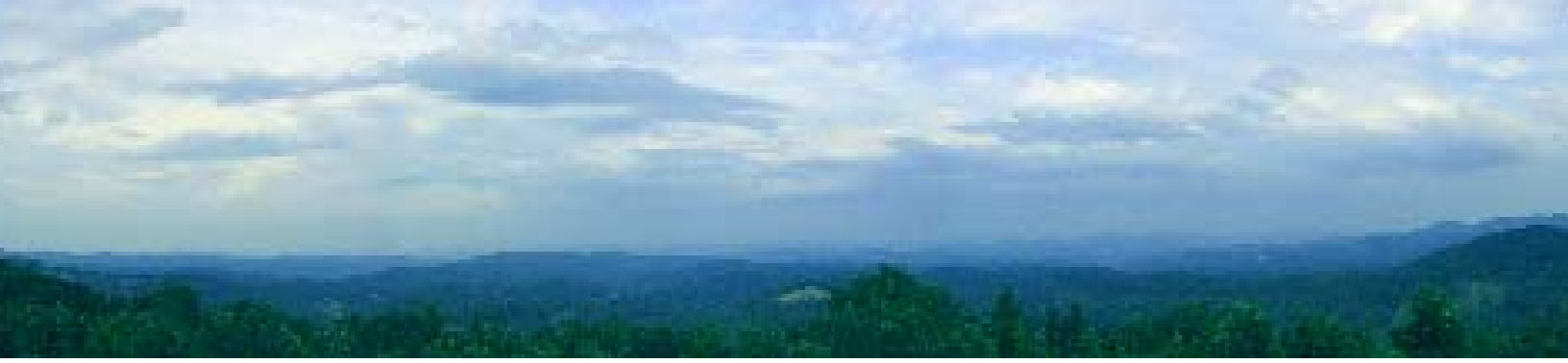


NATIONAL AIR QUALITY TRAINING PROJECT

CATALOG OF COURSES

AUGUST 2011

MARAMA Mid-Atlantic Regional Air Management Association, Inc.

TABLE OF CONTENTS

APTI CLASSROOM COURSES

APTI SELF-INSTRUCTIONAL COURSES

CARB CLASSROOM COURSES

AERMOD	American Meteorological Society and the U.S. Environmental Protection Agency Regulatory Model Improvement Committee (**AER**MIC) **Mod**el
APTI	Air Pollution Training Institute
ATCM	Airborne Toxic Control Measure
BARCT	Best Available Retrofit Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAM	Compliance Assurance Monitoring
CARB	California Air Resources Board
CEMS	Continuous Emission Monitoring
CEU	Continuing Education Unit
CGA	Cylinder Gas Audit
CMB	Chemical Mass Balance
CO	Carbon Monoxide
EI	Emissions Inventory
EKMA	Empirical Kinetic Modeling
EPA	U.S. Environmental Protection Agency
ESP	Electrostatic Precipitators
FRM	Federal Reference Method
HAP	Hazardous Air Pollutant
HMA	Hot Mix Asphalt
HRSG	Heat Recovery Steam Generator
ICE	Internal Combustion Engines
LAER	Lowest Achievable Emissions Rate
LDAR	Leak Detection and Repair
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standards
NAMS	National Air Monitoring Stations
NEI	National Emissions Inventory
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	Nitrogen Oxide
NSPS	New Source Performance Standards
NSR	New Source Review
O_3	Ozone
OSHA	Occupational Safety and Health Administration
PERC	Perchloroethylene
PM	Particulate Matter

PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance/Quality Control
RATA	Relative Accuracy Test Audit
SCR	Selective Catalytic Reduction
SCRAM BBS	**S**upport **C**enter for **R**egulatory **A**tmospheric **M**odeling **B**ulletin **B**oard **S**ystem
SI	Self-instructional
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SNCR	Selective noncatalytic reduction
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxide
STO	Source Test Observation
TEQ	Toxic Equivalency Quotient
UAQTP	Uniform Air Quality Training Program
UV	Ultraviolet
VHAP	Volatile Hazardous Air Pollutant
VOC	Volatile Organic Compound

MARAMA National Air Quality Training Guide

INTRODUCTION AND PURPOSE

The purpose of this guide is to identify training courses appropriate for the various fields of work commonly found in federal, state, and local agency air programs. Each air quality agency has their own policy and procedures regarding training, and this document is meant to complement their current practices. Some of the courses identified may not be applicable for a particular agency or person. Courses may not be offered every year. This guide categorizes topics and generally available training courses under the following expertise functions:

Functions Requiring Air Pollution Training

- Introduction to Air Pollution Control
- Ambient Monitoring, QA/QC, & Data Analysis
- Emissions Estimation & Inventory Development
- Modeling, Forecasting, & Data Analysis
- Planning/ Regulation Development
- Permit Writing
- Inspection & Enforcement
- Air Toxics / Hazardous Air Pollutants
- Data Mobile Sources
- Climate Change

In addition to the above 10 key functions performed by agency personnel, it has been determined that there are other tasks or expertise required that are performed by personnel in one or more of the above functions. As such, we have identified three extensions or additional areas of expertise that are needed by certain individuals in the functions listed above. Certain courses have been identified in this guide under these additional areas of expertise. These additional areas of expertise are listed below:

Additional Areas of Expertise

- Pollution Control Foundations
- Stationary Sources
- Source Sampling and Monitoring

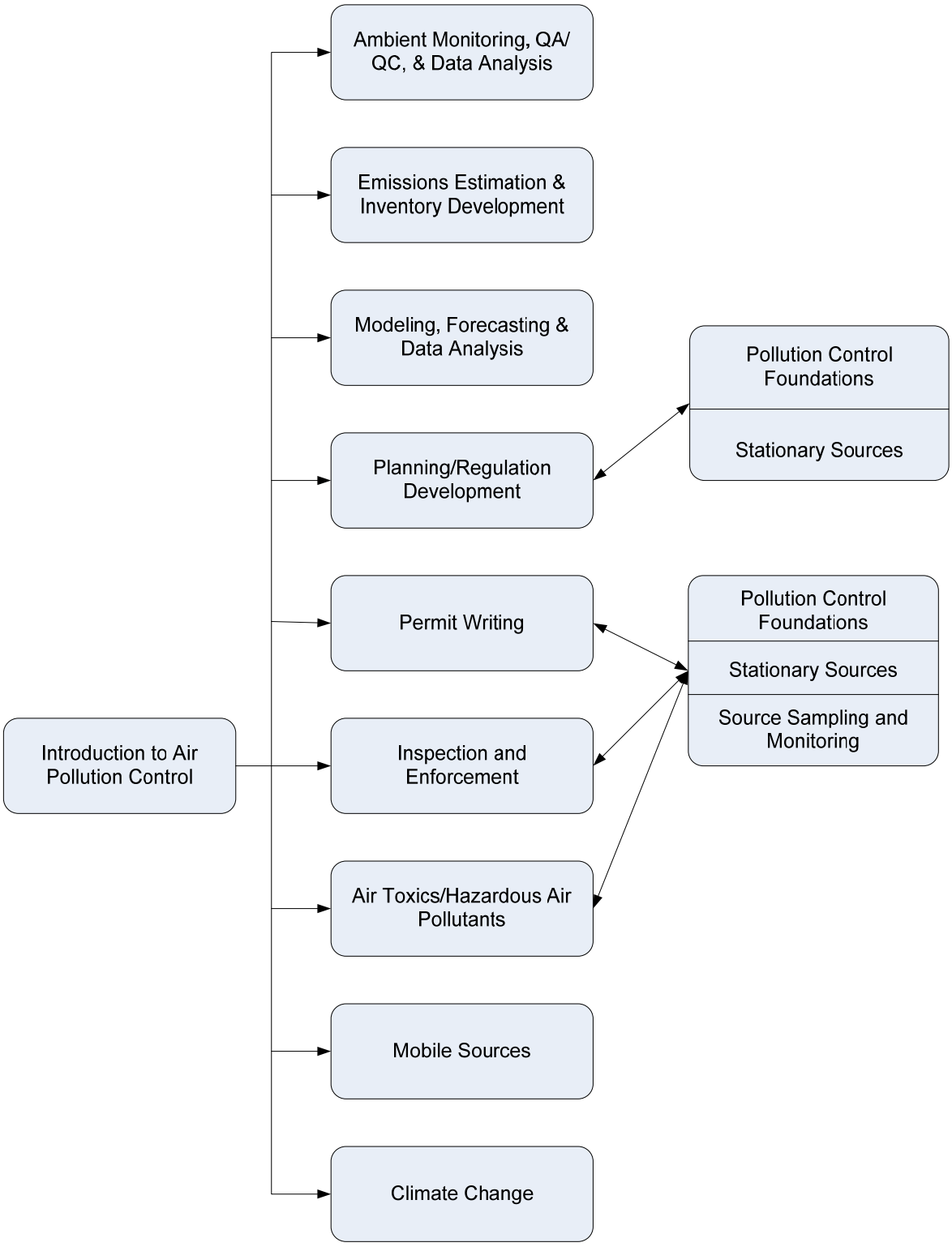
The following information is included in this guide:

- Definitions are included for the above functions and additional areas of expertise.
- A simple flow chart has been developed that reflects how the functions and additional areas of expertise are linked together.
- A tabular course listing has been developed that identifies courses that are included for each of the functions and additional areas of expertise.
- A list of frequently used acronyms or abbreviations has been developed as a reference tool for the user of this guide and is presented in the previous two pages.

Following the above information, the remainder of the document contains a full listing of course descriptions for all courses that have been included in this training document. Some courses are offered in classroom sessions and others are self-instructional (and/or internet based). The table of contents delineates the courses that are classroom sessions and those that are self-instructional.

Definitions

Introduction to Air Pollution Control	These courses are designed for regulatory personnel who are new or will be beginning their career in the air quality regulatory field.
Pollution Control Foundations	These courses present fundamental information on the formation and control of various air pollutants.
Ambient Monitoring, QA/QC, & Data Analysis	These courses are designed for individuals within a regulatory agency whose role is to provide sampling and laboratory analysis of ambient air samples. Course topics also include quality assurance/quality control and analysis of ambient air quality data.
Emissions Estimation & Inventory Development	These courses are designed for regulatory personnel who have or will have the responsibility to develop emissions inventories.
Modeling, Forcasting, & Data Analysis	These courses are designed for individuals who will be conducting or interpreting the results of air quality models.
Planning/ Regulation Development	These courses are designed for individuals who will be preparing State Implementation Plans or regulatory language.
Permit Writing	These courses are designed for personnel of state and local permitting agencies who must review and interpret permit applications and prepare permits. There are also relevant courses listed under stationary sources, for example, depending on the individual assignments.
Inspection & Enforcement	These courses are designed for inspectors who determine compliance with air pollution control requirements in permits, regulations, and orders. There are also relevant courses listed under stationary sources, for example, depending on the individual assignments.
Air Toxics / Hazardous Air Pollutants	These courses are designed for individuals who implement programs designed to reduce emissions of toxic or hazardous air pollutants. There are also relevant courses listed under stationary sources, for example, depending on the individual assignments.
Stationary Sources	These courses provide information for regulatory personnel in permits, compliance/enforcement, or planning programs.
Source Sampling and Monitoring	These courses are designed for regulatory personnel who have or will have the responsibility to evaluate source test methods, approve test protocols, and review source test results as required under various federal and state regulations. In addition, these courses are designed for regulatory personnel who have the responsibility to establish requirements in permits or regulatory language for continuous emissions monitoring or compliance assurance monitoring or to evaluate data provided in response to such requirements.
Mobile Sources	These courses are designed for individuals who implement programs designed to reduce emissions from mobile sources, both on-road and off-road.
Climate Change	These courses present information on greenhouse gas emissions estimation and control and fundamental scientific information about climate change.



Function Flowchart

Courses Offered for Major Air Management Functions		Page			
COURSES PRIMARILY FOR INTRODUCTION TO AIR POLLUTION CONTROL			**Level**	**Sub-set**	**Notes**
APTI SI-422	Air Pollution Control Orientation Course	54	1	Overview Option	Prerequesite for 380, 444, 445, 455, 400, 452, 482, SI-428A, SI-433
APTI SI-105	Introduction to Air Pollution Control	42	1	Overview Option	Much of the same content as APTI SI-105
APTI SI-100	Mathematics Review for Air Pollution Control	65	1	Technical Option	Recommended for RE100.1, 345, 413, 415, 418, 427, 454, 470, 474
APTI RE-100-1	Basic Concepts in Environmental Sciences - Module 1: Basic Concepts	33	1	Technical Option	Prerequisite for 450
APTI RE-100-2	Basic Concepts in Environmental Sciences - Module 2: Characteristics of Gases	34	1	Technical Option	Prerequisite for 450
APTI RE-100-3	Basic Concepts in Environmental Sciences - Module 3: Characteristics of Particles	35	1	Technical Option	Prerequisite for 450
APTI RE-100-4	Basic Concepts in Environmental Sciences - Module 4: Liquid Characteristics	36	1	Technical Option	Prerequisite for 450
APTI RE-100-6	Basic Concepts in Environmental Sciences - Module 6: Air Pollution and Control Techniques	39	1	Technical Option	Prerequisite for 450
APTI 452	Principles and Pracitices of Air Pollution	18	1	Intro Option	Recommended for 444, SI-433
CARB 101	Uniform Air Quality Training Program (UAQTP)	69	1	Intro Option	
COURSES PRIMARILY FOR POLLUTION CONTROL FOUNDATION					
APTI SI-437	Air Pollution Control Technology Series	60	1	Intro	
CARB 299	Theory & Application of Air Pollution Control Devices	96	1		Prerequisite for CARB 220
APTI 415	Control of Gaseous Emissions (1999)	7	2	Gas	
APTI 418	Control of Nitrogen Oxide Emissions (1999)	8	2	Gas	
APTI 455	Inspection of Gas Control Devices and Selected Industries (2003)	20	2	Gas	
APTI 482	Sources and Control of Volatile Organic Air Pollutants	26	2	Gas	
APTI SI-417	Controling VOC Emissions from Leaking Process Equipment	52	2	Gas	
CARB 284	Volatile Organic Compound Control Devices	91	2	Gas	
APTI SI-412C	Wet Scrubber Plan Review	51	3	Gas	
APTI 413	Control of Particulate Emissions	6	2	PM	
APTI 445	Inspection of Particle Control Devices (2003)	15	2	PM	
APTI SI-412A	Fabric Filter Operation Review	49	2	PM	
CARB 281	Electrostatic Precipitators	89	3	PM	
CARB 282	Baghouses	90	3	PM	
COURSES PRIMARILY FOR AMBIENT MONITORING, INCLUDING QA/QC AND DATA ANALYSIS					
APTI SI-434	Introduction to Ambient Air Monitoring	58	1	Intro	Prerequisite for 424, SI-433
CARB 222	Principles of Ambient Air Monitoring	72	1	Intro	
APTI SI-473A	Beginning Environmental Statistical Techniques	65	1		Prerequisite for 424, 470, 903
APTI OS-411A	Series 411 - Computational Atmospheric Sciences for Air Quality Modeling	28	1		Prerequisite for other OS 411 courses
APTI OS-411B	Series 411 - Computational Atmospheric Sciences: Essential Atmospheric Sciences	29	2		Prerequisite for OS 411C
APTI OS-411C	Series 411 - Computational Atmospheric Sciences: Meteorology for Air Quality Monitoring	30	3	Intro	

APTI 435	Atmospheric Sampling (1983) (PM 2.5 Monitoring Update - 1998)	13	2		Prerequisite for 424, 464, SI-433
APTI SI-471	General Quality Assurance Consideration for Ambient Air Monitoring	64	2		Prerequisite for 470
APTI SI-474	Introduction to Environmental Statistics	66	2		
APTI 464	Analytical Methods for Air Quality Standards	22	3	Methods	
APTI 470	Quality Assurance for Air Pollution Measurement Systems	24	3	QA	
APTI SI-433	Network Design and Site Selection for Monitoring PM 2.5 and PM 10 in Ambient Air	57	3		
APTI SI-436	Site Selection for Monitoring PM 2.5 and PM 10 in Ambient Air	59	3		
COURSES PRIMARILY FOR MODELING, FORCASTING, AND DATA ANALYSIS					
APTI OS-411A	Series 411 - Computational Atmospheric Sciences for Air Quality Modeling	28	1		Prerequisite for other OS 411 courses
APTI OS-411B	Series 411 - Computational Atmospheric Sciences: Essential Atmospheric Sciences	29	2		Prerequisite for OS 411C
APTI OS-411C	Series 411 - Computational Atmospheric Sciences: Meteorology for Air Quality Monitoring	30	3		Prerequisite for OS 411D
APTI OS-411D	Series 411 - Computational Atmospheric Sciences: Tropospheric Chemistry for Air Quality Modeling	31	3		Prerequisite for OS 411E
APTI OS-411E	Series 411 - Computational Atmospheric Sciences: Computational Science	32	3		Prerequisite for OS 411F
APTI OS-411F	Series 411 - Computational Atmospheric Sciences: Atmospheric Science Models	33	3		
APTI SI-409	Basic Air Pollution Meteorology	47	1		Prerequisite for 423
APTI SI-410	Introduction to Dispersion Modeling	48	1		Prerequiste for 423, 424
APTI 423	Air Pollution Dispersion Models - Applications	10	2		
APTI 424	Introduction to Receptor Modeling	11	2		
COURSES PRIMARILY FOR EMISSION INVENTORIES					
APTI SI-419A	Introduction to Emission Inventories	53	1		Prerequisite for 419B
APTI 419B	Preparaation of Fine Particulate Emission Inventories	9	2		
COURSES PRIMARILY FOR PLANNING & REGULATION DEVELOPMENT					
APTI RE-100-7	Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements	40	1	Clean Air Act	Prerequisite for 450
COURSES PRIMARILY FOR PERMIT WRITING					
APTI RE-100-7	Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements	40	1	Clean Air Act	Prerequisite for 450
APTI SI-460	Introduction to Permitting	63	1		Prerequisite for 461
CARB 333	Permit Practices and Procedures I	97	1		
APTI 427	Combustion Evaluation (1980)	12	2		
APTI 454	Effective Permit Writing	19	2		Prerequisite for 461
APTI SI-412B	Electorstatic Precipitator Plan Review	50	2		
CARB 334	Permit Writing II	98	2		
APTI 345	Emission Capture and Gas Handling System Inspection (1995)	1	3		
APTI 461	Intermediate Permitting	21	3		
COURSES PRIMARILY FOR INSPECTION AND ENFORCEMENT					
APTI RE-100-7	Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements	40	1	Clean Air Act	Prerequisite for 450
APTI RE-100-5	Basic Concepts in Environmental Sciences - Model 5: Flowcharts and Ventilation Systems	38	1		Prerequisite for 450
CARB 335	Principles of Environmental Compliance & Enforcement	99	1		
CARB 350	Basic Inspector Training	101	1		
APTI SI-303	Chain of Custody	44	1		
APTI SI-445	Introduction to Baseline Source Inspection Techniques	61	2		Prerequisite for 345, 446
APTI SI-446	Air Pollution Source Inspection	62	2		Prerequisite for 446
APTI 446	Inspection Procedures and Safety	16	2		
APTI 345	Emission Capture and Gas Handling System Inspection (1995)	1	2		

