

Pima Community College

Tucson Electric Power

Course: EUT103: Generation Steam Systems

Syllabus for: Spring 2015

Section Code (CRN): 24092 and 24132

Prerequisite(s): Get into Energy Participant

Instructor: Dylan Bearce and Scott Northrup
Phone: (520) **
Email: DBearce@tep.com or Cnorthrup@tep.com
Office Hours: By appointment
Class Time: Monday 4:30 – 7:30 P.M.
Class Location: TEP Irvington Campus- Power Plant Training Facility
4350 E. Irvington Rd.

Key Dates:

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| First day of Classes | 01/26/15 |
| Last Day of classes: | 05/11/15 |
| Holidays (no class): | 02/26/15-02/27/15 Rodeo Break 03/16/15-03/20/15 Spring Break |
| Mid-Semester Exam: | TBA |
| Final Exam: | 05/11/15 |
| Last day to drop: | 02/02/15 |
| Last day to withdraw: | 04/09/15 |

Course Description: This course is an introduction to steam systems, thermodynamics, and boiler operations. Includes steam as an energy generating source, steam system operation, and boilers. Also includes pressure and temperature control.

Course Objectives: Upon completion of this course the student will be able to do the following:

1. Explain the basics of steam systems, including temperature measurement, pressure measurement, and thermal expansion.
2. Explain the science of steam as an energy source.
3. Describe boiler types and components and their functions.
4. Demonstrate basic steam systems operation, including strainers, air, condensate, pressure and temperature controls.
5. Describe the operation of a condensate recovery system.
6. Explain steam system performance.

Course Outline:

- I. Introduction to Steam Systems**
 - A. Basic operation
 - B. Temperature measurement
 - C. Pressure measurement
 - D. Thermal expansion
- II. Science of Steam Systems**
 - A. Steam states
 - B. Internal energy and enthalpy
 - C. Steam tables and diagrams
 - D. Steam power
- III. Boiler**
 - A. Types
 - B. Boiler subsystems
 - C. Boiler operation
 - D. Boiler pressure
 - E. Boiler components
 - 1. Safety devices
 - 2. Water column
 - 3. Blowdown
 - 4. Chemical treatment
- IV. Steam Systems**
 - A. Operation
 - B. Outside stem and yoke valves
 - C. Strainers
 - D. Pressure control
 - E. Regulator valve operation
 - F. Temperature control
 - 1. Heat exchangers
 - 2. Temperature regulation
- V. Air and Condensate Control**
 - A. Steam trap types
 - B. Steam trap testing and maintenance
 - C. Air vents
 - D. Condensate recovery systems
 - 1. Condensate pump operation
 - 2. Condensate pump maintenance
 - 3. Globe valves
 - 4. Check valves
- VI. Steam Systems Performance**
 - A. Performance measurement
 - B. Effects of air
 - C. Troubleshooting steam systems

Required Textbook: *None*

Required Materials: Note taking materials (note book, pens or pencils)

Grading: Grades will be determined as follow:
90-100 percent = A
80-89 percent = B
70-79 percent = C
60-69 percent = D
Below 59% = F

Class Break Down:
Quizzes: 20%
Attendance: 10%
Homework: 20%
Midterm: 25%
Final Exam: 25%

There will be no opportunity to earn extra credit points.

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| Student Withdrawal "W" Grades: | Students may withdraw from class without instructor permission and without incurring any grade penalty until 4/9/15. However, no refunds will be given. This grade may be requested by the student only during the first two-thirds of any session and may be given by the instructor on or before the official census reporting date to students who have ceased attending class before that date. Students who stop attending class after this date may receive a grade of "F." |
| Incomplete "I" Grades: | Due to the nature of this course "I" grades will not be given. |
| "AU" Audit Grades: | Auditing a PCC class means that you enroll, attend and do work for the class but do not expect to receive credit or a grade. To audit the class, you need the instructor's permission and signature on an audit request form from any campus admissions office. This form and appropriate payment must be returned to the admissions office for admission. An audit registration cannot be completed until the first day of class. You must complete your audit registration by the end of the add period for the class you wish to audit. The instructor is not required to grade assignments submitted by students who are auditing the class. |
| Final Grades: | For privacy and security reasons, instructors are advised NOT to give grades over the telephone or via email unless the student signs the exception box on the acknowledgment page of this syllabus. Students who wish to check grades should do so with their "My Pima" account. |
| Attendance: | The class moves quickly and it is critical that students attend the course. Students are given credit for participation in class. If a student has missed more than four classes he or she will be dropped from the class. |
| Assignments: | Homework with due dates are listed herein. Late homework will not be accepted without making prior arrangements with the instructor. |
| Cell Phones: | The use of cell phones or other personal electronic devices during class is prohibited. Students using such devices during class will be asked to leave and be counted as absent for the day. |
| ADA Compliance: | Pima Community College in compliance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act offers reasonable accommodations, including material in alternative formats, to qualified students with appropriate disability documentation. To obtain a reasonable accommodation, students must be registered with a campus Disabled Student Resource Office (DSR) who will verify, identify, and authorize implementation. Accommodations cannot be made without verification of the need. Students are responsible for making all accommodation requests in a timely manner. The Downtown Campus DSR office telephone number is 206-7286. |
| TEP Secured Facility: | Enrolled students will be given "visitors' access to the premises. Students must have a valid driver's license or state I.D. in order to be on-site at TEP. Abuse of this access privilege can be revoked by TEP at their discretion. |

Calendar

The instructor reserves the right to adjust the dates without notice.

