United States
Environmental Protection
Agency

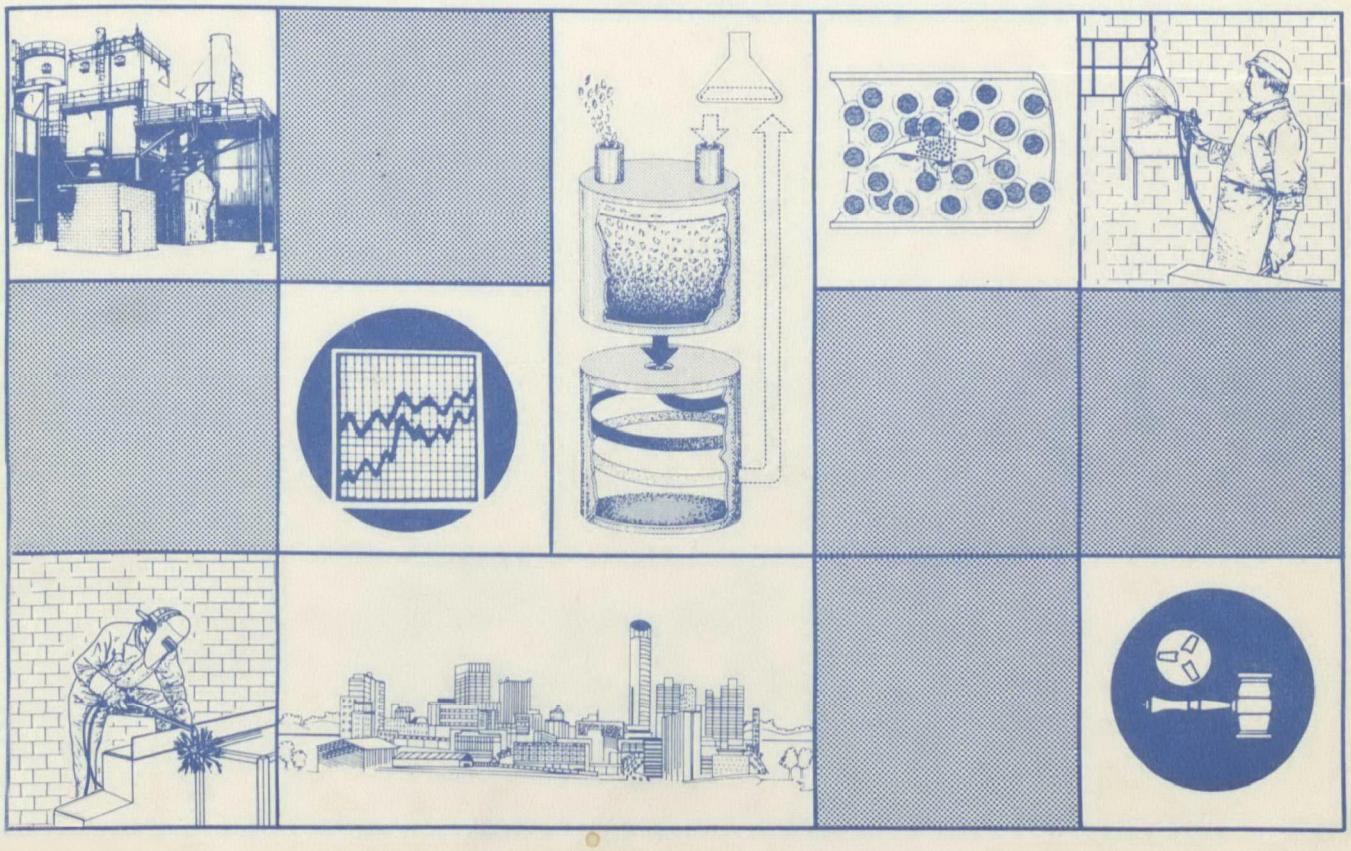
Air Pollution Training Institute
MD 17
Environmental Research Center
Research Triangle Park, NC 27711

Air

EPA

Chronological Schedule of Air Pollution Training Courses

October 1985 through September 1986



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Telephone Contacts

Please contact the following individuals if you need information or assistance in the indicated areas:

Betsy Dodson, Registrar—for information on course registration and other student information.
Phone: Commercial—(919)541-2497
FTS—629-2497

Charles Pratt, Senior Environmental Scientist—assistance with self-study courses and inquiries about technical content of courses and course materials.

Leo Stander, Program Officer for University Activities—information on air pollution training grants, graduate traineeships and fellowships.

Ronnie Townsend, Chief, Manpower and Technical Information Branch—inquiries regarding training needs, special training courses, or overall program operation.

Phone numbers for the above three individuals:
Commercial—(919)541-2401 or 2402
FTS—629-2401 or 2402

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Introduction

The Air Pollution Training Institute

The Air Pollution Training Institute (APTI), with its associated programs, offers the widest scope of air pollution training in the United States. Funded by the U.S. Environmental Protection Agency, APTI develops instructional material for and provides technical assistance to training activities conducted in support of the nation's regulatory programs of air pollution abatement.

EPA-sponsored lecture and laboratory courses using APTI materials are scheduled at several locations across the country. Self-instructional courses providing opportunity for individual training at home or in place of employment are obtainable from APTI. Training material is continually updated, and individual courses undergo periodic major revision.

Area Training Centers

Associated with the APTI in the conduct of air pollution training are seven universities which, with financial support from EPA, serve as Area Training Centers (ATCs). The ATC role is dual: the Centers provide EPA-financed student support for graduate training in air pollution control science/technology, and they provide EPA-sponsored intensive instruction (short courses) in the same subject area.

EPA financial support for graduate study is provided to individuals employed in State/local air pollution control agencies or to individuals interested in pursuing careers in air pollution abatement in such agencies. Support provided through the ATCs is by traineeship appointment, and is conditional; i.e., money is loaned but the loan is forgivable for subsequent service in a non-Federal governmental air pollution agency. Traineeships provide money for tuition/fees and for living expenses. Individual ATCs should be contacted for details on application procedure.

ATCs also conduct scheduled APTI courses on their home campuses or other locations. These courses, using APTI student and instructor materials, are taught by ATC personnel, augmented by specialists from industry and government.

Management and Operation

Activity of APTI and the ATCs is conducted under the technical direction of the Manpower and Technical Information Branch (MTIB), Control Programs Development Division, Office of Air Quality Planning and Standards. Most APTI course materials are developed by Northrop Services, Inc. under contract with EPA.

Area Training Centers operate under grant agreements. Unless otherwise noted, ATCs will conduct all regularly scheduled EPA-sponsored air pollution courses for FY 1986.