APTI 444	Air Pollution Field Enforcement (1990)	14	2		
APTI 427	Combustion Evaluation (1980)	12	2		
CARB 345	Enforcement Case Development & Resolution	100	2		
CARB 355	Advanced Inspector Training	102	3		
COURSES PRIMARILY FOR AIR TOXICS/HAZARDOUS AIR POLLUTANTS					
APTI SI-300	Introduction to Air Pollution Technology	43	1		
APTI 400	Introduction to Hazardous Air Pollutants (2009)	5	2		
CARB 290	MACT General Background Information	95	1		
APTI SI-400	Introduction to Risk Assessment/Risk Management	45	1		
APTI SI-401	Risk-Based Air Toxics	46	2		
APTI 350	Asbestos NESHAP Inspection and Safety Procedures (2011)	2	2		
CARB 251	Asbestos Demolition and Renovation - Regulator Training	82	3		
COURSES PRIMARILY FOR SOURCE SAMPLING AND MONITORING					
APTI 450	Source Sampling for Pollutants (1995)	17	2		Prerequesite for 468 Also requires prerequisites
APTI 468	Monitoring Compliance Test and Source Test Observation	23	2		
CARB 224	Observing Source Tests	73	3		
APTI SI-476B	Continuous Emission Monitoring Systems - Operation and Maintenance of Gas Monitors	67	2		Prerequesite for 474
APTI 474	Continuous Emission Monitoring (1992)	25	3		
CARB 221	Continuous Emission Monitoring	71	3		
CARB 220	Compliance Assurance Monitoring (CAM)	70	2		
CARB 262	Fugitive VOC Emissions Inspections	84	2		
APTI 380	Fugitive Source Inspection	3	2		
COURSES PRIMARILY FOR STATIONARY SOURCE CONTROL					
APTI SI-428A	Introduction to Boiler Operations	55	2		
APTI SI-431	Air Pollution Control Systems for Selected Industries	56	2		Prerequisite for SI-428A
CARB 271	Stationary Reciprocating Engines	86	2		
CARB 272	Stationary Gas Turbines	87	2		
CARB 230	Surface Coating: Metal Parts & Products	70	3		Prerequisite for all courses in the 230 series-- CARB 230.4, CARB 233
CARB 230.4	Graphic Arts	75	3		
CARB 233	Solvent Cleaning: Degreasing Operations	76	3		
CARB 242	Hot Mix Asphalt Facilities	77	3		
CARB 243	Aggregate Plants	78	3		
CARB 244	Concrete Batch Plants	79	3		
CARB 245	Cement Plants	80	3		
CARB 246	Aggregate, Asphalt, & Concrete Batching Operations	96	3		
CARB 261	Polyester Resin and Fiberglass	83	3		
CARB 270	Incinerators	85	3		
CARB 273	Industrial Boilers	88	3		
CARB 285	Landfill Gas Control Facilities	92	3		
CARB 287	Dry Cleaning	93	3		
CARB 288	Petroleum Refining	94	3		

APTI CLASSROOM COURSES

APTI 345 EMISSION CAPTURE AND GAS HANDLING SYSTEM INSPECTION (1995)

CLASS LENGTH: 3-day lecture course **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This introductory course is designed for entry-level personnel at state and local permitting agencies who must review and interpret data in permit applications. The class is intended primarily for air quality staff who are responsible for permitting and compliance activity. The course is also structured for those individuals who must inspect industrial emission sources.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with emission capture and collection systems. Attendees will develop an ability to evaluate the following elements of a capture and control system:

- General ventilation
- Capture systems
- Inspection and performance evaluation
- Measurement methods
- Hood systems
- Fan systems

COURSE DESCRIPTION:

This course provides students with an understanding of the basic components of industrial emission capture and collection systems as well as insight into system design and performance. Case studies and demonstrations of various ventilation systems assist students in developing trouble shooting skills.

PREREQUISITES:

Successful completion of APTI courses SI:100 – Basic Concepts in Environmental Sciences (7 modules), SI:432 – x, SI:445 – Introduction to Baseline Source Inspection Techniques, or equivalent courses/experience.

LAST UPDATED: 1995

APTI 350 ASBESTOS NESHAP INSPECTION AND SAFETY PROCEDURES (2005)

CLASS LENGTH: 4 days **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This introductory course is designed for individuals who have a basic understanding of the compliance assessment requirements for any asbestos regulations within its state, region or territory. This class is intended for air quality professionals whose role is to inspect facilities which contain asbestos related materials and determine regulatory compliance status with any state or federal asbestos regulations.

LEARNING OBJECTIVES:

Those completing this course will gain an understanding of how to conduct an asbestos compliance assessment. Attendees will be able to assess the following factors related to asbestos control programs:

- Health effects of exposure to asbestos
- Identifying asbestos containing material
- Asbestos Inspector Safety Guidance
- Respiratory Protection
- Protective clothing
- Asbestos NESHAP regulation
- PRE: inspection planning
- Facility and landfill inspections
- Asbestos air sampling and analysis

COURSE DESCRIPTION:

This introductory course covers the basics of asbestos regulation, health effects, and identification of asbestos containing materials, OSHA Asbestos Standards, EPA Worker Protection Rule, STEM Guidelines, abatement techniques, respiratory protection requirements, protective clothing, and an in-depth review of the Asbestos NESHAP Regulation.

PREREQUISITES:

LAST UPDATED: 2005

APTI 380 FUGITIVE SOURCE INSPECTION

CLASS LENGTH: 3-day lecture and laboratory course **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is specifically designed for field inspectors who have the responsibility to evaluate compliance with EPA regulations involving LDAR programs. This class is intended for new compliance engineers and scientists who are responsible for LDAR regulatory compliance activities.

LEARNING OBJECTIVES:

The participant will learn how to establish an agency fugitive leak inspection program, defining organization structure and responsibilities, equipment needs, selection, storage, calibration and maintenance, and standardized inspection techniques using audit checklists. In addition to the learning sessions, the course will offer structured panel discussions, field video tape presentations, and laboratory demonstrations of auditing instrumentation. All participants will receive a Course Manual, valuable handouts, and standardized auditing procedures that can be used in the field for reference when planning and administering an agency source inspection. The following topics will be covered:

- Regulations Associated with Fugitive Source Emissions
- Chemical and Physical Properties of Fugitive Emissions
- Applicable Source Categories of Fugitive Emissions
- Defining Leaks
- Federal Reference Method (FRM) 21
- Survey of Portable Instrumentation
- Agency Fugitive Leak Inspection Program
- Performing an Agency Inspection for Fugitive Leaks
- Future Tools For Determining Leak Detection
    - Smart LDAR
    - CellNet Data Systems and Adsistor Ring Sensor

COURSE DESCRIPTION:

As documented under various EPA regulations (NESHAP, NSPS), fugitive emissions of hazardous air pollutants (HAPs) from affected facility equipment must be monitored on a routine basis as part of a facility's leak detection and repair program (LDAR). In particular, these regulations specify Federal Reference Method (FRM) 21 as a procedure for identifying fugitive leaks of volatile hazardous air pollutant (VHAP) from valves, pumps, compressors, relief valves, connectors, flanges and various other pieces of equipment within a process. Equipment leak standards as identified in the regulations are designed to reduce volatile organic compound (VOC) and VHAP emissions from various components within the process.

These regulations have placed the responsibility of fugitive emission reduction of VOCs and VHAPs on the source through their LDAR program. With these programs comes the responsibility of agency personnel and inspectors to verify, inspect, and document the effectiveness of the source-specific LDAR program to minimize emissions. Verification of a source LDAR program meeting compliance requirements may be accomplished through a level approach. Level I involves agency records review. Level II involves on site inspection of the LDAR program, observation of source personnel performing leak detection using portable VOC analyzers meeting FRM 21 requirements, and evaluation of the data acquisition system. Finally, Level III involves agency personnel performing leak detection using portable VOC analyzers meeting FRM 21 requirements.

This course is specifically designed for field inspectors who have the responsibility to evaluate compliance with EPA regulations involving source LDAR programs designed to minimize fugitive VOC and VHAP emissions from specific process equipment. The course briefly reviews applicable regulations and sources affected by those regulations, the type of flanges and valves and other process equipment covered by the regulations, and how EPA defines leaks. Specific to this course offering, a thorough review of FRM 21 will be presented, along with review of field portable instrumentation. Presentations and demonstrations will involve the operation, check-out, calibration, and maintenance of field portable VOC analyzers through approved checklists. In particular, field demonstrations associated with proper orientation and use of portable analyzers in evaluating fugitive emissions from plant process equipment as part of an agency fugitive leak inspection program will be documented.

PREREQUISITES:

Successful completion of APTI course SI:422 – Air Pollution Control Orientation Course, or equivalent courses/experience.

LAST UPDATED:

APTI 400 INTRODUCTION TO HAZARDOUS AIR POLLUTANTS (2009)

CLASS LENGTH: 2-day lecture course **CEUs:** 1.5 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This introductory course is specifically designed for regulatory personnel who have the responsibility to evaluate and determine emissions and compliance status for Hazardous Air Pollutant (HAP) emission sources. This class is intended for engineers, scientists and technicians who are responsible for evaluation of HAP emission sources.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with HAP emission sources that may be regulated under Title I, Part A, of the Clean Air Act. Attendees will be able to conduct reviews of HAP sources to determine applicable regulatory requirements.

COURSE DESCRIPTION:

This course is designed to provide students with the necessary background to understand the provisions and programs regarding Hazardous Air Pollutants (HAPs) as outlined in Title III of the Clean Air Act Amendments of 1990. Students taking the course should be presently involved with (or should anticipate becoming involved with) HAPs, sources, effects, and control. Because the course is multi-disciplinary, people from diverse academic backgrounds should be able to understand and use the information presented. The following topics will be covered:

- History of air pollution control and regulation
- MACT standards
- Overview of Title III Clean Air Act Amendments 1990
- Other regulatory programs
- HAPs
- Risk Assessment and Management

PREREQUISITES:

Successful completion of APTI course SI:422 – Air Pollution Control Orientation Course, or equivalent courses/experience.

LAST UPDATED: 2009

APTI 413 CONTROL OF PARTICULATE EMISSIONS

CLASS LENGTH: 4-day lecture course **CEUs:** 3 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is a basic course that is designed for individuals within a regulatory agency whose role is to evaluate particulate emission sources for permitting and to determine the ongoing compliance status of such emission sources. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting and compliance activities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the different types and the operating characteristics of control devices that are available for specific particulate emission sources. Attendees will be able to perform regulatory reviews involving the following elements of particulate emissions and control:

- Particle formation and behavior
- Particle size distributions
- Reverse air and pulse jet fabric filters
- Electrostatic precipitators
- Particulate wet scrubbers
- Hoods and fans effect on control equipment and process emissions
- Emission testing and monitoring

COURSE DESCRIPTION:

Students successfully completing this course will understand the operating principles of particulate control systems used at air pollution control sources. The scope of the course includes fabric filters, electrostatic precipitators, particulate wet scrubbers, and mechanical collectors. Introductory material concerning particle aerodynamic behavior and particle formation is provided as a basis for course materials on particulate control systems. This course provides a foundation for later courses concerning source sampling, inspection, and permit review. A scientific calculator is required for class exercises.

PREREQUISITES:

Engineering/scientific degree or successful completion of Course RE:100 – Basic Concepts in Environmental Sciences (7 modules), and six months of equivalent course/work experience.

LAST UPDATED: 1999

APTI 415 CONTROL OF GASEOUS EMISSIONS (1999)

CLASS LENGTH: 4-day lecture course **CEUs:** 3 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is a basic course that is designed for individuals within a regulatory agency whose role is to evaluate gaseous emission sources for permitting and to determine the ongoing compliance status of such emission sources. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting and compliance activities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the different types and the operating characteristics of control devices that are available for specific gaseous emission sources. Attendees will be able to perform regulatory reviews involving the following elements of gaseous emissions and control:

- Basic concepts of gas behavior
- Sources of gaseous contaminants
- Emission testing and monitoring
- Carbon bed adsorbers
- Thermal incinerators (or oxidizers)
- Catalytic incinerators
- Absorbers
- Condensers
- Hood and fans effect on control systems

COURSE DESCRIPTION:

Students successfully completing this course will understand the operating principles of gaseous control systems used at air pollution control sources. Introductory material concerning gas stream characteristics, and sources of gaseous contaminants is provided as a basis for this course. This course introduces control of nitrogen oxides and sulfur oxides. This course provides a foundation for later courses concerning source sampling, inspection, and permit review. A scientific calculator is required for class exercises.

PREREQUISITES:

Engineering/scientific degree or successful completion of course RE:100 – Basic Concepts in Environmental Sciences (7 modules), and six months of equivalent course/work experience.

LAST UPDATED: 1999

APTI 418 CONTROL OF NITROGEN OXIDE EMISSIONS (1999)

CLASS LENGTH: 3-day lecture course **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course was designed to address the needs of tribal, state, and local air toxics personnel involved in the permitting and compliance assessment of existing regulatory requirements as well as those personnel involved in the development of NO_x control programs. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

Those completing this course will gain an understanding of the mechanisms by which nitrogen oxide (NO_x)is formed in the combustion process as well as sources of NO_x emissions and the history related to regulating NO_x emissions from these sources. Attendees will be able to perform regulatory reviews involving the types, applicability, capability, and limitations of available control techniques to suppress the formation of NO_x emissions or to minimize NO_x emissions.

COURSE DESCRIPTION:

This course presents fundamental information on NO_x emissions from combustion sources such as industrial and utility boilers. The goal of this course is to present information that will help environmental professionals address present and future NO_x control issues. The course introduces a broad range of control technology topics and identifies some of the sources for obtaining further information on these topics. In addition, the manual that accompanies the course contains a bibliography of technical articles and publications on all control technologies addressed in this manual. This manual also lists web sites that are useful in obtaining additional information related to the control of NO_x emissions from combustion sources.

PREREQUISITES:

Engineering/scientific degree or successful completion of Course RE:100 – Basic Concepts in Environmental Sciences (7 modules), and six months of equivalent course/work experience.

LAST UPDATED: 1999

APTI 419B PREPARATION OF FINE PARTICULATE EMISSION INVENTORIES

CLASS LENGTH: **CEUs:**

CLASS FORMAT: While this course has been designed for the classroom and is designated as a classroom course on this web site, this course is not currently scheduled to be offered by APTI training providers. The course materials are provided here for use by state, local and tribal governments who may wish to conduct such training. This course assumes that participants have a working knowledge of emission inventory terminology and techniques; thus it does not cover material on basic inventory development.

WHO SHOULD ATTEND:

This introductory course is specifically designed for regulatory personnel who have the responsibility to develop PM fine ($PM_{2.5}$) Emission Inventories. This class is intended for engineers, scientists and technicians who have responsibility for developing inventories or reviewing and approving inventories that are developed and submitted for industrial operations.

LEARNING OBJECTIVES:

Those completing this course will develop an understanding of the principal stationary nonpoint and nonroad mobile source categories emitting PM fine particles. Attendees will be able to recognize how emissions are estimated for EPA's National Emission Inventory (NEI), and how state/local/tribal agencies can improve upon those estimates. Students will also be able to identify locations of on-line resources to facilitate improvements to PM fine inventories.

COURSE DESCRIPTION:

One topic currently experiencing a high demand for training is preparation of fine particulate matter (PM) emission inventories. Many government agencies (federal, state, local, tribal) and private organizations conduct training in the preparation of emission inventories. This training can cover a number of topics, including the calculation and compilation of point, stationary nonpoint, and mobile source emission estimates and data quality checking. Case studies are used to provide real-world examples of how state or local agencies can collect data to prepare inventories that are an improvement to the NEI methods.

The purpose of these training materials is to provide government and nongovernment agencies with an organized set of presentation slides and manuals to support such training in a classroom style setting.

PREREQUISITES:

Successful completion of APTI course SI 419A – Introduction to Emission Inventories, or equivalent courses/experience.

LAST UPDATED: 2009

APTI 423 AIR POLLUTION DISPERSION MODELS - APPLICATIONS

CLASS LENGTH: 3-day lecture course **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is designed for individuals who have a basic understanding of atmospheric physics and the structure of air dispersion models. This class is intended for air quality professionals involved with analyzing dispersion modeling data and determining the results with regards to the requirements in permit applications and/or requirements associated with SIP and State Only compliance analyses or future Air Quality Planning.

LEARNING OBJECTIVES:

Students successfully completing this course will be able to select dispersion models appropriate to particular problems in air quality impact analysis, apply recommended models, and judge the validity of the models' output. Those completing this course will have an understanding of the following dispersion modeling topics:

- Dispersion parameters
- Plume rise
- Meteorological data
- Executing specific models for selected scenarios
- Selecting the appropriate air quality model
- Special meteorological situations and model options
- Modeling complex terrain situations
- Modeling hazardous/toxic pollutants
- Forum on air quality modeling issues
- EPA's &Guideline on Air Quality Models & and SCRAM BBS

COURSE DESCRIPTION:

Students will become familiar with selected theories of dispersion as employed in current regulatory modeling practice; and become familiar with EPA's preferred technical options. Students will be able to apply a number of models for point, area, and line sources. They will have use of personal computers and modem connections to EPA's Support Center for Regulatory Models (SCRAM) Bulletin Board System (BBS), to complete examples, exercises, and assignments.

PREREQUISITES:

Successful completion of APTI courses SI:409 – Basic Air Pollution Meteorology and SI:410 – Introduction to Dispersion Modeling, or equivalent courses/experience. Ability to use a personal computer for scientific applications.

LAST UPDATED: 1995

APTI 424 INTRODUCTION TO RECEPTOR MODELING

CLASS LENGTH: 4-day lecture course **CEUs:** 3 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This intermediate course is designed for individuals within a regulatory agency whose role is to provide air quality planning analyses for an urban air shed to help plan the air quality resources for a region. This class is intended for planning engineers, scientists and meteorologists who are experienced with air dispersion modeling and are responsible for state air planning activities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the different types of modeling applications that can be used for state air shed planning purposes. Attendees will be able to apply the following air quality modeling concepts in permitting analyses:

- Mathematics and assumptions of receptor modeling
- Analytical methods for ambient and source measurements
- Application of the EPA receptor modeling software
- New applications (air toxics and volatile organic gases)
- Development of receptor models
- Source composition
- Microscopy and receptor modeling
- Regulatory case studies

COURSE DESCRIPTION:

Receptor models are a group of measurement-based air quality models for identifying the concentration of specific source categories at air measurement (receptor) sites. Students successfully completing this course will learn the major components and criteria for a successful Chemical Mass Balance (CMB) study, methods for ambient sampling and analysis, the requirements for source profiles, and principles of receptor modeling evaluation and validation. Students will be able to apply EPA's CMB software program to appropriate particle and gas monitoring databases. CMB model applications for particulate matter and volatile organic compounds (VOCs) will be reviewed. While this course focuses on CMB receptor modeling, the student will learn the fundamentals of other source apportionment techniques, including optical and scanning electron microscopy, radiocarbon analysis and multiple linear regression. Homework assignments will require students to apply CMB model software (provided) to test data sets using their PCs.

