300</a>	Educational Psychology	3
or <a href="#">EDUC 2102</a>	Educational Psychology	
<a href="#">PSYCH 3310</a>	Developmental Psychology	3
<a href="#">PSYCH 4310</a>	Psychology Of The Exceptional Child	3
or <a href="#">EDUC 2310</a>	Education Of The Exceptional Child	
Clinical Experience: 15 semester hours		
<a href="#">EDUC 1104</a>	Teacher Field Experience I	1
<a href="#">EDUC 1164</a>	Teacher Field Experience II	2
<a href="#">EDUC 4299</a>	Student Teaching	12
Economics: 30 semester hours		
<a href="#">ECON 1100</a>	Principles Of Microeconomics	3
<a href="#">ECON 1200</a>	Principles Of Macroeconomics	3
<a href="#">ECON 2100</a>	Intermediate Microeconomic Theory	3
<a href="#">ECON 2200</a>	Intermediate Macroeconomic Theory	3
<a href="#">ECON 4300</a>	Research Methods and Applications in Economics and Business	3
Econ Electives (3000 or 4000 level)		12
<a href="#">BUS 1210</a>	Financial Accounting	3
Certification: 18 semester hours		
Am History (from approved DESE list)		6
European History (from approved DESE list)		9
Upper Pol Sci (from approved DESE list)		3

#### Justification for request

The addition of two more mathematical courses (ECON 3300 and ECON 3333) makes the program more quantitative, though not as quantitative as the new version of the BS. The stylistic changes are to make the program look like the BS degree.

#### Supporting Documents

[Econ-Emphasis.pdf](#)

[MST PC January 2023.pdf](#)

#### Course Reviewer Comments

**jpnfd (03/08/23 1:43 pm):** CIP code changed from CIP 450601 to CIP 450603.

**jpnfd (03/08/23 1:46 pm):** Updated term to Fall 2023.

**jpnfd (03/09/23 2:49 pm):** Sophomore year first semester- Added "or Econ 1300" to Stat 3111. Added footnote 3- Must be 2000 level or higher, with a minimum grade of C. Per department, revisions to the secondary education emphasis will be submitted once necessary approvals are received (DESE).

**jpnfd (04/06/23 9:51 am):** Rollback: Rolled back for revisions.

**davismc (04/06/23 3:42 pm):** Made the following changes: 1. Comp Sci 1971 and 1981 to replace IST courses (also removed old footnote 2 and footnote 3 became footnote 2) 2. Removed Lab requirement and SP&M 1185 and replaced with 4 free electives. 3. Changed Geo Eng to Geophysics. 4. Removed Econ 1300 from bullet point 3.

**davismc (04/06/23 4:35 pm):** Updated the Stat course.

**jpnfd (04/10/23 11:33 am):** Document attached regarding Econ BA & BS emphasis areas.

**jpnfd (04/10/23 11:38 am):** Added MDHE approval.

**jpnfd (04/10/23 12:03 pm):** Rollback: Add emphasis areas.

**davismc (04/11/23 4:10 pm):** Added the Emphasis areas.

**jpnfd (04/14/23 10:41 am):** Updated Comp Sci courses to Comp Sci 1972 & 1982.

## Program Change Request

Date Submitted: 02/28/23 11:58 am

Viewing: **ECON-BS : Economics BS**

File: 39.31

Last approved: 06/10/21 4:07 pm

Last edit: 04/07/23 8:37 am

Changes proposed by: davismc

Catalog Pages Using this Program

[Economics](#)

Start Term

Fall ~~2023~~ 2024

Program Code

ECON-BS

Department

Economics

Title

Economics BS

### Program Requirements and Description

### In Workflow

1. RECONOMI 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

### Approval Path

1. 02/28/23 2:17 pm  
Melody Lo (mlc2d):  
Approved for  
RECONOMI Chair
2. 03/10/23 11:54 am  
Jennifer Pohlsander (jpnfd): Approved  
for CCC Secretary
3. 03/10/23 12:12 pm  
Cecil Eng Huang  
Chua (cchua):  
Approved for Social  
Sciences DSCC  
Chair
4. 03/22/23 10:05 am  
Jennifer Pohlsander (jpnfd): Approved  
for Pending CCC  
Agenda post
5. 04/06/23 9:52 am  
Jennifer Pohlsander (jpnfd): Rollback to  
RECONOMI Chair  
for CCC Meeting  
Agenda
6. 04/06/23 4:11 pm  
Melody Lo (mlc2d):  
Approved for  
RECONOMI Chair
7. 04/13/23 3:27 pm  
Jennifer Pohlsander (jpnfd): Approved  
for CCC Secretary
8. 04/13/23 3:47 pm  
Cecil Eng Huang  
Chua (cchua):

- Approved for Social Sciences DSCC Chair
- 9. 04/18/23 10:09 am Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
- 10. 05/08/23 3:55 pm Jennifer Pohlsander (jpnfd): Approved for CCC Meeting Agenda
- 11. 05/08/23 4:32 pm Petra Dewitt (dewittp): Approved for Campus Curricula Committee Chair

### History

- 1. May 28, 2015 by pantaleoa
- 2. May 28, 2015 by pantaleoa
- 3. Nov 18, 2015 by Marcy Scott (marcys)
- 4. Aug 14, 2017 by Crystal Wilson (wilsoncry)
- 5. Jun 10, 2021 by Michael Davis (davismc)

## Bachelor of Science Economics

In addition to Economics, the general university requirements for a bachelor Bachelor of science degree, a student must complete: ~~Science degrees consist of 120 credit hours.~~

1. ECON 1100, ECON 1200, ECON 2100, ECON 2200, ECON 3300, ECON 3333, and ECON 4538 with a minimum grade of "C" in each.
2. ~~First, all undergraduate students in Economics are required to complete a prescribed General Education Requirements Core that corresponds to the recommendations of the Missouri State Coordinating Board for Higher Education and consists of 42 credit hours in the areas of Individual Expression, Natural Systems, and Human Institutions. In addition, there are a required 24 credit hour core consisting of courses in Information Technology, Management, Quantitative Skills, and Communication Skills. Finally, each degree includes 28 credit hours of free electives. The remaining 33 credit hours of the required 120 credit hours for the Economics degree are divided into a prescribed 15 credit hour degree core (ECON 1100, 1200, 2100, 2200 and 4300) and 18 credit hours of specific degree electives. At least 9 additional hours A minimum grade of economics electives, at or above "C" is required in the 2000 level, with a minimum grade of "C" in each. 15 credit core courses.~~
3. BUS 1210, ENG MGT 2110, and STAT 3111.

Specific requirements for the Bachelor of Science degree are outlined in the sample program listed below.

Freshman Year			
First Semester	Credits	Second Semester	Credits
<u>ECON 1100<sup>3</sup></u>	3	<u>ECON 1200<sup>3</sup></u>	3

<a href="#">ENGLISH 1120</a> <sup>1</sup>	3	<a href="#">HISTORY 1200, or 1300, or 1310</a>	<u>3</u>
<a href="#">BIO SCI 1113, or 1173, or 1223, or 1943</a>	3	<a href="#">MATH 1212</a>	4
Lab w/Living or Physical Science Course	1	History	3
<a href="#">MATH 1140</a>	3	<a href="#">PSYCH 1101</a>	3
		<a href="#">IS&amp;T 1551, or 1561, or COMP SCI 1971</a> <sup>4</sup>	3
		OR	-
		<a href="#">COMP SCI 1980 or 1984</a>	-
	13		16
<b>Sophomore Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">ECON 2100</a> <sup>3</sup>	3	<a href="#">ECON 2200</a> <sup>3</sup>	3
<a href="#">SP&amp;M S 1185</a>	3	Chemistry, Geology, Geophysics, or Physics	3
<a href="#">ENGLISH 1211, or 1212, or 1231, or 1221, or 1222, or 2230, or 1223</a>	3	<a href="#">ART 1180, or 1185, or MUSIC 1150, or THEATRE 1190</a>	3
<a href="#">STAT 3111</a>	3	<a href="#">BUS 1210</a>	3
Free Elective	3	Free Electives	3
	15		15
<b>Junior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">ECON 3300</a> <sup>3</sup>	<u>3</u>	<a href="#">SP&amp;M S 2184</a>	3
<a href="#">ENGLISH 1600</a>	3	Economics Electives <sup>2</sup>	6
<a href="#">FINANCE 2150</a>	3	<a href="#">ECON 3333</a> <sup>3</sup>	<u>3</u>
<a href="#">POL SCI 1200</a>	3	<a href="#">Culture, Society and Religion</a> <sup>2</sup>	<u>3</u>
<del>Economics Elective<sup>2</sup></del>	6	<a href="#">Economics Electives</a> <sup>5</sup>	<u>3</u>
<a href="#">ENG MGT 2110</a>	<u>3</u>	Free Elective	6
<a href="#">Economics Elective</a> <sup>5</sup>	<u>3</u>		
	15		15
<b>Senior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">Culture, Sociology, Religion</a> <sup>3</sup>	3	Economics Elective <sup>5</sup>	3
<a href="#">Economics Electives</a> <sup>2</sup>	3	<a href="#">ECON 4300</a>	3
<a href="#">ECON 4538</a> <sup>3</sup>	<u>3</u>	Free Electives	13
Free Electives	12		
	15		16
Total Credits: 120			

1

In-Major Writing Intensive

2

One of [ECON 3830](#), [ENGLISH 2242](#), [ENGLISH 2245](#), [ENGLISH 2410](#), [ENGLISH 3215](#), [ENGLISH 4290](#), Foreign Language Beyond Second Semester, [HISTORY 3321](#), [PHILOS 3225](#), [PHILOS 3235](#), [PHILOS 1175](#), [PHILOS 4340](#), Any Political Science, [PSYCH 4600](#), [PSYCH 4992](#), Any Sociology, [SP&M S 3235](#).

3

A Grade of "C" or better is required for [ECON 1100](#), [ECON 1200](#), [ECON 2100](#), [ECON 2200](#), [ECON 3300](#), [ECON 3333](#) and [ECON 4538](#).

4

[COMP SCI 1971](#) must also include [COMP SCI 1981](#).

Must be 2000 level or higher, with a minimum grade of C.

### Decision Data Analytics Emphasis

<u>Junior and Senior Years</u>		
<u>ECON 5350</u>	<u>Course ECON 5350 Not Found</u>	<u>3</u>
<u>ECON 5360</u>	<u>Course ECON 5360 Not Found</u>	<u>3</u>

### Financial Economics and Technology Emphasis

<u>Junior and Senior Years</u>		
<u>ECON 4383</u>	<u>Course ECON 4383 Not Found</u>	<u>3</u>
<u>ECON 5337</u>	<u>Financial Mathematics</u>	<u>3</u>
<u>ECON 5360</u>	<u>Course ECON 5360 Not Found</u>	<u>3</u>

### Energy Economics Emphasis

<u>Junior and Senior Years</u>		
<u>ECON 4440</u>	<u>Environmental And Natural Resource Economics</u>	<u>3</u>
<u>ECON 4540</u>	<u>Energy Economics</u>	<u>3</u>
<u>Choose one of the following courses:</u>		
<u>ECON 3512</u>	<u>Mining Industry Economics</u>	<u>3</u>
<u>ECON 5532</u>	<u>Advanced Mining Economics</u>	<u>3</u>
<u>Choose one of the following courses:</u>		
<u>ENG MGT 5513</u>	<u>Energy and Sustainability Management Engineering</u>	<u>3</u>
<u>CIV ENG 5642</u>	<u>Sustainability, Population, Energy, Water, and Materials</u>	<u>3</u>

~~The Economics degree requires courses in advanced Micro, Macro and Statistics. The electives for this degree consist of courses from areas such as Law and Economics, Money and Banking, Energy Economics and E-Commerce.~~

#### Justification for request

The changes that have taken place are of three different types. The first is adding the emphasis areas that did not exist before and have been approved by MDHE. The second is making the curriculum more quantitative by requiring three econometric courses (3300, 3333 and 4538) in place of just one before (4300). This specific change coincides with the recently approved CIP code change from 45.0601 (Economics, General) to 45.0603 (Econometrics & Quantitative Economics), which will allow S&T's Economics to be designated as a science, technology, engineering, and mathematics (STEM) discipline. The last changes are just to clean up some issues not related to the current changes.

