

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT 215 – AIR QUALITY MANAGEMENT

3 hours lecture, 3 units

Catalog Description

Overview of air quality regulations with an emphasis on federal, state and local requirements. Integrated study of the principles of air permits and permit compliance including source testing, emission reduction, inspections, monitoring, stationary and mobile sources, air toxics, new equipment shakedown, and overall global air quality issues.

Prerequisite

None

Course Content

- 1) Regulatory History and Background
 - a. Clean Air Act (CAA), history and impacts
 - b. Rule development
 - c. Permitting at the local and federal level
 - d. Permit application and permit to operate
 - e. CAA Title V Permitting
 - f. Agencies
- 2) Federal, State and Local Regulations
 - a. Air Resource Board (ARB)
 - b. Air Pollution Control District (APCD)
 - c. Air Quality Management District (AQMD)
 - d. South Coast Air Quality Management District (SCAQMD)
 - e. State Implementation Plan (SIP)
- 3) Stationary and Mobile Sources
- 4) Modeling - General Background (no mathematics)
- 5) Practical Aspects
- 6) APCD Inspection Program
 - a. Source testing
 - b. Reading permits and understanding requirements
 - c. New equipment shakedown
 - d. Not meeting permit requirements
 - e. Notice of Violation (NOV) resolution
 - f. Emission trading
 - g. Off-sets
 - h. Emission reduction
 - i. Non-compliance
 - j. Inspection
 - k. Variances
 - l. Monitoring, sampling and source testing
 - m. Emissions inventory
- 7) Control Devices
 - a. Control Emission Monitoring Systems (CEMS)
 - b. Other technologies
- 8) Air Toxic
- 9) Prop 65, Employee Notification and Labeling Requirements

- 10) AB 2588, Air Toxic Hot Spots Program
- 11) Risk Management/Risk Assessment
- 12) Indoor Air Quality (IAQ)
- 13) Ozone Non-attainment
- 14) Particle Matter PM10 and PM2.5 Standards
- 15) New Source Performance Standards (NSPS)
- 16) National Ambient Air Quality Standards (NAAQS)
- 17) National Emissions Standards for Hazardous Air Pollutants (NESHAP)
- 18) New Source Review Standards (NSR)
- 19) Global Warming
- 20) Greenhouse Gases and Global Effects

Course Objectives

Student will be able to:

- 1) Summarize and identify historical trend of the development of air pollutants
- 2) Distinguish and assess the characteristics of air pollutants
- 3) Interpret federal, state, and local regulations governing air pollution
- 4) Recognize agencies requirements pertaining to air quality compliance
- 5) Identify and compare components of air management programs
- 6) Analyze the criteria for the implementation of air permitting process
- 7) Recognize global impacts due to local air issues
- 8) Define terms commonly found in air regulations and permits

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in the 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' knowledge and understanding of the regulatory process of federal and local permitting.
- 2) Written assessment through the use of a research paper and presentation that measures students' ability to analyze, interpret, and draw conclusions of a selected current air quality issue.
- 3) Demonstration of the requirements of a local permit by a group project in which students are required to analyze, interpret, and evaluate permit requirements.
- 4) Air program management-solving exercises that measure students' ability to model real work application of classroom and handout materials.

Special Materials Required of Student

None

Minimum Instructional Facilities

Smart classroom

Method of Instruction

- 1) Integrated lecture, discussion and demonstration
- 2) Small and large group discussion
- 3) In-class activities and independent homework/research projects

Out-of-Class Assignments

Acceptable out-of-class assignments, with instructor concurrence, include one or more of the following. Note: any field trips will be done in conjunction with school regulations as to permissions and forms that need to be completed and filed; no field trips may be taken without instructor knowledge.

- 1) Time spent in a research library designing and sketching (to scale) air pollution protection equipment based upon an agreed upon industry with the instructor; the research must focus on

known hazards, regulatory citations the applicable industry has sustained, and, where possible, recognize highlighted technological enhancements.

- 2) Reading assignments
- 3) Writing assignments
- 4) Projects
- 5) Reports

Texts and References

- 1) Required (representative example): Tiwary, A., Williams, I., (2018). *Air Pollution: Measurement, Modelling and Mitigation*. (Fourth Edition). CRC Press. ISBN 9781498719452
- 2) Supplemental: None

Student Learning Outcomes

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

- 1) Describe the historical trend and development of air pollutants and be able to define the global impacts due to local, regional and global air pollution issues.
- 2) Identify and describe the characteristics of the most common air pollutants.
- 3) Recognize and define the general application of federal, state and local regulations related to air pollution.
- 4) Identify and compare components of air management programs and define terms commonly found in air regulations and permits.