PREREQUISITES:

Engineering/scientific degree, skill in using a PC for scientific applications, and 6 months of equivalent work experience in emission inventories, atmospheric dispersion modeling, or completion of course SI: 410 – Introduction to Dispersion Modeling, and analytical methods for particles and analytical methods for particles and gas samples, or completion of course 43 – Atmospheric Sampling (1983) (PM 2.5 Monitoring Update – 1998) or SI:434 – Introduction to Ambient Air Monitoring. Students will also find it helpful to have completed a course in statistics, (e.g., SI:473A – Beginning Environmental Statistical Techniques).

LAST UPDATED: 1998

APTI 427 COMBUSTION EVALUATION (1980)

CLASS LENGTH: 4½-day lecture course **CEUs:** 3.5 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is a basic course that is designed for individuals within a regulatory agency whose role is to evaluate combustion sources for permitting and to determine the ongoing compliance status of such emission sources. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting and compliance activities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the different types of combustion sources and the operating characteristics of each source. Attendees will be able to apply the following combustion elements in a regulatory evaluation:

- Combustion sources burning liquid and solid wastes
- Combustion sources burning fossil fuel
- Combustion engines (diesel engines, gas turbines, etc.)
- Combustion principles
- Design and operational parameters
- Selected fundamental calculations
- Pollution control devices

COURSE DESCRIPTION:

Students successfully completing this course should have the knowledge to work on combustion-related pollution problems such as estimating the actual and potential air pollution emissions from combustion sources; reviewing applications for permits to construct combustion facilities; and developing recommendations to improve the performance of malfunctioning combustion equipment.

PREREQUISITES:

Engineering/scientific degree or successful completion of course SI:100 – Mathematics Review for Air Pollution Control, or six months of equivalent course/work experience.

LAST UPDATED: 1980

APTI 435 ATMOSPHERIC SAMPLING (1983) (PM 2.5 MONITORING UPDATE-1998)

CLASS LENGTH: 5-day laboratory course **CEUs:** 4 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is an introductory course that is designed for individuals within a regulatory agency whose role is to provide sampling and laboratory analysis of ambient air samples. This class is intended for recent college hires and technicians who are responsible for the sampling and analysis of ambient air.

LEARNING OBJECTIVES:

Students successfully completing this course will understand how to select sampling methods and the instruments appropriate to various sampling needs. Those completing this course will have a basic understanding of the requirements for ambient air sampling and laboratory analysis that is required for the sampling. The individual will participate in the classroom and laboratory sessions and will gain an understanding of the following sampling-related tasks:

Lecture

- Generation of test atmospheres of gaseous pollutants
- Effects of variables on atmospheric sampling
- Selection of sampling train components
- Air quality surveillance networks and their siting
- Concepts and procedures for ensuring quality in atmospheric sampling

Particulate Laboratory

- High volume sampler and orifice calibration.
- Performance audit of reference flow device.
- Use of constant flow controllers.

Flow Laboratory

- Calibration of flow devices including wet test meters, limiting orifices, rotameters, and mass flow meters.
- Preparation of dynamic calibration gas via a dilution system.

Controlled Test Atmosphere Laboratory

- Preparation of dynamic calibration gas via a permeation system coupled with a dilution system calibration of continuous monitors using these calibration gases.

Calibration of a $PM_{2.5}$ Sampler

- Internal and external leak checks, calibrate temperature sensor, pressure sensor, and flow rate system

COURSE DESCRIPTION:

The students will be able to calibrate and operate laboratory air sampling devices. They will learn about factors affecting sample collection efficiency. Topics discussed in lectures and investigated in the laboratories include methods of calibration, use of flow rate measuring instruments, general techniques for sampling the atmosphere, and reference methods for sampling and analyzing criteria pollutants. A scientific calculator is required for class exercises.

PREREQUISITES:

Use of mathematics at the level of first year college algebra, or equivalent courses/experience.

LAST UPDATED: 1998

APTI 444 AIR POLLUTION FIELD ENFORCEMENT (1990)

CLASS LENGTH: 3½-day lecture course **CEUs:** 2.5 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is designed for individuals who have a basic understanding of state compliance assessment requirements for air emission sources. This class is intended for air quality professionals whose role is to determine permitting and regulatory compliance status and those involved with regulatory enforcement actions.

LEARNING OBJECTIVES:

Those completing this course will have an understanding of the compliance assessment practices that are employed for evaluating air emission sources. The individual will gain an understanding of the following inspector tasks:

- Violation documentation and evidence gathering
- Role of the field inspector
- Enforcement process
- Complaints handling and odor investigations
- Inspection of air pollution sources

COURSE DESCRIPTION:

This course provides an overview of regulatory compliance assessment and enforcement tools that may be employed by the air quality agency. Proper procedures are covered for investigating an air pollution complaint, conducting an inspection, gathering evidence of an emission violation, and presenting that evidence effectively in formal hearings or court sessions. Case studies are provided to illustrate the concepts discussed.

PREREQUISITES:

Satisfactory completion of SI:422 – Air Pollution Control Orientation Course, or six months of equivalent work experience. Recommended courses include APTI 452 – Principles & Practices of Air Pollution.

LAST UPDATED: 1990

APTI 445 INSPECTION OF PARTICLE CONTROL DEVICES (2003)
(FORMERLY BASELINE SOURCE INSPECTION TECHNIQUES)

CLASS LENGTH: 3-day lecture course **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This introductory course is specifically designed for field inspectors who have the initial responsibility to determine the compliance status for particulate emission sources with control devices. This class is intended for compliance engineers, scientists and technicians who are responsible for inspection of control devices at particulate emission sources.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with inspecting particulate control systems. Attendees will be able to evaluate the following equipment in a regulatory inspection:

- Baseline inspection techniques
- Cyclones
- Fabric filters
- Wet scrubbers
- Electrostatic precipitators
- Measurement of inspection parameters
- Flowchart preparation

COURSE DESCRIPTION:

This course presents fundamental procedures for particle control device inspection, problem diagnosis and compliance evaluation. Site-specific information is used to identify shifts in operating variables that indicate a potential for increased emissions. The baseline inspection approach is presented, and operating principles and inspection techniques for particle control devices (cyclones, fabric filters, wet scrubbers and electrostatic precipitators) are discussed. The use of portable instruments for gathering inspection data is also presented, and the preparation and use of flowcharts to organize and evaluate inspection data is discussed. Written and video case studies are used to reinforce the material.

PREREQUISITES:

Engineering/scientific degree or successful completion of SI:422 -- Air Pollution Control Orientation Course, or equivalent courses/work experience.

LAST UPDATED: 2003

APTI 446 INSPECTION PROCEDURES & SAFETY

CLASS LENGTH: 2-day lecture course **CEUs:** 1.5 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This basic course is focused specifically on safety procedures for inspecting and evaluating air pollution control systems. This class is intended for compliance engineers, scientists and technicians (or field inspectors) who are responsible for inspection of industrial emission sources.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with expected safety procedures that should be followed when evaluating air pollution control systems. Attendees will be able to identify critical safety parameters associated with the following potential hazards encountered in an inspection:

- Inhalation hazards
- Burn hazards
- Electrical shock hazards
- Explosion and fire hazards
- Proper ladder climbing techniques
- Hazards involved in walking on elevated surfaces
- Ground level walking hazards
- Eye hazards
- Heat and cold stress
- Confined space entry
- Use of portable inspection instruments
- Elements of a good safety program

COURSE DESCRIPTION:

This course presents safety procedures for inspecting and evaluating air pollution control systems. Practical techniques are described to aid plant operations personnel and regulatory agency inspectors in minimizing health and safety hazards. Emphasis is placed on the early recognition and avoidance of problems. Unique combinations of hazards found around air pollution control systems are presented. The use of personal protection equipment is discussed. This course is intended to supplement general industrial hygiene and safety procedures which should be followed by all personnel engaged in field work.

PREREQUISITES:

Completion of Courses SI:445 – Introduction to Baseline Source Inspection Techniques, and SI:446 – Air Pollution Source Inspection, or comparable courses/work experience with air pollution control equipment.

LAST UPDATED: 1994

APTI 450 SOURCE SAMPLING FOR POLLUTANTS (1995)

CLASS LENGTH: 5-day lecture course **CEUs:** 4 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This introductory course is designed for individuals within a regulatory agency whose role is to observe source testing, evaluate source test methods, approve test protocols and review source test results as required under various federal and state regulations or as required by issued permits. This class is intended for compliance and field engineers, scientists and technicians who have responsibility for the above source testing tasks.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with source testing and source test methods. Attemdees will be able to apply the following measurement concepts in a regulatory sampling event:

- Process tasks and basis for task requirements in EPA Reference Methods
- Source testing procedures for gaseous and particulate pollutants
- Source sampling equipment (function and calibration)
- Basic concepts of gases
- Calculations in source sampling
- Orsat analysis
- Quality assurance and safety in source sampling

COURSE DESCRIPTION:

This course develops the ability to plan, guide, evaluate, and (after experience on the job) perform source sampling measurements to determine rates of emissions from stationary sources. It clarifies EPA Reference Methods 1 to 4, and Method 5. The course develops knowledge of the equipment employed, understanding of why the prescribed methods are established, and ability to perform the calibrations and calculations which are a part of the reference methods. Instruction relies on laboratory exercises in which students work with stack sampling equipment. Students perform components of the various methods and extract a sample from an actual or simulated stack. They make the necessary calculations to follow a sampling procedure and to report test results. A scientific calculator is necessary for class and homework exercises.

PREREQUISITES:

Engineering/scientific degree or successful completion of Course RE:100 – Basic Concepts in Environmental Sciences (7 modules), or six months of equivalent courses/work experience.

LAST UPDATED: 1995

APTI 452 PRINCIPLES & PRACTICES OF AIR POLLUTION

CLASS LENGTH: 3½- day lecture course **CEUs:** 2.5 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This entry level course is specifically designed for regulatory personnel who are new to the air quality regulatory field. This class is intended for engineers, scientists and technicians who are new personnel in regulatory agencies and will have responsibility for permit reviewe and/or regulatory compliance.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with the management of ambient air quality resources under the Clean air Act and state and local regulations. Attendees will be able to identify the important points for each of the following elements on air pollution control:

- History of Air Pollution Control
- Health and Environmental Effects of Air Pollution
- Transport and Dispersion of Air Pollutants
- Air Quality Management
- Ambient Air Quality Monitoring
- Measurement of Emissions from Stationary Sources
- Emission Inventories
- Laws and Regulations
- Control of Emissions from Stationary Sources
- Control of Emissions from Mobile Sources
- Pollution Prevention
- Compliance Monitoring and Enforcement
- Indoor Air

COURSE DESCRIPTION:

This entry-level course presents a broad overview of the major aspects of air pollution control. The lessons include information about pollutants, pollutant sources, effects of pollution, dispersion of pollutants, measurement and control of emissions, laws and regulations pertaining to air pollution control, and other related topics. This course is a recommended background course for all areas of study in the APTI curriculum.

PREREQUISITES:

Students should have a college-level education and six months of equivalent work experience, or equivalent courses/experience. Course SI:422 – Air Pollution Control Orientation Course is highly recommended as a prerequisite.

LAST UPDATED: 2000

APTI 454 EFFECTIVE PERMIT WRITING

CLASS LENGTH: 3-day lecture course **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This introductory permit writing course is designed for entry level personnel at state and local permitting agencies, managers of programs which are impacted by permits, and inspectors who must read and interpret permit conditions. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting and compliance activities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information that is expected for a complete air quality permit application as well as basic approaches for developing an effective permit for industry and the regulatory agency. Attendees will be able to identify the following critical features of establishing an effective permit:

- Identification of the components required in a complete permit application evaluation,
- Explanation of the functions and purposes of each component of a complete permit application,
- Description of the characteristics of an effective permit, and
- Explanation of the process and approaches that can be used to assure an effective permit is produced.

COURSE DESCRIPTION:

This course presents introductory information on the SIP and national programs in air pollution stationary source permitting. This course was designed to provide hands-on training in the methods and procedures used to effectively draft and review permit conditions used with a variety of permit programs. Examples of the various types of permit conditions are presented along with practical exercises.

PREREQUISITES:

Engineering/scientific degree or successful completion of Course RE:100 – Basic Concepts in Environmental Sciences (7 modules), and 6 months of general air pollution experience, or equivalent courses/experience.

LAST UPDATED: 1993

APTI 455 INSPECTION OF GAS CONTROL DEVICES AND SELECTED INDUSTRIES (2003) (FORMERLY ADVANCED INSPECTION)

CLASS LENGTH: 3-day lecture course **CEUs:** 2 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is specifically designed for field inspectors who have the initial responsibility to evaluate and determine the compliance status for gaseous emission sources with control devices. This class is intended for compliance engineers, scientists and technicians who are responsible for inspection of control devices at particulate emission sources.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with inspecting gaseous emission control systems. Attendees will be able to evaluate the following equipment in a regulatory inspection:

- Baseline inspection techniques
- Adsorbers
- Thermal and catalytic oxidizers
- Condensers
- Nitrogen oxides control systems
- Sulfur oxides control systems
- Utility and industrial boilers
- Municipal and medical waste incinerators
- Iron and steel processes
- Asphalt plants

COURSE DESCRIPTION:

This course presents fundamental procedures for the inspection, problem diagnosis and compliance evaluation of gas control devices and significant industrial processes. Site-specific information is used to identify shifts in operating variables that indicate a potential for increased emissions. The baseline inspection approach is reviewed. Operating principles and inspection techniques for gas control devices (adsorbers, oxidizers and condensers) and specific control applications (flue gas desulfurization and nitrogen oxide control systems) are presented. Process descriptions and inspection issues are also discussed for fossil fuel fired boilers, waste incinerators, iron and steel processes, and asphalt plants. Written and video case studies are used to reinforce the material.

PREREQUISITES:

Engineering/scientific degree or successful completion of SI:422 – Air Pollution Control Orientation Course, or equivalent courses/work experience.

LAST UPDATED: 2003

APTI 461 INTERMEDIATE PERMITTING

CLASS LENGTH: 4-day lecture course **CEUs:** 3 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This intermediate permit writing course is designed for personnel of state and local permitting agencies who are new to reviewing permit applications for facilities that are deemed to be major sources under the federal New Source Review programs and the Title V program. This class is intended for permit engineers and scientists who are responsible for permitting major source activities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with permitting emission sources under the federal Major New Source Review programs and the Title V program. Permitting approaches to avoid applicability to these programs will also be addressed. Attendees will be able to apply the following topics in a major source permit review:

- NSR/PSD requirements
- Operating permit requirements
- Permit drafting and analysis
- Source monitoring
- Compliance and enforcement
- Alternative approaches
- Record keeping and resources

COURSE DESCRIPTION:

This course will provide students with an intermediate-level knowledge of permitting so that they will be able to work in permit review or in the preparation of permit applications with some supervision for synthetic minor sources and major sources as defined in the federal New Source review Programs and the Title V program. Case studies will provide practical experience. Permitting requirements will be discussed in detail.

PREREQUISITES:

Students should have a college-level degree in engineering or the sciences and have successfully completed Course 460 – Introduction to Permits and Course 454 – Effective Permit Writing. Alternatively, students should have at least six months experience in air pollution control and exhibit a knowledge of permitting activities listed in the learning objectives, or equivalent courses/experience.

LAST UPDATED:

APTI 464 ANALYTICAL METHODS FOR AIR QUALITY STANDARDS

CLASS LENGTH: 5-day lecture course **CEUs:** 4 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is designed for individuals within a regulatory agency whose role is to provide sampling and laboratory analysis of ambient air samples. This class is intended for air quality professionals, most likely chemists and technicians, who are responsible for the sampling and analysis of ambient air.

LEARNING OBJECTIVES:

Those completing this course will have an understanding of the requirements for ambient air sampling and laboratory analysis that is required for the sampling. The individual will gain an understanding of the following sampling and analysis tasks:

Laboratory
- Equivalent methods for SO_2
- Reference method for NO_2 and CO
- Reference and equivalent methods for O_3

Controlled Test Atmospheres
- Permeation tube systems
- Dynamic dilution systems

Performance Parameters of Instruments
- Zero drift, range, precision, rise time, lag time, and linearity

Audit Sample
- CO (instrumental)

COURSE DESCRIPTION:

This course is designed for chemists and technicians responsible for the sampling and analysis of ambient air. Calibration of continuous analyzers is covered. This laboratory course emphasizes the reference and equivalent methods for air quality standards, including Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Ozone (O_3), and Carbon Monoxide (CO). Quality assurance programs are also introduced. Laboratory procedures and principles include the nondispersive infrared method for CO; the coulometric, flame photometric, and UV fluorescent methods for sulfur compounds; the chemiluminescent method and UV calibrations procedure for O_3; and the chemiluminescent method for NO_2. Students also learn the use of dynamic calibration systems to calibrate continuous air monitoring equipment and to determine performance specifications of the various instruments. A scientific calculator is helpful for preparing laboratory reports.

PREREQUISITES:

Successful completion of Course 435 – Atmospheric Sampling, or familiarity with basic laboratory techniques, including preparation and analysis of test atmospheres, calibration, and the use of common flow-measuring devices, and calculations involving the ideal gas laws, or equivalent courses/experience

LAST UPDATED: 1983

APTI 468 MONITORING COMPLIANCE TEST AND SOURCE TEST OBSERVATION

CLASS LENGTH: 4½-day lecture course **CEUs:** 4 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This introductory course is specifically designed for regulatory personnel who have or will have the responsibility to evaluate source test methods, approve test protocols and review source test results as required under various federal and state regulations or as required by issued permits. This class is intended for compliance and field engineers, scientists and technicians who have responsibility for the above source testing tasks.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with source testing and source test methods. The individual will gain an understanding of the following sampling-related tasks:

- Procedures and checklists to use when observing and certifying compliance source test methods
- Stack test basics [Federal Reference Methods (FRM) 1,2,3 and 4], FRM 5 for particulate matter, FRMs 6,7, and 8 for SO_2, NO_x, and sulfuric acid
- Information and guidance associated with EPA stack test methodologies for characterizing Title III HAPs from industrial sources.
- Standardized stack test methodology for sampling and analysis of HAPs as outlined in EPA's SW-846 Test Methods for Evaluating Solid Waste.
- EPA's stack test monitoring programs associated with PM_{10} (FRM 201/201A) and condensible particulate (FRM 202) monitoring
- Specific observer checklist will be demonstrated during the presentation for each test methodology as part of the source test observation package

COURSE DESCRIPTION:

Since the passage of the Clean Air Act Amendments of 1990 (CAAA of 1990), industrial sources have had to quantify their emissions of hazardous air pollutants (HAPs) in order to demonstrate compliance with regulated emissions. To insure that the source test methods utilized to demonstrate compliance are performed according to EPA guidelines, both agency and industrial personnel will be required to observe stack tests to document that compliance with the methodology is being achieved. This will mean that an observer must be intimately familiar with over 30 or more stack test methods, each one with its own particular operation.