#### Supporting Documents

[Econ-Emphasis.pdf](#)

[MST PC January 2023.pdf](#)

[Substantive Curriculum Change Criteria \(11-17-2022\).pdf](#)

[Email MHHEWD Approval.pdf](#)

#### Course Reviewer Comments

**jpnfd (03/08/23 1:46 pm):** Updated term to Fall 2023.

**jpnfd (03/09/23 2:39 pm):** Sophomore year first semester- Added "or Econ 1300" to Stat 3111. Added Footnote 5: Must be 2000 level or higher, with a minimum grade of C.

**jpnfd (03/24/23 10:13 am):** Omitted extra comma to correct typo.

**jpnfd (04/03/23 10:19 am):** Attached documentation.

**jpnfd (04/06/23 9:52 am):** Rollback: Rolled back for revisions

**davismc (04/06/23 3:08 pm):** Made the three suggested changes: Removed Econ 1300, changed Geo Eng to Geophysics and changed footnote 2.



# Program Change Request

A deleted record cannot be edited

## Program Deactivation Proposal

Date Submitted: 04/02/23 6:38 pm

Viewing: **ECON-MI : Economics Minor**

File: 221.4

Last approved: 05/07/14 10:37 am

Last edit: 05/05/23 1:57 pm

Changes proposed by: mlc2d

Catalog Pages Using this Program

[Economics](#)

Start Term

Fall ~~2014~~ **2023**

Program Code

ECON-MI

Department

Economics

Title

Economics Minor

## Program Requirements and Description

### In Workflow

1. **RECONOMI Chair**
2. **CCC Secretary**
3. **Pending CCC Agenda post**
4. **CCC Meeting Agenda**
5. **Campus Curricula Committee Chair**
6. **FS Meeting Agenda**
7. **Faculty Senate Chair**
8. **Registrar**

### Approval Path

1. 04/03/23 11:32 am  
Melody Lo (mlc2d):  
Approved for  
RECONOMI Chair
2. 04/13/23 3:28 pm  
Jennifer Pohlsander (jpnfd): Approved  
for CCC Secretary
3. 04/18/23 10:09 am  
Jennifer Pohlsander (jpnfd): Approved  
for Pending CCC  
Agenda post
4. 05/08/23 3:55 pm  
Jennifer Pohlsander (jpnfd): Approved  
for CCC Meeting  
Agenda
5. 05/08/23 4:32 pm  
Petra Dewitt (dewittp): Approved  
for Campus  
Curricula  
Committee Chair

### History

1. May 7, 2014 by  
[Lahne Black \(lahne\)](#)
2. May 7, 2014 by  
[Lahne Black \(lahne\)](#)
3. May 7, 2014 by  
[Lahne Black \(lahne\)](#)

## Economics Minor

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Students majoring in other disciplines are encouraged to develop a minor in economics. The formal minor in economics is designed to provide students with a solid understanding of economic principles and concepts and the ability to apply this knowledge to a host of economic, public policy and business problems. This program will be of particular benefit to those students whose major field of study may lead them to pursue a management position or later graduate studies in business.

The minor in economics requires the completion of a minimum of 15 hours of economics course work with a grade of "C" or better. Required courses in the minor program include both [ECON 1100](#) and [ECON 1200](#) and at least one of the intermediate theory courses, [ECON 2100](#) and/or [ECON 2200](#). The choice of which intermediate theory course depends on which 300 level economic electives the student, in consultation with the department's minor advisor, selects for their program.

### Justification for request

The intent is to streamline the economics curriculum and offer non-economics majors (including business, engineering, and science students) the most valuable economics minor – quantitative economics minor, to strengthen their competitiveness in the job markets.

### Supporting Documents

### Course Reviewer Comments

**jpnfd (05/05/23 1:57 pm):** Updated term to Fall 23

## Program Change Request

Date Submitted: 03/19/23 12:42 pm

Viewing: **ENG MG-BS : Engineering Management BS**

File: 44.45

Last approved: 06/14/22 9:37 am

Last edit: 05/05/23 2:04 pm

Changes proposed by: schumanj

Catalog Pages Using this Program

[Engineering Management](#)

Start Term

Fall ~~2022~~ 2023

Program Code

ENG MG-BS

Department

Engineering Management and Systems Engineering

Title

Engineering Management BS

### Program Requirements and Description

### In Workflow

1. RENG MNGT 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

### Approval Path

1. 03/19/23 1:35 pm  
David Enke (enke):  
Approved for  
RENG MNGT Chair
2. 04/13/23 4:07 pm  
Jennifer Pohlsander (jpnfd): Approved  
for CCC Secretary
3. 04/18/23 9:16 am  
Mark Fitch (mfitch):  
Approved for  
Engineering DSCC  
Chair
4. 04/18/23 10:09 am  
Jennifer Pohlsander (jpnfd): Approved  
for Pending CCC  
Agenda post
5. 05/08/23 3:55 pm  
Jennifer Pohlsander (jpnfd): Approved  
for CCC Meeting  
Agenda
6. 05/08/23 4:32 pm  
Petra Dewitt (dewittp): Approved  
for Campus  
Curricula  
Committee 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 ershenb
- 10. Apr 6, 2022 by Stephen Raper (sraper)
- 11. Jun 14, 2022 by Jennifer Pohlsander (jpnfd)

## Bachelor of Science Engineering Management

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 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.

The bachelor of science degree in engineering management requires a minimum of ~~121~~ **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
<a href="#">FR ENG 1100</a>	1	<a href="#">MECH ENG 1720</a>	3

<a href="#">CHEM 1310</a> <sup>1</sup>	4	<a href="#">MATH 1215</a> or <a href="#">1221</a> <sup>1</sup>	4
<a href="#">CHEM 1319</a>	1	<a href="#">PHYSICS 1135</a> <sup>1</sup>	4
<a href="#">CHEM 1100</a>	1	<a href="#">ECON 1100</a> or <a href="#">1200</a>	3
<a href="#">MATH 1214</a> or <a href="#">1211</a> <sup>1</sup>	4	<del>COMP SCI 1972, or 1570, or 1974</del> <sup>1,6</sup>	<del>2</del>
<a href="#">ENGLISH 1120</a>	3	<del>COMP SCI 1982 or 1984</del> <sup>6</sup>	<del>4</del>
<a href="#">HISTORY 1200</a> , or <a href="#">1300</a> , or <a href="#">1310</a> , or <a href="#">POL SCI 1200</a>	3	<a href="#">Programming Elective</a> <sup>3</sup>	<u>3</u>
	17		17
<b>Sophomore Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">MATH 2222</a> <sup>1</sup>	4	<a href="#">MATH 3304</a> <sup>1</sup>	3
<a href="#">PHYSICS 2135</a> <sup>1</sup>	4	<a href="#">STAT 3115</a> or <a href="#">3117</a> <sup>1</sup>	3
<a href="#">CIV ENG 2200</a> <sup>1</sup>	3	<a href="#">ENG MGT 2110</a> <sup>1</sup>	3
<a href="#">ENG MGT 1210</a> <sup>1</sup>	2	<a href="#">ENG MGT 2211</a> <sup>1</sup>	3
<a href="#">ENG MGT 2310</a> <sup>1</sup>	3	<del>MECH ENG 2350</del>	<del>2</del>
		<a href="#">PSYCH 1101</a>	3
	16		15
<b>Junior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">ENG MGT 3310</a> <sup>1</sup>	3	<a href="#">ENG MGT 4710</a> <sup>1</sup>	3
<a href="#">CIV ENG 2210</a>	3	<a href="#">MECH ENG 2527</a>	3
<del>CIV ENG 2214</del>	<del>4</del>	<del>ELEC ENG 2800</del>	<del>3</del>
<a href="#">ENG MGT 3510</a> <sup>1</sup>	3	<a href="#">ENGLISH 3560</a> or <a href="#">1160</a>	3
<a href="#">SP&amp;M S 1185</a>	3	<a href="#">ENG MGT 3320</a> <sup>1</sup>	3
Humanities and Social Sciences <sup>2</sup>	3	<a href="#">MECH ENG 2350</a>	<u>2</u>
	15		14
<b>Senior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
Emphasis Area Required Course	3	ENG MGT Technical Elective	3
Emphasis Area Required Course	3	Emphasis Area Required Course	3
Emphasis Area Required Course	3	<a href="#">ENG MGT 4907</a> <sup>1</sup>	3
<a href="#">ENG MGT 4110</a> <sup>1</sup>	3	Upper Level Hum/SS <sup>2</sup>	3
<del>ENG MGT Technical Elective</del>	<del>3</del>	<del>Free Elective</del> <sup>3</sup>	<del>3</del>
<a href="#">ELEC ENG 2800</a>	<u>3</u>		
	15		12
Total Credits: 121			

## 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

<a href="#">ENG MGT 5511</a>	Technical Entrepreneurship	3
<a href="#">ENG MGT 5512</a>	Legal Environment	3
<a href="#">ENG MGT 5410</a>	Industrial System Simulation	3

<a href="#">ENG MGT 5614</a>	Supply Chain Management Systems	3
<del>ENG MGT Technical Electives (in consultation with your advisor)</del>		<del>6</del>
<a href="#">ENG MGT Technical Elective (in consultation with your advisor)</a>		<u>3</u>

## Industrial Engineering

<a href="#">ENG MGT 4310</a>	Materials Handling and Plant Layout	3
<a href="#">ENG MGT 4330</a>	Human Factors	3
<a href="#">ENG MGT 5410</a>	Industrial System Simulation	3
<a href="#">ENG MGT 5414</a>	Introduction To Operations Research	3
<del>ENG MGT Technical Electives (in consultation with your advisor)</del>		<del>6</del>
<a href="#">ENG MGT Technical Elective (in consultation with your advisor)</a>		<u>3</u>

## General

Engineering Area Courses (Engineering Discipline)	<u>12</u>
<del>15</del> 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 121 hours, ~~128 hours~~.

1

Must have a grade of "C" or better in these courses for graduation. MATH 1208 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

The programming elective consists of a lecture and lab combination, and may be selected from 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.

4

~~Students are required to select an emphasis area and maintain a minimum 2.0 GPA for these courses.~~<sup>5</sup>

~~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 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 graduate-level ~~5000-level~~ or above EMSE courses may be ~~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 ~~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.~~ 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.~~ audit

~~Graduate Courses being placed in the pathway: For general: SYS ENG 5101 Systems Engineering and Analysis ENG MGT 5412 Operations Management Science ENG MGT 5511 Technical Entrepreneurship ENG MGT 5512 Legal Environment SYS ENG 6103 Systems Life Cycle Costing SYS ENG 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

These changes are in response to the request for reducing the minimum required credit hours for our program.

One free elective and one Engineering Management Technical elective were removed. Also, the lab associated with Civ Eng 2210 (2211) was dropped from the curriculum.

Faculty voted to approved these change and it drops us from 128 credit hours to 121.

Also, the wording was edited for the Graduate Track Pathway to allow nine hours of 5000-level graduate courses rather than any 5000-Level courses to be used in the program.

