

Clackamas Community College

Online Course/Outline Submission System

 Show changes since last approval in red

ERM-103 Fossil Fuels in the Utility Industry

General education certified: Yes **No**

- Writing
- Oral Communication
- Arts and Letters
- Science & Computer Science
- Mathematics
- Social Science
- Cultural Literacy
- Health & Physical Education

 Approved Date (mm/dd/yyyy): / / **Section #1 General Course Information****Department:** Energy & Utility Resource Management**Submitter**

First Name: Shelly

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Phone: 0945

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Course Prefix and Number: ERM - 103**# Credits:** 3**Contact hours**

Lecture (# of hours): 33

Lec/lab (# of hours):

Lab (# of hours):

Total course hours: 33

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Course Title: Fossil Fuels in the Utility Industry

Course Description:

Examine various methods for generating electricity, and power distribution throughout the Northwest. Coal, natural gas, nuclear, hydro, diesel powered plants, and the path to emerging technologies such as wind, solar, geothermal and wave energy resources.

Type of Course: Career Technical Preparatory

Is this class challengeable?

Yes

Can this course be repeated for credit in a degree?

No

Is general education certification being sought at this time?

No

Does this course map to any general education outcome(s)?

Yes**Check which General Education requirement:**

- ✓ Writing
- ✓ Oral Communication
- ✓ Arts and Letters
- ✓ Science & Computer Science
- ✓ Mathematics
- ✓ Social Science

Is this course part of an AAS or related certificate of completion?

Yes**Name of degree(s) and/or certificate(s):** Energy & Utility Resource Management AAS & Certificate

Are there prerequisites to this course?

Yes

Pre-reqs: Pass RD-090 with a C or better or placement in RD-115; pass MTH-060 with a C or better or placement in MTH-065; pass WR-095 with a C or better or placement in WR-121; pass CS-090 with a C or better or placement in CS-120.

Have you consulted with the appropriate chair if the pre-req is in another program?**No**

Are there corequisites to this course?

No

Are there any requirements or recommendations for students taken this course?

No

Are there similar courses existing in other programs or disciplines at CCC?

No

Will this class use library resources?

Yes

Have you talked with a librarian regarding that impact?

No

Is there any other potential impact on another department?

No

Does this course belong on the Related Instruction list?

No

GRADING METHOD:

A-F Only

Audit: Yes

When do you plan to offer this course?

✓ Spring

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

No

Will this course appear in the college catalog?

Yes

Will this course appear in the schedule?

Yes

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. define the basic science, principles and terminology related to various forms of electrical generation;
2. explain the methods and different technologies for the production and distribution of the various forms of

generated electricity,

3. define environmental and political issues and strategies addressing sustainable, renewable and efficient practices relevant to the Northwest and globally;
 4. explain the current and future issues related to each of the various forms of generation including their reliability and effectiveness in relationship to the grid,
 5. define the components and technology of the grid and distribution systems and explain their roles in taking power from generation facilities to the consumer,
 6. identify the various current and future career opportunities in generation and distribution, and demonstrate how to research and find jobs.
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**AAOT/ASOT GENERAL EDUCATION OUTCOMES
COURSE OUTLINE MAPPING CHART**

Mark outcomes addressed by the course:

- Mark "C" if this course completely addresses the outcome. Students who successfully complete this course are likely to have attained this learning outcome.
- Mark "S" if this course substantially addresses the outcome. More than one course is required for the outcome to be completely addressed. Students who successfully complete all of the required courses are likely to have attained this learning outcome.
- Mark "P" if this course partially addresses the outcome. Students will have been exposed to the outcome as part of the class, but the class is not a primary means for attaining the outcome and assessment for general education purposes may not be necessary.

As a result of completing the AAOT/ASOT general education requirements, students will be able to:

WR: Writing Outcomes

- P** 1. Read actively, think critically, and write purposefully and capably for academic and, in some cases, professional audiences.
- P** 2. Locate, evaluate, and ethically utilize information to communicate effectively.
- P** 3. Demonstrate appropriate reasoning in response to complex issues.

SP: Speech/Oral Communication Outcomes

- P** 1. Engage in ethical communication processes that accomplish goals.
- P** 2. Respond to the needs of diverse audiences and contexts.
- P** 3. Build and manage relationships.

MA: Mathematics Outcomes:

1. Use appropriate mathematics to solve problems.
- P** 2. Recognize which mathematical concepts are applicable to a scenario, apply appropriate mathematics and technology in its analysis, and then accurately interpret, validate, and communicate the results.

AL: Arts and Letters Outcomes

1. Interpret and engage in the Arts & Letters, making use of the creative process to enrich the quality of life.
- P** 2. Critically analyze values and ethics within range of human experience and expression to engage more fully in local and global issues.

SS: Social Science Outcomes

1. Apply analytical skills to social phenomena in order to understand human behavior.
- P** 2. Apply knowledge and experience to foster personal growth and better appreciate the diverse social world in which we live.

SC: Science or Computer Science Outcomes

- P** 1. Gather, comprehend, and communicate scientific and technical information in order to explore ideas, models, and solutions and generate further questions.
- P** 2. Apply scientific and technical modes of inquiry, individually, and collaboratively, to critically examine the influence of scientific and technical knowledge on human society and the environment.

P

3. Assess the strengths and weaknesses of scientific studies and critically examine the influence of scientific and technical knowledge on human society and the environment.

Outcomes Assessment Strategies:

- ✓ **General Examination**
- ✓ **Presentations**
- ✓ **Thesis/Research Project**
- ✓ **Writing Assignments**
- ✓ **Industry Standards**

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Major Topic Outline:

1. Role in Production and Distribution.
 - a. Hydro.
 - b. Coal.
 - c. Diesel.
 - d. Natural Gas.
 - e. Wind.
 - f. Nuclear.
 - g. Solar.
 - h. Geothermal.
 - i. Wave energy.
2. Management Issues.
 - a. Regulatory.
 - b. Organization Structures.
 - c. Safety.
 - d. Economic.
 - e. Environment.
 - f. Aging Infrastructure.
3. Resource and Environmental Themes.
 - a. Efficiency, Sustainability, Renewable.
 - b. Life Cycle Assessment.
 - c. Life Cycle Costs.
 - d. Ecological Footprint.
 - e. Global Warming.

Does the content of this class relate to job skills in any of the following areas:

- | | |
|--------------------------------------|------------|
| 1. Increased energy efficiency | Yes |
| 2. Produce renewable energy | Yes |
| 3. Prevent environmental degradation | Yes |
| 4. Clean up natural environment | Yes |
| 5. Supports green services | Yes |

Percent of course: 60%

First term to be offered:

Next available term after approval

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