BS IN ELECTRICAL AND ELECTRONIC ENGINEERING

SACRAMENTO STATE
Redefine the Possible

In Workflow

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Approval Path

1. Fri, 09 Apr 2021 22:28:32 GMT
   Perry Heedley (pheedley): Approved for EEE Committee Chair
2. Sat, 08 May 2021 00:54:10 GMT
   Mahyar Zarghami (mahyar.zarghami): Approved for EEE Chair
3. Fri, 17 Sep 2021 16:58:53 GMT
   Mohammed Eltayeb (mohammed.eltayeb): Rollback to EEE Chair for ECS College Committee Chair
4. Fri, 17 Sep 2021 19:46:34 GMT
   Mahyar Zarghami (mahyar.zarghami): Approved for EEE Chair
5. Fri, 24 Sep 2021 17:17:07 GMT
   Mohammed Eltayeb (mohammed.eltayeb): Approved for ECS College Committee Chair
6. Fri, 24 Sep 2021 17:22:06 GMT
   Behnam Arad (arad): Approved for ECS Dean

History

1. May 2, 2018 by clmig-jwehrheim
2. Sep 17, 2018 by 212408496
3. Oct 17, 2019 by Perry Heedley (pheedley)
4. Apr 28, 2020 by Celena Showers (celena.showers)

Date Submitted: Fri, 09 Apr 2021 21:52:16 GMT

Viewing: BS in Electrical and Electronic Engineering

Last approved: Tue, 28 Apr 2020 17:11:58 GMT

Last edit: Fri, 17 Sep 2021 19:46:29 GMT

Changes proposed by: Mahyar Zarghami (214200923)

Academic Group: (College)

Engineering & Computer Science

Academic Organization: (Department)

Electrical and Electronic Engineering

Catalog Year Effective:

2021-2022 Catalog

Individual(s) primarily responsible for drafting the proposed degree major program:

Name (First Last)	Email	Phone 999-999-9999
Mahyar Zarghami	mahyar.zarghami@csus.edu	916-278-7113

Type of Program Proposal:

Major

Program Change Type:

Substantive

Title of the Program:

BS in Electrical and Electronic Engineering

Designation: (degree terminology)

Bachelor of Science

Briefly describe the program proposal (new or change) and provide a justification:

This proposal is part of a series of changes in the BS EEE Program, which would modify our current program description. We also make corrections to previous errors in the program description.

Modification to the Program:
Currently, students in the BS EEE program need to take EEE 130 in the power area as a core course. EEE 130 is a course in Electromechanics which deals with electric generators and motors. Electromechanics is considered as a subfield in the power area among numerous other areas, such as transmission and distribution systems, renewable power generations systems, power electronics, and power markets. As a result, BS EEE students will not grasp an overview of the power systems by taking a course just in electromechanics. To provide our BS EEE students with a holistic overview of power engineering, we propose to make EEE 141 (Power System Analysis I) a core course which deals with an introduction to all areas of power systems, and to make EEE 130 an elective course for all BS EEE students who want to learn more about electromechanics as a subfield in power engineering. We also revise certain topics in EEE 130, EEE 141 and EEE 142 to ensure that EEE 141 can serve as a common course on the fundamentals of electric power systems for all BS EEE students.

Another advantage associated with the proposed changes is to bring symmetry in the BS EEE program. Currently, students in the BS EEE program need to choose between two required Senior Project series (Electrical Power Design vs Product Design), where the number of required units in each of these series is different (11 units for Electrical Power Design vs 8 units for the Product Design). These different requirements have caused asymmetry in the BS EEE program which has resulted in confusion among students, staff, and even faculty advisors. Through the proposed changes, students in both Power Design and Product Design will be required to take 8 required units in their senior project series.

Corrections to the current program description (these changes are not due to modification of the program. They are correcting the wrong numbers)
- Change the total required units for the program from 123 to 122 (on the top of the page of BS EEE page)
- Change the total required units for the major from 94 to 92 (at the end of the table of Program Requirements in the BS EEE page)
- Change the number of units of CpE 187 from 2 to 3 (the number of units changes from 2 to 3 through an already approved Form A, but has not been reflected in the new BS EEE page)

Objectives of the degree program:

Core Knowledge: Our graduates will have active careers in Electrical and Electronic engineering, or be actively engaged in a related career path.

Application of Knowledge: Our graduates will apply their knowledge and skills to solve practical engineering problems.

Professionalism: Our graduates will demonstrate the professional skills, such as high ethical standards, effective oral and written communications, and teamwork, necessary to be productive engineers and to advance in their careers.

Life-long Learning: Our graduates will continue to develop their skills and seek knowledge after graduation in order to adapt to advancing technology and the needs of society. This may be indicated by the graduate's pursuit of an advanced degree or other formal instruction, and/or that the graduate has developed a professional specialty.

University Learning Goals

Undergraduate Learning Goals:

Competence in the disciplines
Knowledge of human cultures and the physical and natural world
Integrative learning
Personal and social responsibility
Intellectual and practical skills

Will this program be required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Do these changes impact the Smart Planner roadmap?