Supporting Documents

Course Reviewer Comments

**jpnfd (04/03/23 11:36 am):** Updated Freshman Year 2nd semester to Programing Elective, added footnote #5.

**jpnfd (04/05/23 9:34 am):** Updated footnotes

**jpnfd (05/05/23 2:04 pm):** Corrected spelling error "programming" in Plan of Study Grid.

## Program Change Request

Date Submitted: 02/21/23 2:31 pm

Viewing: **ENV SCI-BS : Environmental Sciences BS**

File: 382.20

Last approved: 02/17/23 10:03 am

Last edit: 03/23/23 8:54 am

Changes proposed by: nancym

Catalog Pages Using this Program

[Environmental Sciences](#)

Start Term

Fall 2023

Program Code

ENV SCI-BS

Department

Biological Sciences

Title

Environmental Sciences BS

### Program Requirements and 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

### Approval Path

1. 02/20/23 6:02 pm  
David Duvernell (duvernell): Approved for RBIOLSCI Chair
2. 02/21/23 1:41 pm  
Jennifer Pohlsander (jpnfd): Rollback to Initiator
3. 02/21/23 2:36 pm  
David Duvernell (duvernell): Approved for RBIOLSCI Chair
4. 03/09/23 8:30 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
5. 03/16/23 1:17 pm  
Katie Shannon (shannonk): Approved for Sciences DSCC Chair
6. 04/18/23 10:10 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
7. 05/08/23 3:56 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Meeting Agenda
8. 05/08/23 4:32 pm  
Petra Dewitt

(dewitt): Approved  
for Campus  
Curricula  
Committee Chair

## History

1. Jan 24, 2022 by  
[Nancy Winterburg](#)  
(nancym)
2. Jan 24, 2022 by  
[Evie Sherlock](#)  
(esdk3)
3. Jan 24, 2022 by  
[Evie Sherlock](#)  
(esdk3)
4. May 2, 2022 by  
[Katie Shannon](#)  
(shannonk)
5. Feb 17, 2023 by  
[Robin Verble](#)  
(verbler)

## Bachelor of Science in Environmental Sciences

An Environmental Science degree at Missouri S&T commences with a first-year seminar course that is taken concurrently with an introductory environmental science course, creating familiar student cohorts that can support and motivate one another through the program. Throughout their four years in the program, students are trained in five core areas: economics, biology, geology, environmental engineering, and humanities. In addition, they build foundational skills in mathematics, physical science, and communications. As they progress through the program, students increasingly connect ideas from among and within core areas to build their understanding of the integrated multidisciplinary concepts in environmental science. During their junior and senior years, students will be able to customize their degrees by selecting from a diverse array of elective courses within core areas. The degree's flexible upper division elective choices also allow students to specialize and earn minors in core areas if they choose to do so.

Students apply the skills they learn in the classroom in hands-on laboratory and field courses. Students will finish their senior year with a capstone course that will be designed to engage them in professional development, connect them to career opportunities, hone their research and presentation skills through hands-on projects, and foster lifelong collegial relationships with their peers and instructors through intensive group work.

This curriculum benefits from a flexible design that allows students who may be transitioning from other programs on campus to complete the program in a timely manner. In addition, the degree creates opportunities for students to complete multiple minors within the degree, adding focus and strength to the interdisciplinary foundation.

Freshman Year			
First Semester	Credits	Second Semester	Credits
<a href="#">BIO SCI 1173</a>	3	<a href="#">ENGLISH 1160</a>	3
<a href="#">ENV SCI 1110</a>	1	<a href="#">CHEM 1320</a> or <a href="#">GEOLOGY 3410</a>	3
<a href="#">CHEM 1310</a>	4	<a href="#">BIO SCI 1223</a>	3
<a href="#">CHEM 1100</a>	1	<a href="#">BIO SCI 1229</a>	1
<a href="#">CHEM 1319</a>	1	<a href="#">MATH 1212</a> , or <a href="#">1208</a> , or <a href="#">1211</a> , or <a href="#">1214</a>	4
<a href="#">ECON 1100</a>	3		
<a href="#">ENGLISH 1120</a>	3		
	16		14
Sophomore Year			

First Semester	Credits	Second Semester	Credits
<a href="#">GEOLOGY 1110</a>	3	<a href="#">BIO SCI 2263</a>	3
<a href="#">ECON 4440</a> or <a href="#">MIN ENG 4523</a>	3	<a href="#">HISTORY 1200</a> , or <a href="#">1300</a> , or <a href="#">1310</a>	3
<a href="#">ENV ENG 2601</a> or <a href="#">CIV ENG 2601</a>	3	<a href="#">ENV ENG 2602</a> or <a href="#">CIV ENG 2602</a>	3
<a href="#">PHYSICS 1145</a> or <a href="#">1135</a>	4	<a href="#">GEO ENG 3148</a>	3
<a href="#">POL SCI 1200</a>	3	<a href="#">CIV ENG 5640</a> or <a href="#">ENV ENG 5640</a>	3
	16		15
<b>Junior Year</b>			
First Semester	Credits	Second Semester	Credits
<a href="#">PHILOS 1130</a>	3	<a href="#">HISTORY 4470</a> , or <a href="#">2510</a> , or <a href="#">3530</a> , or <a href="#">3510</a>	3
<a href="#">GEO ENG 5331</a>	3	<a href="#">GEOLOGY 2611</a>	3
<a href="#">ENV ENG 5642</a> or <a href="#">CIV ENG 5642</a>	3	<a href="#">PHILOS 4350</a>	3
<a href="#">ECON 4540</a> , or <a href="#">MIN ENG 4524</a> , or <a href="#">CHEM ENG 4540</a>	3	<a href="#">STAT 3425</a> , or <a href="#">3115</a> , or <a href="#">GEO ENG 4115</a>	3-4
<a href="#">BIO SCI 4313</a>	3	<a href="#">BIO SCI 2223</a>	3
	15		15-16
<b>Senior Year</b>			
First Semester	Credits	Second Semester	Credits
<a href="#">GEOLOGY 4310</a> , or <a href="#">GEO ENG 2536</a> , or <a href="#">GEO ENG 5144</a>	3	FREE ELECTIVES	3
FREE ELECTIVES	2	<a href="#">ENV SCI 4028</a>	3
UPPER DIVISION ELECTIVES <sup>1</sup>	9	UPPER DIVISION ELECTIVES <sup>1</sup>	9
	14		15
Total Credits: 120-121			

1

See Upper Division Elective Course List

### Upper Division Elective Course List

<a href="#">BIO SCI 2242</a>	Cave Biology	2
<a href="#">BIO SCI 2252</a>	Vegetation of the Ozarks	2
<a href="#">BIO SCI 2264</a>	Field Ecology	2
<a href="#">BIO SCI 2353</a>	Zoology	3
<a href="#">BIO SCI 2372</a>	Issues in Public Health	3
<a href="#">BIO SCI 2383</a>	Plant Biology	3
<a href="#">BIO SCI 2389</a>	Plant Biology Laboratory	1
<a href="#">BIO SCI 3353</a>	Comparative Vertebrate Anatomy	4
<a href="#">BIO SCI 4363</a>	Freshwater Ecology	3
<a href="#">BIO SCI 4663</a>	Animal Behavior	3
<a href="#">BIO SCI 4369</a>	Freshwater Ecology Laboratory	1
<a href="#">BIO SCI 4316</a>	Introduction to Geomicrobiology	3
<a href="#">BIO SCI 4099</a>	Undergraduate Research	1-3
<a href="#">BIO SCI 3363</a>	Ecophysiology	3
<a href="#">BIO SCI 2359</a>	Zoology Laboratory	1
<a href="#">BIO SCI 5423</a>	Advanced Biodiversity	3
<a href="#">BIO SCI 5443</a>	Population and Conservation Genetics	3
<a href="#">BIO SCI 4383</a>	Toxicology	3

<a href="#">BIO SCI 4423</a>	Introduction to Astrobiology	3
<a href="#">BIO SCI 4563</a>	Global Ecology	3
<a href="#">ECON 4643</a>	Ethical Problems in a Global Environment	3
<a href="#">ECON 4642</a>	Introduction to Global Eco- and Social-preneurship and Innovation	3
<a href="#">MIN ENG 5742</a>	Environmental Aspects of Mining	3
<a href="#">ECON 5644</a>	Creativity, Innovation, and Sustainability	3
<a href="#">CHEM 4710</a>	Principles Of Environmental Monitoring	3
<a href="#">ENV ENG 3615</a>	Water And Wastewater Engineering	3
<a href="#">ENV ENG 5605</a>	Environmental Systems Modeling	3
<a href="#">ENV ENG 5630</a>	Remediation of Contaminated Groundwater And Soil	3
<a href="#">ENV ENG 5635</a>	Phytoremediation and Natural Treatment Systems: Science and Design	3
<a href="#">ENV ENG 5660</a>	Introduction To Air Pollution	3
<a href="#">ENV ENG 5662</a>	Air Pollution Control Methods	3
<a href="#">GEOLOGY 4310</a>	Remote Sensing Technology	3
<a href="#">GEOLOGY 4411</a>	Hydrogeology	3
<a href="#">GEOLOGY 4711</a>	Paleoclimatology and Paleoecology	3
<a href="#">GEOLOGY 4721</a>	Meteorology and Climatology	3
<a href="#">GEOLOGY 5681</a>	Lidar Principles and Application	3
<a href="#">GEOLOGY 5741</a>	Micropaleontology	3
<a href="#">GEO ENG 4115</a>	Statistical Methods in Geology and Engineering	3
<a href="#">GEO ENG 4276</a>	Environmental Aspects Of Mining	3
<a href="#">GEO ENG 5233</a>	Risk Assessment In Environmental Studies	3
<a href="#">ENV ENG 5650</a>	Public Health Engineering	3
<a href="#">ENV ENG 4609</a>	Research in Environmental Engineering	1
<a href="#">ENV ENG 4099</a>	Undergraduate Research	0-6
<a href="#">ENV ENG 4010</a>	Senior Seminar: Engineering In A Global Society	1
<a href="#">CIV ENG 5605</a>	Environmental Systems Modeling	3
<a href="#">CIV ENG 5630</a>	Remediation of Contaminated Groundwater and Soil	3
<a href="#">CIV ENG 5635</a>	Phytoremediation and Natural Treatment Systems: Science and Design	3
<a href="#">CIV ENG 5650</a>	Public Health Engineering	3
<a href="#">CIV ENG 5660</a>	Introduction To Air Pollution	3
<a href="#">CIV ENG 5665</a>	Indoor Air Pollution	3
<a href="#">CIV ENG 5662</a>	Air Pollution Control Methods	3
<a href="#">ENV ENG 5665</a>	Indoor Air Pollution	3
<a href="#">GEO ENG 4099</a>	Undergraduate Research	0-6
<a href="#">GEO ENG 5085</a>	Internship	0-15
<a href="#">GEO ENG 5146</a>	Applications Of Geographic Information Systems	3
<a href="#">GEO ENG 5174</a>	Geological Engineering Field Methods	3
<a href="#">GEO ENG 5239</a>	Groundwater Remediation	3
<a href="#">GEO ENG 5276</a>	Advanced Environmental Aspects Of Mining	3
<a href="#">GEO ENG 5320</a>	Groundwater Modeling	3
<a href="#">GEO ENG 5332</a>	Fundamentals of Groundwater Hydrology	3
<a href="#">GEO ENG 5556</a>	Renewable Energy Systems	3

<a href="#">GEOLOGY 2096</a>	Field Geology	3
<a href="#">GEOLOGY 2731</a>	Introduction to Planetary Science	3
<a href="#">GEOLOGY 4085</a>	Internship	3
<a href="#">GEOLOGY 4099</a>	Undergraduate Research	0-6
<a href="#">GEOLOGY 4411</a>	Hydrogeology	3
<a href="#">GEOLOGY 4421</a>	Radioactive Waste Management And Remediation	3
<a href="#">GEOLOGY 4431</a>	Methods Of Karst Hydrogeology	3
<a href="#">GEOLOGY 4711</a>	Paleoclimatology and Paleoecology	3
<a href="#">GEOLOGY 4721</a>	Meteorology and Climatology	3
<a href="#">GEOLOGY 4841</a>	Geological Field Studies	3
<a href="#">GEOLOGY 5681</a>	Lidar Principles and Application	3
<a href="#">GEOLOGY 5741</a>	Micropaleontology	3
<a href="#">POL SCI 4320</a>	The Politics of Innovation	3
<a href="#">POL SCI 4085</a>	Political Science Internship	0-6
<a href="#">POL SCI 3300</a>	Principles Of Public Policy	3
<a href="#">ECON 4085</a>	Internship	0-6
<a href="#">ECON 4641</a>	Foundations of Sustainability	3

### **Secondary Education Emphasis Area**

You may earn a BS degree in environmental sciences from Missouri S&T and certification to teach at the secondary level in the schools of Missouri with this emphasis area. This program can be completed in four academic years, and student teaching is arranged with public schools anywhere in the state. Students interested in this emphasis area should consult with the advisor for environmental science.

