# Course Outline

**2026-2027 Catalog**

## CNST 35 - Electrical and Mechanical Systems

### Catalog Description

**Transfer Status:** CSU

**Unit(s):** 3.00

**Lecture:** 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

**Lab:** 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)

**Total:** 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

**Course Description:** This course is an introduction to Mechanical, Electrical, and Plumbing Systems and the integration of these systems into the building design and construction process.

### Objectives

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

1. Describe the fundamental properties of plumbing systems, such as pressure, velocity, and flow rate [ACCE-SLO #20] ACCE-SLO: American Council for Construction Education – Student Learning Outcomes
2. Identify plumbing components using correct terminology and nomenclature [ACCE-SLO #20].
3. Apply simple plumbing distribution, sanitary drainage, and storm water drainage systems.
4. Describe the fundamental properties of HVAC (heating, ventilating, and air conditioning) systems [ACCE-SLO #20].
5. Describe how the psychometric chart can be used [ACCE-SLO #20].
6. Identify HVAC components using correct terminology and nomenclature [ACCE-SLO #20].
7. Compare and contrast advantages and disadvantages of the different HVAC systems available for building structures.
8. Solve problems using fundamental units of electricity, such as resistance, current, voltage, power, and energy [ACCE-SLO #20].
9. Describe the advantages and disadvantages of different types of electrical systems, such as AC versus DC, and single-phase versus three-phase power [ACCE-SLO #20].
10. Apply correct terminology and nomenclature for electrical, lighting, and communication components.
11. Identify sustainable options for MEP scopes of work. [ACCE-SLO #18]

### Course Content

**Topic Titles / Suggested Time Topic**

**Lecture**

| Topics | Lec Hrs |
|---|---|
| Safety in mechanical, electrical, and plumbing system construction | 3.00 |
| Introduction to plumbing systems | 3.00 |
| Introduction to sanitary sewage systems and drainage | 3.00 |
| Introduction to storm water drainage systems | 3.00 |
| Introduction to heating systems | 3.00 |
| Introduction to ventilating systems | 3.00 |
| Introduction to air conditioning systems | 3.00 |
| Introduction to electricity | 4.00 |
| Introduction to electrical systems | 3.00 |
| Introduction to lighting and communication systems | 3.00 |
| Introduction to fire alarm and sprinkler systems | 3.00 |
| **Total Hours:** | **34.00** |

**Lab**

| Topics | Lab Hrs |
|---|---|
| MEP safety and lab procedures | 3.00 |
| Plumbing systems | 6.00 |
| Sanitary sewage systems and drainage | 6.00 |
| Storm drainage systems | 3.00 |
| Heating systems | 6.00 |
| Ventilating systems | 3.00 |
| Air conditioning system | 6.00 |
| Electricity | 3.00 |

| Topics | Lab Hrs |
|---|---|
| Electrical systems | 6.00 |
| Lighting and communication systems | 6.00 |
| Fire alarm and sprinkler systems | 3.00 |
| **Total Hours:** | **51.00** |

## Methods of Instruction

A. Demonstrations
B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
C. Laboratory Experiments
D. Lecture
E. Multimedia Presentations

## Methods of Evaluation

A. Exams/Tests
B. Quizzes
C. Homework
D. Lab Projects

## Examples of Assignments

**Reading Assignments**

1. Read the chapter on electrical units and be prepared to discuss in class.
2. Read assigned trade journal article and be prepared to discuss in class.

**Writing Assignments**

1. Write a one-page essay, explaining the use of a psychometric chart.
2. Write a two-page essay, detailing the advantages and disadvantages of a community leach field as compared to individual septic systems.

**Out-of-Class Assignments**

1. Utilizing the provided schematic of a heat pump system, clearly label and explain the function of each component of the system.
2. Using the Butte College Field House Project Plans and Specifications, identify and list all of the electrical fixtures to be installed in the Team Room.

## Recommended Materials of Instruction

ATP Staff. (2013). Mechanical and Electrical Systems for Construction Manager. *American Technical Publishers, 3rd.*

**Other Learning Materials**

All tools listed in the Core Program Guide.

## Minimum Qualifications

Construction Technology
Engineering (Masters Required)
Engineering Technology (Masters Required)
Industrial Technology
Manufacturing Technology
Building Codes And Regs
Construction Management

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