

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Environmental Health and Safety Management 221 – Stormwater Runoff Management Technical Background

1 hour lecture, 1 unit

Catalog Description

Stormwater Runoff Management Technical Background provides background knowledge in stormwater management for managers and inspectors in industrial, construction, agriculture, tribal and municipal operations. Coursework covers a brief review of stormwater regulations and introduces the applicable technical math, water quality, and chemistry contexts for understanding stormwater runoff. Applications include understanding units of concentrations and loadings applied to Best Management Practices (BMPs) in field settings. The course provides entry-level coursework for stormwater management and reporting, and skills for those seeking or pursuing positions in stormwater such as Qualified SWPPP Developer (QSD), Qualified SWPPP Practitioner (QSP), or Qualified Industrial SWPPP Practitioner (QISP).

Prerequisite

“C” grade or higher or “Pass” in EHSM 220 or equivalent

Entrance Skills

- 1) General knowledge of stormwater permits (industrial, construction, municipal), the hydrologic cycle, and common water quality pollutants (e.g., metals, nutrients, sediment).
- 2) Understand the purpose of BMPs, be able to reference factsheets, and apply fundamental safety and inspection practice.

Course Content

- 1) Watersheds: surface water; groundwater
- 2) Stormwater Permit types: Municipal; Tribal; Construction; Industrial
- 3) Common water quality parameters; pH and turbidity
- 4) Pollutant types and sources, concentrations, loads
- 5) Water quality: mass, volume, and concentration calculations
- 6) Best Management Practices (BMPs) and Field Inspections
- 7) Field Sampling; Labs, Field Kits
- 8) SWPPP and lab reports review

Course Objectives

Students will be able to:

- 1) Apply California and Federal regulations to manage stormwater compliance programs in various industries.
- 2) Identify stormwater runoff constituents and application to BMPs.
- 3) Identify and evaluate pollutant types and sources.
- 4) Calculate water quality concentrations, loads, and unit conversions.
- 5) Assess and find errors during on-site stormwater reporting.

Method of Evaluation

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

- 1) Quizzes and exams that measure students' ability to identify, describe and apply fundamental water quality concentration, loads, and unit conversions tied to California and Federal stormwater permits.
- 2) Exercises that measure students' ability to interpret stormwater inspections and reports, and defend programs for compliance with California and Federal stormwater regulations and standards.
- 3) Video presentations/projects measuring the student's ability to create or apply environmental math and chemistry for stormwater management.

Special Materials Required of Student

None

Minimum Instructional Facilities

Smart Classroom

Method of Instruction

- 1) Lecture and discussion
- 2) Field trips, guest lecturers
- 3) Projects, hands-on exercises

Out-of-Class Assignments

- 1) **Reading:** Review local watershed water resources such as maps, posters, and current video depictions, lecture notes describing rain to stormwater and the hydrologic cycle, review other videos describing the management of water from reservoirs to groundwater sources.
- 2) **Writing:** Review of the California Water Project, review and summarize local watershed projects, roughly estimate volumes of water needed and required to meet water demands, presentation on the allocation of water as a vital resource and a commodity, and the impacts to streams and waterbodies.
- 3) **Other:** Assess a watershed from field observations including the paved and unpaved areas, assess differences between runoff from paved and unpaved areas. Observe reservoirs and their sources from within the watershed and imported sources.

Texts and References

- 1) Required (representative example): California State Water Resources Control Board. (n.d.). *NPDES 2022 Construction Stormwater General Permit*. Retrieved September 24, 2025, from https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction/general_permit_reissuance.html
- 2) Supplemental: California Department of Transportation. (2024, March). *Construction site best management practices (BMP) manual* (Report No. CTSW-RT-24-425.11.1). Division of Environmental Analysis, Stormwater Program. Brown and Caldwell. <https://dot.ca.gov/programs/environmental-analysis/stormwater-management-program>

Student Learning Outcomes

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

- 1) Apply California and Federal stormwater standards to critique permit compliance, analyze site inspections, and assess industry-specific Best Management Practices (BMPs).
- 2) Implement and review site-specific stormwater compliance programs that align with permit requirements and integrate watershed management principles.