In order to successfully complete the emphasis area, students must attain at least a 3.0 GPA average for all environmental science courses and professional education courses required by the Missouri Department of Elementary and Secondary Education for teacher certification.

Students must also meet all requirements listed under the teacher education website including passing the state-required assessments.

A degree in the emphasis area requires a minimum of 128 credit hours. The required courses are provided below.

<u>Humanities: 15 semester hours</u>		
<a href="#">ENGLISH 1120</a>	<a href="#">Exposition And Argumentation</a>	<u>3</u>
<a href="#">ENGLISH 1160</a>	<a href="#">Writing And Research</a>	<u>3</u>
or <a href="#">ENGLISH 3560</a>	<a href="#">Technical Writing</a>	
<a href="#">ENGLISH 3170</a>	<a href="#">Teaching And Supervising Reading and Writing</a>	<u>3</u>
<a href="#">PHILOS 1130</a>	<a href="#">How Should I Live? An Introduction to Ethics</a>	<u>3</u>
<a href="#">PHILOS 4350</a>	<a href="#">Environmental Ethics</a>	<u>3</u>
<u>Social Sciences: 18 semester hours</u>		
<a href="#">HISTORY 1310</a>	<a href="#">American History Since 1877</a>	<u>3</u>
<a href="#">PSYCH 1101</a>	<a href="#">General Psychology</a>	<u>3</u>
<a href="#">PSYCH 3310</a>	<a href="#">Developmental Psychology</a>	<u>3</u>
<a href="#">ECON 1100</a>	<a href="#">Principles Of Microeconomics</a>	<u>3</u>
<a href="#">ECON 4440</a>	<a href="#">Environmental And Natural Resource Economics</a>	<u>3</u>
<a href="#">HISTORY 2510</a>	<a href="#">History of Technology</a>	<u>3</u>
or <a href="#">HISTORY 3510</a>	<a href="#">Twentieth Century Technology And Society</a>	
or <a href="#">HISTORY 3530</a>	<a href="#">History of Science</a>	

Mathematics/Physical Science: 12 semester hours

<u>MATH 1208</u>	<u>Calculus With Analytic Geometry I</u>	<u>4-9</u>
or <u>MATH 1214</u>	<u>Calculus I</u>	
or <u>MATH 1210</u> & <u>MATH 1211</u>	<u>Calculus I-A</u> and <u>Calculus I-B</u>	
<u>PHYSICS 1505</u> & <u>PHYSICS 1509</u>	<u>Introductory Astronomy</u> and <u>Astronomy Laboratory</u>	<u>4</u>
<u>PHYSICS 1145</u>	<u>College Physics I</u>	<u>4</u>
or <u>PHYSICS 1135</u>	<u>Engineering Physics I</u>	

Statistics: 3 semester hours

<u>STAT 3425</u>	<u>Introduction to Biostatistics</u>	<u>3-4</u>
or <u>STAT 3113</u>	<u>Applied Engineering Statistics</u>	
or <u>STAT 3115</u>	<u>Engineering Statistics</u>	

Biological Sciences: 13 semester hours

<u>BIO SCI 1223</u> & <u>BIO SCI 1229</u>	<u>Biodiversity</u> and <u>Biodiversity Lab</u>	<u>4</u>
<u>BIO SCI 1173</u>	<u>Introduction to Environmental Sciences</u>	<u>3</u>
<u>BIO SCI 2223</u>	<u>General Genetics</u>	<u>3</u>
<u>BIO SCI 2263</u>	<u>Ecology</u>	<u>3</u>

Chemistry: 9 semester hours

<u>CHEM 1100</u>	<u>Introduction To Laboratory Safety &amp; Hazardous Materials</u>	<u>1</u>
<u>CHEM 1310</u>	<u>General Chemistry I</u>	<u>4</u>
<u>CHEM 1319</u>	<u>General Chemistry Laboratory</u>	<u>1</u>
<u>CHEM 1320</u>	<u>General Chemistry II</u>	<u>3</u>

Civil, Architectural and Environmental Engineering: 9 semester hours

<u>ENV ENG 2601</u>	<u>Fundamentals Of Environmental Engineering and Science</u>	<u>3</u>
<u>ENV ENG 2602</u>	<u>Biological Fundamentals Of Environmental Engineering</u>	<u>3</u>
<u>ENV ENG 5640</u>	<u>Environmental Law And Regulations</u>	<u>3</u>
or <u>ENV ENG 5642</u>	<u>Sustainability, Population, Energy, Water, and Materials</u>	

Environmental Science: 1 semester hour

<u>ENV SCI 1110</u>	<u>Environmental Science Freshman Seminar</u>	<u>1</u>
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Geological Sciences/Geological and Petroleum Engineering: 12 semester hours

<u>GEO ENG 2536</u>	<u>Basic Weather</u>	<u>3</u>
<u>GEOLOGY 1110</u>	<u>Physical And Environmental Geology</u>	<u>3</u>
<u>GEOLOGY 2611</u>	<u>Physical Mineralogy And Petrology</u>	<u>3</u>
<u>GEO ENG 3148</u>	<u>Fundamentals Of Geographic Information Systems</u>	<u>3</u>

Education: 36 semester hours

<u>EDUC 1040</u>	<u>Perspectives In Education</u>	<u>2</u>
<u>EDUC 1174</u>	<u>School Organization and Administration For Teachers</u>	<u>2</u>
<u>EDUC 3216</u>	<u>Instructional Literacy in the Content Area</u>	<u>3</u>
<u>EDUC 3280</u>	<u>Instructional Strategies in the Content Area</u>	<u>3</u>
<u>EDUC 4298</u>	<u>Student Teaching Seminar</u>	<u>1</u>
<u>PSYCH 2300</u>	<u>Educational Psychology</u>	<u>3</u>
or <u>EDUC 2102</u>	<u>Educational Psychology</u>	

<a href="#">EDUC 3340</a>	<a href="#">Assessment of Student Learning</a>	<a href="#">3</a>
<a href="#">PSYCH 4310</a>	<a href="#">Psychology Of The Exceptional Child</a>	<a href="#">3</a>
<a href="#">or EDUC 2310</a>	<a href="#">Education Of The Exceptional Child</a>	
<a href="#">EDUC 1104</a>	<a href="#">Teacher Field Experience I</a>	<a href="#">1</a>
<a href="#">EDUC 1164</a>	<a href="#">Teacher Field Experience II</a>	<a href="#">2</a>
<a href="#">EDUC 3298</a>	<a href="#">Teacher Field Experience III</a>	<a href="#">1</a>
<a href="#">EDUC 4299</a>	<a href="#">Student Teaching</a>	<a href="#">12</a>

### ~~Upper Division Elective Course List~~

Justification for request

Supporting Documents

[Environmental Science Emphasis Secondary Edu.pdf](#)

[BioSci-EnvSci-Curriculum Correction.pdf](#)

[MST PC October 2022.pdf](#)

[Approved New Matrix MoST Earth Science 3Mar21.pdf](#)

Course Reviewer Comments

**jpnfd (02/21/23 1:41 pm):** Rollback: formatting course list

**jpnfd (02/21/23 3:16 pm):** Updated/corrected course name abbreviations.

**jpnfd (02/21/23 3:30 pm):** Format Edit

**jpnfd (02/21/23 3:32 pm):** Edits

**jpnfd (02/21/23 4:02 pm):** Updated area header in Secondary Educ Emphasis area.

**jpnfd (02/21/23 4:06 pm):** Format update.

**jpnfd (02/23/23 8:50 am):** Updated Math credit range from 4-5 to 4-9.

**jpnfd (03/01/23 2:32 pm):** Attached the document showing the curriculum correction of the Humanities- 15 credit hours instead of the current statement of 12 hours and the following statement added, "A degree in this emphasis area requires a minimum of 128 credit hours." Both edits completed.

**jpnfd (03/01/23 2:37 pm):** Updated text formatting.

**jpnfd (03/21/23 9:31 am):** Attached MDHE approval.

**jpnfd (03/23/23 8:51 am):** Attached DESE approval

**jpnfd (03/23/23 8:54 am):** 3/22/23 Verified with Beth Kania-Gosche that the courses are good with DESE.

## Program Change Request

Date Submitted: 03/22/23 12:56 pm

Viewing: **MC ENG-BS : Mechanical Engineering BS**

File: 86.56

Last approved: 05/02/22 1:31 pm

Last edit: 03/22/23 12:56 pm

Changes proposed by: nisbett

Catalog Pages Using this Program

[Mechanical Engineering](#)

Start Term

Fall ~~2022~~ 2023

Program Code

MC ENG-BS

Department

Mechanical & Aerospace Engineering

Title

Mechanical Engineering BS

### Program Requirements and Description

### In Workflow

1. RMECHENG 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

### Approval Path

1. 03/22/23 1:08 pm  
David Bayless  
(djbkqf): Approved for RMECHENG Chair
2. 04/13/23 4:09 pm  
Jennifer Pohlsander  
(jpnfd): Approved for CCC Secretary
3. 04/18/23 9:17 am  
Mark Fitch (mfitch): Approved for Engineering DSCC Chair
4. 04/18/23 10:10 am  
Jennifer Pohlsander  
(jpnfd): Approved for Pending CCC Agenda post
5. 05/08/23 3:57 pm  
Jennifer Pohlsander  
(jpnfd): Approved for CCC Meeting Agenda
6. 05/08/23 4:33 pm  
Petra Dewitt  
(dewittp): Approved for Campus Curricula Committee Chair

### History

1. Feb 24, 2014 by J. Keith Nisbett (nisbett)

2. Aug 6, 2014 by J. Keith Nisbett (nisbett)
3. Jul 21, 2015 by pantaleoa
4. May 3, 2018 by J. Keith Nisbett (nisbett)
5. Jun 14, 2019 by J. Keith Nisbett (nisbett)
6. Mar 3, 2020 by ershenb
7. Oct 8, 2020 by Crystal Wilson (wilsoncry)
8. May 5, 2021 by J. Keith Nisbett (nisbett)
9. Oct 28, 2021 by J. Keith Nisbett (nisbett)
10. May 2, 2022 by J. Keith Nisbett (nisbett)

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## Bachelor of Science Mechanical Engineering

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

For the bachelor of science degree in mechanical 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. An average of at least two grade points per credit hour must also be attained in all courses taken in mechanical engineering.

Each student's program of study must contain a minimum of 21 credit hours of course work in general education as follows:

1. [ENGLISH 1120](#)
2. [HISTORY 1200](#) or [HISTORY 1300](#) or [HISTORY 1310](#) or [POL SCI 1200](#)
3. [ECON 1100](#) or [ECON 1200](#)
4. [ENGLISH 1160](#) or [ENGLISH 3560](#) or [SP&M S 1185](#)
5. A literature elective
6. A humanity or social science elective\*
7. A humanity or social science elective\* that has, as a prerequisite, a humanity or social science course already taken.

\* Humanity and social science electives must be at least 3 credit hours of lecture designation, and also meet the requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog.

