National Pollutant Discharge Elimination System (12-Week Course)

PREREQUISITE: INTRODUCTION TO PUBLIC WORKS

GRADING METHOD: Instructor may choose to Grade or offer Pass/No Pass.

COURSE DESCRIPTION (12-week course)
This course is an overview of stormwater environmental issues in Public Works. Topics include Clean Water Act, EPA, Regional Water Quality Control Boards, watershed management and effect on water runoff. Construction Impact, Low Impact Designs, Maintenance Impacts, Enforcement Regulatory Authorities, and related issues.

COURSE CONTENT

I. Stormwater Management Plan (SWMP) or Stormwater Pollution Prevention Plan (SWPPP)
II. Minimum Control Measures (MCM)
III. Introduction to the Clean Water Act
    a. Phases of Enforcement Responsibilities
IV. Permit Requirements
V. Authorities
    a. Ordinances
    b. Local Enforcement
VI. Public Education and Outreach
VII. Public Participation & Involvement
VIII. Illicit Discharge Detection and Elimination
IX. Construction Site Storm Water Runoff Control
X. Post-Construction Storm Water Management
XI. Pollution Prevention/Good Housekeeping

Module 1
- National Pollution Discharge Elimination System (NPDES)
    - Stormwater Management Plan (SWMP) or Stormwater Pollution Prevention Plan (SWPPP)
    - Authorities
    - Ordinances
    - Local Enforcement

Module 2
- Public Education and Outreach.
    - What is Exempt
    - Construction Industry
    - Business Communities
    - General Public
    - Schools

Module 3
- Construction Site SWPPP,
    - Plan Approval,
    - Site Inspection,
    - Failure Corrections,
    - Enforcements

Module 4

- Maintenance
    - Road Construction
    - Park Maintenance
    - Building Maintenance
    - Sidewalks
    - Storm Systems

Module 5

- Corporation Yard SWPPP
    - Fuel Island
    - Fleet Maintenance
    - Equipment Storage
    - Material Storage
    - Electrical Utility Storage
    - Covered vs: Non-Covered

MID-TERM

Module 6

- Best Management Practices
    - Good Housekeeping
    - Street Cleaning
    - Storm System Maintenance
    - Catch Basin cleaning

Module 7

- Illicit Discharges Detection & Elimination
    - Locate Priority Problem Areas
    - Trace the Source of Illicit Discharges
    - Removal of Sources
    - Point Source Control
    - Non-Point Source

Module 8

- Maximum Extent Practicable (MEP).
    - Technology Based Standard Set by Congress.
    - Pollution Prevention and Source Control BMP's are First Tier MEP's
    - Evolving, Flexible, and Advanced Concept.
    - Technical and Economic Feasibility.

Module 9

- Best Management Practices
    - Mechanical Designs
    - Filters
    - Erosion Controls

Module 10

- Low Impact Design (LID)
    - Calculate Runoff
    - Reduce Stormwater run off

FINAL EXAM

STUDENT LEARNING OUTCOMES

Upon completion of this course, students will be able to do the following:
Creative, Critical, and Analytical Thinking to understand NPDES permits, goals, objectives that reduce pollutants from entering the waters of the United States.

Calculate the effectiveness to the maximum extent practical environmental technologies, products, and best management practices, and evaluate effectiveness to specific projects. Be able choose most appropriate and cost-effective methods, technologies, and products

OUTCOME: PUBLIC EDUCATION

- RATIONALE: Understand the need to change public perception regarding stormwater pollution.
- ASSESSMENT: Greater public awareness should result in reduced polluted stormwater.

OUTCOME: PUBLIC INVOLVEMENT

- RATIONALE: Public outreach through media outlets, PSA, elementary and high schools, service clubs.
- ASSESSMENT: Tracking contacts, attendance media outlet ratings.

OUTCOME: ILLICITE DISCHARGE DETECTION & ELIMINATION

- RATIONALE: Through source control, consistent education, inspection and enforcement, illicit discharges should be reduced.
- ASSESSMENT: Reduce violations should result in improve water quality.

OUTCOME: CONSTRUCTION SITE RUNOFF

- RATIONALE: BMP's reduce construction site pollutants of concern from enter water ways.
- ASSESSMENT: Inspection of sites and monitoring storm system

OUTCOME: POST CONSTRUCTION STORMWATER MANAGEMENT

- RATIONALE: Low Impact Design (LID) should reduce runoff
- ASSESSMENT: Measure the amount of rain and runoff

OUTCOME: POLLUTION PREVENTION/GOOD HOUSEKEEPING

- RATIONALE: Alternative products and good housekeeping practices reduce the impact on pollutants of concern from entering the waterways.
- ASSESSMENT: Monitor waterways for Dissolved Oxygen, Turbidity, Total Solids, PH levels and Flow Rates Nitrates, Fecal Coliform, Biochemical Oxygen Demand (BOD) pollutants, Phosphorous, & Temperature

OBJECTIVES

1. Develop a program that would reduce stormwater pollutants, choose most appropriate and cost-effective methods, technologies, and products
2. Calculate cost effectiveness of environmental technologies, products, and methods, and evaluate appropriations to specific projects
3. Identify the various regulatory agencies and explain their authority and purview as regulators in the Public Works industry

4. Identify and describe operational procedures, including examples of Best Management Practices
5. Compare and contrast public vs. private projects with regard to scope, outcomes, benefits, related permitting requirements, regulatory issues, and exemptions

METHODS OF EVALUATION/ASSESSMENT

Typical classroom assessment techniques

Exams - Tests
Quizzes
Research Projects
Class Participation Conference calls
Homework
Competency based written and practical tests which demonstrate the students' ability to apply skills and concepts learned to minimum standards established by the instructor

REQUIRED TEXTS AND MATERIALS

Recommended

Material supplied by Maintenance Superintendent Association

Adopted: 04/25/2020

DISTANCE EDUCATION

Method of Instruction

More written work in the form of weekly homework, required synchronous and asynchronous communication between student and professor, and between student and student. Other adaptations may include discussion area/bulletin boards, frequently asked questions, optional orientation sessions, telephone sessions, and virtual office hours.

Adapted Method of Instruction

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Method of Communication

Email will be the primary form of communication. This is also used for individual feedback on assignments, reminders of upcoming projects, notices of performance, and answering student questions.

Weekly conference calls to discuss weekly lessons used for instruction and communication of material that is pertinent to all students. It also facilitates student interaction.

There may be an optional orientation that covers all material the student needs to access and navigate the course. Phone communication will be at the instructor's discretion.

Method of Evaluation

Written essay, exams, and quizzes may be administered either online or in the campus Testing Center. Assignments may be submitted online. Synchronous and asynchronous communication will be used.

Accessibility

All websites follow required accessibility guidelines, audio files will have back up text files, students are provided with guidance through DSPS, and all materials have alt tags and can be read by computer reading software.

Sample Assignments

Written essays describing environmental projects in Public Works.

Outside Assignments

Suggested reading other than required textbook California Water Boards http://www.swrcb.ca.gov/index.html

California Stormwater Quality Association http://www.cabmphandbooks.com/

Examples of Outside Assignments

Research local agency NPDES permit. Who is responsible for implementing?

Examples of Required Writing Assignments

Write a cost comparison of non-compliance with NPDES requirements and analyze their compliance to current environmental legislation.