PREREQUISITES:

Engineering/scientific degree or one year work experience in source sampling. Successful completion of APTI 450 – Source Sampling for Pollutants is recommended, or equivalent courses/experience.

LAST UPDATED:

APTI 470 QUALITY ASSURANCE FOR AIR POLLUTION MEASUREMENT SYSTEMS

CLASS LENGTH: 4-day lecture course **CEUs:** 3 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is specifically designed for regulatory personnel who operate and oversee ambient air monitoring data. This class is intended quality assurance coordinators or managers, field or laboratory supervisors, and technicians involved with quality assurance of monitoring system data.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the information associated with the management of air quality monitoring systems required under the Clean Air Act and state and local regulations. Attendees will be able to apply the following topics in esablishing a measurement system:

- Basic concepts of statistical control charts
- Regression analysis and control charts for calibration data
- Identification and treatment of outliers
- Quality assurance for SLAMS and PSD
- Performance and system audits
- Measurement
- Intra-laboratory testing
- Procurement quality control
- Data validation
- Quality costs

COURSE DESCRIPTION:

This course presents a broad overview of the quality assurance required for air pollution monitoring systems. Lectures present the basic quality management principles and techniques applicable to air pollution monitoring systems. It covers the four principal areas of management, measurement, systems, and statistics.

PREREQUISITES:

Students should be proficient in high school algebra and familiar with basic statistical concepts. Successful completion of APTI SI:100 "Mathematics Review for Air Pollution Control" will satisfy the high school algebra requirement. Course SI:473A -- Beginning Environmental Statistical Techniques is recommended for the statistical techniques used in this course.

LAST UPDATED:

APTI 474 CONTINUOUS EMISSION MONITORING (1992)

CLASS LENGTH: 4-day lecture course **CEUs:** 3 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is designed for individuals within a regulatory agency whose role is to evaluate and to determine the operational and compliance status of Continuous Emission Monitoring Systems (CEMS) that are required to be operated on emission sources. This class is intended for engineers and other technical personnel who are responsible for the development and implementation of Continuous Emissions Monitoring (CEM) programs.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the following operational and regulatory focus associated with the operation of CEMS:

- System and operational principles
- Inspection techniques
- Enforcement procedures
- Review of regulatory basis for CEM and source- specific CEM requirements
- Performance Specification Test procedures and quality assurance requirements

COURSE DESCRIPTION:

This course reviews Federal CEM requirements, details of commercially available instrumentation, and QA and audit techniques. Emphasis is placed on CEM system inspection procedures and calculations necessary for agency inspectors to perform their job functions. The guide is a reference source for evaluating monitoring systems, applying Federal regulations, and introducing CEM auditing techniques.

PREREQUISITES:

Student should have successfully completed APTI courses SI:100 – Mathematics Review for Air Pollution Control, SI:476A – x and SI:476B – Continuous Emission Monitoring Systems - Operation and Maintenance of Gas Monitors, or have equivalent course/work experience.

LAST UPDATED: 1992

APTI 482 SOURCES AND CONTROL OF VOLATILE ORGANIC AIR POLLUTANTS

CLASS LENGTH: 4-day lecture course **CEUs:** 3 **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This basic course is designed for individuals within a regulatory agency whose role is to evaluate volatile organic compound emission sources for permitting and to determine the ongoing compliance status of such emission sources. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting and compliance activities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the different types of volatile organic emission sources are present at industrial facilities and the types of control devices that are available for certain emission sources. Attendees will be able to perform regulatory reviews involving the following elements of gaseous emissions and control:

- Basics of organic chemistry and photochemistry
- VOC properties
- National emissions and the regulatory approach
- Source measurement of VOCs
- Surface coating processes
- Graphic arts processes
- Petroleum refining and product storage and distribution
- Liquid asphalt
- Degreasing processes
- Dry cleaning processes
- VOC control methods

COURSE DESCRIPTION:

This course prepares the student to evaluate techniques typically used to control volatile organic emissions from certain industrial sources. Process descriptions, emission sources and characterizations, regulatory requirements, and emission controls are discussed, along with techniques for field evaluation. Industrial sources covered include surface coating, graphic arts, petroleum refining, petroleum product storage and distribution, liquid asphalt, degreasing and dry cleaning. Supporting topics include basic organic chemistry, photochemistry, VOC properties, source measurement, national emissions inventory, and the Federal approach to regulation of VOC sources. A scientific calculator is required.

PREREQUISITES:

Engineering/scientific degree or successful completion of SI:422 – Air Pollution Control Orientation Course, or equivalent courses/experience.

LAST UPDATED:

APTI SELF-INSTRUCTIONAL COURSES

APTI OS:411A SERIES 411 - COMPUTATIONAL ATMOSPHERIC SCIENCES: ESSENTIAL SCIENCES FOR AIR QUALITY MODELING

CLASS LENGTH: 40 hours **CEUs:** 4 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is intended for any student who requires an introduction or a review of the most fundamental scientific principles and concepts from the areas of mathematics, chemistry, physics and statistics.

LEARNING OBJECTIVES:

Upon completion of this course, you will be able to do the following:

- define and use appropriately the following mathematical concepts:
- vectors; derivatives; integrals; difference and differential equations; vector calculus
- define and describe the following chemical concepts: stoichiometry; the elements and atomic structure; organic and inorganic nomenclature; chemical equations; gases; kinetics; equilibrium; thermodynamics
- define and describe the following concepts from physics:
- motion; gravitation; temperature and heat; thermal properties; fluid mechanics; electric charges; electromagnetic waves; light
- define and use the following statistical methods:
- basic statistics: mean, median, mode; statistical distributions; probabilities

COURSE DESCRIPTION:

This course serves as the prerequisite course for the OS:411 series. The modules and units in this course serve to provide an introduction or refresher program in the basic sciences found in the study of atmospheric science, meteorology, air quality science and modeling, and the other topics presented in subsequent courses. Major topics include:

- Basic mathematics
- Basic chemistry
- Basic physics
- Basic statistics

PREREQUISITES:

This course is intended for any student who requires an introduction or a review of the most fundamental scientific principles and concepts from the areas of mathematics, chemistry, physics and statistics. All of the OS:411 series modules assume a reasonable degree of fluency in the topics presented in this course, or equivalent courses/experience.

LAST UPDATED: 1995

APTI OS:411B SERIES 411 - COMPUTATIONAL ATMOSPHERIC SCIENCES: ESSENTIAL ATMOSPHERIC SCIENCES

CLASS LENGTH: 20 hours **CEUs:** 2 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is intended for all who have an interest in atmospheric sciences, with a specific target audience of those who need to be able to use air quality models or interact with air quality modelers. This course is designed to be an overview of atmospheric science.

LEARNING OBJECTIVES:

Upon completion of this course, you will be able to do the following:

- Describe the layers of the atmosphere and understand the chemical cycles that occur in them.
- Describe the physical process by which chemicals move from one position to another.
- Understand current issues in stratospheric chemistry, particularly dealing with the ozone layer and aerosols in the upper atmosphere.

COURSE DESCRIPTION:

This course focuses on the basic concepts required for an understanding of atmospheric science. This course is intended to serve as a prerequisite for the more advanced courses in the OS:411 series.
Major topics include:

- atmospheric structure
- atmospheric chemistry
- atmospheric physics
- stratospheric chemistry

PREREQUISITES:

Prior to taking this course, we recommend that students complete and/or pass the final examination for the OS411A: Essential Science for Air Quality Modeling, or equivalent courses/experience.

LAST UPDATED: 1995

APTI OS:411C SERIES 411 - COMPUTATIONAL ATMOSPHERIC SCIENCES: METEOROLOGY FOR AIR QUALITY MONITORING

CLASS LENGTH: 40 hours **CEUs:** 4 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is intended for all who have an interest in air quality meteorology, with a specific target audience of those who need to be able to use air quality models or interact with air quality modelers. This course is designed to be a detailed yet concise overview of meteorology.

LEARNING OBJECTIVES:

Upon completion of this course, you will be able to do the following:

- Describe the troposphere in terms of its structure and meteorological events
- Describe in detail the role of meteorology in air pollution studies, with specific examples
- Use a variety of meteorological products, including calculators and models, in ways that meteorologists also use them on the job

COURSE DESCRIPTION:

This course is designed to introduce the student to the impact and influences of the weather on air quality issues, with a focus on air quality modeling. The course is designed as an introduction to meteorology, with emphasis on weather effects in air pollution studies. The major modules for this course are:

- meteorology in forecasting
- composition and structure of the atmosphere
- atmospheric energy balance
- measures of the atmosphere
- atmospheric forces
- scales of motion
- atmospheric stability
- the planetary boundary level
- physical meteorology and visibility
- meteorological models

PREREQUISITES:

Prior to taking this course, we recommend that students complete and/or pass the final examination for the following APTI courses:

- OS:411A: Essential Science for Air Quality Modeling
- OS:411B: Essential Atmospheric Sciences for Air Quality Modeling

Or have equivalent courses/experience.

LAST UPDATED: 1995

APTI OS:411D SERIES 411 - COMPUTATIONAL ATMOSPHERIC SCIENCES: TROPOSPHERIC CHEMISTRY FOR AIR QUALITY MODELING

CLASS LENGTH: 10 hours **CEUs:** 1 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is intended for all who have an interest in tropospheric chemistry, with a specific target audience of those who need to be able to use air quality models or interact with air quality modelers. This course is designed to be a detailed yet concise overview of tropospheric chemistry.

LEARNING OBJECTIVES:

Upon completion of this course, you will be able to do the following:

- Describe in detail the major chemical species and processes found in the troposphere, including primary and secondary pollutants
- Show a variety of chemical reaction mechanisms for several key processes in the troposphere.
- Describe the major forms and sources of pollution
- Understand the procedures used for the monitoring and measurement of pollutants, and the procedure used for developing emissions inventories
- Identify the major control strategies used, including devices used for control of mobile and stationary emission sources
- Identify the major legislation affecting emission control

COURSE DESCRIPTION:

This course focuses on the fundamental chemistry of the lower atmosphere, with an emphasis on air pollution chemistry. Major topics include:

- Major primary pollutants and their reactions, with a focus on NOx, VOCs, sulfur compounds, and radical chemistry
- Major pollution products and their impact such as ozone and photochemical smog
- Classification of different emission sources, and information about monitoring emissions, measuring emissions, and creating emissions inventories
- Control Strategies, including major control concepts, devices used, and important legislation dealing with emissions

PREREQUISITES:

Prior to taking this course, we recommend that students complete and/or pass the final examination for the following APTI courses:

- OS:411A: Essential Science for Air Quality Modeling
- OS:411B: Essential Atmospheric Sciences for Air Quality Modeling
- OS:411C: Meteorology for Air Quality Modeling,

or equivalent courses/experience.

LAST UPDATED: 1995

APTI OS:411E SERIES 411 - COMPUTATIONAL ATMOSPHERIC SCIENCES: COMPUTATIONAL SCIENCE

CLASS LENGTH: 40 hours **CEUs:** 4 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is intended for all who have an interest in scientific computing, with a specific target audience of those who need to be able to use air quality models or interact with air quality modelers. This course is designed to be a detailed yet concise overview of scientific computing.

LEARNING OBJECTIVES:

Upon completion of this course, you will be able to do the following:

- Understand the main elements of computational science: Application, Algorithm, and Architecture
- Use numerical techniques to model dynamical systems
- Describe in detail the state of the art in scientific computing, and how it can be used in air quality modeling

COURSE DESCRIPTION:

This course focuses on computational science as applied to air quality modeling. Major topics include methods and tools used in computational science.

PREREQUISITES:

Prior to taking this course, we recommend that students complete and/or pass the final examination for the following APTI courses:

- OS:411A: Basic Sciences for Air Quality Modeling
- OS:411B: Basic Atmospheric Sciences for Air Quality Modeling
- OS:411C: Meteorology for Air Quality Modeling
- OS:411D: Tropospheric Chemistry for Air Quality Modeling,

or equivalent courses/experience.

LAST UPDATED: 1995

APTI OS:411F SERIES 411 - COMPUTATIONAL ATMOSPHERIC SCIENCES: ATMOSPHERIC SCIENCE MODELS

CLASS LENGTH: 20 hours **CEUs:** 2 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is the "capstone" course in the OS411: Computational Atmospheric Science series, and is designed to acquaint the prospective air analyst with a broad yet detailed overview of important modeling tools in atmospheric science studies.

LEARNING OBJECTIVES:

Upon completion of this course, you will be able to do the following:

- Describe, in general terms, the technologies, techniques, and tools of atmospheric science modeling
- Describe in detail a variety of representative models, including those used in air quality modeling

COURSE DESCRIPTION:

This course presents the student with an overview of models used in the atmospheric sciences, with an emphasis on air quality models. This course uses the organizational tool of "application-algorithm-architecture" presented in OS411E: Computational Science to describe a variety of representative models, including "state-of-the-art" models such as AERMOD. The models presented in this course include:

- energy balance models
- radioactive convective models
- regional acid deposition models
- Gaussian plume models
- air quality models such as EKMA/OZIP and AERMOD

PREREQUISITES:

Since this course is the final course in the series, it is assumed that the student has a good working knowledge of all of the topics discussed in the previous five courses. The student should have a working knowledge of the composition and structure of the atmosphere, air pollution meteorology, chemistry to include tropospheric chemistry, and the use of computer modeling tools and their limitations. As such, prior to taking this course, we recommend that students complete and/or pass the final examination for the following APTI courses:

- OS411A: Essential Science for Air Quality Modeling
- OS411B: Essential Atmospheric Sciences for Air Quality Modeling
- OS411C: Meteorology for Air Quality Modeling
- OS411D: Tropospheric Chemistry for Air Quality Modeling
- OS411E: Computational Science for Air Quality Modeling,

or equivalent courses/experience.

LAST UPDATED: 1995

APTI RE:100 BASIC CONCEPTS IN ENVIRONMENTAL SCIENCES - MODULE 1: BASIC CONCEPTS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course was designed to address the needs of Tribal, state, and local air toxics personnel involved in the permitting and compliance assessment related to existing regulatory requirements. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

After completing this Module you will be able to do the following:

- Solve problems using dimensional calculations.
- Solve basic mathematical problems involving logarithms and exponents.
- Calculate the surface areas and volumes of common geometric shapes important in air pollution control.
- Apply the concept of material balance in solving air pollution control problems.
- Convert temperature and pressure data between relative and absolute scales.
- Calculate the quantities of materials in terms of gram moles and pound moles.

COURSE DESCRIPTION:

Designed primarily as a review session, this module presents some of the basic mathematical and chemical concepts that must be understood to successfully solve many types of air pollution problems. By combining this information in one concise module, we hope to save you the time of flipping through old texts in search of basic formulas and equations. This session also includes general problem solving techniques that may be new to many engineers, chemists, and biologists. These general techniques are very useful in avoiding the simple mistakes that can create errors.

PREREQUISITES:

If some or all of this material is new, you may wish to study some additional material. A refresher course in mathematics is provided in U.S. EPA, APTI Course SI:100, titled Mathematics Review for Air Pollution Control, which is prepared as a self-instructional manual.

LAST UPDATED:

APTI RE:100 BASIC CONCEPTS IN ENVIRONMENTAL SCIENCES – MODULE 2: CHARACTERISTICS OF GASES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course was designed to address the needs of Tribal, state, and local air toxics personnel involved in the permitting and compliance assessment related to existing regulatory requirements. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

After completing this Module you will be able to do the following:

- Use the ideal gas law to determine gas volumes and gas flow rates at different absolute temperatures and absolute pressures.
- Convert gas flow rates between actual and standard conditions and between a wet and dry basis.
- Calculate the concentration of gaseous pollutants in different units of measurement and represent that concentration on either a wet or dry basis and at either a measured or standard oxygen level.
- Calculate the concentration of dioxin-furan compounds in units of nanograms per cubic meter and Toxic Equivalency Quotient (TEQ) nanograms per cubic meter.
- Calculate the gas velocity based on the gas flow rate and cross-sectional area and calculate the average gas velocity in a duct based on the measured velocity pressure.
- Calculate the treatment time and space velocity of a gas stream in an air pollution control device.
- Determine the gas density as a function of the absolute gas temperature.
- Determine the change in enthalpy of a gas stream when it changes temperature.
- Determine the gas viscosity as a function of the absolute temperature and the oxygen and water vapor concentrations.
- Determine if the gas stream is laminar, transitional, or turbulent based on the calculated Reynolds Number of the gas stream.

COURSE DESCRIPTION:

The characteristics of gases influence virtually every aspect of air pollution control including ambient monitoring, emission measurement, and engineering. In this Module, you will be introduced to the ideal gas law and to gas flow rates and velocity. This Module also presents the numerous ways of expressing concentrations of constituents in the gas stream. Gas density and gas viscosity at different gas temperatures are also covered.

PREREQUISITES:

LAST UPDATED:

APTI RE:100 BASIC CONCEPTS IN ENVIRONMENTAL SCIENCES – MODULE 3: CHARACTERISTICS OF PARTICLES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course was designed to address the needs of Tribal, state, and local air toxics personnel involved in the permitting and compliance assessment related to existing regulatory requirements. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

After completing this Module you will be able to do the following:

- Calculate the surface area and volume of spherical particles.
- Calculate the aerodynamic diameter and the terminal settling velocity of particles.
- Distinguish between the different EPA particle categories with respect to size and behavior.
- Determine the mass median particle diameter and standard deviation of a lognormal particle size distribution.
- Describe the five main particle formation processes important at air pollution sources and identify the particle size range associated with each process.
- Describe the six main particle collection mechanisms used in particulate control systems including factors that influence their collection efficiency.
- Identify the particle size ranges where the particle collection mechanisms are most efficient.

COURSE DESCRIPTION:

This Module discusses industrially generated particles. The particle size distribution, which can be extremely broad, is primarily dependent on how the particles were created during the industrial process. This Module discusses some of the basic types of particle formation mechanisms active in air pollution sources as well as the basic collection mechanisms employed by particulate control devices.

Here are some benefits to understanding the characteristics of particles in air pollution control:

- The efficiency of the particle collection mechanisms strongly depends on particle size.
- The particle size distribution of flue gas dictates the manner in which air testing is performed.
- The particle size distribution of flue gas determines the operating conditions necessary to collect the particles.
- Particle characteristics are important in determining the behavior of particles in the respiratory tract.

PREREQUISITES:

LAST UPDATED:

APTI RE:100 BASIC CONCEPTS IN ENVIRONMENTAL SCIENCES – MODULE 4: LIQUID CHARACTERISTICS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course was designed to address the needs of Tribal, state, and local air toxics personnel involved in the permitting and compliance assessment related to existing regulatory requirements. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

After completing this Module you will be able to do the following:

- Describe the properties of the four different types of liquids that are commonly encountered in air pollution control systems and emission sampling
- Determine the density, pH and specific gravity of a liquid
- Calculate the concentration of solutions on a parts per million, milligram per liter, molar, and normal basis
- Explain how temperature affects liquid viscosity and how liquid viscosity can affect some important processes in air pollution control
- Calculate the concentration of a gas in equilibrium with the liquid phase using the vapor pressure
- Determine the amount of water necessary to cool a gas stream to a desired temperature by calculating the change in enthalpy
- Identify the normal operating pH range for air pollution control systems
- Explain the factors that affect the absorption of gases into the liquid phas
- Using solubility data at a specific temperature, determine the Henry's law constant for a substance that is slightly soluble in a liquid

COURSE DESCRIPTION:

This Module discusses some characteristics and properties of liquids that play an important role in air pollution control and emission testing. Some of the situations where this knowledge is used are listed below.

