EEE 192B: ELECTRICAL POWER DESIGN PROJECT II

In Workflow

1. EEE Committee Chair (pheedley@csus.edu)
2. EEE Chair (mahyar.zarghami@csus.edu)
3. ECS College Committee Chair (mohammed.eltayeb@csus.edu)
4. ECS Dean (arad@csus.edu)
5. Academic Services (catalog@csus.edu)
6. Senate Curriculum Subcommittee Chair (curriculum@csus.edu)
7. GE Crs Rev Subcomittee Chair (angela.leslie@csus.edu)
8. Dean of Undergraduate (james.german@csus.edu; celena.showers@csus.edu)
9. Dean of Graduate (cnewsome@skymail.csus.edu)
10. Catalog Editor (torsetj@csus.edu)
11. Registrar's Office (wlindsey@csus.edu)
12. PeopleSoft (PeopleSoft@csus.edu)

Approval Path

1. Fri, 08 Oct 2021 21:36:03 GMT
   Perry Heedley (pheedley): Approved for EEE Committee Chair
2. Sat, 16 Oct 2021 00:32:50 GMT
   Mahyar Zarghami (mahyar.zarghami): Approved for EEE Chair
3. Fri, 22 Oct 2021 17:23:55 GMT
   Mohammed Eltayeb (mohammed.eltayeb): Approved for ECS College Committee Chair
4. Fri, 22 Oct 2021 17:27:33 GMT
   Behnam Arad (arad): Approved for ECS Dean

History

1. May 8, 2019 by Fethi Belkhouche (fbelkhou)

Date Submitted: Fri, 08 Oct 2021 21:35:28 GMT

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Changes proposed by: Mohammed Eltayeb (219702627)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
Atousa Yazdani	atousa.yazdani@csus.edu	916-278-4964
Mahyar Zarghami	mahyar.zarghami@csus.edu	916-278-7113

Catalog Title:
Electrical Power Design Project II

Class Schedule Title:
Elec Power Design Proj II

Academic Group: (College)
ECS - Engineering & Computer Science

Academic Organization: (Department)
Electrical and Electronic Engineering

Will this course be offered through the College of Continuing Education (CCE)?
No

Catalog Year Effective:
Fall 2022 (2022/2023 Catalog)

Subject Area: (prefix)
EEE - Electrical and Electronic Engineering

Catalog Number: (course number)
192B

Course ID: (For administrative use only.)
203073

Units:
2

Is the primary purpose of this change to update the term typically offered or the enforcement of requisites at registration?
No

In what term(s) will this course typically be offered?
Fall, Spring

Does this course require a room for its final exam?
No, final exam does not require a room (Last Class)

Does this course replace an existing experimental course?
No

This course complies with the credit hour policy:
Yes

Justification for course proposal:
This course was submitted in Spring 2018 as part of a package to satisfy EO 1100 without increasing units for the BS in Electrical and Electronics Engineering. The package included the following as described in an email from the ECS Associate Dean to GEGR Subcommittee on 4/16/18 (attached):

Area B5:
EEE: EEE 193A + EEE 193B (3 GE units from two 2-unit courses) or EEE 192A + EEE 192B

Area E:
EEE: ENGR 1 (1 GE unit from 1 unit course) + EEE 64 (2 GE units from 4 unit course)

GE Area E requirements are correctly appearing in the catalog for EEE 64 and ENGR 1 and the current program catalog (Form B) indicates that both senior project sequences (EEE 192A/B and EEE 193A/B) are satisfying GE requirements, but the individual courses are not showing up as satisfying GE for upcoming graduates of the program both in the catalog and in their Academic Requirements pages. This Form A is being submitted to correct this discrepancy between the courses (that the department was under the impression and advising students counted as GE for the past 3 years) and the program which is now causing students completing their BS degree in a high unit major to be subjected to additional unit requirements.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)
Continuation of EEE 192A. Students are expected to continue the power engineering design project begun the previous semester in EEE 192A. Final results of the project report will be presented orally to the class and invited faculty in a publicized seminar. Lecture one hour; laboratory three hours.

Are one or more field trips required with this course?
No

Fee Course?
No

Is this course designated as Service Learning?
No

Does this course require safety training?
No

Does this course require personal protective equipment (PPE)?
No

Does this course have prerequisites?
Yes

Prerequisite:
EEE 142, EEE 143, and EEE192A.

