Lecture Contact Hours: 16-18; Outside-of-Class Hours: 32-36; Total Student Learning Hours: 48-54

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Environmental Health and Safety Management 227 – Erosion and Sedimentation Calculations

1 hour lecture, 1 unit

Catalog Description
Erosion and Sedimentation Calculations applies to construction, agricultural and other land uses with an emphasis on erosion control calculation, sediment load calculations, and Best Management Practice (BMP) design. The course involves calculations evolving from erosion and sedimentation theory and transitioning to erosion and sediment control. Erosion and sedimentation calculation scenarios are reviewed in agriculture and the transitional application into construction.

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 practices.

Course Content
1) Concepts of soil: sand, silt, clay, and living soil organisms
2) Revised Universal Soil Loss Equation, RUSLE
3) Modified Universal Soil Loss Equation, MUSLE
4) Agriculture and construction sediment runoff calculations
5) Sedimentation mass and volume
6) Rill and gully erosion
7) BMP loading/capacity calculations
8) Reservoirs and estuary sediment loading

Course Objectives
Students will be able to:
1) Apply California and Federal regulations for calculating and designing BMPs for stormwater compliance programs.
2) Apply and design stormwater BMPs for SWPPP documentation.
3) Determine pollutant sediment sources.
4) Calculate sediment loads.
5) Criticize proper/improper BMPs during on-site stormwater inspections.

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 California and Federal stormwater permits.
2) Exercises that measure students' ability to perform erosion and sedimentation inspections and calculations and develop programs in compliance with California and Federal stormwater and sedimentation regulations and standards.
3) Video presentations/projects measuring the student's ability to design and apply BMPs for stormwater management programs.

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
4) Scenario designs

Out-of-Class Assignments
1) **Reading:** Calculations using Revised Universal Soil Loss Equation (RUSLE), introduce the Modified USLE (MUSLE), describe other advanced watershed modeling for soil and watersheds, modeling of erosion and sediment control BMPs, discuss calculation units from sediment runoff.
2) **Writing:** Assess BMPs and use of RUSLE from observed field scenarios, report on construction phases and potential for erosion and sedimentation, calculate RUSLE for several construction scenarios.
3) **Other**: Discuss field observations, develop concepts of volumes and mass of sediment as observed in the field.

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:
   a. 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
   b. Supplemental: International Erosions Control Association. (2025, September). IECA Design Standards. https://connect.ieca.org/resources/design-standards

Student Learning Outcomes
Upon successful completion of this course, students will be able to:
1) Apply California and Federal stormwater standards and calculation design guidelines to create an effective erosion and sediment control BMP implementation.
2) Manage and inspect site-specific stormwater compliance programs for erosion and sedimentation controls.
3) Evaluate BMPs per appropriate calculations to defend BMP success.