

NRG 101: Energy Industry Fundamentals
CRN: 24091
Pima Community College, Downtown Campus
COURSE SYLLABUS

Instructor:	Michael Esser	Term:	Spring 2015
Office:	None - Email me to meet	Class Meeting Days:	Tues & Thurs
Phone:	No office phone number	Class Meeting Hours:	7:00 – 9:15 pm
Email:	messer@pima.edu	Class Location:	ST-102
Website:	Energy Industry Fundamentals website TBA in class	Start Date:	Jan 20
Office Hours:	By appointment - Email me to meet	End Date:	Apr 9

I. Welcome!

Welcome to Energy Industry Fundamentals (EIF). The curriculum for this course was developed by the national Center for Energy Workforce Development (CEWD) as part of the national Get Into Energy program. Following is the Pima-required Full Syllabus with important information. *An abbreviated syllabus with expected class schedule can be found at the end.*

II. College Course Catalog Description

Introduction to various types of energy and their conversion to useable energy such as electrical power. Includes how generated electrical power is transmitted and distributed to the point of use.

III. Course Overview

First the curriculum addresses the history and regulation of electric utilities. Then we will cover safety before delving into electricity generation, transmission and distribution. The curriculum ends with an introduction to natural gas utilities.

IV. Course Objectives /SLOs

There are many very specific Objectives / SLOs for this course, specified at the beginning of each unit of the CEWD text, which you can reference at any time. You can also find a complete list by unit at the end of this syllabus.

V. Course Prerequisites

There are no prerequisite courses for this class.

VI. Course Credits

Passing this class will earn you 3.0 credits.

VII. Required Texts and Materials:

CEWD EIF Student Modules 1-5, available for free on-line

VIII. Supplementary Texts and Materials

Computer and internet access will be necessary to complete the course. You may use your personal computer, PCC computers in ST-102 or another lab, or at a public library.

IX. Basis for Final Grade

Assessment	Percent of Final Grade
Regular Class Participation	30%
Module 1 Quizzes	10%
Module 2 Quizzes	10%
Module 3 Quizzes	10%
Module 4 Quizzes	10%
Module 5 Quizzes	10%
Final Exam	20%
	100%

Grading Scale (%)	
90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

X. Grades of "Incomplete" and W: Offer specifics about your policy on incomplete grades.

Student Withdrawal "W" Grades: We understand that unexpected events occur that may cause you to need to drop or withdraw from some or all of your courses. Before dropping or withdrawing, it is important for you to consider how the decrease in credits will affect your financial aid or scholarships. You may owe funds back to PCC and/or the U.S. Department of Education. It is strongly recommended that you Speak with a financial aid staff member prior to dropping, or withdrawing from, courses. Dropping or withdrawing may also have a negative impact on your Satisfactory Academic Progress. Please see <http://www.pima.edu/financialaid/managingaward/dropping-withdrawing.shtml>

W Grades: Students who do not wish to finish the course are responsible for withdrawing themselves by the deadline date (<https://www.pima.edu/calendars/key-dates-and-deadlines/index.html>). Failure to complete the class and/or withdraw will result in a grade of **"F"**. Under very unusual circumstances, the instructor may give an "instructor withdrawal" as the final grade, if attendance and effort has been satisfactory.

Audit Grades: "A". Audit status in a course will depend on availability of seats after credit-seeking students have been accommodated, and only with the permission of the instructor. All Audit requests require the signature of the instructor during the first week of classes. Once a student has signed up for audit credit, it may not be converted to credit-bearing status.

XI. Grade Dissemination

You will complete your tests on-line, and see your score after submitting them. At any time you may come to see me for your cumulative score for the course so far.