- Cooling hot gas streams in evaporative cooling towers and condensers
- Using liquids as a tool in air pollution control systems to remove gaseous and particulate emissions from gas streams
- Condensing vapor to a liquid or solid state by use of condensers and evaporative cooling towers
- Understanding the behavior of liquid droplets in the atmosphere
- Treatment of liquid waste from control equipment
- Using various types of liquids in air emission sampling trains for determining the amount of specific emissions in the gas stream

This Module emphasizes: (1) the physical properties of liquids such as density, viscosity, and pH, (2) the capacity of water to cool hot gas streams, and (3) the mass transfer between soluble gases and liquids.

PREREQUISITES:

LAST UPDATED:

APTI RE:100 BASIC CONCEPTS IN ENVIRONMENTAL SCIENCES – MODULE 5: FLOWCHARTS AND VENTILATION SYSTEMS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course was designed to address the needs of Tribal, state, and local air toxics personnel involved in the permitting and compliance assessment of existing regulatory requirements. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

After completing this Module, you will be able to do the following:

- Evaluate operating data on flowcharts to identify (1) possible system abnormalities and (2) health and safety dangers that may be encountered during on-site field work
- Describe the factors that affect hood capture effectiveness
- Determine if the necessary hood capture velocity is being attained
- Calculate the transport velocity and explain its importance
- Use hood static pressure and fan motor currents to evaluate hood capture effectiveness
- Evaluate gas flow rate changes using fan characteristic curves and system characteristic curves

COURSE DESCRIPTION:

Industrial process systems consist of the process equipment, which generates the pollutants, the air pollution control equipment that removes them, and the fan that moves the gas stream. The process equipment and the air pollutant control devices do not work independently. The operating conditions of all the system components are closely linked together by the fans, hoods, and ductwork.

In addition to discussing how hoods and fans operate in an industrial system, this Module introduces you to the preparation and use of industrial source system flowcharts. Flowcharts provide an important tool for evaluating the overall system.

Some reasons for understanding and evaluating the entire industrial process as a whole are given below.

- Changes in the process equipment can have a major impact on the efficiency of the control device
- Changes in the air pollution control device can affect the ability of the process hoods to capture the pollutants at the point of generation
- The operating data from one unit in the system can be valuable in evaluating the operating conditions in another unit in the system
- Hoods and fans can influence the efficiency of the air pollution control equipment and the release of fugitive emissions from the process equipment

PREREQUISITES:

LAST UPDATED:

APTI RE:100 BASIC CONCEPTS IN ENVIRONMENTAL SCIENCES – MODULE 6: AIR POLLUTANTS AND CONTROL TECHNIQUES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course was designed to address the needs of Tribal, state, and local air toxics personnel involved in the permitting and compliance assessment related to existing regulatory requirements. This class is intended for new permit and compliance engineers and scientists, who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

After completing this Module you will be able to do the following:

- List the major categories of air pollutants.
- Describe the major characteristics of each category of air pollutant.
- Describe the major formation mechanisms for each category of air pollutant.
- Identify the types of control techniques used for minimizing the emission of various types of air pollutants.
- Evaluate the general applicability of various types of air pollution control systems for the removal of the major categories of air pollutants.

COURSE DESCRIPTION:

This Module provides an introduction to the characteristics, formation mechanisms, and control techniques of the major categories of air pollutants. Pollutant characteristics determine the types of air pollution control techniques that can be used to minimize emissions. Many of the pollutants discussed in this Module (particulate matter, sulfur dioxide, nitrogen oxides, ozone, and carbon monoxide) are designated as criteria pollutants by the U.S. EPA and are regulated under the National Ambient Air Quality Standards (NAAQS). The NAAQS regulate common pollutants that, if not regulated, could occur in the ambient air at levels deleterious to human health. Volatile organic compounds are considered to be primary pollutants because they photochemically react with nitrogen oxides to form ozone. Even though dioxins and furans are emitted in small quantities, they are important pollutants to control due to their high toxicity. Hydrogen halides are one of the more common hazardous air pollutants covered by Title I, Part A of the Clean Air Act.

PREREQUISITES:

LAST UPDATED:

APTI RE:100 BASIC CONCEPTS IN ENVIRONMENTAL SCIENCES – MODULE 7: REGULATORY REQUIREMENTS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course was designed to address the needs of Tribal, state, and local air toxics personnel involved in the permitting and compliance assessment related to existing regulatory requirements. This class is intended for new permit and compliance engineers and scientists who are responsible for permitting, compliance, and SIP planning activities.

LEARNING OBJECTIVES:

After completing this Module, you will be able to do the following:

- Identify the general areas covered by the Titles of the 1990 Clean Air Act Amendments
- Identify the name and purpose of the various regulatory programs developed under Titles I, III, IV, and V of the Clean Air Act
- Describe the standards or requirements represented by the following acronyms and identify the Title of the Clean Air Act with which they are associated: BACT, CAM, LAER, MACT, NAAQS, NESHAPs, NSPS, NSR, PSD, and SIP
- Explain the difference between pollutants covered by NAAQS and those covered by NESHAPs

COURSE DESCRIPTION:

The regulations involved in air pollution control are often complex, extensive, and continuously changing. This Module introduces the major types of regulations that have been promulgated or proposed to control air pollution emissions. Most of these regulations are based on the statutory authority included in the 1990 Clean Air Act Amendments (1990 CAAA). Regulations covered under each Title of the 1990 CAAA are discussed in this Module.

PREREQUISITES:

LAST UPDATED:

APTI SI:100 MATHEMATICS REVIEW FOR AIR POLLUTION CONTROL

CLASS LENGTH: 30 hours **CEUs:** 0

CLASS FORMAT: Self-instruction 20 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is an introductory math course that is designed to assist those working in air pollution control.

LEARNING OBJECTIVES:

Upon completion of this course, given various mathematical problems and using a calculator when appropriate, the student will be able to do the following:

- Properly round and maintain appropriate accuracy or precision for the problem at hand.
- Execute mathematical functions in proper algebraic order.
- Rewrite any equation, by moving terms, to produce the equation that yields the desired results.
- Solve mathematical problems that employ exponents.
- For various geometric shapes, find the:
  - ❖ Perimeter, Circumference, Area and Volume.
- Use appropriate trigonometric functions to solve problems with triangular exponents.
- Plot (or graph) values for linear and non-linear equations.
- Find the slope and derive the equation from a plot (or graph) of a linear equation.

COURSE DESCRIPTION:

This course presents the basic mathematics required to work with and understand ambient air measurements. Presentations will cross disciplinary lines of mathematics using illustrations and examples to refresh your memory. The major topics are

- Principles of commutation in multiplication and division
- Logarithms and exponential functions
- Units conversion and rounding to appropriate accuracy or precision
- Basic principles of geometry
- Basic principles of trigonometry
- Creation and interpretation of graphs
- Basic statistics
- Introductory forms of calculus

PREREQUISITES:

LAST UPDATED: 1994

APTI SI:105 INTRODUCTION TO AIR POLLUTION CONTROL

CLASS LENGTH: **CEUs:**

CLASS FORMAT: Self-Instruction 14-chapter web-based program

WHO SHOULD ATTEND:

The course is intended primarily for those unfamiliar with governmental control of air pollution or those who require a general knowledge of the principles and practices associated with air pollution control. The class is intended for new air quality professionals to provide a general overview.

LEARNING OBJECTIVES:

Those completing this course will have a basic understanding of air pollution control. The major topics covered include:

- Control program history
- Health and environmental effects of pollution
- Air pollution meteorology
- Air quality management
- Ambient air quality monitoring
- Measurement and control of emission
- Pollution prevention
- Laws and regulations
- Emissions inventories
- Compliance and enforcement, and other related topics

COURSE DESCRIPTION:

This course is designed to present an introductory view of all major, practical aspects of air pollution control. The course will review history of air pollution control and legislative actions that have developed the air quality management program. The course will review effects of pollution on human health, how meteorological and geographic factors affect pollution, a review of indoor air quality, review of the Clean Air Act, and a overview of ambient air quality monitoring method and regulations and test methods and CEMS. The course will provide an overview of how to perform emissions inventories, and control of particulate sources, control of gaseous sources and control of mobile sources. Finally the course will review pollution prevention techniques, control regulations and compliance and enforcement systems.

PREREQUISITES:

LAST UPDATED:

APTI SI:300 INTRODUCTION TO AIR POLLUTION TOXICOLOGY

CLASS LENGTH: 12 hours **CEUs:** 1.2

CLASS FORMAT: Self-Instruction 6 lessons in .pef format and a quiz

WHO SHOULD ATTEND:

This course is intended primarily for air pollution control agency personnel who might work with criteria pollutants but are not familiar with hazardous air pollutants (HAPs) and their effects on human health. The course is multi disciplinary in its approach so that students from diverse academic backgrounds will understand and use the information.

LEARNING OBJECTIVES:

Those completing this course will have a basic understanding of HAPs and how their effects on human health. The major topics covered include:

- How air toxicants can alter body functioning
- How adverse health effects are measured and estimated
- Chemical classifications of air toxicants
- Air pollution history
- Air pollution regulations
- Where air toxicants are likely to be found
- Acute symptoms of exposure
- Human pharmacokinetics
- Normal body system function

COURSE DESCRIPTION:

This course introduces students to hazardous air pollutants (HAPs) and their effects on human health. Students will become familiar with the history of air pollution and effects on health such as biological effects, how to measure adverse effects an how to recognize a hazardous situation. The issues are addressed with a level of generality that will allow students to understand the basic principles of air pollution toxicology.

PREREQUISITES:

LAST UPDATED: 1993

APTI SI:303 CHAIN-OF-CUSTODY

CLASS LENGTH: 1 hour **CEUs:**

CLASS FORMAT: Self-Instruction Web-based

WHO SHOULD ATTEND:

This course is designed for environmental professionals working at state, local, and tribal agencies who are involved in the collection, transfer, analysis, storage, and disposal of samples and data.

LEARNING OBJECTIVES:

The course goals are to provide students with the ability to:

- perform the proper procedures for documenting the possession or custody of samples and data, and
- recognize the importance of establishing and maintaining correct chain-of-custody procedures when handling samples and data.

COURSE DESCRIPTION:

This course introduces you to what chain of custody is, why it is relevant to environmental professionals, and how to correctly perform chain-of-custody procedures for samples and data. The model chain-of-custody procedure, presented in the final lesson, allows you to track the movement of samples and chain-of-custody forms from start to finish as they exchange hands.

PREREQUISITES:

None

LAST UPDATED:

APTI SI:400 INTRODUCTION TO RISK ASSESSMENT/RISK MANAGEMENT

CLASS LENGTH: 20 hours **CEUs:** 2

CLASS FORMAT: Self-Instruction 8 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed as an introduction to risks assessment of hazardous air pollutants (HAPs). The focus of this course is to provide a basic understanding of how to identify risks, types of risk and how to manage risks. This class is intended for air quality professionals responsible for permitting, compliance inspections and planning.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding risk assessment analysis. The following topics will be covered in this course:

- General principles of risk assessment
- Hazard identification
- Dose-response assessment
- Exposure assessment
- Risk characterization
- Risk management
- Ecosystem risk assessment
- Trends in risk assessment

COURSE DESCRIPTION:

This course provides a basic understanding of risk assessment as it pertains to hazardous air pollutants. It discusses what is a risk assessment, why a risk assessment is needed, the four components of risk assessments: Hazard identification, dose-response assessment, exposure assessment and risk characterization. The course also discusses risk management issues. The course will equip the student with the necessary knowledge to perform their job as it relates to risk assessment and HAPs.

PREREQUISITES:

LAST UPDATED: 1993

APTI SI:401 RISK-BASED AIR TOXICS

CLASS LENGTH: **CEUs:**

CLASS FORMAT: Self-Instruction CD – web-based; 10 lessons

WHO SHOULD ATTEND:

This course is for Federal, Tribal, State, and local air pollution agency personnel new to the air toxics program.

LEARNING OBJECTIVES:

Those completing this course will have an understanding risk based air toxics. The major topics are

- Toxicology and Epidemiology: including History of Air Pollution and the Effects on the Human Body, Biological Effect of Air Pollution, and Environmental Toxicology
- Risk Assessment including: General Principles of Risk Assessment, Hazard Identification, Dose Response Assessment, Exposure Assessment and Risk Assessment
- Risk Management and the EPA including: Risk Management and Problem Identification to Regulation

COURSE DESCRIPTION:

This training course has been designed to cover the impact that Air Toxins have on the body and also discuss how principles of Risk Management can be applied to help to reduce emissions. It is important to first understand how the body processes toxins and what type of harm they can inflict on the body. This then makes it possible to be able to measure the amount of risk that certain toxins present. It is then the combination of the science and the calculated risks that lead to policy.

PREREQUISITES:

LAST UPDATED: 2002

APTI SI:409 BASIC AIR POLLUTION METEOROLOGY

CLASS LENGTH: 20 hours **CEUs:** 2

CLASS FORMAT: Self-Instruction 7 lessons and a quiz

WHO SHOULD ATTEND:

This course is designed for scientists, engineers and other technical personnel who would like to gain an introductory level understanding of basic air pollution meteorology.

LEARNING OBJECTIVES:

Those completing this course will have a general understanding of meteorology and the role it plays influencing ambient air quality. Upon completion of this course, students will be able to do the following:

- Briefly describe the heat balance of the earth-atmosphere system including the effect of solar radiation.
- Describe the relationship of atmospheric pressure and wind.
- Describe the general circulation of the atmosphere.
- Describe how topographical features influence wind flow and affect pollutant dispersion.
- Describe the importance of turbulence in the atmosphere for dispersing air pollutants and explain the different classifications of atmospheric stability.
- Briefly describe how the vertical temperature distribution influences atmospheric stability.
- Identify the key meteorological instruments that are used to collect data for air pollution studies.
- Briefly define plume rise and effective stack height.
- Describe how air quality models utilize meteorological data and how these models are used to make quantifiable dispersion estimates of air pollutant concentrations.
- Generally describe how meteorology is used in regulatory programs affecting air quality.

COURSE DESCRIPTION:

This course uses video presentations, text materials, and reading assignments to present basic meteorology, meteorological effects on air pollution, meteorological instrumentation, air quality modeling, and regulatory programs requiring a knowledge of meteorology. Specifically this course focuses on the meteorological aspects that affect air pollution transport and dispersion in the ambient atmosphere. Topics covered include:

- Solar and terrestrial radiation
- Cyclones and anticyclones
- Wind speed and direction
- Atmospheric circulation
- Cold, warm, and occluded fronts
- Atmospheric stability
- Turbulence
- Meteorological instrumentation
- Plume rise/effective stack height
- Topography
- Types of air quality models
- Regulatory air quality programs

PREREQUISITES:

LAST UPDATED: 2005

APTI SI:410 INTRODUCTION TO DISPERSION MODELING

CLASS LENGTH: 35 hours **CEUs:** 3.5

CLASS FORMAT: Self-Instruction 17 lessons in .pef format and a quiz

WHO SHOULD ATTEND:

This course is designed to assist air quality professionals with a basic understanding of dispersion modeling. This course will provide clarification on modeling topics such as regulations, modeling guidance and types of EPA models.

LEARNING OBJECTIVES:

Those completing this course will have a basic understanding of how to deal with atmospheric dispersion models for industrial point sources. The student will be able to:

- Cite specific parts of federal regulations that require modeling
- Name and describe modeling techniques used in formulating SIPs
- Describe one typical atmospheric pollution problem that can be solved with air quality modeling;
- Describe the Gaussian plume approach and the rational for using the Gaussian distribution in dispersion models
- List the available EPA models
- Limitations of Gaussian models
- Know what model input data is needed and how to obtain model input data
- Explain model output of ground level estimates
- Execute a SCREEN2 model

COURSE DESCRIPTION:

This course consists of computer model, text materials, and reading assignments. The course presents general concepts of air quality point source models and specific, detailed considerations of individual point source models. Two case studies will be examined to demonstrate the use of models in determining air pollution ground level concentrations. Major topics covered include:

- Introduction to the regulations requiring model use
- Introduction to air quality point source models
- General characteristics of air quality point source models
- Required model inputs
- Interpreting model output

PREREQUISITES:

LAST UPDATED: 1997

APTI SI:412A FABRIC FILTER OPERATION REVIEW

CLASS LENGTH: 20 hours **CEUs:** 2

CLASS FORMAT: Self-Instruction 5 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed for engineers and other technical personnel in the field of air quality who are responsible for reviewing fabric filter cleaning devices installed on various industrial sources. The course is useful for air permit reviewers and air quality inspectors employed by State and local agencies; and for technical personnel in industry who prepare air permit applications and fabric filter designs.

LEARNING OBJECTIVES:

Those completing this course will have a general understanding of the following topics on fabric filters and their operation. The individual will be able to perform regulatory reviews involving the following elements of fabric filter control:

- General fabric filter description
- Bag cleaning methods
- Fabric selection and filter types
- Design parameters affecting collection efficiency
- Operation and maintenance problems associated with fabric filters

COURSE DESCRIPTION:

The course focuses on the operational aspects of fabric filters. The students will learn how various fabric filters operate and how to evaluate their effectiveness in achieving particle collection.

PREREQUISITES:

LAST UPDATED: 1995

APTI SI:412B ELECTROSTATIC PRECIPITATOR PLAN REVIEW

CLASS LENGTH: 20 hours **CEUs:** 2

CLASS FORMAT: Self-Instruction 6 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed for engineers and other technical personnel responsible for reviewing the plans for installation of electrostatic precipitators (ESP). The course is useful for air permit reviewers and air quality inspectors employed by State and local agencies; and for technical personnel in industry who prepare air permit applications and ESP designs.

LEARNING OBJECTIVES:

Those completing this course will have a general understanding of the following topics on ESPs and their operation. The individual will be able to perform regulatory reviews involving the following elements of ESP control:

- General description
- Theory of precipitation
- Estimating collection efficiency
- Design parameters
- Industrial Applications
- Operation and maintenance problems

COURSE DESCRIPTION:

The course reviews procedures for evaluating the performance of electrostatic precipitators that are used to reduce particulate emissions from industrial sources. Students will be able to understand how an ESP operates, the different designs, the different components of an ESP, the design parameters and effects on efficiency, industrial application and standard operation and maintenance of ESPs.

PREREQUISITES:

LAST UPDATED: 1998

APTI SI:412C WET SCRUBBER PLAN REVIEW

CLASS LENGTH: 40 hours **CEUs:** 4

CLASS FORMAT: Self-Instruction 11 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed for engineers and other technical personnel responsible for reviewing plans for the installation of wet scrubbers.

