

# ME 132: SOLAR ENERGY, GEOTHERMAL ENERGY, AND BIOENERGY SYSTEMS

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## In Workflow

1. ME Committee Chair (akuma@csus.edu)
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11. PeopleSoft (PeopleSoft@csus.edu)

## Approval Path

1. Thu, 10 Oct 2019 23:24:20 GMT  
Akihiko Kumagai (akuma): Approved for ME Committee Chair
2. Thu, 10 Oct 2019 23:26:37 GMT  
Akihiko Kumagai (akuma): Approved for ME Chair
3. Fri, 11 Oct 2019 17:32:34 GMT  
Troy Topping (troy.topping): Approved for ECS College Committee Chair
4. Fri, 25 Oct 2019 16:56:35 GMT  
Kevan Shafizadeh (kevan): Approved for ECS Dean

## New Course Proposal

Date Submitted: Tue, 24 Sep 2019 22:42:58 GMT

**Viewing: ME 132 : Solar Energy, Geothermal Energy, and Bioenergy Systems**

**Last edit: Fri, 11 Oct 2019 17:31:58 GMT**

Changes proposed by: Farshid Zabihian (219191571)

**Contact(s):**

Name (First Last)	Email	Phone 999-999-9999
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**Catalog Title:**

Solar Energy, Geothermal Energy, and Bioenergy Systems

**Class Schedule Title:**

Solar, Geothermal, Bioenergy

**Academic Group: (College)**

ECS - Engineering & Computer Science

**Academic Organization: (Department)**

Mechanical Engineering

**Will this course be offered through the College of Continuing Education (CCE)?**

No

**Catalog Year Effective:**

Spring 2020 (2020/2021 Catalog)

**Subject Area: (prefix)**

ME - Mechanical Engineering

**Catalog Number: (course number)**

132

**Course ID: (For administrative use only.)**

TBD

**Units:**

3

**In what term(s) will this course typically be offered?**

Fall, Spring

**Does this course require a room for its final exam?**

Yes, final exam requires a room

**Does this course replace an existing experimental course?**

No

**This course complies with the credit hour policy:**

Yes

**Justification for course proposal:**

Currently there are two elective courses offered to ME students each two units: Solar Thermal and Energy Storage Systems (ME 121) and Geothermal and Bioenergy Systems (ME 122). ME students require 6 units of electives to graduate. In the past, there were many two-unit electives that students could pick three to satisfy their six-unit required electives. However, these two-unit electives either are not offered anymore or converted to three-unit courses. Therefore, by taking these two courses, students can end up taking one extra unit (7 unit electives). The proposed course will combine these two courses to a single three-unit course to eliminate this problem for students. The four topics from the previous two 2-unit courses have been reduced to 3 topics, which reflects the change to one combined 3-unit course.

**Course Description: (Not to exceed 80 words and language should conform to catalog copy.)**

In this course, the students will study solar energy, geothermal energy, and bioenergy systems. They will apply their engineering knowledge gained in the fundamental courses to design these systems. They will also learn about theoretical foundations, characterization, operation, and environmental impacts of these energy systems.

**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:**

Thermodynamics (ENGR 124)

**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):**

Lecture

**Lecture Classification**

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

**Lecture Units**

3

**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."**

After successful completion of this course students will be able to

1. Describe theoretical foundations and terminology relevant to solar energy, geothermal energy, and bioenergy systems
2. Critically evaluate the energy potential for solar energy, geothermal energy, and bioenergy systems
3. Objectively evaluate the technical, economic, and environmental impacts of solar energy, geothermal energy, and bioenergy systems
4. Identify various solar energy, geothermal energy, and bioenergy systems and subsystems
5. Formulate, analyze, and design real-world solar energy, geothermal energy, and bioenergy systems and use realistic assumptions to evaluate their performance
6. Identify and locate sources of information related to solar energy, geothermal energy, and bioenergy systems and apply the information

**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.**

Homework/Quizzes/Assignments (ELOs 1-6)

Test on solar energy (ELOs 1-6)

Test on geothermal energy (ELOs 1-6)

Test on bioenergy (ELOs 1-6)

Projects (ELOs 2, 5, and 6)

**For whom is this course being developed?**

Majors in the Dept

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

No

**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:

Competence in the disciplines

Knowledge of human cultures and the physical and natural world

**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?**

No

**Please attach any additional files not requested above:**

Course Outline F2020-ME 132 - Sep 22, 19.pdf

Key: 14142