Yes

Please attach the Smart Planner roadmap:

Proposed_SmartPlanner_BS_EEE_8Unit_Power_NonPower.DOCX

Briefly describe the change:

- Change in the number of depth and elective requirements. Both Power Design and Product Design senior project series require 7 units (including 1 lab unit) of depth area, plus 6 units of electives.
- Change in GE Requirements

Catalog Description:

Units required for Major: 92
Total units required for BS: 122

Program Description

The field of Electrical and Electronic Engineering continues to expand in scope, driven by advances in technology and new challenges faced by society. To prepare our graduates for careers in this demanding field, we equip them with a strong background in the fundamental principles of the discipline, and subsequent advanced courses in specific areas. Our curriculum provides practical, hands-on experience through laboratory courses.

The Electrical and Electronic Engineering program provides breadth (core courses), depth (elective sequence), and a culminating design project to apply the knowledge gained through the curriculum. The curriculum allows flexibility by offering a number of elective courses providing our graduates with depth in their respective areas of interest. The electives offered provide depth in one or more of the following areas: Analog/Digital Electronics, Control Systems, Communication Engineering, and Power Engineering. Students select a senior project either in power engineering or in the general area of electronics. Each of these options includes a sequence of two courses for the completion of the project, and has its own pre-requisite requirements.

Note: Students graduating with a BS in Electrical and Electronic Engineering will not be subject to the University's Foreign Language Graduation Requirement. Students who change major may be subject to the University's Foreign Language Graduation Requirement.

Admission Requirements: Course prerequisites and other criteria for admission of students to the degree major program, and for their continuation in it.

Minimum Grade Requirement

A grade of "C-" or better is required in all courses applied to an Electrical and Electronic Engineering major.

As defined by policy http://www.csus.edu/umanual/acadaff/fsm00010.htm, a change in units constitutes a substantive change to the program. If your changes constitute a substantive change, please refer back to the "Program Change Type" field above to ensure that "Substantive" is selected.

Program Requirements: (If new courses are being created as part of a new program, it will be useful to propose courses first.)

Program Requirements

Code	Title	Units
REQUIRED LOWER DIVISION COURSES (38 Units)		
First Semester Freshman Year		
CHEM 1E	General Chemistry for Engineering [1]	4
ENGR 1	Introduction to Engineering [1]	1
MATH 30	Calculus I [1]	4
Second Semester Freshman Year		
ENGR 50	Computational Methods and Applications	3
MATH 31	Calculus II [1]	4
PHYS 11A	General Physics: Mechanics [1]	4
First Semester Sophomore Year		
EEE/CPE 64	Introduction to Logic Design [1,2]	4
MATH 32	Calculus III	4
PHYS 11C	General Physics: Electricity and Magnetism [1]	4
Second Semester Sophomore Year		
ENGR 17	Introductory Circuit Analysis [2]	3

MATH 45	Differential Equations for Science and Engineering	3
REQUIRED UPPER DIVISION COURSES (33 Units) [3]		
First Semester Junior Year		
EEE 117 & 117L	Network Analysis Networks Analysis Laboratory	4
EEE 161	Applied Electromagnetics	4
EEE 180	Signals & Systems	3
ENGR 140	Engineering Economics [1]	2
Second Semester Junior Year		
EEE 108 & 108L	Electronics I Electronics I Laboratory	4
EEE 141	Power System Analysis I	3
EEE 174	Introduction to Microprocessors	4
EEE 184	Introduction to Feedback Systems	3
ENGR 120	Probability and Random Signals	3
First semester senior year		
EEE 185	Modern Communication Systems	3
REQUIRED DESIGN PROJECT SERIES		
Select one of the following two series:		
POWER DESIGN PROJECT SERIES (8 Units)		
EEE 142 & EEE 143	Power System Analysis II Power System Laboratory	4
EEE 192A	Electrical Power Design Project I [1]	2
EEE 192B	Electrical Power Design Project II [1]	2
OR		
PRODUCT DESIGN PROJECT SERIES (8 Units)		
EEE 109	Electronics II	4
EEE 193A	Product Design Project I [1]	2
EEE 193B	Product Design Project II [1]	2
ADDITIONAL ELECTIVE REQUIREMENTS FOR BOTH POWER/PRODUCT DESIGN PROJECT SERIES		
Select 6 units of lecture and 1 unit of laboratory from one of the four areas listed below.		
Select 6 additional units from any of the four areas listed below.		
TOTAL UNITS		**92**

1 Course also satisfies General Education (GE)/Graduation Requirement. The designation "General Education course" denotes a course which meets GE requirements other than those which also serve as prerequisites to courses in the major. Students are expected to satisfy the University's GE requirements. Consult the Department Chair for specific GE requirements. Students should take ENGL 5 as early as possible since it is required for admission to the upper division.

2 CPE 64W, EEE 64W or ENGR 17W may be available to augment understanding of material; however, these courses cannot be used to satisfy graduation requirements.

3 It is imperative that students take the University's Writing Placement for Juniors (WPJ) during the first semester of the junior year, as it is a prerequisite to some laboratory courses after EEE 117L.