LEARNING OBJECTIVES:

Those completing this course will have a basic understanding of how wet scrubbers operate and different types in practice. The individual will be able to perform regulatory reviews involving the following elements of wet scrubber control:

- General description of scrubbers
- Particle collection and absorption theory
- Estimating collection efficiency
- Use in flue gas desulfurization
- Operation and maintenance problems

COURSE DESCRIPTION:

The course reviews procedures for evaluating the performance of wet scrubbers used to reduce particulate and gaseous emissions from industrial sources. This course reviews the operating principles of wet scrubbers. The course reviews types of scrubbers including gas phase, liquid phase, wet film, combination (liquid and gaseous),dry scrubbers and acid gas scrubbers. The course reviews equipment associated with scrubbers and design of particulate wet scrubbers and gaseous scrubbers.

PREREQUISITES:

LAST UPDATED: 1998

APTI SI:417 CONTROLLING VOC EMISSIONS FROM LEAKING PROCESS EQUIPMENT

CLASS LENGTH: 20 hours **CEUs:** 2

CLASS FORMAT: Self-Instruction 6 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed for technical people involved in monitoring industries for VOC emissions from leaking process equipment. The course is useful for air permit reviewers and air quality inspectors employed by State and local agencies; and for technical personnel in industry who prepare air permit applications and monitor VOCs from process equipment.

LEARNING OBJECTIVES:

Those completing this course will have an understanding of the sources of VOC emissions from process vessels and methods used to detect and control leaks. The individual will be able to perform regulatory reviews involving the following elements of leak detection programs:

- Introduction to source categories and regulations
- Devices used to detect leaking components
- Equipment and procedures used to control leaks
- Potential sources of emissions
- Inspection procedures

COURSE DESCRIPTION:

Students successfully completing this course will have a general understanding of sources that would potentially have VOC emissions from processes and ways to detect and control them. Students will be able to describe a leak, recognize major components of leaks, identify control techniques and ways to prevent leaks, detection methods as well as portable VOC detectors. This course reviews fugitive VOC emission regulations and terminology used when controlling VOC leaks from process components such as valves, pump seals and compressor seals. The course will review sources of VOC leaks from process equipment and techniques to reduce them. Students will understand the operating principles of portable VOC detection devices and safety procedures. Students will be prepared to inspect process components for VOC leaks.

PREREQUISITES:

LAST UPDATED: 1982

APTI SI:419A INTRODUCTION TO EMISSION INVENTORIES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This introductory course is designed to assist air pollution professionals and others in understanding the process of developing an air emissions inventory. This class is intended for air quality professionals responsible for permitting, inspections and planning.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of emission inventories. The individual will be able identify the following:

- What an emissions inventory is, what is included (i.e. types of pollutants and emissions sources).
- The steps in the development of an emission inventory: planning, emission estimation methods, required data.
- How to QA/QC the data and emission estimates
- How to document the emissions inventory
- Reporting of EI data
- Maintenance and updating data

COURSE DESCRIPTION:

This introductory course is designed to assist air pollution professionals and others in understanding the process of developing an air emissions inventory. The course will define common terms and concepts associated with the development of an emissions inventory as well as presenting and explaining the various components of developing an air emissions inventory. This course will cover the major aspects of preparing emission inventories by examining each step in the emissions inventory development process.

PREREQUISITES:

LAST UPDATED: 2004

APTI SI:422 AIR POLLUTION CONTROL ORIENTATION COURSE

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is intended primarily for new employees in governmental air pollution control agencies. It may also be useful to people who are seeking basic knowledge about air pollution.

LEARNING OBJECTIVES:

Those completing this course will be familiar with the basics of air pollution control. They will be familiar with understand the basic terminology, and have understanding of some of the technical aspects of regulation, measuring and controlling air pollution. Major topics covered are:

- The atmosphere and its components
- How air pollutants are categorized
- The sources of air pollution
- The difference between criteria pollutants and hazardous air pollutants
- How pollution affects health and welfare

COURSE DESCRIPTION:

This Web-based course replaces the SI: 422 Air Pollution Control Orientation Course Self-Instruction Manual. The modules in this course serve to provide the student with an introduction or refresher in the basics of air pollution control. After completing this course, the student should be familiar with the various interrelated aspects of air pollution control, understand the basic terminology, and have a rudimentary understanding of some of the technical aspects of regulating, measuring, and controlling air pollution. The student will find links to the Environmental Protection Agency (EPA) Web site for further research in the air pollution control field. Each module in the course is composed of units that include introductory materials, graphics, and a quick quiz for review. After completing the course, the student must pass the final test with a score of 90% or better to earn a certificate. Because the test is randomly generated, each test is different; therefore, there is no limit as to the number of times a student can take the test. Students seeking a certificate will need access to a printer when testing.

PREREQUISITES:

LAST UPDATED: 2007

APTI SI:428A INTRODUCTION TO BOILER OPERATIONS

CLASS LENGTH: 20 hours **CEUs:** 2

CLASS FORMAT: Self-Instruction 6 lessons in .pef format and a quiz

WHO SHOULD ATTEND:

This course is designed for engineers and other technical persons responsible for permitting and inspecting boilers.

LEARNING OBJECTIVES:

Those completing this course will understand the following about boilers:

- Fire tube and water tube designs
- Factors that affect combustion efficiency
- Method of introducing air and fuel to a boiler
- Operation and maintenance (system controls)
- Operations of steam turbines used to produce electricity and operation of auxiliary equipment (condenser and cooling towers)
- Air pollution emissions generated in a boiler, the regulations that limit emissions and control techniques to reduce emissions

COURSE DESCRIPTION:

This course is an introduction to the operation of boilers. The course focuses on the major components of boilers and how boilers operate to produce steam, heat and electricity. Major topics covered:

- Basic components
- Combustion principles
- Efficiency calculations
- Burning fuel with air
- Air pollution emissions and control techniques
- FiRE:tube and water-tube boilers

PREREQUISITES:

SI422 – Air Pollution Control Orientation Course and SI431 – Air Pollution Control Systems for Selected Industries, or equivalent courses/experience.

LAST UPDATED: 1984

APTI SI:431 AIR POLLUTION CONTROL SYSTEMS FOR SELECTED INDUSTRIES

CLASS LENGTH: 40 hours **CEUs:** 4 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is designed for engineers and other technical personnel in the field of air quality who are responsible for reviewing air pollution control systems installed on various industrial sources. The course is useful for air permit reviewers and air quality inspectors employed by State and local agencies; and for technical personnel in industry who prepare air permit applications.

LEARNING OBJECTIVES:

Those completing this course will be familiar with the operation of air pollution control equipment and with nine industrial processes, their air pollution emission points and equipment used to reduce their emissions. Major topics are:

- Principles of gaseous emission control equipment, including scrubbers, afterburners, condensers, and adsorbers
- Principles of particulate emission control equipment, including cyclones, fabric filters, electrostatic precipitators, and scrubbers
- Application of control equipment to selected industries such as power plants, incinerators, asphalt batch plants, cement plants, and foundries
- Methods of hydrocarbon, NO_x and Sulfur Oxides (SO_x) control

COURSE DESCRIPTION:

This course is an introduction to the fundamental operating characteristics of particulate and gaseous pollutant emission control systems. The course reviews physical, chemical, and engineering principles of control devices and the application of control systems to several types of industrial processes.

PREREQUISITES:

LAST UPDATED: 1983

APTI SI:433 NETWORK DESIGN AND SITE SELECTION FOR MONITORING PM $_{2.5}$ AND PM $_{10}$ IN AMBIENT AIR

CLASS LENGTH: 40 hours **CEUs:** 4

CLASS FORMAT: Self-Instruction 7 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed for chemist, engineering and other technical personnel responsible for the $PM_{2.5}$ and PM_{10} monitoring network design and site selection.

LEARNING OBJECTIVES:

Upon completed of this course, you will be able to:

- Describe $PM_{2.5}$ and PM_{10} monitoring requirements
- Explain the network design elements required for accurate, appropriate, and community oriented monitoring of $PM_{2.5}$ and PM_{10}
- Apply techniques needed to locate PM monitors that represent community exposure, transport and background particulate concentrations
- Apply appropriate data analysis methods to evaluate compliance with NAAQS site selection network evaluation, and annual reporting

COURSE DESCRIPTION:

This course is intended to provide a comprehensive, self-instructional, practical application of how to optimally design and determine site selection for a particulate matter (PM) monitoring network in accordance with federal regulations and guidelines .The major topics are

- Discussion of the National Ambient Air Quality Standards (NAAQS) and their impact on PM monitoring
- Overviews of the various network design and PM monitoring guidance documents
- Fundamental properties of particles
- General considerations for PM network design
- basic concepts and principles of PM monitoring and siting strategies
- Discussion of PM monitoring data and data analysis techniques currently available
- Site selection, documentation and reporting requirements

PREREQUISITES:

APTI 452 – Principles and Pracitices of Air Pollution or SI 422 – Air Pollution Control Orientation Course

APTI 435 – Atmospheric Sampling (1983) ($PM_{2.5}$ Monitoring Update - 1998) or SI 434 – Introduction to Ambient Air Monitoring, or equivalent courses/experience.

LAST UPDATED: 1997

APTI SI:434 INTRODUCTION TO AMBIENT AIR MONITORING

CLASS LENGTH: 50 hours **CEUs:** 5

CLASS FORMAT: Self-Instruction 7 lessons in .pef format and a quiz

WHO SHOULD ATTEND:

This course is designed to provide a basic understanding of ambient air quality monitoring. Training concepts are mainly geared for individuals responsible for ambient air quality monitoring and planning.

LEARNING OBJECTIVES:

Those completing this course will have an understanding if the following ambient air monitoring topics:

- Statistical techniques pertaining to air monitoring
- Ambient sampling of particulate matter
- Manual sampling of ambient gaseous pollutants
- Reference methods and reference measurement principles for criteria pollutants
- Air quality monitoring network design
- Ambient air monitoring objectives
- Ambient air sampling train design
- Basic gas properties
- Air movers and air measuring devices
- Calibration gas preparation
- Continuous air quality monitors

COURSE DESCRIPTION:

This course introduces terms used in ambient air monitoring and presents practical information about the monitoring process. Theoretical monitoring concepts are also described. The goal of this course is to provide general information about the reference methods, continuous air quality monitors, monitoring network design and statistical techniques pertaining to ambient air monitoring. The course will review information on basic gas properties, PM sampling, manual sampling of ambient gaseous pollutants and calibration of monitors.

PREREQUISITES:

LAST UPDATED: 1983

APTI SI:436 SITE SELECTION FOR MONITORING OF SO_2 AND PM_{10} IN AMBIENT AIR

CLASS LENGTH: 35 hours **CEUs:** 3.5 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is intended primarily for chemists and engineers employed by federal, state, or local air pollution control agencies or private organizations involved in PSD ambient monitoring.

LEARNING OBJECTIVES:

Those completing this course will be able to:

- Describe general considerations for siting ambient air quality monitors
- Select the optimum general siting area and probe location for SO2 and PM_{10} monitors for a given objective
- Describe the logic of the SO_2 and PM_{10} siting criteria

COURSE DESCRIPTION:

This course trains students to site ambient SO_2 and PM_{10} monitors. Students will learn general concepts of ambient monitor site selection and sepecific detailed considerations and procedures for selecting SO_2 and PM_{10} ambient moniotring sites. Course topics include:

- Use of monitoring data and related monitor siting objectives
- Special considerations associated with SO_2 and PM_{10} monitoring
- Procedures and criteria for site selection for SO_2 and PM_{10} monitors
- Rationale for SO_2 and PM_{10} siting criteria
- Network design and probe siting criteria for SO_2 and PM_{10} SLAMS, NAMS, and PSD monitoring stations

PREREQUISITES: Completion of APTI courses SI:411 – Air Pollution Control Orientation or SI:452 – Principles and Practice of Air Pollution Control and SI:435 – Atmospheric Sampling, or equivalent courses/experience. Students should have prior experience with air quality monitoring, but this is not required to take this course.

LAST UPDATED: 1994

APTI SI:437 AIR POLLUTION CONTROL TECHNOLOGY SERIES

CLASS LENGTH: **CEUs:**

CLASS FORMAT: Self-Instruction Executable file

WHO SHOULD ATTEND:

The training tool is designed to provide a basic overview to those unfamiliar with a variety of air pollution control technologies. Students will be provided an introduction to the types of control devices and how they operate.

LEARNING OBJECTIVES:

Upon completion of this tool, the student will have a basic understanding of:

- What the different types of devices are
- How they work
- How to tell if they are working correctly
- Causes of decreased performance
- Performance monitoring

COURSE DESCRIPTION:

The training tool is designed to provide a basic overview to those unfamiliar with a variety of air pollution control technologies. Although this training tool is not intended as complete training in the inspection of these devices, it will provide a basic understanding of the different types of devices used. The series consists of the following topics:

- Electrostatic Precipitators
- Incineration
- Carbon Adsorption
- Wet Scrubbers
- Condensation
- Absorbers
- Fabric Filters

PREREQUISITES:

LAST UPDATED:

APTI SI:445I NTRODUCTION TO BASELINE SOURCE INSPECTION TECHNIQUES

CLASS LENGTH: 25 hours **CEUs:** 2.5

CLASS FORMAT: Self-Instruction 13 lessons in .pef format and a quiz

WHO SHOULD ATTEND:

This course is designed for air pollution inspectors to give them a basic understanding of inspection techniques.

LEARNING OBJECTIVES:

Upon completing this course inspectors will have an understanding of how to perform an air quality inspection. They will have general knowledge of inspection techniques and types of control devices. The individual will be able to identify key concepts including:

- Level 1 (visual inspections) and 2 (plant walk through) baseline inspection techniques
- Follow-up Level 2 baseline inspection techniques (includes flow charting)
- Inspection procedures for fabric filters, dry and wet scrubbers, mechanical collectors, carbon bed adsorbers, incinerators, and electrostatic precipitators
- Control technology, air movement systems, and inspection safety procedures

COURSE DESCRIPTION:

The goal of this course is to familiarize air pollution inspectors with the principles of baseline inspection techniques, to present basic descriptions of fan and ventilation system operations and specific air pollution control devices, and to present the applicable Level 1 and 2 inspection steps for these control devices. Control devices reviewed are fabric filters, dry and wet scrubbers, mechanical collectors, multi-bed type carbon bed adsorbers, thermal and catalytic incinerators and ESP. The course also presents general considerations for all facility inspections, including safety procedures.

PREREQUISITES:

LAST UPDATED: 1992

APTI SI:446 AIR POLLUTION SOURCE INSPECTION

CLASS LENGTH: 40 hours **CEUs:** 4 **CLASS FORMAT:** Self-Instruction

WHO SHOULD ATTEND:

This course is designed for plant operations personnel and regulatory agency inspectors to provide general knowledge of hazards associated with performing an inspection. This course is intended for air quality professional whose role is to perform inspections.

LEARNING OBJECTIVES:

This course provides basic orientation in air pollution source inspection health and safety. The course will provide techniques for identifying and avoiding inspection health and safety problems, review PPE and will review examples of field inspection situations. The individual will be able to identify critical safety elements associated with following potential hazards encountered in an inspection:

- Eye hazards
- Asbestos inspections
- Heat and cold stress
- Confined space entry
- Use of portable inspection instruments
- Elements of a good safety program
- Ground level walking hazards
- Inhalation hazards
- Burn hazards
- Electrical shock hazards
- Explosion/fire hazards
- Proper ladder climbing techniques
- Hazards of walking on elevated surfaces

COURSE DESCRIPTION:

This course presents inspection safety procedures for air pollution control systems. It describes practical techniques to aid plant operations personnel and regulatory agency inspectors to minimize health and safety hazards. Emphasis is placed on recognition and avoidance of common inspection hazards. The selection and use of personal protection equipment for "back--up" protection is also stressed.

PREREQUISITES:

LAST UPDATED: 1990

APTI SI:460 INTRODUCTION TO PERMITTING

CLASS LENGTH: **CEUs:** 0.5

CLASS FORMAT: Self-Instruction 8 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed as an introductory course for technical, nontechnical, management, and other personnel needing to understand the fundamentals of the Title V permit process

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the basic components and processes in air quality permitting. The individual will be able to identify the following key components of an air quality permit application:

- Operating permit process steps, terms, concepts
- Determining if an operating permit is required
- Preparation and submission of the permit application
- Finalizing and issuing a permit
- Titles of Clean Air Act Amendments of 1990
- Receiving and logging applications
- Application review

COURSE DESCRIPTION:

This course is designed to introduce students to the terms and concepts associated with Title V requirements of the Clean Air Act Amendments of 1990. The course will review the purpose of the federal air permit program, common permit definitions, elements required in a permit application and application review.

PREREQUISITES:

LAST UPDATED: 1998

APTI SI:471 GENERAL QUALITY ASSURANCE CONSIDERATIONS FOR AMBIENT AIR MONITORING

CLASS LENGTH: 30 hours **CEUs:** 3

CLASS FORMAT: Self-Instruction 5 lessons in .pef format and a quiz

WHO SHOULD ATTEND:

This course is designed to provide air quality professionals with general quality assurance consideration for ambient air monitoring. This course is intended for air quality professionals responsible for review of air monitoring data and planning.

LEARNING OBJECTIVES:

Upon completion of this course, students should be able to describe the following: general principles of quality assurance; general quality assurance considerations for the acquisition, installation, and operation of air quality monitoring systems; quality control programs and data quality assessment for SLAMS and PSD air monitoring; and audit criteria and procedures for air quality monitoring networks.

COURSE DESCRIPTION:

This course is designed to provide information on general quality assurance considerations for ambient air monitoring. The major topics covered include:

- Quality assurance for air quality monitoring systems
- Quality assurance for SLAMS and PSD air monitoring networks
- Performance auditing of air quality monitoring systems
- Quality assurance policy and principles
- System auditing of SLAMS networks

PREREQUISITES:

This course is a prerequisite for Course 470 – Quality Assurance for Air Pollution Measurement Systems.

LAST UPDATED: 1984

APTI SI:473A BEGINNING ENVIRONMENTAL STATISTICAL TECHNIQUES

CLASS LENGTH: 25 hours **CEUs:** 2.5

CLASS FORMAT: Self-Instruction 5 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed for employees who need to use and understand statistical techniques and/or data such as air quality monitoring/QA professionals.

LEARNING OBJECTIVES:

Those completing this course will have a general understanding of statistics and will be able to apply the following concepts to analysis of environmental data:

- Frequency distributions
- Percentage distributions
- Measures of central tendency
- Standard deviation
- Probability
- Sampling
- Chi-square distribution
- Variance

COURSE DESCRIPTION:

The course gives students a "conversational" knowledge of statistics so they can understand the statistics in journal articles and reports, do some basic statistical calculations and analyses of their own, or listen to a statistician and understand what he or she is saying. The basic statistical principles and methods presented in the course can be applied in many fields including medicine, business, science, or other fields. The course serves as background material for APTI courses that require statistics, such as SI:426 "Analysis of Ambient Measurements" and classroom course 426 "Statistical Analysis for Ambient Measures".

PREREQUISITES:

A basic desire to understand statistics.

