

Course Outline

COURSE: CMGT 105 **DIVISION:** 50 **ALSO LISTED AS:**

TERM EFFECTIVE: Fall 2020 **CURRICULUM APPROVAL DATE:** 11/13/2019

SHORT TITLE: ELEC, MEC, PLUM SYSTEMS

LONG TITLE: Electrical, Mechanical and Plumbing Systems

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
3	18	Lecture:	3	54
		Lab:	0	0
		Other:	0	0
		Total:	3	54

COURSE DESCRIPTION:

This course provides the student with an introduction to the electrical, mechanical and plumbing systems used in the construction industry. How these systems integrate into the building design and construction process will also be covered.

PREREQUISITES:

Completion of CMGT 104, as UG, with a grade of C or better.

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion

05 - Hybrid

72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Describe the basic principles of mechanical, electrical and plumbing systems.
2. Examine the basic principles of sustainable construction as it relates to mechanical, electrical and plumbing systems.

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Curriculum Approval Date: 11/13/2019

3 Hours

Content: Introduction. Mechanical and Electrical Systems. Sustainable Options for Plumbing Systems.

Student Performance Objectives: Explain the fundamental properties of mechanical and electrical systems. Examine sustainable options for MEP scopes.

3 Hours

Content: Plumbing Materials. Sanitary DWV. Storm-water Drainage.

Student Performance Objectives: Recognize plumbing components using correct terminology and nomenclature. Explain the fundamental properties of plumbing systems, such as pressure, velocity, and flow rate.

3 Hours

Content: Sizing Sanitary DWV. Sizing Water Supply Piping.

Student Performance Objectives: Explain the fundamental properties of plumbing systems. Apply simple plumbing distribution, sanitary drainage, and storm water drainage systems.

5 Hours

Content: Plumbing Fixtures and Appliances. Exam.

Student Performance Objectives: Examine the fundamental properties of plumbing systems, such as pressure, velocity, and flow rate as they relate to plumbing fixtures and appliances.

3 Hours

Content: Comfort and Psychrometric. Sustainable Options for Mechanical Systems.

Student Performance Objectives: Discuss the psychrometric chart. Explain the fundamental properties of mechanical systems. Examine sustainable options for MEP scopes.

3 Hours

Content: Forced-Air Heating Systems. Steam and Hydronic Heating.

Student Performance Objectives: Differentiate a forced-air heating system from a steam or hydronic heating system. Discuss the fundamental properties of HVAC (Heating, Ventilating, and Air Conditioning) systems.

3 Hours

Content: Refrigeration. Air Conditioning Systems. Heating and Cooling Loads. Load Calculations.

Student Performance Objectives: Explain the fundamental properties of mechanical and electrical systems as they relate to refrigeration, air conditioning, and heating systems. Discuss the fundamental properties of HVAC (Heating, Ventilating, and Air Conditioning) systems. Calculate loads.

3 Hours

Content: Forced-Air System Design. Building Automation Control Systems and Heat Pumps.

Student Performance Objectives: Explain how forced-air systems work. Analyze a forced-air system design. Discuss how to build automation control systems and heat pumps.

5 Hours

Content: Hydronic System Design. Exam.

Student Performance Objectives: Describe the fundamental properties of hydronic systems. Discuss the do's and don'ts of hydronic system design.

3 Hours

Content: Electrical Principles, Tools, and Safety. Basic Quantities. Test Instruments. Ohm's Law. The Power Formula. Series and Parallel Circuits.

Student Performance Objectives: Recognize HVAC components using correct terminology and nomenclature. Identify various tools used when working with electricity. State proper safety practices when working with electricity. Recall Ohm's Law. Utilize the Power Formula. Discuss the difference between series circuits and parallel circuits.

3 Hours

Content: Electrical Plans and Connections. Switches and Receptacles.

Student Performance Objectives: Explain the fundamental properties of electrical systems. Apply advantages and disadvantages of different HVAC systems available for building structures. State the difference between an outlet and a receptacle.

3 Hours

Content: Nonmetallic-Sheathed Cable. Metallic-Sheathed Cable. Conduit. Service Entrances and Panel Boards.

Student Performance Objectives: Explain the fundamental units of electricity, such as resistance, current, voltage, power, and energy, and solve problems using them. Apply advantages and disadvantages of different HVAC systems available for building structures.

3 Hours

Content: Transformers. Generators and Automatic Transfer Switches. Construction Plan Set.

Student Performance Objectives: Explain the advantages and disadvantages of different types of electrical systems, such as AC versus DC, and single-phase versus three-phase power.

5 Hours

Content: Sustainable Options for Electrical Systems. Exam.

Student Performance Objectives: Examine sustainable options for MEP scopes.

4 Hours

Content: Plumbing and Mechanical Review Session. Sustainability and Electrical Review Session.

Student Performance Objectives: Describe the fundamental properties of plumbing, mechanical, and electrical systems. Apply correct terminology and nomenclature for electrical, lighting, and communication components. Examine sustainable options for MEP scopes.

2 Hours

Final

METHODS OF INSTRUCTION:

lecture, discussion, multi-media presentation

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 54

Assignment Description: Complete assigned readings and study for quizzes and exams.

Required Outside Hours: 54

Assignment Description: Assignments, such as: skill review, homework, weekly check in assignments.

METHODS OF EVALUATION:

Objective examinations

Percent of total grade: 60.00 %

50% - 70% Quizzes and Exams

Problem-solving assignments

Percent of total grade: 30.00 %

20% - 40% Homework Weekly Check In Assignments, Systems Skill Review

Other methods of evaluation

Percent of total grade: 10.00 %

0% - 20% Class Participation

REPRESENTATIVE TEXTBOOKS:

ATP Staff. Mechanical and Electrical Systems for Construction Managers. Orland Park, Illinois: American Technical Publishers, 2013.

This is the most current edition (3rd) of this book and is the one currently used by CSU, Chico. When the next edition is published it will be adopted for the course.

ISBN: 9780826993632

Reading Level of Text, Grade: 12 Verified by: MS Word

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Transferable CSU, effective 202070

UC TRANSFER:

Not Transferable

SUPPLEMENTAL DATA:

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education: N

Program Status: 1 Program Applicable

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department: CMGT

CSU Crosswalk Course Number: 235

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code:

In-Service: N

Occupational Course: D

Maximum Hours:

Minimum Hours:

Course Control Number:

Sports/Physical Education Course: N

Taxonomy of Program: 095700