ATC-taught courses are identified on the FY 1986 course schedule. Registration for all ATC courses is processed by the Air Pollution Training Institute (see Registration section). The Area Training Centers and their directors are:

1. **Rutgers, The State University**
   Cook College
   Raymond M. Manganelli
   Department of Environmental Science
   P.O. Box 231
   New Brunswick, NJ 08903
   (Coml. & FTS) 201-932-9860/9253

2. **University of Florida**
   Dale A. Lundgren
   Department of Environmental Engineering Sciences
   Gainesville, Florida 32611
   (Coml. & FTS) 904-392-0834/0846

3. **University of Cincinnati**
   Timothy C. Keener
   Department of Civil & Environmental Engineering
   Location 71
   Cincinnati, OH 45221
   (Coml. & FTS) 513-475-5721

4. **Illinois Institute of Technology**
   Kenneth E. Noll
   Pritzker Department of Environmental Engineering
   Alumni Hall, Room 102
   3200 South State
   Chicago, IL 60616
   (Coml. & FTS) 312-567-3538

5. **University of Texas-Dallas**
   Jerry R. Crowder
   Department of Environmental Sciences
   P.O. Box 688
   Richardson, TX 75080
   (Coml & FTS) 214-690-2236

6. **Colorado State University**
   Jerry P. Walker
   Department of Industrial Sciences
   Fort Collins, CO 80523
   (Coml. & FTS) 303-491-7240

7. **California Polytechnic State University**
   Harold M. Cota
   Department of Environmental Engineering
   San Luis Obispo, CA 93407
   (Coml. & FTS) 805-546-2559

EPA Regional Offices

EPA Regional Offices may be able to provide technical assistance and information on other air pollution training. For information, please contact the appropriate Regional Office, as listed:

Air Branch
Region I—EPA
John F. Kennedy Federal Bldg.
Boston, MA 02203
(Coml.) 617-223-5134
(FTS) 223-5134

Air Branch
Region II—EPA
Federal Office Bldg.
26 Federal Plaza
New York, NY 10007
(Coml.) 212-264-2517
(FTS) 264-2517

Air Programs & Energy Branch
Region III—EPA
841 Chestnut Bldg.
Philadelphia, PA 19107
(Coml.) 215-597-8175
(FTS) 597-8175

Training Representative
Air, Pesticides, and Toxic Management Div.
Region IV—EPA
345 Courtland Street, NE
Atlanta, GA 30365
(Coml.) 404-881-3286
(FTS) 257-3286

Air Branch
Region V—EPA
230 S. Dearborn Street
Chicago, IL 60604
(Coml.) 312-353-3211
(FTS) 353-3211

Air Branch
Region VI—EPA
1201 Elm Street
Dallas, TX 75270
(Coml.) 214-767-2746
(FTS) 729-2746

Air Branch
Region VII—EPA
726 Minnesota Av.
Kansas City, KS 66101
(Coml.) 913-236-2893
(FTS) 757-2893

Air Programs Branch
Region VIII—EPA
999 18th Street, Suite 1300
Denver, CO 80202
(Coml.) 303-293-1753
(FTS) 564-1753

Air Programs Branch
Region IX—EPA
215 Fremont Street
San Francisco, CA 94105
(Coml.) 415-974-8058
(FTS) 454-8058

Air Programs Branch
Region X—EPA
1200 Sixth Avenue
Seattle, WA 98101
(Coml.) 206-442-4198
(FTS) 399-4198

How to Use this Schedule

This Chronological Schedule contains full information on Institute courses and registration procedures. It is divided into several major sections, including (a) Registration; (b) Lecture and Laboratory Courses; (c) Self-Instructional, Correspondence, and Video-Instruction Courses; (d) 1985-1986 Schedule Air Pollution Training Institute Courses; and (e) Application for Training forms.

In the Registration section you will find application and registration instructions. In the section following are descriptions of lecture and laboratory courses. Self-instructional, correspondence, and video-instruction course descriptions appear in a later section. Finally, a course schedule for Fiscal Year 1986 and Application for Training forms are included at the back of this schedule.

Registration

Applications for Courses

Application for all lecture and laboratory courses must be made on the standard Application for Training form, included at the back of this schedule. You may photocopy the form if you need additional ones.

Please mail your application and fee payment (if applicable—see section on tuition fees), as early as possible. Otherwise you may be denied admission, since many courses fill as much as six months in advance.

Telephone applications are not accepted.

Mail all applications to:

Registrar
Air Pollution Training Institute
Environmental Research Center, MD 17
Research Triangle Park, NC 27711

Approval of Applications

The basic prerequisite for approval of an application is employment in a position with work responsibility involving enforcement of or compliance with regulatory programs for achievement of air quality. Applications are reviewed for enrollment eligibility by APTI staff. Applicants judged to be fully qualified are approved immediately following application review. Applicants considered less than fully qualified, or those whose attendance would make class enrollment exceed established ceilings, are placed on a "wait" list with final decision on acceptance for enrollment deferred until 4 to 6 weeks before the scheduled start date for the course. In general, ceilings are 36 for lecture courses and 24 for laboratory courses.

Confirmation

Written notice of application action (acceptance, wait list, or disapproval) is typically mailed within 10 working days from receipt of your application. Please do not telephone to check on application status unless you have not received notice within the time frame established by this section. Pre-course materials, if any, are mailed to students who have been accepted for enrollment 4 to 6 weeks prior to the course starting date.

Cancellations/Substitutions

If you find that you cannot attend a course for which you are registered, please notify the Registrar as soon as possible. APTI courses often have waiting lists, and your failure to cancel in advance means that another qualified applicant cannot take your place. To receive a refund of fees, you must cancel in writing at least 10 days prior to the course start date.

Substitutions cannot be made except through the normal application and approval procedures.

Fees

Employees of the U.S. Environmental Protection Agency and non-Federal employees of regional, State, and local government agencies are exempt from tuition fees. All other students must pay fees according to the following schedule:

Course length	Lecture course	Laboratory course
3 days	$ 66.00	$105.00
3½ days	$ 77.00	$122.50
4 days	$ 88.00	$140.00
4½ days	$ 99.00	$157.50
5 days	$110.00	$175.00

Applicants employed by commercial firms must send a check or money order payable to the U.S. Environmental Protection Agency with the application form. EPA cannot bill individuals or companies.

Non-EPA Federal employees must send a check or money order with applications, or they may send billing instructions. The former is preferable.

If you are subject to tuition fees, you **must** send payment or billing instructions (as appropriate); otherwise your application will be returned to you without further consideration. No exceptions can be made.

Grading and Certification

Course certificates and Continuing Education Units (CEUs) are awarded only to students who:

- maintain an attendance record considered satisfactory by the Course Director. (Note: Students are expected to attend all scheduled meetings of the class. Course Directors may authorize short term absence for illness or emergency, but if such absence exceeds ½ day over the period of the course, a certificate and CEUs may not be awarded.)
- satisfactorily complete all course assignments.
- receive a satisfactory score on the final examination, normally 70 or above.

The Institute maintains a record of the CEUs awarded to each student and updates this record as additional units are earned in APTI courses.

Travel

Students must make their own travel arrangements. Please note that some courses include half days, which are always the last days (e.g., a 4½-day course beginning on Monday ends at noon on Friday). Allow ample time between the end of the course and your departure.

Lodging

Students must also make their own lodging arrangements. You will receive local lodging information with your confirmation letter when such information is available.

Lecture and Laboratory Courses

Course Characteristics

The Air Pollution Training Institute conducts both lecture and laboratory courses. Instruction is intensive. Classes are typically held from 8:30 a.m. to 4:30 p.m. each day; students usually have homework problems and reading assignments for the evenings.

Complete course descriptions follow this introduction. The course schedule for FY 1986 appears on page 47.

Course Materials for Registered Students

Students receive full course materials either in pre-course mailings or during the course. These materials include such items as student manuals, workbooks, lab manuals, and handouts, depending on the course.

Availability of Course Materials

Training course materials, while developed primarily for use by the Institute, have proven to be useful as training aids for universities, technical schools, and other training programs.

