Date Submitted: 01/22/21 2:59 pm

Viewing: CHEGBS : Chemical Engineering, Bachelor of Science in Chemical Engineering

Last approved: 03/05/20 8:25 am

Last edit: 02/04/21 12:20 pm

Changes proposed by: eclause

Catalog Pages Using this Program

- Chemical Engineering B.S.Ch.E.
- Chemical Engineering (CHEG)

Submitter: 5-5412	User ID:	crsleaf1	Phone:
Program Status	Active		
Academic Level	Undergraduate		
Type of proposal	Major/Field of Study		

Select a reason for this modification

Making Minor Changes to an Existing Degree (e.g. changing 15 or fewer hours, changing admission/graduation requirements, adding/changing Focused Study or Track)

Are you adding a concentration?

No

Are you adding or modifying a track?

No

Are you adding or modifying a focused study?

No

Effective Catalog Year Fall 2021

College/School Code

College of Engineering (ENGR)

In Workflow

1. ENGR Dean Initial
2. Director of Program Assessment and Review
3. Registrar Initial
4. Institutional Research
5. CHEG Chair
6. ENGR Curriculum Committee
7. ENGR Faculty
8. ARSC Dean
9. ENGR Dean
10. Global Campus
11. Provost Review
12. University Course and Program Committee
13. Faculty Senate
14. Provost Final
15. Provost's Office--Notification of Approval
16. Registrar Final
17. Catalog Editor Final

Approval Path

1. 03/05/20 10:46 am Norman Dennis (ndennis): Approved for ENGR Dean Initial
2. 03/05/20 5:08 pm Alice Griffin (agriffin): Rollback to Initiator

Department Code

Department of Chemical Engineering (CHEG)

Program Code	CHEGBS
Degree	Bachelor of Science in Chemical Engineering
CIP Code	

3. 07/29/20 8:50 am Norman Dennis (ndennis): Approved for ENGR Dean Initial
4. 08/04/20 1:27 pm Alice Griffin (agriffin): Approved for Director of Program Assessment and Review
5. 08/14/20 12:06 pm Lisa Kulczak (lkulcza): Rollback to Director of Program Assessment and Review for Registrar Initial
6. 08/25/20 10:04 am Alice Griffin (agriffin): Approved for Director of Program Assessment and Review
7. 09/02/20 9:50 am Lisa Kulczak (lkulcza): Approved for Registrar Initial
8. 09/02/20 10:04 am Gary Gunderman (ggunderm): Approved for Institutional Research
9. 01/11/21 4:50 pm Dave Ford (daveford):

Approved for CHEG Chair

10. 01/12/21 4:34 pm Manuel Rossetti (rossetti): Rollback to CHEG Chair for ENGR Curriculum Committee
11. 01/20/21 3:46 pm Dave Ford (daveford): Rollback to ENGR Dean Initial for CHEG Chair
12. 01/21/21 9:41 am Lisa Kulczak (lkulcza): Rollback to Initiator
13. 01/21/21 4:03 pm Norman Dennis (ndennis): Approved for ENGR Dean Initial
14. 01/22/21 1:18 pm Alice Griffin (agriffin): Rollback to Initiator
15. 01/29/21 1:18 pm Norman Dennis (ndennis): Approved for ENGR Dean Initial
16. 02/04/21 12:20 pm Alice Griffin (agriffin): Approved for Director of Program Assessment and Review
17. 02/09/21 5:02 pm Lisa Kulczak

(lkulcza): Approved for Registrar Initial

18. 02/09/21 5:31 pm Gary Gunderman (ggunderm): Approved for Institutional Research
19. 02/11/21 9:38 am Dave Ford (daveford): Approved for CHEG Chair
20. 02/18/21 9:36 am Manuel Rossetti (rossetti): Approved for ENGR Curriculum Committee
21. 02/18/21 9:44 am Norman Dennis (ndennis): Approved for ENGR Faculty
22. 02/18/21 9:56 am Jeannie Hulen (jhulen): Approved for ARSC Dean
23. 02/18/21 10:27 am Norman Dennis (ndennis): Approved for ENGR Dean
24. 02/18/21 10:35 am Suzanne Kenner (skenner): Approved for Global Campus
25. 02/18/21 10:45 am Terry Martin (tmartin): Approved for Provost Review

History

1. Aug 15, 2014 by Leepfrog Administrator (clhelp)
2. Mar 11, 2015 by Ed Clausen (eclause)
3. Aug 14, 2015 by Lisa Kulczak (lkulcza)
4. Mar 15, 2016 by Charlie Alison (calison)
5. Jun 6, 2016 by Charlie Alison (calison)
6. Apr 26, 2018 by Ed Clausen (eclause)
7. Mar 5, 2020 by Ed Clausen (eclause)

14.0701 - Chemical Engineering.