XII. Course Policies:

Attendance/Active Participation Policy: Consider this course an introduction to working in the industry. Just as missing work in non-emergency situations wouldn't help you stay employed, attendance here is critical. It forms a large part of your participation grade (the largest individual component of your final class grade). If you don't attend, you can't receive participation points for that class. But far worse, you miss valuable class discussion and fall behind your peers in being prepared to earn employment in the industry. Just as you would contact your employer, I will expect you to email me in advance anytime you must miss a class... which hopefully won't need to happen. **PLEASE ALSO NOTE IMPORTANT FEDERAL "ACTIVE PARTICIPATION" REQUIREMENTS IN SECTION XIX BELOW THAT CAN AFFECT FINANCIAL AID.**

Professionalism Policy: Professionalism is of course expected here too just as it will be on the job. Please arrive on time, turn cell phones off, etc so as not to disturb learning. You know what to do. (If you don't, here's a link to the Student Code of Conduct: <https://www.pima.edu/current-students/code-of-conduct/index.html>)

Academic Integrity Policy: Academic dishonesty in any form will not be tolerated. If you are uncertain as to what constitutes academic dishonesty, please consult your instructor. Violations of these rules will result in a record of the infraction being placed in your file and receiving a zero on the work in question AT A MINIMUM. At the instructor's discretion, you may also receive a failing grade for the course. Confirmation of such incidents can also result in expulsion from the College.

Late Work Policy: You should stick to the schedule outlined below as far as turning in your work. You may work on-line at any time on any assignments you don't finish during class. If you don't finish an assignment on schedule, make sure to complete it before the next class, and then notify me of your on-line reported score so that I may add it to my gradebook and make sure you receive credit.

Extra Credit Policy: No formal extra credit is planned nor should be necessary. If I add any extra credit opportunities to the course I will announce the details.

Rewrite Policy: There is little writing in this standardized on-line course. However, for any writing assignments that I may add, feel free to re-write them to improve your grade if you are unsatisfied with your first score.

Group Work Policy: CEWD has created a nationally-standardized curriculum in which you are predominantly assessed as an individual. However each class we will have group discussions and/or activities, and your active participation in these activities will play a large part in determining your participation grade (the largest individual component of your final class grade).

XIII. Course Policies: Technology and Media

Email: I will use email to contact you as necessary at your Pima.edu email address. Please get in the habit of checking your Pima.edu email every day, including an hour or so before each class, to make sure you do not miss important and sometimes last-minute class announcements (for example, cancellations due to weather).

Webcourses: The CEWD EIF curriculum is an on-line webcourse, so you will be logging in every class period.

Laptop Usage: You are free to use your own laptop or one of PCC's computers in this course.

Classroom Devices: You are free to use calculators, tape recorders, and other audio & technology devices in this course.

XIV. Disabled Student Resources (DSR)

Pima Community College is committed to providing accommodations for qualified individuals with disabilities in a timely and effective manner. To request a reasonable accommodation, students must be registered with the campus Disabled Student Resources (DSR) office. Accommodations will be made based on eligibility determined by Disabled Student Resources. Services can be requested at any time during the semester. Requesting services well in advance will help to ensure that resources are available when needed. Please contact a DSR office at 206-6688 or DSRhelp@pima.edu. (5/1/12)

One or more field trips are planned during this course. If you need a reasonable accommodation to participate in field trips, again, please contact the campus DSR office as soon as possible to ensure timely evaluation of your request and possible provision of services.

XV. Family Education Rights and Privacy Act (FERPA)

Subject to certain exceptions set forth in the Federal Family Education Rights and Privacy Act (FERPA) of 1974, Pima Community College will not provide personally identifiable student information (including but not limited to grades, billing, tuition and fees assessments, financial aid and other student records) to third parties absent the student's consent. Third parties include parents, spouses and third-party sponsors. You (the student) may grant Pima Community College permission to release certain information to a third party by submitting the FERPA Release form. Ask your instructor for a copy of the form BEFORE you arrive with a third party.

XVI. Arizona's Mandatory Reporting Law (A.R.S. 13-3620)

Pursuant to Arizona law (A.R.S. §13-3620), College personnel, including faculty, staff, and administrators, who learn in the course and scope of their employment that a minor (defined as under 18 years of age) has been the victim of physical or sexual abuse, are required to report this information immediately to law enforcement.