The Institute encourages these uses of our training materials. However, funding is not available to provide the quantity of manuals needed for such purposes, and the Institute is prohibited from providing them for a fee. For universities and post-secondary educational institutions which offer specific training in air pollution control, a single copy of our training materials may be made available upon written request. Please request materials for specific courses. We cannot fill blanket requests for all materials in our curriculum. We will evaluate each request on its merits and provide materials which we consider suitable. We cannot provide reference or library copies. In many cases copies may be obtained from other public and/or private sources. You may request a list of sources of APTI training materials from the Registrar.

400
Introduction to Air Toxics

3 1/2-day lecture course
2 CEUs

Course Description

The student successfully completing this course should have a basic understanding of the development, implementation and enforcement measures suitable for control of air toxics. This course covers the fundamental concepts of toxicology, ambient monitoring, source assessment, exposure assessment, risk assessment and regulatory issues pertaining to air toxics. This course is intended for professionals entering the toxic air pollution control field and others desiring an overview to air toxics.

Major Topics

- General concepts in toxicology
- Measurements and types of toxic health effects
- Overview of monitoring for air toxics
- Overview to source assessment for air toxics
- Exposure assessment overview
- Risk assessment overview
- Regulatory issues in air toxics
- Case studies in air toxics

Desired Background

Course SI:422 - Air Pollution Control Orientation Course (3rd Ed.).

1985-1986 Offering

December 16-19, 1985 ..... **San Luis Obispo, CA**
January 14-17, 1986 ..... **New Brunswick, NJ**
April 15-18, 1986 ..... **Research Triangle Park, NC**
May 20-23, 1986 ..... **Chicago, IL**

401
Site Specific Source Monitoring and Evaluation for Air Toxics

5-day lecture course
3.5 CEUs

Course Description

This course is designed for first line supervisors and field personnel who will be or are currently performing sampling study designs, sampling, analysis and investigations of sites with potential air toxics problems. This course emphasizes the methods and procedures currently being used in the field. Case studies feature lagoon emissions, hazardous waste site evaluation and a source receptor evaluation for a chemical manufacturing facility.

Major Topics

- Regulatory programs
- Monitoring program development for air toxics
- Sampling and analysis techniques specifically for air toxics
- Modeling - Applicable procedures and processes
- Quality assurance/quality control
- Case studies

Desired Background

Successful completion of courses 400, 435, and SI:422 (3rd Ed.) or equivalent experience is required.

1985-1986 Offerings

October 21-25, 1985 ..... **Research Triangle Park, NC**
March 17-21, 1986 ..... **New Brunswick, NJ**
July 21-25, 1986 ..... **San Luis Obispo, CA**

411
Air Pollution Dispersion Models—Fundamental Concepts

4½-day lecture course
3 CEUs

Course Description

The student successfully completing this course will comprehend the role of meteorology in the transport and dispersion of airborne pollutants. Students will be able to identify types and sources of meteorological data, assemble such data needed for air quality impact analysis and will understand the limitations that meteorology as a science imposes on the accuracy of pollution dispersion estimates. With case study and problem solving exercises, students address selected basic problems in air quality impact analysis such as meteorological instrument siting to obtain representative observations, industrial plant siting to minimize the impact of pollutant discharge on receptors, calculation of continuous-release pollutant concentrations, calculation of plume rise, etc.

A scientific calculator is required for class exercises.

Major Topics

- Atmospheric structure and motion (fundamentals review)
- Statistical method in air quality impact analysis
- Meteorological measurements, instruments and instrument siting
- Meteorological observations and forecasts
- Climatology
- Atmospheric stability and turbulence
- Plume rise
- Dispersion models: point source, line source and area source
- Industrial plant siting

Desired Background

Completion of APTI Course SI:409; skill in operational use of mathematics to the level acquired by successful completion of freshman undergraduate courses in algebra.

1985-1986 Offering

February 3-7, 1986 ..... Louisville, KY

413
Control of Particulate Emissions

4-day lecture course
3 CEUs

Course Description

Students successfully completing this course will be able to evaluate systems typically employed for controlling particulate emissions including installation inspections and permit applications. Installation inspection, typically associated with an emission standard violation, is for the purpose of determining need for regulatory action; permit review is for the purpose of deciding whether a proposed particulate control system, when operating as it is supposed to, will meet regulatory standards. Students will acquire: (1) knowledge of the types of devices available for

particulate control; (2) an understanding of how the devices work and of the influences on control efficiency; (3) ability to perform the calculations necessary to determine control efficiency; and (4) ability to select and size a particulate pollutant control device.

A scientific calculator is required for class exercises.

Major Topics

- Particulate pollutant control equipment (cyclones, scrubbers, fabric filters, electrostatic precipitators). For each of the foregoing:
  principles of operation, design influences, mechanical designs, efficiency considerations, installation factors, typical applications, capital and operating costs
- Particle dynamics
- Particle sizing

Desired Background

Engineering or scientific degree

1985-1986 Offerings

May 13-16, 1986 ..... Denver, CO
June 3-6, 1986 ..... New Brunswick, NJ

415
Control of Gaseous Emissions

4-day lecture course
3 CEUs

Course Description

Students successfully completing this course will be able to evaluate systems typically employed for controlling emissions of gaseous pollutants including systems operation and review of permit applications. Evaluation may be associated with inspection or for judging whether a planned system will meet regulatory standards. A primary focus of the course is on calculations which are needed to check system design. The course develops understanding of the process factors which guide selection of control devices for various abatement requirements and develops ability to select and size a gaseous pollutant control device.

A scientific calculator is required for class exercises.

Major Topics

- Basic concepts of gases (review)
- Gaseous pollutant control processes: (condensation, combustion, absorption, adsorption). For each of the foregoing:
  principles of operation, design influences, mechanical designs, installation considerations and features, typical applications, capital and operating costs
- Gas flow design including fan laws
- Flue-gas desulfurization
- NO_x control

Desired Background

Engineering or scientific degree

1985-1986 Offerings

May 19-22, 1986 ..... Atlanta, GA

420
Air Pollution Microscopy

4½-day laboratory course
3 CEUs

Course Description
This course is designed for chemists, engineers, technicians, and others responsible for the collection and identification of airborne particulate matter and the identification, through optical microscopic techniques, of particles in the 0.5 to 100 micrometer size range. Course material is designed to give the student knowledge of the effective use of the polarizing microscope as an aid in this identification process. Sample collection and handling, physical optics, illumination, particle morphology, and analytical microscopy are discussed.

Major Topics
LECTURE
- The polarized light microscope
- Particle morphology
- Crystal optics—refractive index, birefringence, retardation, dispersion staining
- Micrometry and particle sizing

LECTURE/LABORATORY
- Sample collection and mounting of atmospheric particles
- Photomicrography of atmospheric particles
- Using the polarizing microscope effectively

LABORATORY
- Determination of refractive index of airborne particles
- Particle morphology
- Preparation of a dispersion staining curve
- Identification of particles by dispersion staining
- Sizing of atmospheric particles by optical micrometry
- Examination of airborne particles

1985-1986 Offering
December 9-13, 1985 ..... **Gainesville, FL**

423
Air Pollution Dispersion Models—Application

4½-day lecture course
3 CEUs

Course Description
Students successfully completing this course will be able to select dispersion models appropriate to particular problems in air quality impact analysis, will be able to guide application of the models, judge validity of the answers, and apply some of the more basic models. Students will become familiar with selected theories of dispersion as employed in current modeling practice

(UNAMAP) and with the application of plume rise and dispersion formulas to actual situations. Students will review the accuracy of calculations based on Pasquill's method and will apply the concepts employed in selected dispersion models for point, area, and line sources. Case studies will be a part of the course.

A scientific calculator is required for class exercises.

