

Date Submitted: 09/17/21 4:26 pm

Viewing: **CENGBS : Computer Engineering,
Bachelor of Science in Computer Engineering**

Last approved: 12/10/20 10:04 am

Last edit: 09/24/21 8:16 am

Changes proposed by: drt

Catalog Pages Using
this Program

[Computer Engineering B.S.Cmp.E.](#)

[Computer Science and Computer Engineering.\(CSCE\)](#)

Submitter: 575-5090 User ID: drt 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 Certificate or 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 2022

College/School Code
College of Engineering (ENGR)

In Workflow

1. ENGR Dean Initial
2. Director of Curriculum Review and Program Assessment
3. Registrar Initial
4. Institutional Research
5. CSCE 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. Registrar Final
16. Catalog Editor Final

Approval Path

1. 09/22/21 2:26 pm
Kevin Hall (kdhall):
Approved for ENGR
Dean Initial
2. 09/24/21 8:16 am
Alice Griffin
(agriffin): Approved
for Director of
Curriculum Review
and Program
Assessment

Department Code

Department of Computer Science and Computer Engineering (CSCE)

Program Code

CENGBS

Degree

Bachelor of Science in Computer Engineering

CIP Code

3. 09/28/21 5:11 pm
Lisa Kulczak
(lkulcza): Approved
for Registrar Initial
4. 09/28/21 5:17 pm
Doug Miles
(dmiles): Approved
for Institutional
Research
5. 09/28/21 6:13 pm
Dale Thompson
(drt): Approved for
CSCE Chair
6. 10/07/21 1:48 pm
Manuel Rossetti
(rossetti): Approved
for ENGR
Curriculum
Committee
7. 11/05/21 10:05 am
Kevin Hall (kdhall):
Approved for ENGR
Faculty
8. 11/08/21 12:03 pm
Jeannie Hulen
(jhulen): Approved
for ARSC Dean
9. 11/15/21 4:21 pm
Kevin Hall (kdhall):
Approved for ENGR
Dean
10. 11/15/21 4:21 pm
Suzanne Kenner
(skenner): Approved
for Global Campus
11. 11/22/21 8:17 am
Ketevan
Mamiseishvili
(kmamisei):

Approved for
Provost Review

History

- 1. Aug 15, 2014 by
Leepfrog
Administrator
(clhelp)
- 2. Jan 14, 2015 by
Susan Huskey (srh)
- 3. Apr 21, 2015 by
Susan Huskey (srh)
- 4. Mar 21, 2016 by
Susan Huskey (srh)
- 5. Jun 7, 2016 by
Charlie Alison
(calison)
- 6. Feb 17, 2020 by
Dale Thompson
(drt)
- 7. Dec 10, 2020 by
Karen Turner
(kjvestal)

14.0901 - Computer Engineering, General.

Program Title

Computer Engineering, Bachelor of Science in Computer Engineering

Program Delivery

Method

On Campus

Is this program interdisciplinary?

Yes

College(s)/School(s)

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

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

No

What are the total 126
hours needed to
complete the
program?

Program Requirements and Description

Requirements

The computer engineering degree has required sequences of courses in both hardware and software aspects of computer applications and design. Since almost all of today's complex systems encompass hardware and software elements, computer engineering graduates must acquire the skills required to design, build, and test complex digital systems. At the advanced level, students are exposed to hands-on experience with open-ended problems with opportunities for research and design.

The Bachelor of Science in Computer Engineering program culminates in a capstone project completed in two consecutive semesters. In the first semester, students form teams and develop a project proposal. In the second semester, students develop, implement, and present the final project.

~~Humanities and social science electives are selected from the state minimum core listed in the Catalog of Studies. To satisfy the state minimum core, all CSE students are required to take the following 18 hours of humanities/social science courses: The Undergraduate Handbook has a list of approved basic science, mathematics, and technical electives. Any course not included in these lists requires faculty approval.~~

PHIL 3103	Ethics and the Professions	3
Fine Arts from Category "A"		3
U.S. History		3
Social Science		9
Total Hours		0

8-Semester Plan

Computer Engineering B.S.Cmp.E. Eight-Semester Degree Program

The following sections contain the list of courses required for the Bachelor of Science in Computer Engineering (B.S.Cmp.E.) with a suggested sequence below.