XVII. Arizona's Mandatory Reporting of Sexual Violence and/or Sexual Offenses (A.R.S. 13-14xx):

Pursuant to Arizona law (A.R.S. §13-14xx) and Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistic Act; 34 CFR Part 668; College personnel, including faculty, staff, and administrators, who learn in the course and scope of their employment that an individual has been a victim of sexual violence, or is informed about an alleged sexual offense shall, as soon as possible, contact the Department of Public Safety.

XVIII. Important Dates to Remember:

For key dates and deadlines for this semester (like Drop, Refund and Withdrawal dates), please NOTE THIS CLASS IS ONLY A 10-WEEK COURSE, and see:

<https://www.pima.edu/calendars/key-dates-and-deadlines/index.html>

XIX. Federal "Active Participation" Requirements:

Active Participation* (Academic Activity) by Students: Throughout the term, students must substantively participate in such a way as to ensure successful completion of the course by the end of the term (i.e. regularly submit assignments and continue to interact with other students and the course instructor). Students must complete at least one academic task per week/7-day period (including during the first 7 days of the course) that will serve as documented active participation. Academic tasks can include:

- Attending this class at least once each week/7-day period
- Completing a course-related activity, such as on-line assignments, at least once each week/7-day period
- Participating in a course-related academic discussion at least once each week/7-day period

Students who do not **actively participate*** (see above definition) in the class by the drop deadline will be dropped from the class. This may result in adverse financial consequences such as a change in financial aid, veterans' benefits, and/or other benefits related to being a student.

<https://www.pima.edu/about-pima/policies/board-policies/BP-3108.html>

Continued Participation: If the student begins the course but does not **actively participate*** as per the above definition for 10 consecutive calendar days, the student's record will be flagged with the Registered but Not Attending (RN) status. The College will initiate contact to determine whether the student intends to return to the course. If the College is unable to confirm the student's intent to return, the student will be considered unofficially withdrawn for purposes such as Financial Aid and Veterans' Benefits and adverse consequences may result for the student.

<https://www.pima.edu/about-pima/policies/board-policies/BP-3103.html>

Center for Energy Workforce Development Energy Industry Fundamentals

Course Objectives / SLO's by Unit

Unit 1A:

Discuss the history of the United States energy industry/infrastructure.

Discuss environmental laws and regulations that impact the energy industry (local, state, and federal) and explain importance of proper documentation to ensure compliance.

Explain the role of regulatory bodies in the energy industry (Federal Energy Regulatory Commission and others) and understand what "obligation to serve" means.

Unit 1B:

Explain the different structures of energy companies.

Explain the different types of energy businesses.

Identify the role and function of generation, transmission, and distribution organizations.

Describe the process of electric metering and billing for energy consumption.

Unit 1C:

Explain the flow of energy from generation through distribution to the customer.

Unit 2A:

Understand the roles of federal, state, and local agencies in workplace safety and health.

Understand the importance of compliance with standards, regulations, and established procedures to ensure a safe and healthful work environment.

Know basic regulatory requirements that promote safe and effective operations for the protection of people, data, property, and institutions.

Know basic procedural guidelines that promote safe and effective operations for the protection of people, data, property, and institutions.

Understand the roles and responsibilities of employers, employees, and the general public in creating and maintaining workplace, personal, and community safety cultures.

Unit 2B:

Name potential threats created by deviation from safety procedures and improper use of tools.

Use personal protective equipment (PPE) including safety glasses, hearing protection, gloves, work boots, and hard hats.

Keep personal safety equipment in working order.

Use safety equipment as specified by user manuals and safety training.

Use tools and equipment in compliance with user manuals and safety training.

Unit 2C:

Evaluate changes in the environment with respect to their impact on safety of self and others.

Identify both potential hazards and accident scenarios in the work environment.

Call attention to potential and actual hazardous conditions as they arise.

Alert coworkers and supervisory personnel to hazardous conditions and deviations from safety procedures in a timely manner.

Notify person in charge and/or coworkers of unsafe work conditions.

Stop the job if there are unsafe working conditions.

Maintain appropriate certification and be knowledgeable in first aid or first response procedures.