Major Topics

- Basic dispersion factors, data sources, and representation
- Briggs' plume rise equation
- Atmospheric dispersion factors in application of Gaussian theory
- Use of climatological data
- EPA guidelines on air quality models and UNAMAP series
- Single source modeling
- Topographical and pollutant-type influences in physical modeling
- Cooling tower plume dispersion
- Introduction to receptor modeling

Desired Background

Completion of APTI Courses SI:409, 411, and SI:410; skill in operational use of mathematics to the level acquired by successful completion of freshman undergraduate courses in algebra.

1985-1986 Offerings

No regularly scheduled courses in FY 86.

426

Statistical Evaluation Methods for Air Pollution Data

4½-day lecture course
3 CEUs

Course Description

This course is designed for professionals responsible for the collection, analysis, and interpretation of air quality data. It is intended to provide the student with an understanding of the statistical concepts and procedures needed for the detailed analysis of air pollution data. All topics are illustrated with examples based on air quality data. Students are given in-class exercises to promote a working knowledge of the procedures being discussed.

A calculator with a square root function is required for the class exercises.

Major Topics

- Aspects of the analysis of air quality data
- Nonparametric procedures
- Principles of the analysis of variance
- Principles of regression analysis
- Model fitting: multiple regression techniques
- Assumptions, advantages, and disadvantages of the various procedures

Desired Background

Certificate of completion of SI:473. A working knowledge of one- and two-sample estimation and hypothesis-testing procedures involving the normal and t-distributions is necessary to follow

the course presentation. Students with prior training or experience in statistics who do not wish to take course SI:473 may request a special exam from the Registrar; satisfactory performance on the exam will meet the course prerequisites.

1985-1986 Offering

March 24-28, 1986 ..... Cincinnati, OH

427
Combustion Evaluation

4½-day lecture course
3 CEUs

Course Description

The student successfully completing this course will understand combustion principles and the more significant design influences on achievement of combustion efficiency. In application of this understanding students will be able to evaluate combustion system design as typically contained in permit applications. Evaluation is for the purpose of judging whether a proposed design will meet regulatory standards. Students will also, in conduct of regulatory-type inspections, be able to recognize sub-optimal performance in combustion system component operations. To help develop these skills the course emphasizes problem sessions in which students make the basic chemical/thermodynamic calculations involved in checking design.

A scientific calculator is required for class exercises.

Major Topics

- Combustion fundamentals
- Burning of fossil fuels (coal, oil, and natural gas)
- Municipal incineration and the burning of solid wastes
- Catalytic incineration
- NO_x and SO_2 control

Desired Background

Engineering or scientific degree

1985-1986 Offering

July 21-25, 1986 ..... Chicago, IL

435
Atmospheric Sampling

4½-day laboratory course
3 CEUs

Course Description

The student successfully completing this course will understand the basis for selection of sampling methods and instruments appropriate to various sampling needs. The student will be able to calibrate and operate certain air sampling devices and will gain knowledge of factors affecting sample collection efficiency. Topics which are 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 calculator is necessary for class exercises.

Major Topics

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 assuring quality in atmospheric sampling

PARTICULATE LABORATORY
- High volume sampler and orifice calibration
- Reference flow device performance audit
- Use of constant flow controllers

FLOW LABORATORY
- Calibration of flow devices including wet test meters, limiting orifices, rotameters, and mass flow meters

CONTROLLED TEST ATMOSPHERE LABORATORY
- Preparation of dynamic calibration gas via a dilution system
- Preparation of dynamic calibration gas via a permeation system coupled with a dilution system
- Calibration of continuous monitors using these calibration gases

Desired Background

Skill in operational use of mathematics to the level acquired by successful completion of freshman undergraduate courses in algebra.

1985-1986 Offering

July 7-11, 1986 ..... New Brunswick, NJ

444
Air Pollution Field Enforcement

3½-day lecture course
2 CEUs

Course Description

The student successfully completing this course will be able to follow legally proper and effective procedure in investigating an air pollution complaint, conducting an inspection, gathering evidence of an emission violation, presenting that evidence effectively in formal hearings or court sessions and, finally, to handle complaints in all the steps involved in a way that generates public acceptance and support of agency programs. The course provides an overview of the statutory and regulatory base that governs enforcement actions and the types of enforcement systems that may be employed. Case study method is a part of the instruction with attention to specific problems.

Major Topics

- Common and statutory law as related to air pollution control
- The Clean Air Act
- The role of the field inspector
- Handling public complaints on air quality
- Inspection of air pollution sources
- Gathering evidence
- Hearing boards
- Courtroom procedures
- The expert witness

Desired Background

Course SI:422—*Air Pollution Control Orientation Course* (3rd ed.) or have a minimum of six months of applicable work experience.

1985-1986 Offerings

No regularly scheduled courses in FY 1986

445
Baseline Source Inspection Techniques

3½-day lecture course
2 CEUs

Course Description

This advanced course in air pollution control equipment inspection and problem diagnosis is designed for agency inspectors and control system operating personnel.

This course presents discussions on the Baseline Techniques for equipment inspection and evaluation. These techniques utilize site specific information to facilitate the identification of shifts in significant operating variables.

The techniques presented in the course will be useful in diagnosing complex control system operating problems which are often due to a combination of factors. It will also be helpful in the early identification of problems, before excess emissions or serious equipment damage occurs. Operating problems of a number of control systems will be reviewed to illustrate the Baseline Technique.

Major Topics

- Basic principles of the Baseline Inspection Techniques
- Application to: fabric filters
  - Electrostatic precipitators
  - Mechanical collectors
  - Particulate wet scrubbers
  - Gaseous absorbers
  - Carbon bed adsorbers
  - Incinerators
- Visible emission observation
- Inspection/maintenance safety
- Administrative and legal aspects of plant inspection

Desired Background

Course SI:445, 413, 415 and 427 or equivalent field experience are required.

1985-1986 Offerings

October 1-4, 1985 ..... **Research Triangle Park, NC**
December 10-13, 1985 ..... **Richardson, TX**

446
Inspection Procedures and Safety

2-day lecture course
1-day field exercise
1.5 CEUs

Course Description

This course presents inspection safety procedures for 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 recognition and avoidance of the numerous unique problems and combinations of hazards which can be present around the air pollution control systems. The use of personal protection equipment is discussed. The safety procedures will be illustrated by a one day field exercise. Discussions in this course are limited to air pollution control system inspection and maintenance. This course is intended to supplement general industrial hygiene and safety procedures which should be taken by all personnel engaged in field work.

Major Topics

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

Necessary Equipment and Supplies

Safety shoes and hard hats should be brought by each attendee.

Desired Background

Completion of APTI Courses 452, 413, 415 and 444 or comparable work experience with air pollution control equipment.

1985-1986 Offering

November 13-15, 1985 ..... Research Triangle Park, NC

450
Source Sampling for Particulate Pollutants

4½-day laboratory course
3 CEUs

Course Description

This course develops ability to plan for, guide, evaluate, and (after experience on the job) perform source sampling measurements to determine rates of particulate emissions from stationary sources. The course details and clarifies EPA Reference Methods 1, 2, 3, 4, and 5. The course develops: (1) knowledge of the equipment employed; (2) understanding of why the prescribed methods are established; and (3) ability to perform the calibrations and calculations which are a part of the reference methods. Instruction relies heavily on laboratory exercises where students work with stack sampling equipment. They perform components of the various methods, extract a sample from an actual or simulated stack, and make calculations necessary in sampling procedure and for reporting test results.