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.

First Year

Units

	Fall	Spring
<u>GNEG 1111</u> Introduction to Engineering I		1
<u>MATH 2554</u> Calculus I (ACTS Equivalency = MATH 2405) (Satisfies General Education Outcome 2.1)	1	4
PHYS 2054 University Physics I (ACTS Equivalency = PHYS 2034) (Satisfies General Education Outcome 3.4)	4	-
<u>CHEM 1103</u> University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)		3
<u>ENGL 1013</u> Composition I (ACTS Equivalency = ENGL 1013) (Satisfies General Education Outcome 1.1)		3
U.S. History Elective (Satisfies General Education Outcomes 3.2 and 4.2) Choose from one of the following courses:		3
<u>HIST 2003</u> History of the American People to 1877 (ACTS Equivalency = HIST 2113)		
<u>HIST 2013</u> History of the American People, 1877 to Present (ACTS Equivalency = HIST 2123)		
<u>GNEG 1121</u> Introduction to Engineering II		1
<u>MATH 2564</u> Calculus II (ACTS Equivalency = MATH 2505)		4
U.S. History Elective (Satisfies General Education Outcomes 3.2 and 4.2) Choose from one of the following courses:	-	3
HIST 2003 History of the American People to 1877 (ACTS Equivalency = HIST 2113)		
HIST 2013 History of the American People, 1877 to Present (ACTS Equivalency = HIST 2123)		
PHYS 2074 University Physics II (ACTS Equivalency = PHYS 2044 Lecture) (Satisfies General Education Outcome 3.4)	-	4
ENGL 1023 Composition II (ACTS Equivalency = ENGL 1023) (Satisfies General Education Outcome 1.1)	-	3
or ENGL 1033 Technical Composition II (ACTS Equivalency = ENGL 1023)		
<u>PHYS 2054</u> University Physics I (ACTS Equivalency = PHYS 2034) (Satisfies General Education Outcome 3.4)		4
Freshman Science Elective (Satisfies General Education Outcome 3.4) Choose one of the following science and corresponding lab options:		4
<u>BIOL 1543</u> Principles of Biology (ACTS Equivalency = BIOL 1014 Lecture)		
<u>BIOL 1541L</u> Principles of Biology Laboratory (ACTS Equivalency = BIOL 1014 Lab)		
<u>CHEM 1123</u> University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture)		
<u>CHEM 1121L</u> University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)		
<u>GEOS 1113</u> Physical Geology (ACTS Equivalency = GEOL 1114 Lecture)		
<u>GEOS 1111L</u> Physical Geology Laboratory (ACTS Equivalency = GEOL 1114 Lab)		
<u>ENGL 1033</u> Technical Composition II (ACTS Equivalency = ENGL 1023) (Satisfies General Education Outcome 1.2)		3
Year Total:	14	16
Second Year		Units
		Fall
		Spring
<u>CSCE 2004</u> Programming Foundations I		4
<u>CSCE 2114</u> Digital Design		4

<u>MATH 2574</u> Calculus III (ACTS Equivalency = MATH 2603)	4
MATH 2603 Discrete Mathematics	3 -
PHYS 2074 University Physics II (ACTS Equivalency = PHYS 2044 Lecture) (Satisfies General Education Outcome 3.4)	4
<u>CSCE 2014</u> Programming Foundations II	4
<u>CSCE 2214</u> Computer Organization	4
<u>MATH 2584</u> Elementary Differential Equations	4
MATH 2603 Discrete Mathematics	3
Social Sciences Elective (Satisfies General Education Outcomes 3.3 and 4.1)2	3
Social Sciences Elective (Satisfies General Education Outcome 3.3)3	- 3
Year Total:	16 18

Third Year

Units

	Fall	Spring
<u>CSCE 3193</u> Programming Paradigms	3	
<u>CSCE 3613</u> Operating Systems	3	
<u>CSCE 3953</u> System Synthesis and Modeling	3	
Social Sciences Elective (Satisfies General Education Outcome 3.3)3	3	
<u>INEG 3313</u> Engineering Probability and Statistics4	3	
Basic Science Elective with lab5	4 -	
<u>CSCE 3513</u> Software Engineering (Satisfies General Education Outcome 6.1)	3	
CSC E Elective (4000 level)	3	
<u>ELEG 3933</u> Circuits & Electronics	3	
<u>PHIL 3103</u> Ethics and the Professions (Satisfies General Education Outcome 5.1)	3	
General Elective	- 3	
COMM 1313 Public Speaking (ACTS Equivalency = SPCH 1003)	3	
Year Total:	15	15