Program Title

Chemical Engineering, Bachelor of Science in Chemical Engineering

Program Delivery Method

On Campus

Is this program interdisciplinary?

No

Does this proposal impact any courses from another College/School?

Yes ~~No~~

College(s)/School(s)

College/School Name
Fulbright College of Arts and Sciences (ARSC)

What are the total hours needed to complete the program?

128

Program Requirements and Description

Requirements

Requirements for B.S. in Chemical Engineering

Each student in chemical engineering is required to complete 128 hours of coursework including the 35-hour University Core. To be eligible for graduation, all students must complete at least 30 hours of Chemical Engineering (CHEG) classes at the University of Arkansas, Fayetteville that are required for the degree. Each student in chemical engineering is also required to complete six semester hours of technical electives, three semester hours of Advanced Science electives, three semester hours of Chemical Engineering electives, and three semester hours of Advanced Science or Chemical Engineering electives. As discussed in the department's Undergraduate Advising Manual, students can select elective courses to better prepare for employment or further study in areas such as:

Biotechnology
Biomedical engineering
Environmental engineering
Food process engineering
Materials engineering
Microelectronics
Nanotechnology
Nuclear engineering
Pre-medicine
Simulation and optimization

Additional opportunities are available to enhance the educational experience of students in these areas. Students should consult their academic adviser for recommendations.

8-Semester Plan

Chemical Engineering B.S.Ch.E.

Eight-Semester Degree Program

The following section contains the list of courses required for the Bachelor of Science in Chemical Engineering degree. Not all courses are offered every semester, so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites. Students wishing to follow the eight-semester degree plan should see the Eight-Semester Degree Policy in the Academic Regulations chapter for university requirements of the program. Entering freshmen will be required to participate in selected

Freshman Engineering Student Services.

First Year	Units Fall	Spring
MATH 2554 Calculus I (ACTS Equivalency = MATH 2405) (Satisfies General Education Outcome 2.1)1	4	
CHEM 1103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)	3	
ENGL 1013 Composition I (ACTS Equivalency = ENGL 1013) (Satisfies General Education Outcome 1.1)	3	
~~PHYS 2054 University Physics I (ACTS Equivalency = PHYS 2034)~~	~~4~~	-
GNEG 1111 Introduction to Engineering I	1	
Fine Arts Core Elective (satisfies General Education Outcome 3.1)2	**3**	
Select one of the following to satisfy General Education Outcome 4.2:		
HIST 2003 History of the American People to 1877 (ACTS Equivalency = HIST 2113)	**3**	
or HIST 2013 History of the American People, 1877 to Present (ACTS Equivalency = HIST 2123)		
or PLSC 2003 American National Government (ACTS Equivalency = PLSC 2003)		
MATH 2564 Calculus II (ACTS Equivalency = MATH 2505)		4
CHEM 1123 University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture)		3
CHEM 1121L University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)		1
~~ENGL 1023 Composition II (ACTS Equivalency = ENGL 1023)~~	-	~~3~~
~~PHYS 2074 University Physics II (ACTS Equivalency = PHYS 2044 Lecture)~~	-	~~4~~
ENGL 1033 Technical Composition II (ACTS Equivalency = ENGL 1023) (Satisfies General Education Outcome 1.2)		**3**
GNEG 1121 Introduction to Engineering II		1
PHYS 2054 University Physics I (ACTS Equivalency = PHYS 2034) (Satisfies General Education Outcome 3.4)		**4**
Year Total:	17	16

Second Year	Units Fall	Spring
MATH 2584 Elementary Differential Equations	4	
CHEM 3603 Organic Chemistry I	3	
CHEM 3601L Organic Chemistry I Laboratory	1	
CHEG 2113 Introduction to Chemical Engineering I	3	
~~HIST 2003 History of the American People to 1877 (ACTS Equivalency = HIST 2113)~~	~~3~~	-
~~or HIST 2013 History of the American People, 1877 to Present (ACTS Equivalency = HIST 2123)~~		
~~or PLSC 2003 American National Government (ACTS Equivalency = PLSC 2003)~~		
~~Humanities or Social Science Elective~~	~~3~~	-
PHYS 2074 University Physics II (ACTS Equivalency = PHYS 2044 Lecture) (Satisfies General Education Outcome 3.4)	**4**	
MATH 2574 Calculus III (ACTS Equivalency = MATH 2603)		4
CHEM 3613 Organic Chemistry II		3
CHEM 3611L Organic Chemistry II Laboratory		1