Major Topics

- Basic concepts of gases
- EPA Reference Methods 1 through 5, process tasks and basis for tasks requirement
- Source sampling equipment (function and calibration)
- Calculations in source sampling
- Orsat analysis
- Quality assurance and safety in source sampling

Desired Background

Engineering or scientific degree or technician work experience in source sampling.

1985-1986 Offering

May 5-9, 1986 ..... Gainesville, FL

452
Principles and Practice of Air Pollution Control

3½-day lecture course
2 CEUs

Course Description

This entry level classroom course deals with the principles and practice of air pollution control. The course presents a broad view of all major practical aspects of air pollution control. The lessons include information about pollutants, pollutant sources, effects of pollution, dispersion of pollution, legal authority for air pollution control, measurement and control of emissions, enforcement of regulations, inspections, implementation plans, and other related topics.

In the Air Pollution Training Institute curriculum, this is a recommended background course for all areas of study. Students should have a college-level education.

Major Topics

- Legal authority—State, Federal, and local; administrative law, regulation, and the agency
- Field enforcement: the role of the inspector
- Principles of ambient air sampling and analysis
- Criteria pollutants and reference methods for their measurement
- Elements of air quality surveillance networks
- Standards and criteria: the Clean Air Act and State implementation plans
- Legislative and judicial developments related to the Clean Air Act
- Meteorological and topographical factors affecting pollutant dispersion
- Emission regulations
- Source sampling for air pollutants
- Systems for control of pollutant emissions

Desired Background

Course SI:422—*Air Pollution Control Orientation Course* (3rd ed.) or have a minimum of six months of applicable work experience.

1985-1986 Offerings

February 4-7, 1986 ..... **Washington, DC**
March 11-14, 1986 ..... **Richardson, TX**

454
Effective Permit Writing Workshop

3-day workshop
1.5 CEUs

Workshop Description

Students who successfully complete this workshop will have a working knowledge of the permitting requirements for the New Source Review, Prevention of Significant Deterioration and Air Toxics. The regulatory requirements will not be covered in detail but the students will have an opportunity to ask questions on information not covered in the prerequisite SI:454 Course. Emphasis in this workshop will be in reviewing, analyzing and drafting construction and operating permits. A series of case studies will provide practical experience for the attendee.

Major Topics

- Regulatory requirements for major national programs such as NSR, PSD, NSPS, NESHAPS and SIPs
- Definitions
- Special issues such as tall stacks, supplemental control systems, court decisions and ship emissions
- Decision flow charts for permit analysis
- Sources of information needed for permit review and analysis
- Models available
- Effective permit drafting
- Permit tracking systems
- Case studies and calculations

Desired Background

Prerequisites for this course are APTI Courses SI:454 and SI:453. Recommended courses include SI:422 (3rd. Ed.) or 452 or equivalent experience.

1985-1986 Offering

January 27-29, 1986 ..... **Denver, CO**

5-day laboratory course
3.5 CEUs

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, nitrogen dioxide, ozone and carbon monoxide. Quality assurance programs are also introduced. Laboratory procedures and principles taught include the nondispersive infrared method for carbon monoxide; the coulometric, flame photometric, and UV fluorescent methods for sulfur compounds; the chemiluminescent method and UV calibration procedure for ozone; and the chemiluminescent method for nitrogen dioxide. 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 calculator is helpful for laboratory reports.

Major Topics

LABORATORY
- Equivalent methods for SO_2
- Reference method for NO_2
- Reference method for 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, fall time, and linearity

AUDIT SAMPLE
- CO (instrumental)

Desired Background

Successful completion of Course 435 or familiarity with basic laboratory techniques, including preparation and analysis of test atmospheres, calibration and use of common flow-measuring devices, and calculations involving the ideal gas laws.

1985-1986 Offering

No regularly scheduled courses in FY 86.

468
Source Sampling and Analysis of Gaseous Pollutants

4-day laboratory course
3 CEUs

Course Description
This course presents the principles and techniques necessary for gaseous sampling and analysis of source pollutants, as outlined in Reference Methods 6, 7, and 11 of the New Source Performance Standards. In addition, students are given experience in problem solving and application, using EPA Reference Methods 1, 2, 3, and 4. The course is designed around laboratory exercises, which familiarize the student with the analytical procedures for determination of gaseous pollutants. Students perform extraction, recovery, and analysis of various pollutants to determine their concentration. Lectures cover theory and application of gaseous source testing.

A calculator is recommended.

Major Topics
LECTURE
- Measurement and calculation of stack gas velocity, pressure, temperature, and moisture
- Calculation of stack volumetric flow rate
- Orsat analyses of stack gas oxygen, carbon dioxide, and molecular weight
- Sampling and analysis of SO_2, NO_x, and H_2S
- Introduction to continuous source monitoring

LABORATORY
- Reference Methods 1 through 4 (velocity, pressure, temperature, Orsat, and moisture)
- Sampling and analysis of SO_2, NO_x, and H_2S

Desired Background
Engineering or scientific degree or technical work experience in source sampling; successful completion of Course 450 is recommended.

1985-1986 Offering
No regularly scheduled courses in FY 86.

470
Quality Assurance for Air Pollution Measurement Systems

4-day lecture course
3 CEUs

Course Description
The course is designed for quality assurance coordinators or managers, field or laboratory supervisors, and technicians involved with quality assurance activities or responsibilities. Examples of ambient air monitoring activities are used to present the basic quality management principles and techniques applicable to air pollution monitoring systems. A group problem allows the students to apply their knowledge in the development of a comprehensive quality assurance plan for a hypothetical ambient air monitoring project.

A scientific calculator is very helpful for homework problems.

Major Topics

MANAGEMENT
- Basic areas of quality assurance activities
- Elements primarily involved in establishing a QA program
- Group problem—development of QA plan

SYSTEMS
- Document and configuration control
- Preventive maintenance
- Procurement quality control

STATISTICS
- Regression analysis and control charts for calibration data
- Identification and treatment of outliers
- Data validation

MEASUREMENT
- Major elements of the measurement process
- Standards and their availability for calibration
- QA requirements for SLAMS and PSD
- Conducting performance and systems audits
- Interlaboratory performance surveys
- Routine intralaboratory quality control checks
- Quality costs

Desired Background

High school algebra and familiarity with basic statistical concepts. Course SI:473 is recommended but not required.

1985-1986 Offering

December 9-12, 1985 ..... Research Triangle Park, NC

474
Continuous Emission Monitoring

4-day laboratory course
3 CEUs

Course Description

This course is designed for engineers and other technical personnel responsible for the development and implementation of continuous monitoring systems for both gaseous and particulate source emissions. Federal regulations for continuous monitoring, instrumental principles, and problems involved in developing monitoring systems are included in the course presentation. Three afternoons of the course are devoted to laboratory experiments involving the operation and inspection of transmissometers, in-situ gas monitors, extractive spectroscopic systems, and extractive electrochemical systems. This course has been updated to include recent CEM regulations.

A calculator or slide rule is required for class exercises.

Major Topics
- Regulations for continuous source monitoring
- Instrumentation for the continuous monitoring of gases (extractive and in-situ systems)
- Opacity monitoring and transmissometers

- Continuous monitor data evaluation
- Performance specification tests for gas and opacity monitors
- Quality assurance programs—role of the inspector
- Research developments on continuous monitoring systems
- Laboratory sessions—exercises with continuous monitoring instrumentation

Desired Background

Completion of Course 468 or 450; equivalent experience with EPA source test methods may be substituted.