Fourth Year

Units

	Fall	Spring
<u>CSCE 4561</u> Capstone I	1	
<u>CSCE 4114</u> Embedded Systems	4	
CSC E Elective (4000 level)	3	
CSC E Elective (4000 level)	3	
Fine Arts Elective (Satisfies General Education Outcome 3.1)5	3	
COMM 1313 Public Speaking (ACTS Equivalency = SPCH 1003) (Satisfies General Education Outcome 3.1-2)	3 -	
General Elective	3	
<u>CSCE 4213</u> Computer Architecture	3	
<u>CSCE 4963</u> Capstone II	3	
CSC E Elective (4000 level)	3	

Social Sciences Elective (Satisfies General Education Outcome 3.3)	3
General elective	3
Year Total:	17 15

Total Units in Sequence: 126

- 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 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 1113H](#), [HIST 1123](#), [HIST 2093](#), [HUMN 1114H](#), [HUMN 2114H](#), [INST 2013](#), [INST 2813](#), [INST 2813H](#), [PLSC 2013](#), [PLSC 2813](#), [PLSC 2813H](#), [RESM 2853](#), [SOC 2013](#), [SOC 2013H](#), or [SOC 2033](#).
- 3 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](#), [SOC 2013](#), [SOC 2013H](#), [SOC 2033](#).
Note, courses cannot be counted twice in degree requirements.
- 4 Student may petition to take the two-course sequence, STAT 3013 and STAT 3113, instead of INEG 3313.
- 5 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](#).
- ~~6 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](#).~~

Are Similar Programs available in the area?

No

Estimated Student Demand for Program	NA
Scheduled Program Review Date	2026-2027 2020- 2021

Program Goals and Objectives

Program Goals and Objectives

Program Goals and Objectives

Program Educational Objectives

For the B.S. degree program in computer engineering, the following set of program educational objectives describe what graduates are expected to attain within a few years after graduation.

Computer Engineering graduates will:

1. Be able to practice their profession in a competitive market. The competitive market includes being recruited by industrial firms, government agencies and graduate schools.
2. Make a significant contribution to society, including improving the standard of living particularly for the taxpayers of the state of Arkansas.
3. Understand the need for life-long learning and continued professional development for a successful and rewarding career.
4. Accept responsibility for leadership roles, in their profession, communities, and society.

Learning Outcomes

Learning Outcomes

Learning Outcomes

Student Learning Outcomes

CE1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

CE2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

CE3. An ability to communicate effectively with a range of audiences.

CE4. 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.

CE5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

CE6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

CE7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Description and justification of the request

Description of specific change	Justification for this change
Moved PHYS 2054 University Physics I to second semester of Freshman year. Expanded list of Freshman Science Electives to match proposed FEP changes. This caused us to rebalance courses.	FEP proposed moving PHYS 2054 to second semester of Freshman Year so that students would be better prepared with Calculus 1 instead of taking Calculus 1 and Physics 1 during the same semester.

Upload attachments

Reviewer Comments

Alice Griffin (agriffin) (09/23/21 10:30 am): Changed General Education Outcome from 2.1 to 1.2 for ENGL 1033 to match approved outcome.

Alice Griffin (agriffin) (09/24/21 8:14 am): Additional changes included: US History moved from spring first year to fall first year. ENGL 1023 was removed as an option with ENGL 1033 in spring first year. PHYS 2074 was moved from spring of first year to fall second year. MATH 2603

was moved from fall second year to spring second year. Social Science Elective was moved from spring second year to fall third year. General Elective was moved from spring their year to fall fourth year. COMM 1313 was moved from fall fourth year to spring third year. Basic Science Elective removed from fall third year to Freshman Science Elective spring first year.

Alice Griffin (agriffin) (09/24/21 8:16 am): ATTENTION: Due to including courses from another college, this minor change will require campus approval.

Key: 474