

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Center for Water Studies 132 – Wastewater Collection Systems

3 hours lecture, 3 units

Catalog Description

Study of the components of wastewater collection systems. Overview of design installation, operation, monitoring, maintenance and repair of sewer pipelines, pump stations and related facilities. Preparation for California Water Environment Association (CWEA) Collection System Maintenance Grade 1 and Grade 2 certification exams.

Prerequisite

None

Course Content

- 1) Introduction to Wastewater Collection
 - a. The Wastewater Collection system Operator and Operations and Maintenance overview
- 2) Wastewater Collections Systems: Purpose, Components, and Design
 - a. Design of flow measurements and variations, Components of various Collection systems, new construction, testing, and inspection of systems.
- 3) Safety Procedures
 - a. Vehicle, Streets, Excavation and Shoring, Confined Spaces, Safety Equipment and Procedures.
- 4) Inspecting and Testing Collection Systems
 - a. Manhole inspection, Closed Circuit Television Inspection, Smoke and Dye testing.
- 5) Pipeline Cleaning and Maintenance Methods
 - a. Identifying problems and selecting solutions, Hydraulic and Mechanical cleaning systems and equipment maintenance, Maintenance with chemical controls, System Odor Control measures, and Corrosion Control Measures.
- 6) Underground Repair and Construction
 - a. Gravity Sewer repairs, Main Line repairs, Manhole repairs, Service line repairs, trenchless repairs, new construction, and Inspection and Testing of sewer construction and rehabilitation work.

Course Objectives

Students will be able to:

- 1) Define common terminology pertaining to collections system components, design, and management as well as inspection and quality control.
- 2) Identify the types and functions of pipes and fittings used in wastewater collection system design and management.
- 3) Given a wastewater collection map book, identify pipeline dimensions, pipe construction materials, direction of flow, and location of valves, services and lift stations.
- 4) Describe the basic cleaning methods and basic principles involved in hydraulic and mechanical cleaning methods.
- 5) List and describe the operation of common valves used in a wastewater collection system.
- 6) Perform basic mathematical computations and conversions relating to wastewater collection systems.
- 7) Successfully pass CWEA Collection System Maintenance certification exams.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Projects, writing assignments and/or exams/quizzes which measure students' ability to compare and contrast components of wastewater collections systems including design, installation, operation, monitoring, and maintenance and repair.
- 2) Tests and/or writing assignments which measure students' ability to demonstrate familiarity and knowledge of wastewater collection system operations.
- 3) Projects and assignments utilizing the Field Operations Skills Yard

Special Materials Required of Student

None

Minimum Instructional Facilities

Smart classroom

Method of Instruction

- 1) Lecture and discussion
- 2) Multimedia presentations
- 3) Field trips
- 4) Demonstrations utilizing the Field Operations Skills Yard

Out-of-Class Assignments

- 1) Reading assignments
- 2) Writing assignments

Texts and References

- 1) Required (representative example): Kerri, Kenneth. *Operation and Maintenance of Wastewater Collection Systems, Volume I*. 8th edition. California State University, 2018.
- 2) Supplemental: None

Exit Skills

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Understand terminology common to collection system design, components, operation, inspection and testing.
- 2) Identify the types and uses of pipes, fittings, and appurtenant structures commonly used in a wastewater collection system.
- 3) Describe in detail procedures and methods utilized in the field for shoring, backfill, and compaction.
- 4) Describe the basic cleaning methods and basic principles involved in hydraulic and mechanical cleaning operations.
- 5) List and describe the operation of common valves used in a wastewater collection system.
- 6) Perform basic mathematical computations and conversions relating to wastewater collection systems.

Student Learning Outcomes

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

- 1) Explain the operation and design of a wastewater Collection System and describe the work performed by a wastewater Collection Systems Operator.
- 2) Explain the procedures for working safely with vehicles, confined spaces, trench shoring, construction in street traffic, and the methods used to inspect and test wastewater Collections System piping and appurtenances for issues and problems.

- 3) Identify types and causes of sewer blockages, select the proper methods for clearing the blockages and cleaning the sewer line, and describe how components of the system are tested.
- 4) Demonstrate competency to pass CWEA Collection System Maintenance Grade 1 and Grade 2 certification exams.