1985-1986 Offering

March 24-27, 1986 ..... Atlanta, GA

480
Control Measures for CO, O_3, and NO_X

3-day workshop
1.5 CEUs

Workshop Description

This entry level classroom workshop presents a view of the major control measures utilized to attain and maintain the National Ambient Air Quality Standards for carbon monoxide, ozone and nitrogen oxides. The lessons include information about these pollutants, their sources and effects, the control activities which are utilized to reduce their concentrations in the atmosphere, measurement techniques, regulatory activities, enforcement techniques, and other related topics.

In the Air Pollution Training Institute Curriculum, this will be a recommended background course for those courses involving mobile sources and control of volatile organic substances. Students should have a college-level education.

Major Topics

- Sources of pollutants - mobile and stationary sources
- Principles of ambient air sampling and analysis
- Standards and criteria, the Clean Air Act and State Implementation Plans
- Control techniques - stationary sources
- Control techniques - mobile sources
- Motor vehicle certification and standards
- Transportation planning
- Dispersion modeling
- Emission regulations
- Legislative and judicial developments related to the Clean Air Act

Desired Background

Successful completion of Course SI:422 - Air Pollution Control Orientation (3rd Ed.), 452 - Principles and Practice of Air Pollution Control, or applicable work experience is recommended.

1985-1986 Offering

April 16-18, 1986 ..... New York, NY

482
Sources and Control of Volatile Organic Air Pollutants

4-day lecture course
3 CEUs

Course Description

The student successfully completing this course will be able to evaluate systems typically employed for the control of volatile organic emissions including systems in operation and as represented in VOC control plans. Evaluation of systems in operation identifies sub-optimal features and is for the purpose of guiding regulatory action. Evaluation of planned systems is for the purpose of determining whether a VOC control plan is likely to meet the control objective it addresses. The course emphasizes calculations needed to check system efficiency. Course content draws heavily from EPA Control Technique Guidelines, and it has been updated to include recent NSPS Regulations.

A scientific calculator is required for class exercises.

Major Topics

- The regulatory frame for VOC control
- Organic chemistry basics
- Impact of VOC emissions on achievement of photochemical oxidant standards
- VOC emissions measuring techniques
- Source categories emitting significant volumes of VOC:
  - Petroleum storage and transport
  - Industrial surface coating
  - Operations involving organic solvents evaporation
  - Asphalt operations
- Common VOC control methods
- Operation and maintenance programs in VOC control

Desired Background

Course SI:422—*Air Pollution Control Orientation Course* (3rd ed.) or have a minimum of six months of applicable work experience.

1985-1986 Offerings

April 28-May 1, 1986 ..... Los Angeles, CA
August 12-15, 1986 ..... Chicago, IL

484
Motor Vehicle Emissions Control - Diagnosis and Repair

5-day laboratory course
3.5 CEUs

Course Description

This course features hands-on laboratory exercises as well as lectures and demonstrations on the diagnosis and repair of motor vehicle emission control systems. The successful student will have a working knowledge of the causes and effects of motor vehicle emission control system failures. Students will understand the relationships among the various control systems, how they work and the appropriate diagnostic procedure for each.

This course requires some experience with motor vehicle engines and electrical systems. It is not an overview or basic course. It is highly recommended for personnel who will be providing mechanics training as part of the State plan to control mobile source emissions.

Major Topics

- Regulations applicable to motor vehicle emissions
- Chemistry of internal combustion
- Types of failures and methods for detection
- Specific diagnostic procedures for hydrocarbon, carbon monoxide and oxides of nitrogen failures
- Laboratory sessions on use of diagnostic equipment, failure identification, carburetor adjustments, and computer system failure

Desired Background

Course 480 and/or experience in inspection and maintenance of motor vehicle emissions control systems.

1985-1986 Offering

April 7-11, 1986 ..... **Fort Collins, CO**

485
Motor Vehicle Emissions Control - Antitampering and Misfueling

3-day laboratory course
1.5 CEUs

Course Description

The purpose of this course is to provide the automotive emissions control inspector the technical background and knowledge necessary to perform tampering and misfueling inspections. Visual and physical techniques for determining compliance status will be presented. Individual control systems will be discussed along with methods of detecting for tampering or component failure.

Major Topics

- Basic engine operations and pollutant formation
- Legislation and regulations related to tampering
- Sources of information on vehicle and service manuals
- Control systems components
- Misfueling test procedures
- Laboratory exercises

Desired Background

Completion of courses 480 and 484 or comparable experience are recommended.

1985-1986 Offering

January 14-16, 1986 ..... **Cincinnati, OH**

486

Motor Vehicle Emissions Control - Quality Assurance for I/M Programs

3-day lecture course
1.5 CEUs

Course Description

This course is designed to present some of the background and technical information used by new inspection and maintenance program auditors in carrying out their duties and responsibilities. Course materials and lectures will provide the students with information typically needed for performing audits including general information about automotive emissions and their controls, technical information on emissions control equipment commonly tampered with, guidelines on tampering inspection procedures, general information on the role of auditors, and general information for conducting a regular inspection station audit.

Major Topics

- Automotive emissions and their controls
- Inspection and maintenance programs
- The need for quality control
- The role of the auditor
- The development and use of regular audit checklists
- Quality control tools and procedures

Desired Background

Successful completion of 480 and 484 or comparable work experience is recommended.

1985-1986 Offering

February 19-21, 1986 ..... **Research Triangle Park, NC**

502
Hazardous Waste Incineration

4-day lecture course
3 CEUs

Course Description

This course offers the student a comprehension review of the theoretical, practical and technical aspects of hazardous waste incineration. This course features lectures on the basic concepts and principles, workbook calculations, case studies and project design for hazardous waste incineration. Emphasis will be on calculations and practical exercises related to design, testing and operation of hazardous waste incineration facilities. A workbook with over 50 application - oriented problems with solutions will be provided along with a comprehensive student manual.

Major Topics

- Legislation, permitting and siting
- Stoichiometric calculations
- Properties of hazardous wastes
- Other hazardous waste treatment options
- Emission calculations
- Air pollution control measures
- Facility design principles and project application
- Specific facilities and case studies, quench units, waste heat boilers, auxiliary equipment, solid waste incinerators, sludge incinerators, liquid waste incinerators, and hazardous waste incinerators.

Desired Background

Successful completion of Course 427 or equivalent education or experience is required. Completion of Courses 413, 415 and SI:422 (3rd Ed.) are highly recommended.

1985-1986 Offering

August 12-15, 1986 ..... **San Luis Obispo, CA**

Self-Instructional, Correspondence, Video-Instruction, and Slide-Tape Courses

The most frequently asked question concerning the self-study courses is "What do they cost?" **No tuition fees** are currently applicable to the self-study courses. They are provided on a loan basis except as outlined below. To apply for one of these courses, send a completed APTI course application. Several blank application forms may be found at the end of this booklet.

APTI, for the second year, has added many new courses to the self-study series of courses. These courses are the most advanced in their subject available from the Institute. A list of currently available and anticipated courses has been provided in the form of a check list for your personal training record.

Self-Instructional (SI) Courses

Self-instructional courses have been developed for individual self-paced learning. They are provided in a format which is best suited for the material being presented and may include written text or audio tape and slide presentations.

