

ENGR 106: ENERGY AND MODERN LIFE

In Workflow

1. ME Committee Chair (troy.topping@csus.edu)
2. ME Chair (troy.topping@csus.edu)
3. ECS College Committee Chair (abadi@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 Subcommittee Chair (perry@csus.edu)
8. Dean of Undergraduate (gardner@csus.edu)
9. Dean of Graduate (cnewsome@skymail.csus.edu)
10. Catalog Editor (catalog@csus.edu)
11. Registrar's Office (k.mcfarland@csus.edu)
12. PeopleSoft (PeopleSoft@csus.edu)

Approval Path

1. Thu, 22 Aug 2024 21:29:41 GMT
Troy Topping (troy.topping): Approved for ME Committee Chair
2. Thu, 22 Aug 2024 23:23:49 GMT
Troy Topping (troy.topping): Approved for ME Chair
3. Fri, 23 Aug 2024 16:42:13 GMT
Masoud Ghodrat Abadi (abadi): Approved for ECS College Committee Chair
4. Fri, 23 Aug 2024 17:38:07 GMT
Behnam Arad (arad): Approved for ECS Dean

History

1. Dec 7, 2020 by Farshid Zabihian (farshid.zabihian)
2. Jun 10, 2022 by 302822325
3. Apr 23, 2024 by Katie Hawke (katiedickson)

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Changes proposed by: Farshid Zabihian (219191571)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
Farshid Zabihian	farshid.zabihian@csus.edu	(916) 278-6222

Catalog Title:

Energy and Modern Life

Class Schedule Title:

Energy and Modern Life

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 2025 (2025/2026 Catalog)

Subject Area: (prefix)

ENGR - Engineering

Catalog Number: (course number)

106

Course ID: (For administrative use only.)

203230

Units:

3

Is the only purpose of this change to update the term typically offered or the enforcement of existing prerequisites at registration?

No

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

Fall, Spring, Summer

Does this course require a room for its final exam?

No, final exam does not require a room

This course complies with the credit hour policy:

Yes

Justification for course proposal:

As society continues to develop technological innovations that consume energy our decisions become increasingly driven by the need for clean energy sources. Informed decisions about energy, energy production and consumption, and the impact on society and the environment will be asked of every educated member of the society.

The course in its current form has many writing assignments, which makes it an ideal candidate for a writing intensive course. The course was offered for the first time in spring 2020 with only 12 students. But the number of students in the class rapidly increased, and this semester (spring 2024) there are 38 students in the class. Since spring 2020 semester, 14 sections of the course have been successfully offered. The student feedback has been overwhelmingly positive. Here, I will just quote one student "During my education, I have not taken any classes remotely close to the content presented in this class. This was a tough class for me, I am a sociology major so it is out of my wheelhouse. However, I really enjoyed learning about energy from an engineering professor. Previously I had respect for engineering, now I have even more!" While, in general, I believe students from all majors can learn a lot from the course, the course can be particularly beneficial for students from all branches of engineering. However, for almost all engineering students, GE Area B5 is fulfilled by a major course. Therefore, offering the course as a writing intensive can open the course for students who might benefit most from the course. Furthermore, to the best of my knowledge, no engineering course is being offered as a writing intensive course, and this course can expand the choices our students have to meet this graduation requirement.

Course Description: (Not to exceed 90 words and language should conform to catalog copy.)

Our modern life is intimately and increasingly intertwined with energy utilization. This course deals with where energy comes from, how it is converted to desirable forms, where it is consumed, and what the consequences of this consumption are. In each case, historical prospective, current status, and future projections will be discussed. The ultimate objective of this course is to help students to make informed decisions on energy-related issues in their personal life and as responsible members of the society.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Is this course designated as Curricular Community Engaged 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:

Completion of GE Areas A2, A3, second semester composition (ENGL 20); Junior standing; a WPJ Portfolio score OR ENGL 109M or ENGL 109W

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 and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Explain historical prospective of energy and its impacts on human development.	Writing Assignments Quizzes Exams
2	Describe how energy intimately intertwined with daily life in the society including its impacts on living standard, economy, politics, and environment, both qualitatively and quantitatively.	Writing Assignments Quizzes Exams
3	Locate energy information and critically, objectively and accurately interpret the information.	Writing Assignments
4	Identify important factors to consider when making evidence-based decisions on energy-related matters.	Writing Assignments Quizzes Exams
5	Qualitatively explain the laws of thermodynamics and their applications.	Quizzes Exams
6	Identify various energy demand sectors.	Quizzes Exams