Unit 3A:

Explain the conventional electric power generation systems and process (coal, gas, hydroelectric, and nuclear).

Identify electric power generation equipment and systems.

Unit 3B:

Explain how oil was created and list its advantages and disadvantages.

Explain how coal was created and list its advantages and disadvantages.

Explain how natural gas was created and list its advantages and disadvantages.

Explain how water is used in hydroelectric power generation and list its advantages and disadvantages.

Explain how uranium is created and lists its advantages and disadvantages.

Unit 3C:

Explain how solar energy is used to produce electricity in photovoltaic systems and what its advantages and disadvantages are.

Explain how solar energy is used to produce electric energy using steam and what its advantages and disadvantages are.

Explain how wind energy is used to produce electric energy and what its advantages and disadvantages are.

Explain how geothermal energy is used to produce electric energy and what its advantages and disadvantages are.

Explain how biomass energy is used to produce electric energy and what its advantages and disadvantages are.

Explain how ocean wave energy is used to produce electric energy and what its advantages and disadvantages are.

Unit 4A:

Explain the electric power transmission process.

Discuss the application of different electric power transmission principles (including AC vs. DC).

Name electric power transmission equipment and systems.

Unit 4B:

Explain ownership/governance of the electric transmission system.

Discuss the emerging technologies in electric power transmission (including Smart Grid).

Unit 5A:

Explain the electric power distribution process.

Discuss the need for electric distribution systems and how they are designed to operate.

Name electric-power-distribution system equipment and what the various components do.

Unit 5B:

Explain the general ownership and governance structures of the electric distribution system.

Discuss the emerging technologies in electric power distribution including distribution automation and Smart Grid systems.

Unit 5C:

Explain the natural gas transmission and distribution process.

Name the components of the natural gas distribution system and how the equipment is designed to operate.

Discuss emerging technologies in natural gas distribution.

NRG 101 Energy Industry Fundamentals (EIF) Abbreviated Syllabus

Pima Community College
Spring 2015 10-week Schedule

Time: T & Th 7:00-9:15pm
Location: PCC Downtown Campus ST Building Room 102
E-Text: Center for Energy Workforce Development (CEWD) EIF Student Modules 1-5
Instructor: Michael Esser
E-mail: messer@pima.edu

Predicted Semester Schedule:

Date In-Class Goals

1/20 Orientation to class; on-line setup
1/22 EIF Module 1 Unit A Reading, Discussion & Quiz
1/27 EIF Module 1 Unit B Reading, Discussion & Quiz
1/29 EIF Module 1 Unit C Reading, Discussion & Quiz
2/3 EIF Module 2 Unit A Reading, Discussion & Quiz
2/5 EIF Module 2 Unit B Reading, Discussion & Quiz
2/10 EIF Module 2 Unit C Reading, Discussion & Quiz
2/12 EIF Module 3 Unit A Reading, Discussion & Quiz
2/17 EIF Module 3 Unit B Reading, Discussion & Quiz
2/19 EIF Module 3 Unit C Reading, Discussion & Quiz
2/24 EIF Module 4 Unit A Reading, Discussion & Quiz
2/26 NO CLASS – RODEO HOLIDAY
3/3 EIF Module 4 Unit B Reading, Discussion & Quiz
3/5 EIF Module 5 Unit A Reading, Discussion & Quiz
3/10 EIF Module 5 Unit B Reading, Discussion & Quiz
3/12 EIF Module 5 Unit C Reading, Discussion & Quiz
3/17-19 NO CLASSES – SPRING BREAK
3/24 Module 1 Review
3/26 Module 2 Review
3/31 Module 3 Review
4/2 Module 4 Review
4/7 Module 5 Review
4/9 Final Exam

NOTE THAT ATTENDING ALL CLASSES IS CRITICAL DUE TO MEETING JUST TWICE/WEEK & LEARNING GOALS

Grading:

Regular Class Participation	30%
Module 1 Quizzes	10%
Module 2 Quizzes	10%
Module 3 Quizzes	10%
Module 4 Quizzes	10%
Module 5 Quizzes	10%
Final Exam	20%
Total	100%