LAST UPDATED: 1993

APTI SI:474 INTRODUCTION TO ENVIRONMENTAL STATISTICS

CLASS LENGTH: **CEUs:**

CLASS FORMAT: Self-Instruction 7 on-line courses – media files

WHO SHOULD ATTEND:

This course is designed as an introduction to environmental statistics. This course is intended for air quality professionals whose role will be to review monitoring data.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of how to perform statistical analysis of environmental data. The individual will be able to apply the following concepts to analysis of environmental data:

- Module 1: Interpreting Your Monitoring Data
- Module 2: Sampling and Analytical Limitations & Sample Detection Limits
- Module 3: Quality Assurance Quality Control
- Module 4: Analysis of Trends (28 MB Flash file, turn on your speakers) - 50 minutes
- Module 5: Language of Data Graphing (15 MB Flash file, turn on your speakers) - 1 hour, 50 minutes
- Module 6: Censored Values and Extreme Values (107 MB Windows Media file, turn on your speakers) - 1 hour, 10 minutes
- Module 7: Fundamentals of Trajectory Analysis (81 MB Windows Media file, turn on your speakers) - 54 minutes

COURSE DESCRIPTION:

This series of online lectures was developed for USEPA by the University of Illinois at Chicago School of Public Health, Environmental and Occupational Health Sciences Division. This course will provide a basic understanding of how to interpret monitoring data and how to analyze environmental data.

PREREQUISITES:

LAST UPDATED:

APTI SI:476B CONTINUOUS EMISSION MONITORING SYSTEMS – OPERATION AND MAINTENANCE OF GAS MONITORS

CLASS LENGTH: 30 hours **CEUs:** 3

CLASS FORMAT: Self-Instruction 15 lessons in .pdf format and a quiz

WHO SHOULD ATTEND:

This course is designed to give a more detailed knowledge of CEMs and their operation. The course is useful for air permit reviewers and quality inspectors employed by State and local agencies; and for technical personnel in air quality monitoring/quality assurance and quality control roles.

LEARNING OBJECTIVES:

Those completing this course will have an understating of CEMs and will be able to apply the following concepts to the evaluation of CEMs:

- Types of CEMs and analytical techniques
- Understand spectroscopic, luminescence, electro analytical and paramagnetic analyzers
- Identify sources categories required to install CEMS and the applicable requirements
- How to perform QA/QC, develop an audit program and maintenance procedures

COURSE DESCRIPTION:

This advanced course is a study program designed to develop a working knowledge of continuous gas emission monitoring systems. The course reviews operating characteristics and common maintenance techniques used to provide continuous operation of both extractive and in-situ monitors. Discussions focus on regulatory specifications in terms of instrument design, installation, and performance testing. Both existing regulatory programs and the implications of pending specifications are considered. Major Topics

- Operational principles of gas monitoring systems
- Maintenance and quality assurance procedures
- Specification testing (design and performance testing)
- Calculation methods
- Installation guidelines

PREREQUISITES:

LAST UPDATED: 1990

CARB CLASSROOM COURSES

CARB 101 UNIFORM AIR QUALITY TRAINING PROGRAM (UAQTP)

CLASS LENGTH: 4 days

CEUs: 0
The entire series must be completed for a certificate of completion to be issued.

CLASS FORMAT: Classroom

WHO SHOULD ATTEND:

New, entry-level stationary source inspectors, regulatory agency staff, and environmental specialists in business and government.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with to air pollution control and enforcement. Attendees will be able to identify key elements related to the following air quality topics:

- History of Air Pollution Control
- Meteorology and Climatology
- Classification of Air Pollutants
- Inspector Safety
- Concepts of Regulatory Development
- Inspection and Report Writing Techniques
- Basic Air Pollution Control Equipment
- Complaint Response Procedures
- Sample Gathering and Integrity
- Basic Chemistry of Air Pollution
- Evolution of Environmental Law
- Inspector Conduct and Liability
- Air Quality Monitoring Concepts
- Diesel Particulate Control Strategies

COURSE DESCRIPTION:

The Uniform Air Quality Training Program (UAQTP) is a series of 14 sections providing an introduction to air pollution control and enforcement. You will learn the basics of air pollution history, the evolution of air pollution laws and regulations, control equipment, and inspection procedures associated with proper compliance inspections. You are encouraged to ask questions and share your experiences.

PREREQUISITES: None

LAST UPDATED: 2010

CARB 220 COMPLIANCE ASSURANCE MONITORING (CAM)

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for intermediate stationary source permit engineers and inspectors.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with compliance assurance monitoring. Attendees will be able to perform regulatory reviews involving the following elements of CAM:

- Effect of Title V
- Background of CAM
- Part 64 applicability
- Exception
- CAM monitoring design criteria
- Source, district, and EPA Roles
- Quality Improvement plan

COURSE DESCRIPTION:

On October 22, 1997, EPA promulgated the CAM rule, 40 CFR part 64, which addresses monitoring for certain emission units at major sources. The CAM rule, which applies only to emission units with active control devices whose potential pRE:control device emissions are at or above the major source thresholds, requires the title V permit for these sources to contain monitoring sufficient to give a reasonable assurance of compliance with requirements applicable to the source and with all permit terms and conditions over the anticipated range of operation. Thus, emission units with an approved CAM plan will require sufficient monitoring to satisfy the periodic monitoring requirement under title V and part 70.

The CAM rule generally will not require implementation of its requirements for most units subject to CAM until the first round of title V permit renewals, which will generally be 5 years after initial permit issuance. Therefore, until emission units become subject to the requirements of part 64, the initial title V permit for major sources with units subject to Federal or SIP regulations will need to include periodic monitoring for these CAM units.

CAM concepts like background, 40 CFR part 64 (CAM) applicability, who will be affected by CAM.,.who is exempt from CAM, CAM timing, monitoring design criteria, frequency of monitoring, source, District & EPA roles in evaluating CAM plans, quality improvement plans will be discussed in this course.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP) and Course 299 – Theory & Application of Air Pollution Control Devices, or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 221 CONTINUOUS EMISSION MONITORING

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

New, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with continuous emission monitoring. Attendees will be able to perform regulatory reviews involving the following elements of Continuos Emissions Monitoring systems:

- CEM Implementing regulations
- CEM basic theory and operation
- CEM system components
- System certification requirements
- Inspection and quality assurance

COURSE DESCRIPTION:

Continuous emission monitoring (CEM) involves determining compliance of stationary sources with their emission limitations on a continuous basis. CEM are also used for process control and to monitor the operations of the control equipment. In this course, we will review the purpose and applicability of CEM systems mandated by federal regulations such as 40 CFR Part 60 and Part 75. We will discuss several different types of commercially available extractive & in situ systems with emphasis on performance specifications, including installation, design, testing, & certification. We will also discuss data recording & reporting requirements, system calibration & quality assurance program including procedures for conducting performance audits (CGA, linearity & RATA).

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 222 PRINCIPLES OF AMBIENT AIR MONITORING

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is specifically designed for regulatory personnel who operate and oversee ambient air monitoring data. This class is intended quality assurance coordinators or managers, field or laboratory supervisors, and technicians involved with quality assurance of monitoring system data.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with principles of ambient air monitoring. Attendees will be able to perform regulatory reviews involving the following elements of ambient air monitoring:

- Regulations and Standards
- Monitoring Networks
- Station Siting
- Instrumentation
- Documentation
- Data Handling
- Quality Assurance
- References and Resources

COURSE DESCRIPTION:

This course covers the basic design and theory of ambient air monitoring, quality assurance and control methods as they relate to monitoring instruments, site development criteria and data processing. This course will address $PM_{2.5}$ and other particulate methods, ozone, oxides of nitrogen, carbon monoxide, hydrocarbon, sulfur dioxide, meteorology systems, data recording systems, gas calibration systems, and zero air systems.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2008

CARB 224 OBSERVING SOURCE TESTS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

New, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with observing source tests. Attendees will be able to perform regulatory reviews involving the following elements of source testing:

- Basic principles of source test observation (STO)
- The fundamentals of source testing methods
- Method 5
- Sampling train and procedures
- Sample recovery observations
- Procedural inspections, calculations, report writing and QA techniques

COURSE DESCRIPTION:

Observations of compliance performance emission tests are an important part of any air pollution enforcement program. Data obtained during these tests are used to determine compliance with regulatory standards or to determine baseline operating conditions for a source. We present the basic principles of STO and the fundamentals of source testing methods, including Method 5, sampling train and procedures. We also discuss sample recovery observations, procedural inspections, calculations, report writing and QA techniques. Students will participate in a Method 5 sampling train "mock inspection" and receive hands-on training.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 230 SURFACE COATING: METAL PARTS & PRODUCTS

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Surface Coating: Metal Parts & Products.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with metal parts and products operations. Attendees will be able to perform regulatory reviews involving the following elements of Metal Parts operations:

- All types of coatings
- Application techniques applied in the controlled conditions of a factory
- Control Technologies
- Inspection procedures
- Coating steps and points of emissions
- List of Hazardous Materials found in Coatings

COURSE DESCRIPTION:

This course addresses the complex matter of paints and coatings used in the manufacture or refurbishment of metal parts and products. Combining lecture, discussion, and informational video, students are introduced to topics such as coating formulation, volatile content limits, transfer efficiency, application equipment, inspector sampling, and laboratory analysis for liquid and powder coatings.

PREREQUISITES:

This course is a prerequisite for all classes in the course #230 series.

LAST UPDATED: 2009

CARB 230.4 GRAPHIC ARTS

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Graphic Arts operations.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with graphic arts operations. Attendees will be able to perform regulatory reviews involving the following elements of Graphic Arts operations:

- Ink Components
- Five Common Types of printing
- Printing Processes
- Estimating Emissions
- Regulations and Standards
- Field Inspections

COURSE DESCRIPTION:

This course addresses the use of inks, coatings and surface preparation/cleanup materials used in the graphic arts industry. Classroom discussion will focus on printing methods, process descriptions, emission control techniques and inspection procedures. Volatile Organic Compound (VOC) content, graphic arts rule limitations and basic VOC emission calculations are outlined and discussed, as well. Discussion of regulatory issues such as the federal NESHAPS, RACT guidelines and the local prohibitory rules are also included. Students will also receive first-hand experience during the afternoon field visit (mock inspection) at a local business with a permitted printing operation.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 233 SOLVENT CLEANING: DEGREASING OPERATIONS

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Solvent Degreasing Operations.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with solvent cleaning specifically degreasing operations. Attendees will be able to perform regulatory reviews involving the following elements of Degreasing operations:

- Types of solvents
- Types of degreasers
- Emission control equipment used and inspection procedures
- Regulatory issues such as the Title III MACT standards
- NESHAPS for Halogenated Solvents
- RACT/BARCT guidelines
- Local prohibitory rules

COURSE DESCRIPTION:

This course provides baseline information on a variety of solvents cleaning/degreasing operations. Topics include: types of solvents, types of degreasers, emission control equipment used and inspection procedures. Discussion of regulatory issues such as the Title III MACT standards, NESHAPS for Halogenated Solvents, RACT/BARCT guidelines and local prohibitory rules are also included. Students will also receive first-hand experience during the afternoon field visit (mock inspection) at a local business with a permitted solvent cleaning operation.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2009

CARB 242 HOT MIX ASPHALT FACILITIES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Hot Mix Asphalt Facilities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with hot mix asphalt facilities. Attendees will be able to perform regulatory reviews involving the following elements of Hot Mix Asphalt facilities:

- Introduction
- Emissions and Effects
- Process
- Control
- Permit Requirements
- Inspection Procedure

COURSE DESCRIPTION:

Hot Mix Asphalt (HMA) facilities produce asphaltic concrete. Asphaltic concrete is a mixture of well graded, high quality aggregate and asphalt cement that is heated and mixed in measured quantities. This course discusses the process of hot mix asphalt production, equipment, types of air pollution control, and techniques on how to perform a compliance inspection. There will be a field visit in the afternoon. Participants must bring their hard hats, safety shoes, hearing and eye protection.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 243 AGGREGATE PLANTS

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

New, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with aggregate plants. Attendees will be able to perform regulatory reviews involving the following elements of Aggregate plans:

- Emissions and Health Impacts
- Aggregate Industry
- Aggregate Process
- Engineering Evaluation
- Inspection Procedures

COURSE DESCRIPTION:

Aggregate plants produce sand and gravel and crushed stone. These plants can also be considered major air pollution sources. Upon completion of this one-day course, the participant will better understand the process flow of sand and gravel and crushed stone operations and the legal requirements associated with aggregate plants. A field visit is included to provide hands-on inspection techniques. In order to participate in the field visit, all students are required to bring appropriate safety equipment (hard hat, safety shoes, hearing and eye protection).

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 244 CONCRETE BATCH PLANTS

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Concrete Batch Plants.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with concrete batch plants. Attendees will be able to perform regulatory reviews involving the following elements of Concrete Batch plants:

- Introduction
- Industry History
- Emissions and Health Impacts
- Concrete Industry Description
- Inspection Procedures
- Engineering Evaluation/Permit Process

COURSE DESCRIPTION:

Concrete is a mixture of water, cement, sand, gravel and other substances designed to harden and form durable surfaces and structures. A batch plant is a facility which collects and stores concrete ingredients, selects and combines proportions, and dispenses the mixture into a mixer-truck. This course covers process and control, air pollution control measures, inspection procedures, and legal requirements applicable to concrete batch plants. There will be a field visit in the afternoon. Participants must bring their hard hats, safety shoes, hearing and eye protection.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 245 CEMENT PLANTS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Cement Plants.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with cement plants. Attendees will be able to perform regulatory reviews involving the following elements of Cement plants:

- How is Cement Made
- Types of Cement Kilns
- Types of Calciner Towers
- Classes of Cement
- Raw materials in Cement
- Major Components of Portland Cement Clinker
- Types of Cement
- Inspection Techniques
- Types of controls used

COURSE DESCRIPTION:

Cement is a powdered substance made primarily of burned lime, clay, and fly ash. Cement manufacturing involves many processes including mining, crushing, screening, recovery, calcining, finishing, grinding, conveying and shipping. Particulates can be emitted from any of these steps. Facilities can also operate on a variety of fuels requiring additional air pollution control. This course covers the production processes of cement manufacture with corresponding air pollution control issues. There will be a field visit in the afternoon. Participants must bring their hard hats, safety shoes, hearing and eye protection.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 246

AGGREGATE, ASPHALT, & CONCRETE BATCHING OPERATIONS

CLASS LENGTH: 2 days **CEUs:**

CLASS FORMAT: Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Aggregate, Asphalt, & Concrete Batching Operations.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with aggregate, asphalt, & concrete batching operations plants. Attendees will be able to perform regulatory reviews involving the following elements of Aggregate, Asphalt, and Concrete Batching operations:

The following topics will be covered in this course:

- Emissions and Health Impacts
- Aggregate Industry
- Aggregate Process
- Engineering Evaluation
- Inspection Procedures for Aggregate, Asphalt and Concrete operation
- Concrete Emissions and Effects
- Hot Mix Process and Control
- Permit Requirements
- Health Impacts

COURSE DESCRIPTION:

This course will provide an overview and discussion of the processes commonly seen at sand and gravel operations, concrete batching operations, and hot mix asphalt (HMA) operations. Processes such as quarrying, sizing of quarried material, sorting, stockpiling, and transfer of aggregate products will be discussed in the aggregate section of this class. Concrete batching issues such as dust abatement and the flow of aggregate and cement materials will also be discussed. Hot mix asphalt operations also have many similar processes, and we will discuss the similarities with aggregate and concrete batching operations, including aggregate handling, storage, transfer, processing, and more. Additionally, we will also explore some of the issues that are particular to HMA facilities such as "blue smoke" controls which can include baghouse filters and capture/incineration of blue smoke mist. Combustion controls such as low-NOx burners will also be discussed as they pertain to HMA and aggregate operations. This course includes a field trip to a local aggregate/concrete/HMA facility to observe the process in-person, and affords an opportunity for students to interact with facility operators.

PREREQUISITES: CARB 101, or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 251 ASBESTOS DEMOLITION AND RENOVATION - REGULATOR TRAINING

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for air pollution inspectors.

LEARNING OBJECTIVES:

Those completing this course will gain and understanding of the health effects of asbestos exposure and the Demolition and Renovation NESHAP requirements for asbestos containing buildings. The emphasis is on inspector safety, case development, the decision to enter containment, sampling and decontamination.

COURSE DESCRIPTION:

This course is designed for air pollution inspectors. A variety of asbestos issues are discussed in this one-day course. Since contamination is a major concern when working near asbestos, safety is emphasized. The aspects of an effective inspection with proper and thorough case development are outlined and reviewed as is locating non-notifiers. Group participation is encouraged throughout the course as each individual topic is addressed. Specific coverage is given to health effects of exposure, containment practices, sampling procedures, chain of custody and documentation.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 261 POLYESTER RESIN AND FIBERGLASS

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for permit engineers, compliance engineers and inspectors. The course is designed to provide an overview of Polyester Resin and Fiberglass Facilities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with polyester resin and fiberglass plants. Attendees will be able to perform regulatory reviews involving the following elements of Polyester Resin and Fiberglass plants:

The following topics will be covered in this course:

- Plastics and Plastic resin uses
- Plastic resin theory / operation
- Air pollution control devices
- Implementing regulations
- Typical permit conditions
- Inspection procedures
- Federal regulations

COURSE DESCRIPTION:

This course provides information to air pollution inspectors on the history, use of raw materials, production methods, emission control methods and inspection procedures for polyester resin and fiberglass facilities. This course covers pollution prevention, legal requirements, and RACT/BACT. Upon completion of this course, inspectors will be able to understand what is required of the facility to remain in compliance with the requirements. A field visit to a local facility is included to provide hands-on inspection techniques.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2009

CARB 262 FUGITIVE VOC EMISSIONS INSPECTIONS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of VOC leak inspections.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with fugitive VOC emission inspections. Attendees will be able to perform regulatory reviews involving the following elements of fugitive emissions:

- Regulated Facilities
- Components
- Estimating Emissions
- Regulations and Standards
- Portable Hydrocarbon Analyzers
- Field Inspections

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 270 INCINERATORS

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of incinerators (control devices).