**Freshman Year**

First Semester	Credits	Second Semester	Credits
<a href="#">FR ENG 1100</a>	1	<a href="#">ECON 1100</a> or <a href="#">1200</a>	3
<a href="#">CHEM 1310<sup>a</sup></a>	4	<a href="#">MECH ENG 1720</a>	3
<a href="#">ENGLISH 1120</a>	3	<a href="#">PHYSICS 1135<sup>a</sup></a>	4
<a href="#">HISTORY 1200</a> , or <a href="#">1300</a> , or <a href="#">1310</a> , or <a href="#">POL SCI 1200</a>	3	<a href="#">MATH 1215<sup>a</sup></a>	4
<a href="#">CHEM 1319</a>	1	Elective-Hum or Soc Sci <sup>e</sup>	3
<a href="#">MATH 1214</a> or <a href="#">1211<sup>a</sup></a>	4		
	16		17
<b>Sophomore Year</b>			
First Semester	Credits	Second Semester	Credits
<a href="#">MATH 2222<sup>a</sup></a>	4	<a href="#">MECH ENG 2761</a>	2
<a href="#">CIV ENG 2200<sup>a</sup></a>	3	<a href="#">MECH ENG 2519<sup>a</sup></a>	3
<a href="#">PHYSICS 2135<sup>a</sup></a>	4	<a href="#">MECH ENG 2360<sup>a</sup></a>	3
<a href="#">MECH ENG 2653</a>	3	<a href="#">MATH 3304<sup>a</sup></a>	3
<a href="#">MECH ENG 1761</a>	1	<a href="#">MET ENG 2110<sup>a</sup></a>	3
		Programming Elective <sup>a, b</sup>	3
	15		17
<b>Junior Year</b>			
First Semester	Credits	Second Semester	Credits
<a href="#">MECH ENG 3313</a>	3	<a href="#">MECH ENG 3411<sup>a</sup></a>	3
<a href="#">MECH ENG 3521</a>	3	<a href="#">MECH ENG 3131</a>	3
<a href="#">ELEC ENG 2800</a>	3	<a href="#">MECH ENG 4840</a>	2
<a href="#">CIV ENG 2210<sup>a</sup></a>	3	Elective-Communications <sup>c</sup>	3
<a href="#">CIV ENG 2211</a>	1	<a href="#">MECH ENG 3708</a>	3
Elective-Advanced Math/Stat <sup>d</sup>	3	<a href="#">MECH ENG 3525</a>	3
	16		17
<b>Senior Year</b>			
First Semester	Credits	Second Semester	Credits
<a href="#">MECH ENG 4842</a>	2	<a href="#">ENG MGT 1100</a>	1
<a href="#">MECH ENG 4479</a>	3	<a href="#">ENG MGT 1210</a>	2
MECH ENG technical elective <sup>f</sup>	3	<a href="#">MECH ENG 4761</a>	3
Literature elective <sup>e</sup>	3	<a href="#">MECH ENG 4480</a>	1
Technical elective <sup>g</sup>	3	MECH ENG 5000-level technical elective <sup>f</sup>	3
Elective-Advanced Hum or Soc Sci <sup>e</sup>	3	Breadth elective <sup>h</sup>	3
	17		13
Total Credits: 128			

a

A grade of "C" or better is required in [CHEM 1310](#), [MATH 1214](#) (or [MATH 1211](#)), [MATH 1215](#), [MATH 2222](#), [MATH 3304](#), [PHYSICS 1135](#), [PHYSICS 2135](#), programming elective, [MET ENG 2110](#), [CIV ENG 2200](#), [CIV ENG 2210](#), [MECH ENG 2519](#), [MECH ENG 2360](#), and [MECH ENG 3411](#), both as prerequisite for follow-up courses in the curriculum and for graduation.

b

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](#), or [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.

c

This course must be selected from the following: [ENGLISH 1160](#), [ENGLISH 3560](#) or [SP&M S 1185](#), or the complete four course sequence in Advanced ROTC ([MIL ARMY 3250](#), [MIL ARMY 3500](#), [MIL ARMY 4250](#), and [MIL ARMY 4500](#); or [MIL AIR 3110](#), [MIL AIR 3120](#), [MIL AIR 4110](#) and [MIL AIR 4120](#)).

d

This course must be selected from the following: [MATH 3108](#), [STAT 3113](#), [STAT 3115](#) or any 5000-level math or stat course approved by the student's advisor.

e

All electives must be approved by the student's advisor. Humanity and social science electives must be at least 3 credit hours of lecture designation, and also meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog.

f

Six hours of technical electives, subject to approval by the student's advisor, must be in the department of mechanical and aerospace engineering. At least three of these technical elective hours must be at the 5000 level. This elective may not include co-op, special problems, or research credits, such as as 3002, 4000, or 4099. Honors students have special requirements for technical electives.

g

This elective must be a three credit hour course, subject to approval by the student's advisor, from any of the following areas: math, statistics, science, engineering, or computer science. The course must be at the 3000 or higher level, or have a prerequisite that is part of the required mechanical engineering curriculum. Exceptions to the course level may be approved by the student's advisor. The elective may not include co-op, special problems, or research credits, such as 3002, 4000, or 4099.

h

This elective consists of three credit hours, subject to approval by the student's advisor, and may be satisfied by any of the following: (1) A three credit hour course from any of the following areas: math, statistics, science, engineering, computer science, business, or IST. The course must be at the 3000 or higher level, or have a prerequisite that is part of the required mechanical engineering curriculum. Exceptions to the course level may be approved by the student's advisor; (2) Any three credit hour course in the list of approved courses for the global studies minor; or (3) Any combination of three credit hours from co-op (3002), special problems (3000, 4000, or 5000), or research (4099).

i

All mechanical 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.

## Energy Conversion Emphasis Area for Mechanical Engineering

Students desiring to obtain a bachelor of science degree in mechanical engineering with an emphasis area in energy conversion must satisfy all the requirements of the bachelor of science degree in mechanical engineering, with the additional stipulation that four courses must be taken as follows:

a. Two courses from the following list:	6
<a href="#">MECH ENG 5527</a>	Combustion Processes 3
or <a href="#">AERO ENG 5527</a>	Combustion Processes
<a href="#">MECH ENG 5533</a>	Internal Combustion Engines 3
<a href="#">MECH ENG 5566</a>	Solar Energy Technology 3
<a href="#">MECH ENG 5567</a>	Heat Pump And Refrigeration Systems 3
<a href="#">MECH ENG 5571</a>	Environmental Controls 3
<a href="#">MECH ENG 5575</a>	Mechanical Systems For Environmental Control 3
<a href="#">AERO ENG 5169</a>	Introduction to Hypersonic Flow 3
<a href="#">AERO ENG 5535</a>	Aerospace Propulsion Systems 3
b. One course from the following list:	3
<a href="#">MECH ENG 5519</a>	Advanced Thermodynamics 3
or <a href="#">AERO ENG 5519</a>	Advanced Thermodynamics
<a href="#">MECH ENG 5525</a>	Intermediate Heat Transfer 3
or <a href="#">AERO ENG 5525</a>	Intermediate Heat Transfer
<a href="#">MECH ENG 5131</a>	Intermediate Thermofluid Mechanics 3
or <a href="#">AERO ENG 5131</a>	Intermediate Thermofluid Mechanics
<a href="#">MECH ENG 5139</a>	Computational Fluid Dynamics 3
or <a href="#">AERO ENG 5139</a>	Computational Fluid Dynamics
c. One additional course from either list "a" or list "b", or from the following list:	3
<a href="#">ECON 4540</a>	Energy Economics 3
<a href="#">ELEC ENG 5150</a>	Photovoltaic Systems Engineering 3
<a href="#">ENV ENG 5660</a>	Introduction To Air Pollution 3

**Note:** By using the breadth elective and technical electives to satisfy the above requirements, this emphasis area requires the same total number of credit hours as the BSME degree. A change of major form should be submitted to designate the energy conversion emphasis area.

## Manufacturing Processes Emphasis Area for Mechanical Engineering

Students desiring to obtain a bachelor of science in mechanical engineering with an emphasis area in manufacturing processes must satisfy all requirements of the bachelor of science in mechanical engineering with the additional stipulation that four courses must be taken as follows:

a. The following course:		3
<a href="#">MECH ENG 3653</a>	Manufacturing	3
b. One course from the following Manufacturing/Automation courses:		3
<a href="#">MECH ENG 5653</a>	Computer Numerical Control of Manufacturing Processes	3
<a href="#">MECH ENG 5655</a>	Manufacturing Equipment Automation	3
<a href="#">MECH ENG 5449</a>	Robotic Manipulators and Mechanisms	3
<a href="#">MECH ENG 5606</a>	Material Processing By High-Pressure Water Jet	3
c. One course from the following Design courses:		3
<a href="#">MECH ENG 5763</a>	Computer Aided Design: Theory and Practice	3
<a href="#">MECH ENG 5656</a>	Design For Manufacture	3
<a href="#">MECH ENG 5702</a>	Synthesis Of Mechanisms	3
d. One course from the following list:		3
<a href="#">MECH ENG 5708</a>	Rapid Product Design And Optimization	3
<a href="#">MECH ENG 5758</a>	Integrated Product Development	3
e. The Math/Stat elective must be one of the following:		3
<a href="#">STAT 3113</a>	Applied Engineering Statistics	3
<a href="#">STAT 3115</a>	Engineering Statistics	3

A suggested sequence for the junior and senior years is given below. Note that by using the breadth elective and technical electives to satisfy the above requirements, this emphasis area requires the same total number of credit hours as the BSME degree. A change of major form should be submitted to designate the manufacturing processes emphasis area.

Junior Year			
First Semester	Credits	Second Semester	Credits
<a href="#">MECH ENG 3313</a>	3	<a href="#">MECH ENG 3411</a> <sup>a</sup>	3
<a href="#">ELEC ENG 2800</a>	3	<a href="#">MECH ENG 3131</a>	3
<a href="#">MECH ENG 3521</a>	3	<a href="#">MECH ENG 3525</a>	3
<a href="#">CIV ENG 2210</a> <sup>a</sup>	3	<a href="#">MECH ENG 4840</a>	2
<a href="#">CIV ENG 2211</a>	1	<a href="#">MECH ENG 3653</a>	3
<a href="#">STAT 3113</a> or <a href="#">3115</a>	3	Elective-Communications <sup>c</sup>	3
	16		17
Senior Year			
First Semester	Credits	Second Semester	Credits
<a href="#">MECH ENG 4842</a>	2	<a href="#">ENG MGT 1100</a>	1
<a href="#">MECH ENG 4479</a>	3	<a href="#">ENG MGT 1210</a>	2
<a href="#">MECH ENG 3708</a>	3	<a href="#">MECH ENG 4761</a>	3
Manufacturing Technical Elective <sup>e</sup>	3	<a href="#">MECH ENG 4480</a>	1

Manufacturing Technical Elective <sup>e</sup>	3	Manufacturing Technical Elective <sup>e</sup>	3
Elective Literature <sup>d</sup>	3	Electives-Hum or Soc Sci <sup>d</sup>	3
	17		13
Total Credits: 63			

a

A grade of "C" or better is required in [CHEM 1310](#), [MATH 1214](#) (or [MATH 1211](#)), [MATH 1215](#), [MATH 2222](#), [MATH 3304](#), [PHYSICS 1135](#), [PHYSICS 2135](#), programming elective, [MET ENG 2110](#), [CIV ENG 2200](#), [CIV ENG 2210](#), [MECH ENG 2519](#), [MECH ENG 2360](#) and [MECH ENG 3411](#), both as prerequisite for follow-up courses in the curriculum and for graduation.

b

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.

c

This course must be selected from the following: [ENGLISH 1160](#), [ENGLISH 3560](#) or [SP&M S 1185](#), or the complete four course sequence in Advanced ROTC ([MIL ARMY 3250](#), [MIL ARMY 3500](#), [MIL ARMY 4250](#), and [MIL ARMY 4500](#)); or [MIL AIR 3110](#), [MIL AIR 3120](#), [MIL AIR 4110](#) and [MIL AIR 4120](#)).

d

All electives must be approved by the student's advisor. Humanity and social science electives must be at least 3 credit hours of lecture designation, and also meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog.

e

The nine hours of manufacturing technical elective must be selected as follows:

One course from the following manufacturing/automation courses: [MECH ENG 5653](#), [MECH ENG 5655](#), [MECH ENG 5449](#), [MECH ENG 5606](#).

One of the following design courses: [MECH ENG 5763](#), [MECH ENG 5656](#), [MECH ENG 5702](#).

One course from the following list: [MECH ENG 5708](#), [MECH ENG 5758](#).

f

All mechanical 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.