CHEG 2133 Fluid Mechanics		3
or CHEG 2133H Honors Fluid Mechanics		
CHEG 2313 Thermodynamics of Single-Component Systems		3
or CHEG 2313H Honors Thermodynamics of Single-Component Systems		
~~Humanities or Social Science Elective~~	~~-~~	~~3~~
Social Sciences State Mimimum Core Elective (Satisfies General Education Outcomes 3.3 and 4.1)3		**3**
Year Total:	15	17

Third Year	Units	
	Fall	Spring
CHEM 3813 Elements of Biochemistry	3	
or CHEM 4813H Honors Biochemistry I		
CHEG 3144 Heat and Mass Transfer	4	
CHEG 3323 Thermodynamics of Multi-Component Systems	3	
or CHEG 3323H Honors Thermodynamics of Multi-Component Systems		
~~Technical Elective~~	~~3~~	~~-~~
Select one of the following to satisfy General Education Outcome 3.3:		
ECON 2143 Basic Economics: Theory and Practice	3	
or ECON 2013 Principles of Macroeconomics (ACTS Equivalency = ECON 2103)		
~~Humanities or Social Science Elective~~	~~3~~	~~-~~
Humanities State Minimum Core Elective (Satisfies General Education Outcomes 3.2 and 5.1)4	**3**	
CHEG 3713 Chemical Engineering Materials Technology		3
CHEG 3333 Chemical Engineering Reactor Design		3
or CHEG 3333H Honors Chemical Engineering Reactor Design		
CHEG 3253 Chemical Engineering Computer Methods		3
CHEG 3233L Chemical Engineering Laboratory I		3
Social Sciences State Minimum Core Elective (Satisfies General Education Outcome 3.3)5		**3**
Technical Elective		3
Year Total:	16	18

Fourth Year	Units	
	Fall	Spring
CHEG 4163 Separation Processes	3	
or CHEG 4163H Honors Separation Processes		
CHEG 4413 Chemical Engineering Design I	3	
or CHEG 4413H Honors Chemical Engineering Design I		
CHEG 4813 Chemical Process Safety	3	
or CHEG 4813H Honors Chemical Process Safety		
Advanced Science Elective	3	
Technical Elective	3	
CHEG 4332L Chemical Engineering Laboratory II		2

CHEG 4423 Automatic Process Control		3
or CHEG 4423H Honors Automatic Process Control		
Satisfies General Education Outcome 6.1:		
CHEG 4443 Chemical Engineering Design II		3
or CHEG 4443H Honors Chemical Engineering Design II		
Advanced Science or Chemical Engineering Elective		3
Chemical Engineering Elective		3
Year Total:	15	14

Total Units in Sequence: 128

1 Students have demonstrated successful completion of the learning indicators identified for learning outcome 2.1, by meeting the prerequisites for MATH 2554.

2 The Fine Arts Elective courses which satisfy General Education Outcome 3.1 include: ARCH 1003, ARHS 1003, COMM 1003, DANC 1003, LARC 1003, MLIT 1003, MLIT 1003H, MLIT 1013, MLIT 1013H, MLIT 1333, THTR 1003, THTR 1013, or THTR 1013H.

3 The Social Sciences Elective courses which satisfy General Education Outcomes 3.3 and 4.1 include: ANTH 1023, COMM 1023, HDFS 1403, HDFS 2413, HIST 1113, HIST 1123, HIST 2093, HUMN 1114H, HUMN 2114H, INST 2013, INST 2813, INST 2813H, PLSC 2013, PLSC 2813, PLSC 2813H, RESM 2853, SOCI 2013, SOCI 2013H, or SOCI 2033.

4 The Humanities Elective courses which satisfy General Education Outcomes 3.2 and 5.1 include: CLST 1003, CLST 1003H, CLST 1013, HUMN 1124H, PHIL 2003, PHIL 2003C, PHIL 2003H, PHIL 2103, or PHIL 2103C.

5 The Social Sciences Elective courses which satisfy General Education Outcome 3.3 include: AGEC 1103, AGEC 2103, ANTH 1023, COMM 1023, ECON 2013, ECON 2023, ECON 2143, EDST 2003, HDFS 1403, HDFS 2413, HDFS 2603, HIST 1113, HIST 1113H, HIST 1123, HIST 1123H, HIST 2003, HIST 2013, HIST 2093, HUMN 1114H, HUMN 2114H, INST 2013, INST 2813, INST 2813H, PLSC 2003, PLSC 2013, PLSC 2203, PLSC 2813, PLSC 2813H, PSYC 2003, RESM 2853, SOCI 2013, SOCI 2013H, SOCI 2033. Note, courses cannot be counted twice in degree requirements.

Are Similar Programs available in the area?