Depth Requirement Areas and List of Electives

Depth Area Requirement for both Power Design and Product Design Series:

- Select 6 units of lecture and 1 unit of laboratory from one of the four areas below.
- Select 6 additional units from any on the four areas listed below.

Code	Title	Units
Analog/Digital Electronics (34 Units)		
CPE/CSC 138	Computer Networking Fundamentals	3
CPE 151	CMOS and Digital VLSI Design	3
CPE 153	Vlsi Design	3
CPE 166	Advanced Logic Design	4
CPE 186	Computer Hardware System Design	3
CPE 187	Embedded Systems Design	3
EEE 109	Electronics II [1]	4
EEE 110	Advanced Analog Integrated Circuits	3
EEE 111	Advanced Analog Integrated Circuits Laboratory	1
EEE 120	Electronic Instrumentation	4

EEE 166	Physical Electronics	3
Control Systems (11 Units)		
EEE 178	Introduction to Machine Vision	3
EEE 187	Robotics	4
EEE 188	Digital Control System	3
EEE 189	Controls Laboratory	1
Communication Engineering (19 Units)		
EEE 122	Applied Digital Signal Processing	3
EEE 162	Applied Wave Propagation	3
EEE 163	Traveling Waves Laboratory	1
EEE 165	Introduction To Optical Engineering	3
EEE 167	Electro-Optical Engineering Lab	1
EEE 181	Introduction to Digital Signal Processing	3
EEE 182	Digital Signal Processing Lab	1
EEE 183	Digital and Wireless Communication System Design	3
EEE 186	Communication Systems Laboratory	1
Power Engineering (29 Units)		
EEE 130	Electromechanical Conversion	3
EEE 131	Electromechanics Laboratory	1
EEE 135	Renewable Electrical Energy Sources and Grid Integration	3
EEE 136	Smart Electric Power Grid	3
EEE 137	Applications of Power Electronics in Power Systems	3
EEE 142	Power System Analysis II [1]	3
EEE 143	Power System Laboratory [1]	1
EEE 144	Electric Power Distribution	3
EEE 145	Power System Relay Protection and Laboratory	4
EEE 146	Power Electronics Controlled Drives	3
EEE 147	Power System Operation and Control Laboratory	1
EEE 148	Power Electronics Laboratory	1

[1] You may not use a course to count for both a required course and an elective course.

Note:

- Other upper division courses in Engineering and Computer Science may be selected as elective lectures with **prior** approval of the student's advisor.
- Other upper division and graduate courses in Engineering and Computer Science may be selected as elective lectures with **prior** approval of the student's advisor. Graduate courses counted towards a BS degree may **not** be used for a MS degree.

General Education Requirements [1]

Code	Title	Units
ENGL 20	College Composition II	3
Area A: Basic Subjects (6 Units)		
A1 - Oral Communication		3
A2 - Written Communication		3
A3 - Critical Thinking (Exempt)		0
Area B: Physical Universe and Its Life Forms (3 Units)		
B1 - Physical Science - Met by major courses.		0
B2 - Life Forms		3
B3 - Lab - Met by major courses.		0
B4 - Math Concepts - Met by major courses.		0
B5 - Additional Course - Met by upper-division major courses.		0
Area C: Arts and Humanities (9 Units)		
C1 - Arts		3
C2 - Humanities		3
C1/C2 - Any Upper-Division Area C Course - Take upper-division course to complete Area & upper division requirements.		3
Area D: The Individual and Society (6 Units)		
Area D Course		3
Area D Course		3
Area D Course - Met by upper-division major courses.		0

Area E: Understanding Personal Development	
Area E Course - Met by major courses.	0
Area F: Ethnic Studies (3 units) (3 Units)	
Area F Course	3
Total Units	**30**

[1] To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (http://catalog.csus.edu/colleges/academic-affairs/general-education/).
Note: There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (http://www.csus.edu/acad/), by phone (916) 278-1000, or email (advising@csus.edu).

Graduation Requirements [1]

Code	Title	Units
Graduation Requirements (required by CSU) (9 Units)		
American Institutions: U.S. History		3
American Institutions: U.S. Constitution & CA Government		3
Writing Intensive (WI)		3
Graduation Requirements (required by Sacramento State) (6 Units)		
English Composition II		3
Race and Ethnicity in American Society (RE)		3
Foreign Language Proficiency Requirement (Exempt)		0

[1] To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (http://catalog.csus.edu/colleges/academic-affairs/general-education/).
Note: There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (http://www.csus.edu/acad/), by phone (916) 278-1000, or email (advising@csus.edu).

Fiscal Impact to Change an Existing Program

Indicate programmatic or fiscal impact which this change will have on other academic units' programs, and describe the consultation that has occurred with affected units:

None

Provide a fiscal analysis of the proposed changes:

None

How will the above changes be accommodated within the department/College existing fiscal resources?

N/A

Will the proposed changes require additional resources?

No

What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed?

None

Estimate the cost and indicate how these resource needs will be accommodated:

None

Reviewer Comments:

Mohammed Eltayeb (mohammed.eltayeb) (Fri, 17 Sep 2021 16:58:53 GMT): Rollback: Update smart planner roadmap.

Key: 166