

Date Submitted: 11/30/20 12:05 pm

Viewing: **ELEGBS : Electrical Engineering,
Bachelor of Science in Electrical Engineering**

Last approved: 11/23/20 3:22 pm

Last edit: 01/07/21 9:10 am

Changes proposed by: rsaunder

Catalog Pages Using
this Program

[Electrical Engineering B.S.E.E.](#)

[Electrical Engineering_\(ELEG\)](#)

Submitter: User ID: rsaunder Phone:
575-3008

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. ELEG 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. 11/30/20 7:49 am
Norman Dennis
(ndennis): Approved for ENGR Dean Initial
2. 11/30/20 7:53 am
Terry Martin
(tmartin): Approved for Provost Initial

Department Code

Department of Electrical Engineering (ELEG)

Program Code

ELEGBS

Degree

Bachelor of Science in Electrical Engineering

CIP Code

3. 11/30/20 10:32 am
Alice Griffin
(agriffin): Rollback
to Initiator
4. 12/04/20 3:26 pm
Norman Dennis
(ndennis): Approved
for ENGR Dean
Initial
5. 12/04/20 4:01 pm
Alice Griffin
(agriffin): Approved
for Director of
Program
Assessment and
Review
6. 12/07/20 1:22 pm
Lisa Kulczak
(lkulcza): Approved
for Registrar Initial
7. 12/07/20 4:25 pm
Gary Gunderman
(ggunderm):
Approved for
Institutional
Research
8. 12/07/20 5:24 pm
Juan Balda (jbalda):
Approved for ELEG
Chair
9. 12/16/20 6:38 pm
Manuel Rossetti
(rossetti): Approved
for ENGR
Curriculum
Committee
10. 12/17/20 1:37 pm
Norman Dennis
(ndennis): Approved
for ENGR Faculty

11. 12/18/20 3:08 pm
Jeannie Hulen
(jhulen): Approved
for ARSC Dean
12. 12/18/20 3:52 pm
Norman Dennis
(ndennis): Approved
for ENGR Dean
13. 12/18/20 4:02 pm
Suzanne Kenner
(skenner): Approved
for Global Campus
14. 01/04/21 10:36 am
Terry Martin
(tmartin): Approved
for Provost Review
15. 01/25/21 10:35 am
Alice Griffin
(agriffin): Approved
for University
Course and Program
Committee

History

1. Aug 15, 2014 by
Leepfrog
Administrator
(clhelp)
2. Mar 24, 2015 by
Connie Howard
(cjhowar)
3. Oct 27, 2015 by
Connie Howard
(cjhowar)
4. Jun 6, 2016 by
Charlie Alison
(calison)
5. May 1, 2018 by
Connie Howard
(cjhowar)

6. Nov 23, 2020 by
Robert Saunders
(rsaunder)

14.1001 - Electrical and Electronics Engineering.

Program Title

Electrical Engineering, Bachelor of Science in Electrical Engineering

Program Delivery

Method

On Campus

Is this program interdisciplinary?

No

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

Yes

College(s)/School(s)

College/School Name

Fulbright College of Arts and Sciences (ARSC)

What are the total
hours needed to
complete the
program?

125

Program Requirements and Description

Requirements

Undergraduate Program in Electrical Engineering

The Electrical Engineering Department maintains the following student learning outcomes:

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

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,

An ability to communicate effectively with a range of audiences,

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

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

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

For more information visit www.abet.org.

The electrical engineering curriculum is designed to provide students with knowledge of scientific principles and methods of engineering analysis to form a solid foundation for a career in design, research and development, manufacturing and processing, measurement and characterization, or management. Students progressively build their design experience throughout the curriculum and demonstrate this ability in the senior electrical engineering design laboratories. The curriculum also introduces students to subjects in the humanities, social sciences, and ethics so they may better understand the interaction of technology and society.

The electrical engineering curriculum is divided into three phases. The first year concentrates on the development of a sound understanding of basic sciences and mathematics. The second and third years further develop scientific principles and cover the basic core of electrical engineering. The fourth year is composed primarily of senior-level elective courses. At this time, the students, in consultation with their advisers, may choose classes related to one or more of the major areas of electrical engineering detailed (e.g., analog and mixed-signal circuit design/test, biomedical, communications, computer hardware and digital circuit design, control systems, electronic packaging, embedded systems design, microwave and radar engineering, nanophotonics, nanotechnology/microelectronics/optoelectronics, pattern recognition and artificial intelligence, power electronics, and renewable energy and power). This final year permits the student to tailor a program suited to her or his individual career objectives. The graduation requirement in electrical engineering is 125 semester hours as given below.