## Mechanical Design and Analysis Emphasis Area

Students desiring to obtain a bachelor of science in mechanical engineering with an emphasis area in mechanical design and analysis must satisfy all requirements of the bachelor of science in mechanical engineering, with the additional stipulation that four courses must be taken as follows:

a. One design course from the following list:		3
<a href="#">MECH ENG 5709</a>	Machine Design II	3
<a href="#">MECH ENG 5702</a>	Synthesis Of Mechanisms	3
<a href="#">MECH ENG 5704</a>	Compliant Mechanism Design	3
<a href="#">MECH ENG 5708</a>	Rapid Product Design And Optimization	3
<a href="#">MECH ENG 5715</a>	Concurrent Engineering	3
<a href="#">MECH ENG 5656</a>	Design For Manufacture	3
<a href="#">MECH ENG 5757</a>	Integrated Product And Process Design	3
<a href="#">MECH ENG 5760</a>	Probabilistic Engineering Design	3
<a href="#">MECH ENG 5763</a>	Computer Aided Design: Theory and Practice	3
<a href="#">MECH ENG 5761</a>	Engineering Design Methodology	3
b. One analysis course from the following list:		3
<a href="#">MECH ENG 5307</a>	Vibrations I	3
<a href="#">MECH ENG 5211</a>	Introduction To Continuum Mechanics	3
<a href="#">MECH ENG 5212</a>	Introduction to Finite Element Analysis	3
<a href="#">MECH ENG 5234</a>	Stability of Engineering Structures	3
<a href="#">MECH ENG 5236</a>	Fracture Mechanics	3
<a href="#">MECH ENG 5313</a>	Intermediate Dynamics Of Mechanical And Aerospace Systems	3
<a href="#">MECH ENG 5222</a>	Introduction To Solid Mechanics	3

<a href="#">MECH ENG 5238</a>	Fatigue Analysis	3
<a href="#">MECH ENG 5449</a>	Robotic Manipulators and Mechanisms	3
<a href="#">MECH ENG 5478</a>	Mechatronics	3
c. Two additional courses from either of the previous lists.		6

Note that by using the breadth elective and technical electives to satisfy the above requirements, this emphasis area requires the same total number of credit hours as the BSME degree. A change of major form should be submitted to designate the mechanical design and analysis emphasis area.

## Systems Integration Emphasis Area

The Systems Integration emphasis area is required and available only for students pursuing a bachelor of science in mechanical engineering in the cooperative program delivered at Missouri State University. This emphasis area includes all requirements of the bachelor of science in mechanical engineering, except for the substitutions stipulated below.

The following requirements in the mechanical engineering curriculum are removed (16 credit hours):		
<a href="#">ELEC ENG 2800</a>	Electrical Circuits	3
<a href="#">ENG MGT 1100</a>	Practical Concepts for Technical Managers	1
Elective-Advanced Math/Stat		3
MECH ENG 5000-level technical elective		3
Technical elective		3
Breadth elective		3
The following requirements are added (16 credit hours):		
<a href="#">ELEC ENG 2100</a>	Circuits I	3
<a href="#">ELEC ENG 2101</a>	Circuit Analysis Laboratory I	1
<a href="#">ELEC ENG 2120</a>	Circuits II	3
<u>Systems Management elective. One of the following:</u>		
<a href="#">MECH ENG 5715</a>	Concurrent Engineering	3
<a href="#">MECH ENG 5757</a>	Integrated Product And Process Design	3
<a href="#">MECH ENG 5758</a>	<u>Integrated Product Development</u>	<u>3</u>
<a href="#">ENG MGT 3320</a>	Introduction to Project Management	3
<a href="#">ENG MGT 4710</a>	<u>Quality</u>	<u>3</u>
Systems Integration technical elective. One of the following:		3
<a href="#">MECH ENG 5307</a>	Vibrations I	3
<a href="#">MECH ENG 5478</a>	Mechatronics	3
<a href="#">MECH ENG 5481</a>	Mechanical And Aerospace Control Systems	3
<a href="#">MECH ENG 5533</a>	Internal Combustion Engines	3
<a href="#">MECH ENG 5571</a>	Environmental Controls	3
<a href="#">MECH ENG 5575</a>	Mechanical Systems For Environmental Control	3
<a href="#">MECH ENG 5656</a>	Design For Manufacture	3
<a href="#">MECH ENG 5704</a>	Compliant Mechanism Design	3
<a href="#">MECH ENG 5708</a>	Rapid Product Design And Optimization	3
<a href="#">MECH ENG 5709</a>	Machine Design II	3
<a href="#">MECH ENG 5715</a>	<u>Concurrent Engineering</u>	<u>3</u>
<a href="#">MECH ENG 5757</a>	<u>Integrated Product And Process Design</u>	<u>3</u>
<a href="#">MECH ENG 5760</a>	<u>Probabilistic Engineering Design</u>	<u>3</u>
<a href="#">MECH ENG 5763</a>	Computer Aided Design: Theory and Practice	3

One of the following:

<a href="#">STAT 3113</a>	Applied Engineering Statistics	3
<a href="#">STAT 3115</a>	Engineering Statistics	3
<a href="#">STAT 3117</a>	Introduction To Probability And Statistics	3

All of the substitutions for this emphasis area appear in the junior and senior years. A suggested sequence for the junior and senior years is given below.

<b>Junior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">MECH ENG 3313</a>	3	<a href="#">MECH ENG 3411<sup>a</sup></a>	3
<a href="#">MECH ENG 3521</a>	3	<a href="#">MECH ENG 3131</a>	3
<a href="#">ELEC ENG 2100</a>	3	<a href="#">MECH ENG 3525</a>	3
<a href="#">ELEC ENG 2101</a>	1	<a href="#">MECH ENG 3708</a>	3
<a href="#">CIV ENG 2210<sup>a</sup></a>	3	<a href="#">MECH ENG 4840</a>	2
<a href="#">CIV ENG 2211</a>	1	<a href="#">ELEC ENG 2120</a>	3
<a href="#">STAT 3113</a> , or <a href="#">3115</a> , or <a href="#">3117</a>	3		
	17		17
<b>Senior Year</b>			
<b>First Semester</b>	<b>Credits</b>	<b>Second Semester</b>	<b>Credits</b>
<a href="#">MECH ENG 4842</a>	2	<a href="#">MECH ENG 4761</a>	3
<a href="#">MECH ENG 4479</a>	3	Systems Integration technical elective <sup>f</sup>	3
<a href="#">MECH ENG 4480</a>	1	<a href="#">Systems Management elective<sup>g</sup></a>	<u>3</u>
MECH ENG technical elective <sup>e</sup>	3	Literature elective <sup>d</sup>	3
Elective - Communications <sup>c</sup>	3	Elective - Advanced Hum or Soc Sci <sup>d</sup>	3
<a href="#">ENG MGT 1210</a>	2	<a href="#">ENG MGT 3320</a>	<b>3</b>
	14		15
Total Credits: 63			

a

A grade of "C" or better is required in [CHEM 1310](#), [MATH 1214](#) (or [MATH 1211](#)), [MATH 1215](#), [MATH 2222](#), [MATH 3304](#), [PHYSICS 1135](#), [PHYSICS 2135](#), programming elective, [MET ENG 2110](#), [CIV ENG 2200](#), [CIV ENG 2210](#), [MECH ENG 2519](#), [MECH ENG 2360](#) and [MECH ENG 3411](#), both as prerequisite for follow-up courses in the curriculum and for graduation.

b

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](#), or [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.

c

This course must be selected from the following: [ENGLISH 1160](#), [ENGLISH 3560](#) or [SP&M S 1185](#), or the complete four course sequence in Advanced ROTC ([MIL ARMY 3250](#), [MIL ARMY 3500](#), [MIL ARMY 4250](#), and [MIL ARMY 4500](#); or [MIL AIR 3110](#), [MIL AIR 3120](#), [MIL AIR 4110](#) and [MIL AIR 4120](#)).

d

All electives must be approved by the student's advisor.

Humanity and Social Science electives must be at least 3 credit hours of lecture designation, and also meet requirements as specified under "Engineering Degree Requirements" published in the current undergraduate catalog.

e

The mechanical engineering technical elective is subject to approval by the student's advisor, and must be in the department of mechanical and aerospace engineering. This elective may not include co-op, special problems, or research credits, such as 3002, 4000, or 4099. Honors students have special requirements for technical electives.

f

The systems integration technical elective must be selected from the following list: [MECH ENG 5307](#), [MECH ENG 5478](#), [MECH ENG 5481](#), [MECH ENG 5533](#), [MECH ENG 5571](#), [MECH ENG 5575](#), [MECH ENG 5656](#), [MECH ENG 5704](#), [MECH ENG 5708](#), [MECH ENG 5709](#), [MECH ENG 5715](#), [MECH ENG 5757](#), [MECH ENG 5760](#), [MECH ENG 5763](#).

g

The systems management elective must be selected from the following list: [MECH ENG 5715](#), [MECH ENG 5757](#), [MECH ENG 5758](#), [ENG MGT 3320](#), [ENG MGT 4710](#).

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

Justification for request

1. In the Systems Integration emphasis area, replacing Eng MGT 3320 with a Systems Management elective to allow a list of options. This will help with course availability for the distance offerings associated with the Missouri State University cooperative program.
2. In the Systems Integration emphasis area, adding MECH ENG 5760 to the list of options for the Systems Integration technical elective.
3. Remove Eng Mgt design team credits from the options for the breadth elective. These courses have not been offered in many years and create confusion.

Supporting Documents

Course Reviewer Comments

## Program Change Request

### New Program Proposal

Date Submitted: 03/24/23 3:48 pm

Viewing: **PROPOSED : Quantitative Economics Minor**

File: 399

Last edit: 03/24/23 3:48 pm

Changes proposed by: mlc2d

Start Term

Fall 2023

Program Code

PROPOSED

Department

Economics

Title

Quantitative Economics Minor

### Program Requirements and Description

#### In Workflow

1. RECONOMI 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

#### Approval Path

1. 04/03/23 11:32 am  
Melody Lo (mlc2d):  
Approved for  
RECONOMI Chair
2. 04/14/23 8:56 am  
Jennifer Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 04/14/23 8:58 am  
Cecil Eng Huang  
Chua (cchua):  
Approved for Social  
Sciences DSCC  
Chair
4. 04/18/23 10:10 am  
Jennifer Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post
5. 05/08/23 3:59 pm  
Jennifer Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda
6. 05/08/23 4:33 pm  
Petra Dewitt  
(dewittp): Approved  
for Campus  
Curricula  
Committee Chair

The Quantitative Economics minor aims to increase job prospects for students across the campus. This minor is designed to prepare business, engineering, or science students to become future business and industry professionals who can apply the core economics principles and quantitative methods to articulate and

make policy recommendations aligned with the current and projected economic environment. The minor provides foundational knowledge of market structure, the global business environment, data analytics, and public policies necessary for strategic corporate and government decision-making.

The Quantitative Economics minor requires completing of a minimum of 17 to 18 hours of coursework with a grade of “C” or better. Required courses in the minor program include both Principles of Microeconomics (ECON 1100) and Macroeconomics (ECON 1200), Introduction to Econometrics (ECON 3300), one course between Data Intelligence using Case Studies (ECON 5350) and Data-Driven Strategic Insights (ECON 5360), and two courses among Economic Analysis of Engineering Projects (ENG MGT 1210), ECON 2100, 2200, or any 3000 and above economic electives of the student’s choices in consultation with the department’s minor advisor.

<a href="#">ECON 1100</a>	Principles Of Microeconomics	3
<a href="#">ECON 1200</a>	Principles Of Macroeconomics	3
<b>ECON 3300</b>	<b>Course ECON 3300 Not Found</b>	3
Choose One of the Following Courses: <sup>1</sup>		
<b>ECON 5350</b>	<b>Course ECON 5350 Not Found</b>	3
<b>ECON 5360</b>	<b>Course ECON 5360 Not Found</b>	3
Choose Two of the Following Courses:		
<a href="#">ENG MGT 1210</a>	Economic Analysis of Engineering Projects	2
<a href="#">ECON 2100</a>	Intermediate Microeconomic Theory	3
<a href="#">ECON 2200</a>	Intermediate Macroeconomic Theory	3
<b>ECON 3333</b>	<b>Course ECON 3333 Not Found</b>	
<a href="#">ECON 3512</a>	Mining Industry Economics	3
<a href="#">ECON 3880</a>	Introduction to Sports Economics	3
<a href="#">ECON 4230</a>	Money And Banking	3
<b>ECON 4383</b>	<b>Course ECON 4383 Not Found</b>	3
<a href="#">ECON 4430</a>	Cost-Benefit Analysis	3
<a href="#">ECON 4440</a>	Environmental And Natural Resource Economics	3
<b>ECON 4538</b>	<b>Course ECON 4538 Not Found</b>	
<a href="#">ECON 4540</a>	Energy Economics	3
<a href="#">ECON 4720</a>	International Finance	3
<a href="#">ECON 5532</a>	Advanced Mining Economics	3
<a href="#">ECON 5337</a>	Financial Mathematics	3
Total Credits: 17 - 18		

1

Both data analytics courses can be counted as a total of six credit hours for this minor. When students choose to take both ECON 5350 and 5360, they must only choose one course from ENG MGT 1210, ECON 2100, 2200, or any other 3000-level and above economic electives to complete the minor.