7	Describe major energy conversion systems.	Writing Assignments Quizzes Exams
8	Identify non-renewable and renewable energy sources.	Quizzes Exams
9	Evaluate environmental impacts of various energy systems on local and global scales.	Writing Assignments Quizzes Exams
10	Communicate evidence-based inquiry, reasoning, and conclusions on energy related issues.	Writing Assignments

Attach a list of the required/recommended course readings and activities:

List of the required-recommended course readings and activities.pdf
 Course Map - Energy and Modern Life (ENGR106).pdf

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:

Knowledge of human cultures and the physical and natural world
 Intellectual and practical skills
 Personal and social responsibility

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

Which GE objective(s) does this course satisfy?

Read, write, and understand relatively complex and sophisticated English prose.
 Construct a non-fallacious verbal argument, recognize fallacious arguments, and follow the verbal arguments of others.
 Find and use common information resources, engage in specialized library research, use computers and seek out appropriate expert opinion and advice.
 Gain a general understanding of current theory, concepts, knowledge, and scientific methods pertaining to the nature of the physical universe, ecosystems, and life on this planet.
 Possess a significant and useful understanding of peoples from a diversity of cultures and backgrounds, including women and ethnic and other minority groups who have been the objects of prejudice and adverse discrimination within our society.

Attach Course Syllabus with Detailed Outline of Weekly Topics:

Course Outline - Energy and modern life - Revised 2019.pdf
 Course Syllabus - Energy and Modern Life (ENGR106) - Writing Intensive.pdf

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?

No

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:

Physical Science or Life Forms

For courses in physical science or life forms:

Develops an understanding of the principles underlying and interrelating natural phenomena including the foundations of our knowledge of living systems.

The ultimate objective of this course is to improve the energy literacy and help students to make informed decisions on energy-related issues in their personal life and as responsible members of the society. After successful completion of this course, the students will be able to identify various energy demand sectors and non-renewable and renewable energy sources. They will be able to describe the origin of various energy sources and their characteristics.

Introduces students to one or more of the disciplines whose purpose is to acquire knowledge of the physical universe and/or living systems and life forms.

After this course, the students will be able to qualitatively explain the laws of thermodynamics and their applications in power cycles, refrigerators, and heat pumps, including their efficiency and coefficient of performance.

Develops an appreciation of the methodologies of science and the limitations of scientific inquiry.

Assignments have been designed where the students should collect information regarding many aspects of energy issues, then analyze them, and draw appropriate conclusions.

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.

After successful completion of this course, the students will be able to locate energy information and critically, objectively and accurately interpret the information. They will also be able to qualitatively explain the laws of thermodynamics, identify various energy demand sectors, and describe major energy conversion systems.

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

After successful completion of this course, the students will be able to make informed evidence-based decisions on energy-related matters. Also, they will be able to evaluate environmental impacts of various energy systems on local and global scales.

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

After successful completion of this course, the students will be able to explain historical prospective of energy and its impacts on human development. They will also be able to describe major energy conversion systems, including the history and the state of the art of electricity generation systems and transpiration systems.

Includes a writing component described on course syllabus

1) **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.]

There are many writing assignments where the students conduct research, collect information, analyze data, etc. and present the results in the form of written reports.

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.

I believe this course can help our students to be able to make better informed decisions in their personal life and as members of the community in energy-related matters.

General Education Details - Writing Intensive

Section 1.

Indicate how the course meets the following criteria for Writing Intensive. Relate the statement to the course syllabus and outline. Be as succinct as possible. Courses must comply with the general criteria for Writing Intensive courses:

The course must build on the basic skills and knowledge acquired by students in their foundation courses in General Education or the major.

The students apply their information literacy skills to search for energy-related information, locate sources and authenticate the validity of the information. They use their critical thinking skills to analyze the information and draw reasonable conclusions. They utilize their writing skills to communicate their findings.

The course must expand students' knowledge by examining complex issues.

Through a wide variety of writing assignments, the students learn about complex issues, such as the relationship between energy consumption and quality of life, natural and human-made energy-related disasters, energy/electricity generation sector, renewable energy sources and systems, misinformation related to renewable energy sources, energy inequality, and politics of energy.

The course must expand students' abilities to reason logically and to write clearly in prose.

In several writing assignments, the students collect raw energy-related data, process them, create graphical representation (diagrams), and analyze them to test a hypothesis or conduct a parametric analysis (some of the topics are listed in the answer for the previous question). Then, they present the entire process in the form of written reports.