Prerequisites Enforced at Registration?
Yes

Does this course have corequisites?
No

Graded:
Letter

Approval required for enrollment?
No Approval Required

Course Component(s) and Classification(s):
Laboratory
Lecture

Laboratory Classification
CS#16 - Science Laboratory (K-factor=2 WTU per unit)
Laboratory Units
1

Lecture Classification
CS#02 - Lecture/Discussion (K-factor=1WTU per unit)
Lecture Units
1

Is this a paired course?
No

Is this course crosslisted?
No

Can this course be repeated for credit?
No

Can the course be taken for credit more than once during the same term?
No

Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc."
ELO 1. Review the initial design and perform further investigations on the defined problem and their peripheral effects.
ELO 2. Exercise team work and divide the investigations for a technical problem and the proposed solutions into various tasks.
ELO 3. Complete and finalize design of the software and/or hardware for the proposed solutions.
ELO 4. Document and effectively communicate the final results and plans for completion of the project in a prescheduled formal presentation and a written report at the end of the semester.
ELO 5. Evaluate ethical and professional issues.

GE Area B5
ELO GE1: Cite critical observations, underlying assumptions and limitations to explain and apply important ideas and models in one or more of the following: physical science, life science, mathematics, or computer science.
ELO GE2: Recognize evidence-based conclusions and form reasoned opinions about science-related matters of personal, public and ethical concern.

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above.
• Problem statement revision report: ELO 1, ELO GE1 & GE 2
• Work breakdown structure report: ELO 2, ELO GE1 & GE 2
• Final project report: ELo3 and ELO 4, ELO GE1 & GE 2
• Final project presentation and demonstration: ELO3 and ELO4, ELO GE1 & GE 2
• Ethics quiz: ELO 5
• Individual reflection of students on the course (1500-word) ELO GE1 & GE2

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

Yes

Identify the program(s) in which this course is required:

Programs:
Certificate in Electric Power Systems and Engineering

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Integrative learning
Personal and social responsibility
Intellectual and practical skills

Is this course 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

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

Yes

In which GE area(s) does this apply?

B5. Further Studies in Physical Science, Life Forms and Quantitative Reasoning (Upper Division Only)

Which GE objective(s) does this course satisfy?

Read, write, and understand relatively complex and sophisticated English prose.
Find and use common information resources, engage in specialized library research, use computers and seek out appropriate expert opinion and advice.
Use mathematical ideas to accomplish a variety of tasks.
Construct a non-fallacious verbal argument, recognize fallacious arguments, and follow the verbal arguments of others.

Attach Course Syllabus with Detailed Outline of Weekly Topics:

EEE 192B ABET Course Outline.docx

Syllabi must include: GE area outcomes listed verbatim; catalog description of the course; prerequisites, if any; student learning objectives; assignments; texts; reading lists; materials; grading system; exams and other methods of evaluation.

Will more than one section of this course be offered?

Yes

Provide a description of what would be considered common to all sections and what might typically vary between sections:

Separate laboratory sections of this course share the same common lecture section meeting.

Students complete senior projects, which are different for different groups. Specific advising and guidance is obtained by groups in their respective laboratory sections, which may have different instructors. Laboratory instructor's advising styles may vary.

The course syllabus is unified. Reports follow standard formatting, so all students will be required to address the same issues as they relate to their particular project experiences.

Please write a statement indicating the means and methods for evaluating the extent to which the objectives of the GE Area(s) and any writing requirements are met for all course sections:

Each student is required to write a 1500-word report on his/her experiences and reflections on the course. The report is expected to be written for the general audience and should address ELO GE1 & GE2 of GE Area B5. Without using complex technical terms, the report is supposed to provide critical observations, assumptions and limitations encountered during the project and the methods used by the student and his/her teammates to address the issues based on appropriate engineering design and methods.

What steps does the department plan to take to ensure that instructors comply with the respective category criteria and who is responsible?

The primary responsibility rests with the lecture instructor for each course, and the Department Assessment Committee and Chair are responsible to the external accreditation agency (ABET) for the accuracy of the course syllabus.

General Education Details - Area B5: Further Studies in Physical Science, Life Forms and Quantitative Reasoning

Section 1.

Indicate in written statements how the course meets the following criteria for Category B5. Relate the statements to the course syllabus and outline. Be as succinct as possible.

Course type:

Quantitative Reasoning

For courses in quantitative reasoning:

Develops basic mathematical or logical concepts, quantitative reasoning skills, and has general applicability in solving problems.