#### Justification for request

Our intent in offering a quantitative economics minor is to provide an effective way for students across the S&T campus to increase their competitiveness in the job market. In particular, this intent is aimed better at serving many engineering and science students on our campus.

#### Supporting Documents

#### Course Reviewer Comments

## Program Change Request

Date Submitted: 03/16/23 10:06 am

Viewing: **WATERSC-MS : Water Science and Engineering MS**

File: 345.10

Last approved: 06/14/22 4:26 pm

Last edit: 04/13/23 3:32 pm

Changes proposed by: jdc

Catalog Pages Using this Program

[Water Science and Engineering](#)

Start Term

Fall ~~2022~~ 2023

Program Code

WATERSC-MS

Department

Geosciences and Geological and Petroleum Engineering

Title

Water Science and Engineering MS

### Program Requirements and Description

### In Workflow

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

### Approval Path

1. 03/16/23 10:23 am  
Jeff Cawfield (jdc):  
Approved for  
RGEOSENG Chair
2. 04/13/23 3:32 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/18/23 9:17 am  
Mark Fitch (mfitch):  
Approved for  
Engineering DSCC Chair
4. 04/18/23 10:10 am  
Jennifer Pohlsander (jpnfd): Approved for Pending CCC Agenda post
5. 05/08/23 4:00 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Meeting Agenda
6. 05/08/23 4:33 pm  
Petra Dewitt (dewittp): Approved for Campus Curricula Committee Chair

### History

1. Jun 10, 2021 by Sharon Lauck (laucks)
2. Jun 14, 2022 by

## Master of Science

### Water Science and Engineering

The Water Science and Engineering (WSE) Master of Science (MS) degree requires a total of 30 graduate credit hours beyond the B.S. [degree](#). ~~The program is non-thesis only. degree for both thesis and non-thesis MS options.~~ We encourage applications from students with undergraduate degrees from one of the seven participating programs (Biology, Chemistry, Chemical Engineering, Civil Engineering, Environmental Engineering, Geology and Geophysics, and Geological Engineering) or closely related degree programs. Graduate certificates in *Subsurface Water Resources* and/or *Surface Water Resources* can serve as an entry point into the WSE program.

The [program](#) ~~thesis option~~ is comprised of the following:

- **Program Courses:** Students will select six courses (18hrs) from the Program Course List. Students must take at least one course from three different course categories and also take at least one course from three separate departments. Course categories include *Engineering Hydrology*, *Water Infrastructure and Remediation*, *Water Resources and the Environment*, and *Water Policy*.
- **Additional Courses:** Students will select ~~four~~ [two](#) courses (~~12~~ [6](#) hrs) from a combination of existing and newly developed graduate courses that are relevant to their degree plans. These courses must be approved by their advisor ~~in consultation with their thesis committee~~ and will be chosen based on ~~the student's~~ [their](#) specific career goals and interests.

~~Thesis Research: Students will complete six hours of research credit. The non-thesis option is identical to the thesis option except that the research hours are replaced with six hours of additional coursework.~~ The non-thesis WSE MS-degree is offered both on campus and online.

Engineering Hydrology		
<a href="#">CIV ENG 6331</a>	Advanced Hydraulics And Hydraulic Engineering	3
<a href="#">CIV ENG 5338</a>	Hydrologic Engineering	3
<a href="#">CIV ENG 5330</a>	Unsteady Flow Hydraulics	3
<a href="#">CIV ENG 5331</a>	Hydraulics Of Open Channels	3
<a href="#">CIV ENG 5333</a>	Intermediate Hydraulic Engineering	3
<a href="#">CIV ENG 5337</a>	River Mechanics And Sediment Transport	3
<a href="#">CIV ENG 6338</a>	Advanced Hydrology	3
<a href="#">GEO ENG 5320</a>	Groundwater Modeling	3
<a href="#">GEO ENG 5331</a>	Subsurface Hydrology	3
<a href="#">GEO ENG 5332</a>	Fundamentals of Groundwater Hydrology	3
<a href="#">GEO ENG 6331</a>	Advanced Subsurface Hydrology	3

Water Infrastructure and Remediation		
<a href="#">CIV ENG 5335</a>	Water Infrastructure Engineering	3
<a href="#">CIV ENG 6340</a>	Urban Hydrology	3
<a href="#">CIV ENG 6335</a>	Hydraulic Structures	3
<a href="#">BIO SCI 6463</a>	Bioremediation	3
<a href="#">CHEM ENG 4210</a>	Biochemical Reactors	3
<a href="#">CHEM ENG 5110</a>	Intermediate Chemical Reactor Design	3
<a href="#">CIV ENG 5332</a>	Transport Processes in Environmental Flows	3
<a href="#">CIV ENG 5360</a>	Water Resources And Wastewater Engineering	3
<a href="#">ENV ENG 5630</a>	Remediation of Contaminated Groundwater And Soil	3

<a href="#">ENV ENG 5635</a>	Phytoremediation and Natural Treatment Systems: Science and Design	3
<a href="#">ENV ENG 5619</a>	Environmental Engineering Design	3
<a href="#">ENV ENG 6612</a>	Biological Operations In Environmental Engineering Systems	3
<a href="#">ENV ENG 6611</a>	Physicochemical Operations In Environmental Engineering Systems	3
<a href="#">GEO ENG 6237</a>	Advanced Geological & Geotechnical Design For Hazardous Waste Mgt	3
<a href="#">GEO ENG 5239</a>	Groundwater Remediation	3
<a href="#">GEO ENG 5381</a>	Intermediate Subsurface Hydrology And Contaminant Transport Mechs	3
Water Resources and the Environment		
<a href="#">BIO SCI 4313</a>	Introduction to Environmental Microbiology	3
<a href="#">BIO SCI 6313</a>	Environmental Microbiology	3
<a href="#">BIO SCI 4383</a>	Toxicology	3
<a href="#">BIO SCI 4363</a>	Freshwater Ecology	3
<a href="#">BIO SCI 6363</a>	Advanced Freshwater Ecology	3
<a href="#">BIO SCI 6383</a>	Advanced Toxicology	3
<a href="#">CHEM ENG 5340</a>	Principles of Environmental Monitoring	3
<a href="#">CHEM 4710</a>	Principles Of Environmental Monitoring	3
<a href="#">CHEM 5710</a>	Environmental Monitoring	3
<a href="#">ENV ENG 5605</a>	Environmental Systems Modeling	3
<a href="#">ENV ENG 5642</a>	Sustainability, Population, Energy, Water, and Materials	3
<a href="#">GEOLOGY 4431</a>	Methods Of Karst Hydrogeology	3
<a href="#">GEOLOGY 4411</a>	Hydrogeology	3
<a href="#">GEOLOGY 4451</a>	Aqueous Geochemistry	3
<a href="#">GEO ENG 5153</a>	Regional Geological Engineering Problems In North America	3
<a href="#">GEO ENG 5233</a>	Risk Assessment In Environmental Studies	3
<a href="#">GEO ENG 5782</a>	Environmental and Engineering Geophysics	3
<a href="#">GEO ENG 6736</a>	Advanced Geophysical Methods	3
Water Policy		
<a href="#">CIV ENG 5640</a>	Environmental Law And Regulations	3
<a href="#">CIV ENG 5650</a>	Public Health Engineering	3
<a href="#">POL SCI 4500</a>	Geopolitics and International Security	3
<a href="#">POL SCI 4320</a>	The Politics of Innovation	3
<a href="#">ECON 4440</a>	Environmental And Natural Resource Economics	3

~~A written thesis and formal thesis defense are required for thesis-based MS degree students.~~ Entrance requirements are equivalent to the baseline university graduate student admission standards. The GRE exam is not required for internal degree applicants.

#### Justification for request

At the suggestion of the Dean of the College of Engineering and Computing, and in consultation with the departments and programs involved in offering the Water Science and Engineering MS degree, it has been decided to offer a non-thesis MS degree only in Water Science and Engineering. I have removed the catalog information that referred to a thesis option and I have changed the course selection information to reflect a non-thesis option only.

#### Supporting Documents

#### Course Reviewer Comments

**jpnfd (04/13/23 3:32 pm):** Edited spacing in description.

# Course Change Request

## New Experimental Course Proposal

Date Submitted: 03/15/23 3:22 pm

Viewing: **CHEM ENG 5001.019 : Materials as Hard Tissue Devices**

File: 4949

Last edit: 03/31/23 8:52 am

Changes proposed by: luksc

Requested	Spring 2024
Effective Change Date	
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	019
Experimental Title	Materials as Hard Tissue Devices
Experimental Abbreviated Course Title	Hard Tissue Devices
Instructors	Mark Towler

Experimental Catalog Description

The structure-property relationships of materials employed as medical devices, as well as the bone, cartilage and ligament that they are designed to replace. The behavior of materials in the physiological environment, the tailoring of that behavior as a response to both bulk and surface properties, and the future of hard tissue medical devices.

Prerequisites

Chem Eng 4301 or instructor's permission.

In Workflow

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

Approval Path

1. 03/15/23 3:47 pm  
Hu Yang (huyang):  
Approved for  
RCHEMENG Chair
2. 04/03/23 11:05 am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 04/12/23 8:51 am  
Mark Fitch  
(mfitch):  
Approved for  
Engineering DSCC  
Chair
4. 04/18/23 10:09 am  
Jennifer  
Pohlsander  
(jpnfd): Approved

Field Trip  
Statement

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

Justification for  
new course:

Course in area of specialization of new faculty member

Semester(s)  
previously taught

Co-Listed  
Courses:

Course Reviewer    **jpnfd (03/24/23 2:33 pm):** Added punctuation to prerequisite.  
Comments

for Pending CCC  
Agenda post  
5. 05/08/23 3:53 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda  
6. 05/08/23 4:31 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

Key: 4949

[Preview Bridge](#)

# Course Change Request

## New Experimental Course Proposal

Date Submitted: 03/22/23 3:51 pm

Viewing: **CHEM ENG 5001.021 : Fermentation Technology**

File: 4973

Last edit: 04/03/23 9:23 am

Changes proposed by: luksc

Requested	Spring 2024
Effective Change Date	
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	021
Experimental Title	Fermentation Technology
Experimental Abbreviated Course Title	Fermentation Technology
Instructors	Christi Luks

Experimental Catalog Description

Application of transport, thermodynamics, and microbial growth to produce new chemical products. Development and scaling up of fermentation processes to successful production for industry. Biofuel, pharmaceutical, food, and beverage applications will be addressed.

Prerequisites

Chem Eng 3101 and Chem Eng 3120 and preceded or accompanied by Chem Eng 3150 or graduate standing.

Field Trip

In Workflow

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

Approval Path

1. 03/23/23 1:22 pm  
Hu Yang (huyang):  
Approved for  
RCHEMENG Chair
2. 04/03/23 11:05 am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 04/12/23 8:51 am  
Mark Fitch  
(mfitch):  
Approved for  
Engineering DSCC  
Chair
4. 04/18/23 10:09 am  
Jennifer  
Pohlsander  
(jpnfd): Approved

Statement

There will be optional industrial field trips scheduled. Students under 21 years of age will not be allowed to sample alcoholic beverages.

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

Justification for  
new course:

There is a strong interest from students and industry for a technical course in fermentation. This is intended for our chemical engineering students, but also ties in with our proposed program in biomedical engineering.