No

Estimated Student Demand for Program: 250

Scheduled Program Review Date: 2020

Program Goals and Objectives

Program Goals and Objectives

Program Goals and Objectives
The educational objectives of the Chemical Engineering undergraduate program are to prepare students for career and professional accomplishments after graduation including:
1. Successfully practicing ~~1.Successfully practice~~ as an engineer or in **another** ~~some other~~ professional pursuit, including traditional or emerging fields of chemical **engineering, making a positive impact locally and globally.** ~~engineering.~~
2. Actively involved ~~2.Enter and successfully participate~~ in ~~a graduate or~~ professional **lifelong learning, both informal and formal,** ~~program~~ that **deepens** ~~continues~~ their **knowledge and readiness to contribute to advancing science, technologies and solutions essential for the future, including successfully participating in a graduate or professional program.** ~~career development.~~

Learning Outcomes

Learning Outcomes
By the time of graduation, our students attain the following student outcomes:
▪ **An** ▪~~an~~ ability to **identify, formulate,** ~~apply knowledge of mathematics, science,~~ and **solve complex** engineering **problems by applying principles of engineering, science, and mathematics.**
▪ **An** ▪~~an~~ ability to **apply the engineering** design **process** ~~and conduct experiments, as well as~~ to **produce solutions that meet specified needs with consideration for public health and safety,** ~~analyze~~ and **global, cultural, social, and environmental, economic, and other factors as appropriate to the discipline.** ~~interpret data~~
▪ **An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.** ▪~~an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability~~
▪ **An ability to communicate effectively with a range or audiences.** ▪~~an ability to function on multidisciplinary teams~~
▪ **An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.** ▪~~an ability to identify, formulate, and solve engineering problems~~
▪ **An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge.** ▪~~an understanding of professional and ethical responsibility~~
▪ **An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.** ▪~~an ability to communicate effectively~~

Learning Outcomes
~~▪the broad education necessary to understand the impact of engineering solutions in global, economic, environmental, and societal contexts~~
~~▪a recognition of the need for, and an ability to engage in life-long learning~~
~~▪a knowledge of contemporary issues~~
~~▪an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.~~

Description and justification of the request

Description of specific change	Justification for this change
Change was made to put in place the new ABET outcomes for engineering	All Engineering programs now receive accreditation under this revised set of engineering outcomes
Revised formatting of the eight semester degree plan. Inserted the General Education language. Also added footnotes and hyper-linked courses for access to course details. AG	To provide consistency with the General Education curriculum language. Footnotes provides list of courses that specifically meets each General Education Outcome on behalf of the college. Changes to ENGL 1033 requirement will need program change to receive campus approval. AG
Moved PHYS 2054 in curriculum (and changes related to this move).	Due to new prerequisites for this course.

Upload attachments

Reviewer Comments

Alice Griffin (agriffin) (03/05/20 5:08 pm): Rollback: Rolling back so program can submit General Education changes.
Lisa Kulczak (lkulcza) (08/14/20 12:06 pm): Rollback: Per request from Alice G.
Alice Griffin (agriffin) (08/21/20 4:17 pm): Added additional courses approved for the General Education curriculum.
Manuel Rossetti (rossetti) (01/12/21 4:34 pm): Rollback: Rollback to allow change with FEP science elective and Physics 1 to be addressed.
Dave Ford (daveford) (01/20/21 3:46 pm): Rollback: Rolling back for Phys 1 change
Lisa Kulczak (lkulcza) (01/21/21 9:41 am): Rollback: Rolling back to submitter for additional updates, per request of dean's office.

Alice Griffin (agriffin) (01/22/21 1:18 pm): Rollback: Please review the eight semester plan. Placing the Humanities elective in the fall semester of the third year, places students in an overload (beyond 18 hours). Recommending the requirement be moved to either third year, spring; or fourth year, fall or spring. Any semester could be used, as long as it remains 18 hours or under.

Alice Griffin (agriffin) (02/04/21 12:09 pm): Reinserted HIST 2013 and PLSC 2003 as course options with HIST 2003 to satisfy the History or Government State Minimum Core requirement in first year of eight semester plan. College is encouraged to review.

Alice Griffin (agriffin) (02/04/21 12:12 pm): Moved gen ed comment regarding 4.2 to first year fall semester to accompanying the movement of the History and Government requirement. College is encouraged to review for accuracy and intended placement.

Alice Griffin (agriffin) (02/04/21 12:19 pm): Reinserted General Education language to PHYS 2054 and PHYS 2074 to clarify that the program satisfies outcome 3.4.

Alice Griffin (agriffin) (02/04/21 12:20 pm): ATTENTION: Since request impacts courses from another college, this minor program change will require campus approval.

Key: 476