This is a capstone course in engineering design. Students will apply a variety of techniques in order to design or analyze systems for the efficient and safe generation/transmission/distribution of electric power. Students have been exposed to mathematical concepts, quantitative reasoning, and problem solving in earlier courses. In this design experience, students are expected to apply these concepts to solve multiple interrelated problems in order to achieve their project goals.

Although mathematical analysis is not explicitly emphasized in the course syllabus, the results of mathematical analysis inform almost every strategic decision during the term of the project. Students will confront real-world mechanisms that impact overall performance, including measurement uncertainty, fault analysis, load demand variations, generation variability, etc. Students use simplified mathematical models for electrical components and must recognize the limitations of those models (e.g., models make simplifying assumptions, etc). Students will confront design trade-offs that require careful comparison of outcomes based on electrical performance, economic performance, efficiency, safety, cost to build and maintain, etc.

Applications include power transmission/distribution, renewable energy sources, distributed generation in grids, smart grids, energy storage, etc.

Develops computational skills or competence in the analysis of arguments.

In some earlier classes, computational skills may be learned as pure math problems with limited physical significance. In this class, computational skills are developed as students use them to analyze and design (these activities represent higher levels in Bloom's taxonomy).

Students work in teams and must make and defend their opinions on design decisions. In addition, teams present their designs to the class and collect feedback from the class.

Written reports must justify decisions including quantitative analysis.

Please Note: Courses listed in this category:
1) Need not be introductory courses and need not be as broad in scope as courses included in B1, B2, B3 or B4 i.e.; they may deal with a specialized topic.
2) These courses may have prerequisites or build on or apply concepts and knowledge covered in Areas B1, B2 and B4. For math courses, there must be an intermediate algebra prerequisite.

Addresses the specific GE student learning outcomes for area B5. A student should be able to do one or more of the following:

Cite critical observations, underlying assumptions and limitations to explain and apply important ideas and models in one or more of the following: physical science, life science, mathematics, or computer science.

Circuit performance is estimated from calculated results and from computer simulation results. It is important to consider what assumptions are made in calculations and in simulations in

order to explain discrepancies between them. Models of real-world devices used in computer simulations need to be reasonably accurate to obtain valid results, but the limitations imposed on simulation results must be recognized. Models can be made more complex to incorporate more real-world effects, but at the cost of increased simulation time.

Correct use of mathematical models for the electrical behavior of components is an essential part of the entire EEE curriculum.

Recognize evidence-based conclusions and form reasoned opinions about science-related matters of personal, public and ethical concern.

Students must reach conclusions about their project designs based on objective calculations, simulations, and measurements.

Students will recognize that energy storage and generation, along with related environmental and economic concerns, are critical issues for society. In addition, public safety is of primary importance.

Discuss historical or philosophical perspectives pertaining to the practice of science or mathematics.

Students discuss the ethics of engineering and professional practice. They learn the pathway to obtaining a professional engineering (PE) license and learn about the public trust placed in engineers.

Includes a writing component described on course syllabus

I) If course is lower division, formal and/or informal writing assignments encouraging students to think through course concepts using at least one of the following: periodic lab reports, exams which include essay questions, periodic formal writing assignments, periodic journals, reading logs, other. Writing in lower division courses need not be graded, but must, at a minimum, be evaluated for clarity and proper handling of terms, phrases, and concepts related to the course.
2) If course is upper division, a minimum of 1500 words of formal, graded writing. [Preferably there should be more than one formal writing assignment and each writing assignment (e.g. periodic lab reports, exams which include essay questions, a research/term paper etc.) should be due in stages throughout the semester to allow the writer to revise after receiving feedback from the instructor. Include an indication of how writing is to be evaluated and entered into course grade determination.]

Team written material is stored on an accessible website. Instructors grade assignments electronically. There is a rubric for communications in the EEE192B materials.

A schedule of assignments is attached which shows that written assignments are due at various stages of the course.

Section 2.

If you would like, you may provide further information that might help the G.E. Course Review Committee understand how this course meets these criteria and/or the G.E. Program Objectives found in the CSUS Policy Manual, General Education Program, Section I.B.

Students will confront design trade-offs that require careful comparison of outcomes based on mathematical analysis. Factors involved include electrical performance, economic performance, efficiency, safety, cost to build and maintain, etc. Students must reach conclusions about their project designs based on objective calculations, simulations, and measurements.

Please attach any additional files not requested above:

EO1100.pdf

Key: 1715