Major features:

- Register and begin course at any time
- No prerequisites
- Self-paced
- May require an audio tape cassette player and a 35-mm slide projector
- Certificate of completion awarded for successful completion of course
- Continuing Education Unit credits awarded
- A minimum score of 70 on final test is required to receive a certificate and CEUs
- Training materials must be returned to APTI

Correspondence (CC) Courses

The correspondences courses differ from the short courses and self-instructional courses in several significant ways: they do not require travel or time away from the office or laboratory as with short courses. They do, however, require pre-registration and tests. Materials may be retained by the student.

Major features:

- Register and begin course at any time
- Training materials may be retained by student as reference material
- Final grade based on homework assignments and posttest grade
- Continuing Education Units and certificates of completion awarded
- A minimum score of 70 on final test is required to receive a certificate and CEUs

Video-Instruction (VI) Courses

Video-instruction courses are sets of video tapes covering a specific topic. These tapes are suitable for individualized or group learning exercises. However, because most programs were not designed as instructional units, Continuing Education Units and certificates are not currently awarded for VI courses. Certain courses are offered in SI and VI formats.

Major features:

- Tapes are available to governmental agencies on a loan basis from APTI
- No testing
- No Continuing Education Units or certificates
- Available only on VHS cassettes

Slide-Tape (ST) Courses

Slide-tape presentations and VHS cassettes are being offered. These courses are suitable for group viewing. They were developed to cover topics of wide general interest, where only a general background is required.

Major features:

- Tapes and slides are available on a loan basis
- Student materials may be retained by the student
- Available in automatic or manual slide change formats

Registration in Home Study Courses

Use the standard APTI course applications found at the end of this publication to register for SI, CC, and VI courses. There is no tuition fee.

Availability of Course Materials

Training course materials, while developed primarily for use by the Institute, have proven to be useful as training aids for universities, technical schools and other training programs.

The Institute encourages these uses of our training materials. However, funding is not available to provide the quantity of manuals needed for such purposes, and the Institute is prohibited from providing them for a fee. For universities and post-secondary educational institutions which offer specific training in air pollution control, a single copy of our training materials may be made available upon written request. Please request materials for specific courses. We cannot fill blanket requests for all materials in our curriculum. We will evaluate each request on its merits and provide materials which we consider suitable. We cannot provide reference or library copies. In many cases copies may be obtained from other public and/or private sources. You may request a list of sources of APTI training materials from the Registrar.

Course Listings

Please note that the following course listings are in numerical order, with CC, SI, and VI courses intermixed.

Air Pollution Training Institute
Self-Study Check List

Course no.	Short title	Publish date	Date taken	Grade	Comments
General Courses					
SI:454	Fundamentals of Effective Permit Drafting and Analysis	1986			
SI:422	Orientation Course	1981			
ST:443	Chain of Custody	1983			
SI:448	Vegetation Injury	1976			
SI/ST:453	PSD Regulations	1984			
SI:473	Environmental Statistics	1986*			
Meteorology-Modeling					
SI:406	Stack Height/Plume Rise	1976			
SI:409	Basic Air Pollution Meteorology	1982			
SI:410	Introduction to Dispersion Modeling	1984			
SI:424	Source Receptor Modeling	1986*			
Atmospheric Monitoring					
CC:434	Ambient Monitoring	1984			
CC:436	Site Selection for SO_2 and TSP	1982			
CC:437	Site Selection for Photochemical and CO	1982			
CC:438	Reference and Automated Methods	1984			
CC:471	General Quality Assurance	1984			
VI:472	AEROS System	1979			
VI:475	CDHS-AQDHS-II, EIS/P&R	1979			
Source Monitoring					
CC:414	Quality Assurance	1983			
SI:449	Source Sampling Programs	1984			
ST:476A	Transmissometer O&M	1984			
ST:483A	Measuring Organic Emissions	1984			
Source Control Technology					
SI:445	Introduction to Baseline Source Inspection Techniques	1985			
SI:412A	Baghouse Plan Review	1982			
SI:412B	ESP Plan Review	1984			
SI:412C	Wet Scrubber Plan Review	1984			
SI:412D	Control Equipment Calculations Workbook	1984			
CC:416	Inspection of Degreasers	1982			
CC:417	Controlling VOC Leaks	1982			
SI:428A	Introduction to Boiler Operation	1985			
SI:431	Control Systems	1984			
ST:491	NSPS Series on Surface Coatings	1986*			

*Will be available soon.

SI:406
Effective Stack Height/Plume Rise

10 hours
1 CEU

Course Description

This self-instructional package is designed for air pollution control agency personnel responsible for making or reviewing plume rise estimates for elevated air pollutant sources. The package consists of three exercises. Exercise 1 is made up of a narrated slide series and an APTI article, both entitled "Effective Stack Height." Exercise 2 is made up of the text "Plume Rise" and an audio tape presentation by Dr. Gary A. Briggs, with accompanying lecture notes in the work manual. Exercise 3 contains a summary of Dr. Briggs' latest analyses and the current EPA calculation procedures. Problem sets conclude each exercise. Suggested involvement time is 10 hours.

Major Topics

- Effective stack height by mathematical calculation
- Observations of plume rise through empirical means
- Formulas for estimating plume rise mathematically
- Comparisons of calculated and observed plume behavior
- Critical analyses of plume rise observation by Dr. Briggs
- Estimation of plume rise

SI:409
Basic Air Pollution Meteorology

25 hours
2.5 CEUs

Course Description

This 25-hour self-instructional course uses slide/tape 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.

Major Topics

- 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

SI:410
Introduction to Dispersion Modeling

35 hours
3.5 CEUs

Course Description
This 35-hour self-instructional course uses slide/tape presentations, text materials, and reading assignments as instructional formats. The course presents general concepts of air quality point source models and specific, detailed considerations of individual point source models. Models and their use in determining air pollution ground-level concentrations will be put into proper perspective by examining two case studies.

Major Topics
- Introduction to the regulations requiring model use
- Introduction to air quality point source models
- General characteristics of air quality point source models
- Review of UNAMAP, Version 4 models
- Required model inputs
- Interpreting model output
- Case studies

SI:412A
Baghouse Plan Review

20 hours
2 CEUs

Course Description
This course is designed for engineers and other technical personnel responsible for reviewing plans for installations of fabric filtration air cleaning devices. The course focuses on review procedures for baghouse devices used to reduce particulate air pollution from industrial sources.

Major Topics
- General baghouse description
- Bag cleaning methods
- Fabric selection and filter types
- Design parameters affecting collection efficiency
- Operation and maintenance problems associated with baghouses

SI:412B
Electrostatic Precipitator Plan Review

20 hours
2 CEUs

Course Description
This course is designed for engineers and other technical personnel responsible for reviewing plans for the installation of electrostatic precipitators (ESPs). The course focuses on review procedures for electrostatic precipitators used to reduce particulate emissions from industrial sources.

Major Topics
- General description of ESPs
- Theory of precipitation
- Estimating collection efficiency
- ESP design parameters
- ESP equipment
- Operation and maintenance problems associated with ESPs

SI:412C
Wet Scrubber Plan Review

40 hours
4 CEUs

Course Description
This course is designed for engineers and other technical personnel responsible for reviewing plans for the installation of wet scrubbers. The course focuses on review procedures for wet scrubbers used to reduce particulate and gaseous emissions from industrial sources.