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| Week 1 | Jan. 21-23 | <ul style="list-style-type: none">• Introduction to EUT104<ul style="list-style-type: none">○ Read Sections 1.0.0 – 3.0.0 & 10.0 of the Power Line Worker Safety○ Review Trade Terms p. 56• Introduction to electrical power and hazards; Job Safety Analysis (Sec 1-3, & 10)<ul style="list-style-type: none">○ HW - Line Worker Safety Trade Terms Quiz 1-34 (p.55-56) (Due Jan, 28th) |
| Week 2 | Jan. 28-30 | <ul style="list-style-type: none">• Line Worker Safety Section 4: Protective Equipment• Line Worker Safety Sections 5-7: Traffic Control; Trenching Safety; Horizontal Drilling |
| Week 3 | Feb. 4-6 | <ul style="list-style-type: none">• Line Worker Safety Section 8: Confined Spaces• Line Worker Safety Section 9-11: Environmental Concerns; Task Safety Analyses; Work-Zone and Personal Safety<ul style="list-style-type: none">○ HW - Line Worker Safety Review Questions 1-25 (p. 53-54) (Due Feb. 11th) |
| Week 4 | Feb. 11-13 | <ul style="list-style-type: none">• Quiz – Line Worker Safety• Tools of the Trade Sections 1-2: Insulated Tools• Tools of the Trade Section 3: Ladders & Work Platforms<ul style="list-style-type: none">○ HM Trade Terms Quiz 1-5 p. 17 (Due Feb. 13th) |
| Week 5 | Feb. 18 (No Class on the 20 th) | <ul style="list-style-type: none">• Tools of the Trade Section 4: Specialty Tools<ul style="list-style-type: none">○ Making up a handline○ HM Review Questions 1-10 p. 16 (Due Feb. 25th) |
| Week 6 | Feb. 25-27 | <ul style="list-style-type: none">• Quiz• Aerial Framing Sections 1-2: Intro & Safety• Aerial Framing Section 3: Aerial Framing Hardware<ul style="list-style-type: none">○ Splicing Techniques |
| Week 7 | Mar. 4-6 | <ul style="list-style-type: none">• Aerial Framing Section 4: Aerial Framing Components• Aerial Framing Section 5: Cross-Arms<ul style="list-style-type: none">○ Lab – Assemble Cross arm components |
| Week 8 | Mar. 11-13 | <ul style="list-style-type: none">• Review for Midterm• Midterm |
| Spring Break | Mar. 17-21 | No Class |
| Week 9 | Mar. 25-27 | <ul style="list-style-type: none">• Review:<ul style="list-style-type: none">○ Cross Arm installation lab• Cross Arm installation lab |
| Week 10 | Apr. 1-3 | <ul style="list-style-type: none">• Aerial Framing Section 6: Guys• Lab: Installing guys<ul style="list-style-type: none">○ HW: Aerial Framing Trade Terms Quiz 1-16, p. 30 (Due Apr. 8th) |

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| Week 11 | Apr. 8-10 | <ul style="list-style-type: none"> • Aerial Framing Section 7: Installing Primary • Installation Lab <ul style="list-style-type: none"> ○ HW: Aerial Framing Review 1-15, p.15 (Due Apr. 15th) |
| Week 12 | Apr. 15-17 | <ul style="list-style-type: none"> • Quiz • Aerial Framing Section 8 – Transformers • Single phase connections, three phase connections |
| Week 13 | Apr. 22-24 | <ul style="list-style-type: none"> • Setting & Pulling Poles Sections 1-3: Intro, Safety & Storage • Setting & Pulling Poles Section 4-5: Setting Wood Poles <ul style="list-style-type: none"> ○ HW: Setting & Pulling Poles Trade Terms Quiz 1-16, p. 18 |
| Week 14 | Apr. 29- May 1 | <ul style="list-style-type: none"> • Setting & Pulling Poles Section 6-8 Site Preparation • Underground Systems <ul style="list-style-type: none"> ○ HW: Setting & Pulling Poles Review Questions 1-15, p. 16-17 |
| Week 15 | May 6-8 | <ul style="list-style-type: none"> • Quiz • Comparing Underground to Overhead • Utility Disciplines |
| Week 16 | May 13-15 | <ul style="list-style-type: none"> • Review for Final • Final Exam |