8-Semester Plan

Electrical Engineering B.S.E.E. Eight-Semester Degree Program

The following section contains the list of courses required for the Bachelor of Science in Electrical Engineering and a suggested eight-semester sequence. See the [Eight-Semester Degree Policy](#) for more details. 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.

First Year	Units
	FallSpring
GNEG 1111 Introduction to Engineering I	1
ENGL 1013 Composition I (ACTS Equivalency = ENGL 1013) (Satisfies General Education Outcome 1.1)	3
MATH 2554 Calculus I (ACTS Equivalency = MATH 2405) (Satisfies General Education Outcome 2.1)	4
CHEM 1103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)	3

PHYS 2054 University Physics I (ACTS Equivalency = PHYS 2034) (Satisfies General Education Outcome 3.4)	4	-
Select one of the following (Satisfies General Education Outcome 4.2):	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>PLSC 2003</u> American National Government (ACTS Equivalency = PLSC 2003)		
<u>GNEG 1121</u> Introduction to Engineering II	1	
<u>ENGL 1033</u> Technical Composition II (ACTS Equivalency = ENGL 1023) (Satisfies General Education Outcome 1.2)	3	
<u>MATH 2564</u> Calculus II (ACTS Equivalency = MATH 2505)	4	
Select one of the following (Satisfies General Education Outcome 4.2):	-	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)		
PLSC 2003 American National Government (ACTS Equivalency = PLSC 2003)		
PHYS 2074 University Physics II (ACTS Equivalency = PHYS 2044 Lecture)	-	4
<u>PHYS 2054</u> University Physics I (ACTS Equivalency = PHYS 2034) (Satisfies General Education Outcome 3.4)	4	
Sophomore Science Elective2	4	
Year Total:	14	16
Second Year	Units	
	Fall	Spring
<u>ELEG 2104</u> Electric Circuits I	4	
ELEG 2904 Digital Design	4	-
Sophomore Science Elective2	4	-
<u>MATH 2584</u> Elementary Differential Equations	4	
<u>PHYS 2074</u> University Physics II (ACTS Equivalency = PHYS 2044 Lecture)	4	
Humanities Elective (Satisfies General Education Outcome 3.2 & 5.1)3	3	
<u>CSCE 2004</u> Programming Foundations I	4	
<u>ELEG 2114</u> Electric Circuits II	4	
<u>MATH 2574</u> Calculus III (ACTS Equivalency = MATH 2603)	4	
Humanities Elective (Satisfies General Education Outcome 3.2 & 5.1)3	-	3
<u>ELEG 2904</u> Digital Design	4	
Year Total:	15	16
Third Year	Units	
	Fall	Spring
<u>ELEG 3124</u> System & Signal Analysis	4	
<u>ELEG 3214</u> Electronics I	4	
<u>ELEG 3924</u> Microprocessor Systems Design	4	
<u>ELEG 3704</u> Applied Electromagnetics	4	

ELEG 3143 Probability & Stochastic Processes	3
ELEG 3224 Electronics II	4
ELEG 3304 Energy Systems	4
Social Sciences Elective (Satisfies General Education Outcome 3.3 & 4.1)4	3
Math/Science/Technical Elective	3
Year Total:	16 17
Fourth Year	Units
	FallSpring
Engineering Science/Technical Elective5	3
Two Electrical Engineering Technical Elective6	6
ELEG 4063 Electrical Engineering Design I	3
Select one of the following:	3
ECON 2013 Principles of Macroeconomics (ACTS Equivalency = ECON 2103)	
ECON 2023 Principles of Microeconomics (ACTS Equivalency = ECON 2203)	
ECON 2143 Basic Economics: Theory and Practice	
Electrical Engineering Technical Elective6	3
ELEG 4071 Electrical Engineering Design II (Satisfies General Education Outcome 6.1)	1
Two Technical Elective	6
Social Sciences Elective 7	3
Fine Arts Elective (Satisfies General Education Outcome 3.1)8	3
Year Total:	15 16
Total Units in Sequence:	125