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with incinerators operations. Attendees will be able to perform regulatory reviews involving the following elements of incinerators:

The following topics will be covered in this course:

- 3 T's of combustion
- Types of combustion
- Categories of Industrial Incinerators
- Typical Incinerator Operating Procedures
- Typical Operational Errors
- Incinerator Emissions & Control
- Incinerator Inspection
- Air Pollution Control Points of Inspection

COURSE DESCRIPTION:

This course will focus on the process, emission control equipment and inspection procedures of small to medium sized solid waste incinerators. The types of incinerators include biomedical, pathological, crematories and commercial heat stripping ovens. This course does not address municipal waste combustors, biomass or hazardous waste incinerators. There is an afternoon field visit where students will receive first-hand experience during a mock inspection of a local business with a permitted incinerator.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 271 STATIONARY RECIPROCATING ENGINES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Stationary Reciprocating Engines.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with stationary reciprocating engines. Attendees will be able to perform regulatory reviews involving the following elements of stationary reciproacting engines:

- Background Information
- Theory and Operation
- Air/Fuel Delivery Systems
- Reciprocating Engine Emissions
- Emissions Control Methods
- Regulations
- Inspecting Stationary ICEs

COURSE DESCRIPTION:

Stationary reciprocating engines are used widely for power generation, gas compression, and many other purposes. They are also a significant source of air contaminants and as such are the focus of increased regulation. This course covers reciprocating engine operating theory, both standard and "cutting-edge" emission control technologies, regulations, permit conditions, and inspection procedures.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 272 STATIONARY GAS TURBINES

CLASS LENGTH: 1½ days **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Stationary Gas Turbines.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with stationary gas turbines plants. Attendees will be able to perform regulatory reviews involving the following elements of stationary gas turbines:

- Gas turbine history, theory of operation
- Gas turbine uses
- Air pollution control devices
- Gas turbine regulations
- Typical permit conditions
- Inspection procedures
- Continuous emission monitoring
- Source testing requirements

COURSE DESCRIPTION:

With an increase in demand of the electric utility industry, stationary gas turbines have become more popular in recent years as combined-cycles, peaking power plants and cogeneration facilities. The course discusses uses of gas turbines, fundamentals of operation of modern turbines with emphasis on state-of-the-art controls to achieve some of the lowest emission concentrations for this source category. The course also discusses combined cycles with HRSG units, steam turbines and power generation. This is followed by a detailed discussion on emissions and control techniques such as Dry Low-NO_x combustors with staged combustion, water or steam injection followed by SCR and CO catalysts. Applicable federal and local BACT regulations, permitting requirements, and agency inspection procedures and safety concerns are thoroughly discussed.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 273 INDUSTRIAL BOILERS

CLASS LENGTH: 1½ days **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of industrial boilers.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with industrial boiler operations Attendees will be able to perform regulatory reviews involving the following elements of industrial boilers:

- Air Pollution - Why
- Boiler Uses
- Boiler Theory and Operation
- Air Pollution Formation
- Air Pollution Control Devices
- Boiler Regulations
- Typical Permit Conditions
- Inspection Procedures

COURSE DESCRIPTION:

Boilers are one of the most common emission sources and range in use from small fire tube boilers to large utility boilers associated with power plant facilities. The course discusses uses of boilers, heat transfer methods and fundamentals of operation of modern industrial and utility boilers including those fired by natural gas, biomass, municipal waste and coal (circulating fluidized bed units). The course also discusses steam turbines and power generation. This is followed by a detailed discussion on emissions and control techniques such as Low-NOx burners, FGR, staged combustion, SCR and SNCR. New technologies such as Ultra Low-NOx 9 ppm burners, applicable federal and local BACT regulations, permitting requirements and agency inspection procedures and safety concerns are thoroughly discussed.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 281 ELECTROSTATIC PRECIPITATORS

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of ESPs (control devices).

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with electrostatic precipitators operations. Attendees will be able to:

- List the major industrial applications for ESPs.
- Explain the theory of operation of ESPs, using appropriate terminology
- Describe the major types/categories of ESPs.
- List the main things to consider in designing an ESP.
- List the major components of a typical ESP and explain the functions of these components.
- Be aware of how ESP performance can be monitored by operators.
- Explain in detail how to conduct an inspection of an ESP.

COURSE DESCRIPTION:

This course will help the inspector understand the fundamentals of electrostatic precipitator operation for fine particulate or aerosols and the likely defects or operator oversights. Topics include: theory and design, cleaning cycles, operation and maintenance and inspection techniques.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 282 BAGHOUSES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of baghouses (control devices).

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with baghouse operations. Attendees will be able to identify the following with respect to baghouses:

- What are we looking at?
- Why do we care?
- How does fabric filtration work?
- Types of baghouses
- Design and operation of baghouses
- Operation and maintenance problems
- Baghouse inspection

COURSE DESCRIPTION:

Baghouses are one of the most effective and widely used control devices for fine particulate matter. This course will present the major uses for baghouses, operational theory and design, applicable regulations, permit conditions and inspection procedures. The course also includes a brief discussion of baghouse troubleshooting and maintenance.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2008

CARB 284 VOLATILE ORGANIC COMPOUND CONTROL DEVICES

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Volatile Organic Compound Control Devices.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with volatile organic compound control devices. Attendees will be able to perform regulatory reviews involving the following elements of gaseous emissions control:

The following topics will be covered in this course:

- Absorbers
- Adsorbers
- Condensers
- Oxidizers
- Process descriptions
- Rule discussion
- Inspection procedures

COURSE DESCRIPTION:

This course provides an overview of equipment used to control the emissions of volatile organic compounds (VOCs). Specifically: absorbers, adsorbers, condensers and oxidizers will each be covered. Classroom discussion will focus on process descriptions, rule discussion and inspection procedures for the VOC control equipment. The afternoon field visit will allow students to see and inspect one of the control options covered in class.

PREREQUISITES:

LAST UPDATED: 2010

CARB 285 LANDFILL GAS CONTROL FACILITIES

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Landfill Gas Control Facilities.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the Landfill Gas control systems. The following topics will be covered in this course:

- Facts and figures regarding Landfills
- Primary and Secondary air pollutants at Lanfills
- Methane monitoring equipment
- Inspections and safety tips
- Scientific principles behind landfill gas generation
- Landfill gas collection technologies and principles
- Landfill gas controls and energy uses
- Description of landfill gas monitoring equipment and proper use
- Regulatory Overview and Update on Green House Gas Regulations, CCR Title 17, Section 95460
- Inspection and Safety Tips

COURSE DESCRIPTION:

This course provides an introduction to the operation of landfill gas collection, controls and gas-to-energy systems. Special emphasis is placed on inspection techniques.

A landfill tour is provided to an active landfill site. Students will be able to discuss and observe landfill operations/activities and landfill gas extraction control components. Depending on the venue, this can be a flare for VOC/methane control, or internal combustion engines/turbines for VOC/methane control and energy generation.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 287 DRY CLEANING

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Dry Cleaning operations.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with dry cleaning operations. Attendees will be able to perform regulatory reviews involving the following elements of Dry Cleaning operations:

The following topics will be covered in this course:

- Introduction
- Industry History
- Emissions and Health Impacts
- The dry cleaning process
- The inspector's role in ensuring compliance with the Airborne Toxic Control Measure (ATCM) for Perchloroethylene from Dry Cleaning Operations, and
- Leak detection equipment

COURSE DESCRIPTION:

Self-inspection, leak checking and compliance assistance for facilities using perchloroethylene are emphasized in this one-day review of organic solvent fabric cleaning. Classroom discussion will focus on the dry cleaning process and the inspector's role in ensuring compliance with the NEW Airborne Toxic Control Measure (ATCM) for emissions of Perchloroethylene (PERC) from Dry Cleaning Operations. During the field portion (mock inspection) of the class, students will get hands-on experience using the latest leak detection equipment at a local permitted dry cleaning operation. For certification as a "Trained Operator", please see course #387.

PREREQUISITES: CARB 101 –Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 288 PETROLEUM REFINING

CLASS LENGTH: 2 days **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended permit engineers, compliance engineers, and inspectors. The course is designed to provide an overview of Petroleum Refining.

LEARNING OBJECTIVES:

The initial section of this course will introduce participants to the terminology, basic chemistry, and process related emissions common to Petroleum Refineries. Participants will also be introduced to the many New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAPs) and other air quality regulatory program requirements potentially applicable to a Petroleum Refinery. This discussion will include the air pollutants of concern and common control techniques.

The remainder of the course will focus on the four steps in the refining process – separation, treatment, conversion and blending. Each step will be addressed separately, including a discussion of the purpose of each step, common processes used to accomplish each step, air pollutant emissions associated with each process and associated inspection points. In addition, emissions and the control of air pollutants associated with supporting activities (such as waste water collection and treatment, tank farms, and safety flares) will be discussed.

COURSE DESCRIPTION:

Petroleum Refineries are a complex maze of vessels, pipes, heaters and processes whose purpose is to transform crude oil into usable products. Though no two refineries are identical, all refineries utilize the same steps to achieve this goal – separation, treatment, conversion and blending. Petroleum refineries emit significant quantities of various regulated air pollutants and are subject to a myriad of air quality regulatory requirements. The purpose of this course is to provide inspectors the basic knowledge necessary to conduct comprehensive inspections of Petroleum Refineries and to effectively communicate with Petroleum Refinery personnel. This course will include a field trip. Participants must bring their hard hats, safety shoes, hearing protection and eye protection. Participants need to check with their training coordinator to determine whether nomex protective clothing will be required for the facility tour.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2011

CARB 290 MACT GENERAL BACKGROUND INFORMATION

CLASS LENGTH: 1 day **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of General Background Information on MACT and ARB standards.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with MACT general background information. The following topics will be covered in this course:

- History: various ARB and EPA toxic regulations/programs: MACTs and ATCMs, ARB Hot Spots vs EPA Significant Risk Programs, EPA and California Accidental Release Prevention Programs
- CAA section 112
- MACT Timeline
- California MAC/ATCMs
- General/Specific requirements of some of the MACT regulations
- Information Resources to help with the MACT regulations

COURSE DESCRIPTION:

This course is designed to provide general background information on (1) various ARB and EPA toxic regulations/programs: MACTs and ATCMs, ARB Hot Spots vs EPA Significant Risk Programs, EPA and California Accidental Release Prevention Programs; (2) listing of toxic air contaminants and hazardous air pollutants, and of EPA's toxic source categories; (3) pathways for ARB and EPA enforcement; and (4) lowering a source's potential to emit (for MACT sources).

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2009

CARB 299 THEORY & APPLICATION OF AIR POLLUTION CONTROL DEVICES

CLASS LENGTH: 2 days **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is intended for new, entry-level as well as semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in business and government. The course is designed to provide an overview of Theory & Application of Air Pollution Control Devices.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with the theory and application of air pollution control devices. Attendees will be able to perform regulatory reviews involving the following emissions control techniques:

The following topics will be covered in this course:

- Control of power plant emissions
- Control of oxides of nitrogen
- Control of particulate emissions and ammonia slip
- Introduction of VOCs and HAPs
- Introduction of VOC control
- Introduction to Control of PM
- Cyclones and Baghouses
- ESPs and Scrubbers
- Particulate Filters and Gas-Fired IC Engine Controls

COURSE DESCRIPTION:

This course will provide a detailed introduction to air pollution control equipment and methods used to control particulate and gaseous air emissions. The course will cover theory, operation, applications, design considerations, inspection strategies, compliance assurance monitoring and regulations for cyclones, baghouses, wet and dry scrubbers, electrostatic precipitators, carbon beds, bio filters, condensers, flares, thermal and catalytic oxidizers. NOx controls like selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), flue gas recirculation (FGR), and ultra low-NO_x burners will also be discussed. This course includes a field trip to a local facility to observe controls in-person, and affords an opportunity for students to interact with facility operators. Personal Protective Equipment including hard hat, safety glasses, hearing protection, and closed toed shoes (preferably safety toed) will be required.

PREREQUISITES: CARB 101 – Uniform Air Quality Training Program (UAQTP), or equivalent courses/work experience.

LAST UPDATED: 2010

CARB 333 PERMIT PRACTICES & PROCEDURES I

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND: This course is designed for new permit writers, but it will also be useful for inspectors and other enforcement personnel who must read and interpret permit conditions and perform inspections of permitted sources. Rule writers and planners will benefit as well. This course is intended for personnel of State and Local agencies who have some experience in permit programs.

LEARNING OBJECTIVES:

- Identification of the components of permits,
- Federal, state and local permitting authority,
- Description of the characteristics of effective permitting agencies,
- The permit application and review process,
- The bases for various types of permit conditions, and
- Discussion of procedures and approaches involved in writing permit documents.

COURSE DESCRIPTION:

This course is a 2 1/2-Day Lecture Course providing hands-on training in the methods and procedures used to review permit applications and to prepare air quality permits. This course provides an overview of the methods and procedures used to prepare air quality permits. The course is intended for personnel of State and Local permitting agencies who are relatively new to permit programs. This course is taught at an introductory level, and is intended to be followed by CARB 334 –Permit Practices and Procedures II. The course is primarily a lecture course.

Course material will address state and local permits, as well as Title V federal operating permits. Other topics covered will include Compliance Assurance Monitoring; Monitoring, Reporting, and Record-keeping requirements; and toxic air contaminant issues associated with permitting.

PREREQUISITES*:* Engineering/scientific degree or successful completion of any fundamentals of air pollution course and 6 months of general air pollution experience, or equivalent courses/work experience.

LAST UPDATED:

CARB 334 PERMIT WRITING II

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:

This course is designed for semi-experienced stationary source permit engineers, inspectors, regulatory agency staff, and environmental specialists in government

LEARNING OBJECTIVES:

Those completing this course will gain an understanding of the information associated with permit writing. The following topics will be covered in this course:

- Review of permitting
  - Definition
  - Types
  - Authority
  - Process
  - Contents
  - State permits
  - SIP authorized state and local preconstruction review
  - Delegated federal programs
  - Title V
  - Public involvement
- New Source Performance Standards
- National Emission Standards for Hazardous Air Pollutants
- Toxics Issues

COURSE DESCRIPTION:

This course provides hands-on training in the methods and procedures used to review permit applications and to prepare air quality permits. This course is designed for personnel of State and local agencies that have some experience in permit programs. The course is designed primarily for permit writers, but inspectors who must read and interpret permit conditions and make site inspections will benefit as well.

Course material will address state and local permits, as well as Title V federal operating permits. Other topics covered will include Compliance Assurance Monitoring; Monitoring, Reporting, and Record-keeping requirements; and toxic air contaminant issues associated with permitting.

PREREQUISITES: Successful completion of any fundamental air pollution permitting course such as CARB 333 – Effective Permit Writing I, and 12 months of air pollution experience in a state or local air pollution permitting program, or equivalent courses/work experience.

LAST UPDATED: 2008

CARB 335 PRINCIPLES OF ENVIRONMENTAL COMPLIANCE & ENFORCEMENT

CLASS LENGTH: 3 days

CEUs: The entire series must be completed for a certificate of completion to be issued.

CLASS FORMAT: Classroom

WHO SHOULD ATTEND: New, entry-level stationary source inspectors, regulatory agency staff, and environmental specialists in business and government.

LEARNING OBJECTIVES:

Those completing this course will gain a basic understanding of the general information associated with to air pollution control and enforcement. The following topics will be covered in this course:

- Developing a framework for designing effective compliance strategies
- Understand different concepts and principles of environmental compliance and enforcement

COURSE DESCRIPTION:

This intensive a 3-day course providing a framework for designing effective compliance strategies and enforcement programs.

The course defines the terms compliance and enforcement, introduces basic principles, and explores different approaches for implementing each element of the framework. The instructors who guide participants through the concepts and principles of environmental compliance and enforcement deliver the course through a series of exercises. Participants, through a "case study" will take part in a negotiation session to resolve a violation of environmental requirements that mimics a real-life enforcement situation.

This course is designed for a student that seeks to understand the complete compliance process including enforcement. The student should come away with the knowledge and skills necessary to become a productive member of a compliance team. The two and one-half day course will focus on the enforcement case process used by US local, state and federal environmental agencies- primarily the administrative and civil judicial processes. Topics include targeting, collecting data that is necessary for case development, determining compliance status, selecting the appropriate enforcement option, penalties, negotiation, and case resolution follow-up. The course discusses all violation resolution options including informal actions, formal notices, administrative orders and administrative consent orders, civil litigation settlement, and case litigation. The importance of proper documentation and adherence to procedures will be emphasized. The course includes a combination of lectures, exercises, and role-playing. A manual is included with the course.

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PREREQUISITES: None

LAST UPDATED: 2010

CARB 345 ENFORCEMENT CASE DEVELOPMENT AND RESOLUTION

CLASS LENGTH: 3 days **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:
This course is designed for new, entry-level stationary source inspectors, regulatory agency staff, and environmental specialists in business and government.

LEARNING OBJECTIVES:
Those completing this course will gain a basic understanding of the general information associated with air pollution control and enforcement. The following topics will be covered in this course:

- Targeting appropriate enforcement option, penalties, negotiation and case resolution follow-up
- Understand different violation resolution options
- Understand the procedure and documentation of the Enforcement and Compliance process

COURSE DESCRIPTION:

This course is designed for a student that seeks to understand the complete compliance assessment process including enforcement. The student should come away with the knowledge and skills necessary to become a productive member of a compliance team. The two and one-half day course will focus on the enforcement case process used by US local, state, and federal environmental agencies primarily the administrative and civil judicial processes.

Topics include targeting the appropriate enforcement option, penalties, negotiation, and case resolution follow-up. The course discusses violation resolution options, including informal action, formal notices, administrative orders and administrative consent orders, civil litigation settlement and case litigation. The importance of proper documentation and adherence to procedure will be emphasized. The course includes a combination of lectures, exercises, and role-playing.

PREREQUISITES: None

LAST UPDATED: 2010

CARB 350 BASIC INSPECTOR TRAINING

CLASS LENGTH: **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:
This introductory course is designed for new federal, state, local, and tribal environmental inspectors, and meets the training requirement under EPA Order 3500.1.

LEARNING OBJECTIVES:
Those completing this course will have an understanding of the compliance assessment practices that are employed for evaluating air emission sources. The individual will gain an understanding of the following inspector tasks:

- Permit condtion compliance documentation and evidence gathering
- Role of the field inspector
- Complaints handling and other inspection investigations
- Inspection of air pollution sources

COURSE DESCRIPTION:

The course provides an overview of the aspects of inspection preparation, the procedures for conducting an inspection, and follow-up tasks that must be completed after conducting an inspection. Proper procedures are covered for investigating an air pollution complaint, conducting an inspection, and gathering evidence of an emission source compliance. The course also introduces various federal environmental laws and regulations to individuals that are new to environmental compliance programs.

PREREQUISITES: None

LAST UPDATED: 2010

CARB 355 ADVANCED INSPECTOR TRAINING

CLASS LENGTH: 3 days **CEUs:** **CLASS FORMAT:** Classroom

WHO SHOULD ATTEND:
The Advanced Inspector Training Course focuses on issues and techniques for the more senior inspector to help enhance and improve their inspection techniques and results.

LEARNING OBJECTIVES:
Those completing this course will have a throrough understanding of the compliance assessment practices that are employed for evaluating air emission sources. After completion of this class, the individual should be able to indepedently complete the following inspector tasks:

- Permit condtion compliance documentation and evidence gathering
- Complete site inspections with appropriate documentation
- Complaints handling and other inspection investigations
- Inspection of air pollution sources

COURSE DESCRIPTION:

This course does not focus on any specific media but covers subjects applicable to inspections in all media. The course is intended to provide additional tools to obtain information before, during and after an inspection. The course will present "best practices" for conducting inspections and give the students an opportunity to discuss how these "best practices" apply or not to their own inspections. Each class will have the opportunity to discuss and evaluate specific issues or areas of interest to them.

Course Delivery

The course includes lectures, discussions, exercises, and role playing. Day one is mainly lecture and discussion with some minor role-play. Day two includes lectures and discussion and ends with a major inspection exercise to allow the student to apply the previous lessons.. Day 3 is a review of the exercise followed by additional lecture and discussion on the criminal investigation program and the most advanced inspection techniques.

PREREQUISITES: None

LAST UPDATED: 2010