Students must be required to write not less than 5,000 words of clear and logical prose (not to include simple narrative or diary writing).

The students are required to write over 6000 words on a wide variety of energy-related complex topics through many writing assignments. These mandatory assignments can range from 200 to 1000 words. There are also several optional writing assignments that the students can earn extra credits by completing them.

Instructors must work actively with students to sharpen analytical abilities and to improve their writing styles.

For four major assignments (total 3500 words), the students are required to submit the first draft of their writing and then revise it based on the feedback provided by the instructor on the content of their report and their writing styles.

Writing assignments must be spread over the entire semester (with at least 3,000 of the 5,000 words due before the last two weeks of instruction).

Writing assignments are spread throughout the semester with over 4000 words due before the last two weeks of instruction.

Instructors must provide timely responses and evaluation of each writing assignment, and evaluations and comments must not only be about the subject matter content but also about writing skills.

I am in the process of developing a detail rubric for each writing assignment based on "Sacramento State University Written Communication Program and Classroom Assessment Rubrics". These rubrics will be used to assess student writing both for the subject matter content and demonstrated writing skills.

Section 2.

WRITING INTENSIVE

Recognizing the value of writing in all disciplines, as a tool in learning as well as conveying knowledge, the Academic Senate mandated that the teaching of writing be an all university responsibility. To that end, the Senate recommended that three units of Writing Intensive be a graduation requirement.

The chief aim of Writing Intensive is to promote students' ability to write logically and clearly, using standard written English, in their major discipline or in a discipline outside their major.

Course Requirement

The Writing Intensive requirement can be satisfied in one of three ways: a) Departments/programs may specify that the Writing Intensive requirement must be met in the major; b) In cases where the requirement is not specified as required in the major, the requirement must be satisfied by taking an Writing Intensive course in the General Education program, or c) student's choice.

Departments/programs wishing to have courses approved as Writing Intensive must submit the course syllabus to the General Education Review Committee which shall review and approve the course for listing as Writing Intensive. (General Education courses must also be approved for G.E. listing in the normal way.)

Criteria

Courses designated as Writing Intensive build on the basic skills and knowledge acquired by students in their foundation courses in General Education or the major. These courses are to expand students' knowledge by examining complex issues and they are to advance students' abilities to reason logically and to write clearly in prose.

The English Composition and Critical Thinking courses and the Writing Proficiency Examination are prerequisites to all Writing Intensive courses. Some Writing Intensive courses listed in the General Education program may explore more specialized topics and may thus require prerequisites, but most are to be courses of a broader nature and generally require no formal preparation in the discipline offering the course. Writing Intensive courses not in the General Education Program may also have prerequisites, but they should focus on the broad and general rather than the more technical areas of a discipline.

Students are required to write not less than 5,000 words (20 typed, double-spaced pages) of clear and logical prose in Writing Intensive classes. (Once a course is approved for Writing Intensive, all students enrolled in the class, whether they are taking it to fulfill their Writing Intensive requirement or not, must write no less than 5,000 words in order to receive a passing grade.)

An important aspect of the task of instructors is working actively with students to sharpen their analytical abilities and to improve their writing styles. Simple narrative and diary-type writing will not fulfill the requirement.

Writing assignments must be analytical in nature, discipline specific and spread out over the entire semester. (At least a total of 3,000 words of writing assignments must be due before the last two weeks of instruction.) Instructors must provide timely responses and evaluations of each writing assignment. Evaluations and comments must only be about the subject matter content but also address the writing skills. Additionally, evaluations and comments must be given to the students early enough to be reviewed before their next formal writing assignment is due.

Recommendations for Implementation

Although Writing Intensive courses have a 5,000 word requirement, this word requirement can be met by both formal and informal writing assignments. Instructors might require 10 pages each of formal and informal assignments (journals, responses to reading, for example). Yet all should require analysis in order to promote learning as well as improved writing skills.

Although the number of writing assignments depends upon the discipline and nature of the course, a study conducted by the Writing Intensive Committee in Spring 1988 discovered that those students who had been assigned a number of shorter assignments (usually four 5 page ones) reported that their writing had improved as a result, in part, of more frequent feedback. Those with only two long assignments reported that they did not feel the assignments had helped them improve their writing.

Please attach any additional files not requested above:

Syllabus Checklist - ECS Academic Council - Energy and Modern Life (ENGR106).pdf

Key: 13702