- 1 Students have demonstrated successful completion of the learning indicators identified for learning outcome 2.1, by meeting the prerequisites for [MATH 2554](#).
- 2 [CHEM 1123](#)/[CHEM 1121L](#) or [BIOL 1543](#)/[BIOL 1541L](#) or [BIOL 2213](#)/[BIOL 2211L](#), or [PHYS 2094](#) or [GEOS 1113](#)/[GEOS 1111L](#)
- 3 The Humanities Elective courses that 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](#).
- 4 The Social Sciences Elective courses that 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 1123H](#), [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](#).
- 5 Engineering Science/Technical Elective: **Any Engineering/Science/Math Technical Elective** or one of these 2000 level courses: [MEEG 2013](#), [MEEG 2303](#), [MEEG 2403](#), [CHEG 2313](#), or [INEG 2413](#)
- 6 [CSCE 4114](#), [CSCE 4613](#), or [CSCE 4233](#) are approved ELEG Technical Electives for students pursuing a dual ELEG/CSCE undergraduate degree.
- 7 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](#)

[INST 2413](#), [INST 2003](#), [INST 1113](#), [INST 1113H](#), [INST 1123](#), [INST 1123H](#), [INST 2003](#), [INST 2013](#), [INST 2033](#), [HUMN 1114H](#), [HUMN 2114H](#), [INST 2013](#), [INST 2813](#), [INST 2813H](#), [PLSC 2003](#), [PLSC 2013](#), [PLSC 2203](#), [PLSC 2813](#), [PLSC 2813H](#), [PSYC 2003](#), [RESM 2853](#), [SOVI 2013](#), [SOVI 2013H](#), [SOVI 2033](#). Note, courses cannot be counted twice in degree requirements.

8 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](#).

Students should become very familiar with the Academic Regulations chapter for university requirements that apply to the electrical engineering program as well as the College of Engineering requirements (in particular the “D rule” and the “Transfer of Credit” for courses taken at another institution). Students are required to complete 40 hours of upper division courses (3000-4000 level). It is recommended that students consult with their adviser when making course selections. In addition to these graduation requirements, candidates for an electrical engineering degree must have earned a grade-point average of no less than 2.00 on all ELEG courses.

Are Similar Programs available in the area?

No

Estimated Student Demand for Program 300

Scheduled Program Review Date 2020-2021

Program Goals and Objectives

Program Goals and Objectives

The program educational objectives (PEOs) for the EE undergraduate program, which leads to a Bachelor of Science degree in Electrical Engineering, are to produce graduates who with in three to five years after graduation:

- 1. Are valued as reliable and competent employees by a wide variety of industries; in particular, electrical engineering industries,**
- 2. Succeed, if pursued, in graduate studies such as engineering, science, law, medicine, business, and other professions,**
- 3. Understand the need for life-long learning and continued professional development for a successful and rewarding career, and**
- 4. Accept responsibility for leadership roles, in their profession, in their communities, and in the global society.**

Per ABET

Learning Outcomes

Learning Outcomes

Learning Outcomes

~~Per ABET~~

The learning outcomes are

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics,
2. 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,
3. an ability to communicate effectively with a range of audiences,
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts,
5. 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,
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions,
7. 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
1. move history elective to first semester freshman year 2. move physics I and science elective to second semester freshman year 3. move physics II and humanities elective to first semester sophomore year. 4. move Digital Design to second semester sophomore year	This change will allow students to take MATH 2554 prior to taking PHYS 2054 to increase student success in PHYS 2054. The other changes are the result of moving PHYS 2054 to the second semester freshman year.

Upload attachments

Reviewer Comments

Alice Griffin (agriffin) (11/30/20 10:32 am): Rollback: Please change the following: 1. Reason for the modification to making minor changes. 2. Please review the changes made to the eight semester plan and compare with the description field. Update as appropriate. 3. Review the scheduled program review date and edit as appropriate. 4. Update Program Goals and Learning Outcomes with language used in your assessment report or ABET self-study.

Norman Dennis (ndennis) (12/04/20 3:26 pm): Changed review date to 2020-2021

Alice Griffin (agriffin) (12/04/20 3:59 pm): Corrected minor typo in description.

Alice Griffin (agriffin) (12/04/20 4:01 pm): College should consider the name of the "Sophomore Science Elective" if the course is going to be taken in the Freshman year.

Alice Griffin (agriffin) (01/07/21 9:10 am): Added HIST 1113H, HIST 1123H to footnote #4.

Key: 496