** Each student must also complete one tailboard during one class.

PCC Student Code of Conduct & Scholastic Ethics

STUDENT RESPONSIBILITIES

By enrolling at Pima Community College, a student assumes the obligation to be a responsible member of the College community. All students are responsible to:

1. Contribute to a climate of academic integrity; rational, critical, and creative inquiry; freedom of individual thought and expression consistent with the rights of others; and commitment to the well-being of society as a whole.
2. Adhere to course requirements as specified by instructor(s) in the course syllabus, and follow all written and/or verbal instructions given by instructors or designated College representatives.
3. Obey all duly established College, local, state, and federal policies, regulations, and laws.
4. Refrain from actions that deny other members of the College community their rights as described herein.
5. Refrain from acts of violence, intimidation, or degradation toward any person.
6. Cooperate with College administrators, faculty, and staff in the performance of their authorized duties.
7. Give and maintain accurate and complete information for all official records required by the College.
8. Meet all financial obligations to the College.
9. Carry personal picture identification at all times while on College property or at College functions.
10. Attend all judicial proceedings when issued notice to do so.
11. Maintain the highest ethical standards in academic achievement.

Students admitted to both PCC and UA through the Program for Joint Admissions and Enrollment will be subject to codes of academic integrity and codes of conduct at both institutions.

SCHOLASTIC ETHICS CODE

The purpose of the Scholastics Ethics Code is to:

- encourage and promote positive learning and ethical scholarly behavior,
- define behavior violating scholastic ethics,
- specify procedures for the determination of the facts of the alleged violations, and to define penalties.

Guidelines for Scholastic Ethics

Students assume full responsibility for the content and integrity of the coursework they submit. The following is a guide to assist students in observing positive behavior in scholastic ethics:

1. Students must do their own work and submit only their own work on essays, examinations, reports, and projects, unless otherwise permitted by the instructor.
2. Students can benefit from working in groups. They may collaborate or cooperate with other students during take-home examinations or projects only if specifically authorized by the instructor in the class syllabus or at the time of the examination.

CODE OF ACADEMIC INTEGRITY: VIOLATIONS

Students enrolled in the College assume the obligation of conducting themselves in accordance with the highest scholarly ethics. Actions constituting violations of academic integrity will be considered a violation of the Student Code of Conduct and include, but are not limited to the following:

1. Cheating:

Intentional deceit during the pursuit of academic coursework, tests, class assignments, activities in any testing area, learning center, clinical setting, tutoring session, or in the gathering of research materials is considered cheating. "Cheating" includes, but is not limited to, the following:

- a) Copying from another student's test paper or knowingly allowing your test to be copied.
- b) Using materials during a test that were not clearly authorized by the person giving the test.
- c) Collaborating with another student during a test without permission.
- d) Knowingly using, buying, selling, offering, transporting, or soliciting any of the contents of a test.
- e) Taking a test for another student or permitting another student to take a test for you.
- f) Bribing or attempting to bribe another person to obtain a passing grade or a better grade on a test or for a course.
- g) Intentional misconstruing of facts or incidents relating to an evaluated exercise or assignment that would change the grade given.

2. Plagiarism:

The representing of the work of other persons as one's own, including the use of term papers written by others and information downloaded from the Internet, is plagiarism. The use of another person's words, ideas, or information without proper acknowledgement is also plagiarism. The student should seek guidance from the instructor about acceptable methods to be used to acknowledge the work and ideas of others.

3. Collusion:

Obtaining from or giving to another student unauthorized assistance on material in any course work is collusion.

4. Compromising Instructional and Test Materials:

Unauthorized acquisition of instructional and/or testing materials from desks, cabinets, work rooms, classrooms, laboratories, instructors' offices, tutoring labs, testing areas, assessment areas, secretarial offices, college offices, and/or other areas is compromising test materials.

5. Misrepresentation/Fraud:

Using false records, false identification papers, unauthorized I.D. cards, or computer access to official college documents or to services such as testing areas, placement assessments, tutoring services, and/or tests or test banks of any type constitutes misrepresentation/fraud.

Acknowledgment of Receipt of Syllabus

Student Name _____

Home Phone # _____ Cell Phone # _____

E-mail _____

Please complete and return the following acknowledgment to your instructor in class.

I, (print name) _____, have received the EUT103 syllabus (including course objectives, policies, requirements and schedule), and have read and understand all the enclosed materials, including the course/instructor expectations and deadlines.

Please read the following statements and check all that apply:

___ I have no objection to receiving phone calls from the instructor at my home phone number.

___ I have no objection to receiving phone calls from the instructor at my cell phone number.

___ I have no objection to receiving email from the instructor.

___ I prefer that the instructor not call or contact me anytime during the semester.

___ I give permission for my instructor to e-mail any grades and materials associated with my student record for this course during this semester to the email address listed above.

___ I give permission for my instructor to tell me my grade over my listed phone numbers.

Student Signature: _____ Date: _____

**If you do not check the options above, grade will only be available through Pima's official site or in person.