Semester(s)  
previously taught  
n/a

Co-Listed  
Courses:

Course Reviewer    **jpnfd (03/30/23 11:28 am):** Updated prerequisite format.  
Comments            **jpnfd (04/03/23 9:23 am):** Updated prerequisite format.

for Pending CCC  
Agenda post  
5. 05/08/23 3:53 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda  
6. 05/08/23 4:31 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

Key: 4973

[Preview Bridge](#)

# Course Change Request

## New Experimental Course Proposal

Date Submitted: 04/05/23 2:07 pm

Viewing: **CHEM ENG 5001.022 : Energy Engineering**

File: 4977

Last edit: 04/12/23 8:56 am

Changes proposed by: luksc

Requested	Spring 2024
Effective Change Date	
Department	Chemical and Biochemical Engineering
Discipline	Chemical Engineering (CHEM ENG)
Course Number	5001
Topic ID	022
Experimental Title	Energy Engineering
Experimental Abbreviated Course Title	Energy Engineering
Instructors	Joseph Smith

Experimental Catalog Description

An assessment of issues related to worldwide energy demand and the key engineering, environmental, industrial, governmental, and market concepts that drive decision making. Discussions of the life-cycle analysis of traditional and renewable energy sources such as fossil fuels, nuclear power, biomass, wind, solar, and geothermal.

Prerequisites

Senior standing.

Field Trip

In Workflow

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

Approval Path

1. 04/05/23 2:09 pm  
Hu Yang (huyang):  
Approved for  
RCHEMENG Chair
2. 04/12/23 8:57 am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
3. 04/18/23 9:16 am  
Mark Fitch  
(mfitch):  
Approved for  
Engineering DSCC  
Chair
4. 04/18/23 10:09  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC

Statement

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

Justification for  
new course:

In an agreement with Dr. Lo in economics, we will no longer be offering ChemEng 4540. This course is a variation of that one which has been very popular with our students. We will be emphasizing the engineering aspects of that course,

Semester(s)  
previously taught

Co-Listed  
Courses:

Course Reviewer  
Comments

Agenda post  
5. 05/08/23 3:53 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda  
6. 05/08/23 4:31 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

Key: 4977

[Preview Bridge](#)

# Course Change Request

## New Experimental Course Proposal

Date Submitted: 03/20/23 3:33 pm

Viewing: **COMP ENG 5001.005 : Fundamentals of Data Engineering**

File: 4971

Last edit: 04/03/23 9:24 am

Changes proposed by: stanleyj

Requested	Fall 2023
Effective Change Date	
Department	Electrical and Computer Engineering
Discipline	Computer Engineering (COMP ENG)
Course Number	5001
Topic ID	005
Experimental Title	Fundamentals of Data Engineering
Experimental Abbreviated Course Title	Fund Data Eng
Instructors	Minsu Choi

Experimental Catalog Description

This course introduces data engineering, covering the essential skills and knowledge required to design and manage data pipelines, integrate and process data from various sources, ensure data quality and security, and deploy machine learning/AI models. Through hands-on experience and real-world examples, you will learn the fundamentals of data engineering.

Prerequisites

Comp Eng 2210, programming experience and junior standing.

In Workflow

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

Approval Path

1. 03/20/23 3:34 pm  
Jonathan Kimball (kimballjw):  
Approved for RELECENG Chair
2. 04/03/23 11:06 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/12/23 8:51 am  
Mark Fitch (mfitch):  
Approved for Engineering DSCC Chair
4. 04/18/23 10:09 am  
Jennifer Pohlsander

Field Trip  
Statement

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

Justification for  
new course:

This course introduces data engineering, covering the essential skills and knowledge required to design and manage data pipelines, integrate and process data from various sources, ensure data quality and security, and deploy machine learning/AI models. Through hands-on experience and real-world examples, you will learn the fundamentals of data engineering, including data modeling, databases, data integration, processing, and pipeline design.

This course addresses an important area in computer engineering that spans multiple disciplines, including hardware-software co-design, security, data science, and computational intelligence. The course would be offered at the junior+ level to provide students with breath and/or depth of knowledge to address the the senior electives in the computer engineering program .

Semester(s)  
previously taught

Co-Listed  
Courses:

Course Reviewer    **jpnfd (03/24/23 2:34 pm):** Updated prerequisite format.  
Comments            **jpnfd (03/30/23 11:24 am):** Added punctuation to course description.  
                             **jpnfd (04/03/23 9:24 am):** Updated prerequisite format.

(jpnfd): Approved  
for Pending CCC  
Agenda post  
5. 05/08/23 3:53 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda  
6. 05/08/23 4:31 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

# Course Change Request

## New Experimental Course Proposal

Date Submitted: 03/20/23 9:46 am

Viewing: **COMP SCI 6001.012 : Topics in Quantum**

## Computing and Information

File: 4961

Last edit: 03/24/23 3:54 pm

Changes proposed by: taylorpat

Requested	Fall 2023
Effective Change Date	
Department	Computer Science
Discipline	Computer Science (COMP SCI)
Course Number	6001
Topic ID	012
Experimental Title	Topics in Quantum Computing and Information
Experimental Abbreviated Course Title	Topics in Quantum
Instructors	Dr. Avah Banerjee

Experimental

Catalog

Description

This course will cover advanced quantum computing. Topics include quantum walks, quantum complexity theory, advanced quantum algorithms, Solovay-Kitaev theorem, quantum simulation, noisy systems, error correction, contextuality, etc.

Prerequisites

B or better in Comp Sci 5200.

Field Trip

Statement

In Workflow

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

Approval Path

1. 03/20/23 7:34 am  
Evie Sherlock (esdk3): Rollback to Initiator
2. 03/20/23 11:24 am  
Stephen Gao (sgao): Approved for RCOMPSCI Chair
3. 04/03/23 11:06 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
4. 04/12/23 8:51 am  
Mark Fitch (mfitch): Approved for Engineering DSCC

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

Justification for  
new course:

Quantum information sciences (QIS) is a promising emerging area. It is vitally important to build a workforce in QIS to keep pace with its growing demand. At the graduate level we need at least two courses to cover the necessary material to prepare interested students to go into QIS. This course will complement our experimental course (CS 5001 - Intro. To Quantum Computing) and cover most of the necessary topics that cannot be covered at the introductory level due to their complexity and time constraints. Further, depending on the instructor, students will be introduced to some advance concepts in QIS to help them get started in their research. Further, this course along with its sister course (CS 5001 - Intro. To Quantum Computing) will be used to create a QIS certification program at the graduate level in CS.

Semester(s)  
previously taught

This is a new proposed experimental course.

Co-Listed  
Courses:

Course Reviewer    **esdk3 (03/20/23 7:34 am):** Rollback: resubmit; Chair update  
Comments            **jpnfd (03/24/23 2:39 pm):** Updated prerequisite format.

Chair  
5. 04/18/23 10:09  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post  
6. 05/08/23 3:54 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda  
7. 05/08/23 4:31 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

Key: 4961

[Preview Bridge](#)

# Course Change Request

## New Experimental Course Proposal

Date Submitted: 10/03/22 2:52 pm

Viewing: **GEOLOGY 2001.001 : Climate Change and Society**

File: 4902

Last edit: 03/07/23 10:02 am

Changes proposed by: johfb

Requested	Fall 2023
Effective Change Date	
Department	Geosciences and Geological and Petroleum Engineering
Discipline	Geology (GEOLOGY)
Course Number	2001
Topic ID	001
Experimental Title	Climate Change and Society
Experimental Abbreviated Course Title	Climate Change
Instructors	Jonathan Obrist-Farner

### Experimental

#### Catalog

#### Description

Introduction to fundamentals of natural and anthropogenic climate change, covering the basics of the climate system, weather and climate phenomena, the greenhouse effect, and climate feedbacks. We will look at past and present climate change, how climate variations have affected human evolution and modern society, and future mitigation strategies.

#### Prerequisites

### In Workflow

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

### Approval Path

1. 10/04/22 12:10 pm  
Jeff Cawlfeld (jdc): Approved for RGEOENG Chair
2. 10/06/22 2:41 pm  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 12/14/22 4:32 pm  
Katie Shannon (shannonk): Approved for Sciences DSCC Chair
4. 01/11/23 2:50 pm  
Jennifer Pohlsander (jpnfd): Approved

Field Trip  
Statement

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

Justification for  
new course:

Scientists attribute the global warming trend to the human expansion of greenhouse gases and climate change will be one of the greatest challenges for society in the coming future. This class will cover fundamentals of climate change so that our students can be educated on the topic.

Semester(s)  
previously taught  
N/A

Co-Listed

Courses:

ENV ENG 2001 - Special Topics  
GEO ENG 2001 - Special Topics

Course Reviewer

Comments

**jpnfd (10/06/22 8:09 am):** Assigned topic ID number. Added capitalization to course title and abbreviated course title.

**esdk3 (01/30/23 1:37 pm):** Rollback: This EC (Geology 2001 - Climate Change and Society) is being rolled back to you because Engineering DSCC/Chair and Bio Sci Chair had not reviewed prior to the last CCC meeting. Please select 'Approve' on this item to push it back through the workflow.

**esdk3 (01/30/23 1:56 pm):** \*\*Engineering DSCC/Chair and Bio Sci Chair had not received the workflow email in order to review prior to CCC meeting.

**shannonk (02/13/23 4:16 pm):** Biology feels like this course would be a good co-list for the new Environmental Science BS, so we prefer a colist of ENV SCI 2001

**jpnfd (03/07/23 10:02 am):** Approved by Civil, Arch, & Environmental Eng (CARE) chair, Joel Burken, via email 2/27/23

- for Pending CCC  
Agenda post
5. 01/30/23 1:37 pm  
Evie Sherlock  
(esdk3): Rollback  
to RGEOENG  
Chair for CCC  
Meeting Agenda
  6. 02/01/23 2:11 pm  
Jeff Cawlfeld  
(jdc): Approved  
for RGEOENG  
Chair
  7. 02/01/23 3:10 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Secretary
  8. 02/13/23 4:16 pm  
Katie Shannon  
(shannonk):  
Approved for  
Sciences DSCC  
Chair
  9. 04/18/23 10:10  
am  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for Pending CCC  
Agenda post
  10. 05/08/23 3:56 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda
  11. 05/08/23 4:32 pm  
Petra Dewitt  
(dewittp):  
Approved for

Campus Curricula  
Committee Chair

[Preview Bridge](#)

# Course Change Request

## New Experimental Course Proposal

Date Submitted: 04/10/23 1:10 pm

Viewing: **TCH COM 6001.001 : Advanced Writing for Business**

File: 4981

Last edit: 04/12/23 8:36 am

Changes proposed by: kswenson

Requested	Fall 2023
Effective Change Date	
Department	English and Technical Communication
Discipline	Technical Communication (TCH COM)
Course Number	6001
Topic ID	001
Experimental Title	Advanced Writing for Business
Experimental Abbreviated Course Title	Adv Writing for Business
Instructors	Carleigh Davis

Experimental Catalog Description

This course helps advanced graduate students develop effective, agile writing skills for industry contexts. Students will learn to navigate “wicked problems” and present viable solutions to stakeholders by crafting compelling, practical communications for a variety of industry situations.

Prerequisites

Graduate standing.

Field Trip

In Workflow

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

Approval Path

1. 04/10/23 1:10 pm  
Kristine Swenson (kswenson):  
Approved for REGLISH Chair
2. 04/12/23 8:37 am  
Jennifer Pohlsander (jpnfd): Approved for CCC Secretary
3. 04/12/23 8:48 am  
Petra Dewitt (dewitt):  
Approved for Arts & Humanities DSCC Chair
4. 04/18/23 10:10 am  
Jennifer Pohlsander

Statement

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

Justification for  
new course:

This course will provide a graduate-level business writing course that should have broad appeal to students across the university as well as within our graduate certificate and MS degree.

Semester(s)  
previously taught  
n/a

Co-Listed  
Courses:

(jpnfd): Approved  
for Pending CCC  
Agenda post  
5. 05/08/23 3:57 pm  
Jennifer  
Pohlsander  
(jpnfd): Approved  
for CCC Meeting  
Agenda  
6. 05/08/23 4:33 pm  
Petra Dewitt  
(dewittp):  
Approved for  
Campus Curricula  
Committee Chair

Course Reviewer    **jpnfd (04/12/23 8:36 am):** Added punctuation to prerequisite.  
Comments

Key: 4981

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