Major Topics
- General description of scrubbers
- Particle collection and absorption theory
- Estimating collection efficiency
- Components
- Use in flue gas desulfurization (FGD)
- Operation and maintenance problems

SI:412D

Problem Workbook for Control of Gaseous and Particulate Emissions

50 hours
5 CEUs

Course Description

This course is designed for engineers and other technical personnel responsible for making and reviewing calculations concerning air pollution control equipment. This self-instructional problems workbook contains three parts: a glossary of common terms with explanations, a units operations section containing the basic principles of chemistry, physics, and thermodynamics which are required in air pollution control equipment calculations, and a problem section with solutions.

Major Topics

- Glossary of engineering and scientific terms
- Basic operations for control equipment calculations
- Problems and solutions
  - Particle size distribution
  - Fluid-particle dynamics
  - Gravity settling
  - ESP
  - Scrubbers
  - Baghouses
  - Combustion
  - Adsorption and absorption
  - Fans
  - Economics

CC:414

Quality Assurance for Source Emission Measurements

35 hours
3.5 CEUs

Course Description

This 35-hour correspondence course covers quality assurance procedures for EPA manual source measurement methods 1 through 8. The course reviews, in detail, essentials of equipment calibration, proper testing methods, proper use of standardized testing forms, and EPA data tolerances.

Major Topics

- Quality assurance principles
- Procurement of apparatus and supplies
- Calibration of apparatus
- Presampling operations
- On-site measurement methods
- Postsampling operations

- Equipment maintenance methods
- Auditing procedures
- Use of data and calculation forms

The following documents are to be used as texts:

- EPA 600/4-77-0276 "Quality Assurance Handbook for Air Pollution Measurement Systems. Volume III—Source Measurements"
- EPA 40 CFR 60 Appendix A

CC:416

Inspection Procedures for Organic Solvent Metal Cleaning (Degreasing) Operations

20 hours
2 CEUs

Course Description

This is a 20-hour correspondence course dealing with inspection procedures for degreasing operations. The course reviews in detail the inspection and VOC source-testing procedures for degreasers.

Major Topics

- EPA policy on RACT regulations for degreasers
- Degreaser description for cold cleaners, open top vapor degreasers, and conveyorized degreasers
- VOC emission points
- Typical emission control methods
- Inspection procedures
- Emission-testing procedures

SI:417

Controlling VOC Emissions from Leaking Process Equipment

20 hours
2 CEUs

Course Description

This course is designed for technical people involved in monitoring industries for VOC emissions from leaking process equipment. The course reviews in detail the sources of fugitive VOC emissions and the procedures and equipment used to detect the leaks.

Major Topics

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

SI:422

Air Pollution Control Orientation Course (3rd Edition)

30 hours
3 CEUs

Course Description

This self-instructional course is intended primarily for new employees in governmental air pollution control agencies. It may also be useful for other persons seeking a general knowledge of the air pollution field. The instructional materials, consisting of audio cassette tapes and printed booklets, provide broad coverage of air pollution and its control. Suggested involvement time is 30 hours.

Major Topics

- Air pollution law
- Air pollutants and their sources
- Effects of air pollution on health and welfare
- Sampling and analysis of air pollutants
- Control techniques for gaseous and particulate pollutants
- Air pollution meteorology
- Standards and regulations
- Enforcement systems
- Air quality management

SI:424

Introduction to Source Receptor Modeling

30 hours
3 CEUs

Course Description

This 30-hour course uses slide/tape presentations and reading assignments to present receptor models and their application to aerosol source apportionment. Receptor models are a group of quantitative source impact assessment techniques that are based on the chemical and physical measurements of the aerosol at the receptor.

Major Topics

- Overview of source apportionment
- Chemical mass balance
- Characteristics of ambient and source aerosols
- Analytical methods of source apportionment
- Multivariate receptor models
- SIP development applications
- Chemical mass balance
- Experimental design

SI:428A
Introduction to Boiler Operation

20 hours
2 CEUs

Course Description
Designed for engineers and other technical persons responsible for inspecting boilers, this course presents an introduction to the operation of boilers. This will be the first in a series of four (or five) courses on inspecting and/or operating different types of boilers—small-package boilers, commercial boilers, industrial boilers, and utility boilers. The series will be designed to use many existing and soon-to-be-published EPA documents. The student completing the first course (*Introduction to Boiler Operation*) may choose any of the remaining courses in the series that are appropriate to his or her background and/or interest.

Major Topics
- Basic components
- Combustion principles
- Efficiency calculations
- Fire-tube and water-tube boilers
- Burning fuel with air
- Accessories
- Air pollution emissions and control techniques

SI:431
Air Pollution Control Systems for Selected Industries

40 hours
4 CEUs

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

Major Topics
- 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 SO_x control

CC:434

Introduction to Ambient Air Monitoring (2nd Edition)

50 hours
5 CEUs

Course Description

This 50-hour correspondence course covers ambient air quality monitoring. It introduces terms used in air monitoring and presents practical information about the monitoring process. Theoretical monitoring concepts are also described.

Major Topics

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

CC:436

Site Selection for Monitoring of SO_2 and TSP in Ambient Air

35 hours
3.5 CEUs

Course Description

This 35-hour correspondence course covers the siting of ambient SO_2 and TSP monitors. The course presents general concepts of ambient monitor site selection and specific, detailed considerations and procedures for selecting SO_2 and TSP ambient monitoring sites.

Major Topics

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

CC:437

Site Selection for Monitoring of Photochemical Pollutants and CO in Ambient Air

35 hours
3.5 CEUs

Course Description

This 35-hour correspondence course covers the siting of ambient monitors for CO, nonmethane hydrocarbons, NO, NO_2, and ozone. The course presents general concepts of ambient monitor site selection and specific, detailed considerations and procedures for selecting CO, nonmethane hydrocarbons, NO, NO_2, and ozone ambient monitoring sites.

Major Topics

- Use of monitoring data and related monitor-siting objectives
- Special considerations associated with the monitoring of CO, nonmethane hydrocarbons, NO, NO_2, and ozone
- Procedures and criteria for site selection for the monitoring of CO, nonmethane hydrocarbons, NO, NO_2, and ozone
- Rationale for siting criteria associated with the monitoring of CO, nonmethane hydrocarbons, NO, NO_2, and ozone
- Network design and probe-siting criteria for CO, NO_2, and ozone SLAMS, NAMS, and PSD monitoring stations

CC:438

Reference and Automated Equivalent Measurement Methods for Ambient Air Monitoring

30 hours
3 CEUs

Course Description

This correspondence course covers in detail EPA-designated reference and equivalent measurement methods for ambient air quality monitoring. Automated nonmethane organic compound analyzers are also discussed.

Major Topics

- Reference and automated equivalent measurement methods for sulfur dioxide
- Reference measurement methods for ozone
- Reference measurement method for total suspended particulate matter
- Reference measurement methods for carbon monoxide
- Reference measurement methods for nitrogen dioxide
- Reference measurement method for lead
- Automated analyzers for nonmethane organic compounds

ST:443

Chain-of-Custody Procedures for Samples and Data

1.5 hours
No CEUs

Course Description

This two part slide/tape presentation covers proper procedures for documenting the possession or custody of samples and data. Part A defines chain of custody, presents a rationale for maintaining proper chain-of-custody documentation, and delineates correct chain-of-custody procedures for both samples and data. Part B presents a model chain-of-custody procedure for a hypothetical measurement project in which manual sampling takes place at one location and the samples are analyzed at another. You will see the entire procedure, from preliminary operations through preparation and storage of the final data.

SI:445

Introduction to Baseline Source Inspection Techniques

88 hours
8.8 CEUs

Course Description

This course was designed for the air pollution field inspector and industrial air pollution control equipment operators. It covers the basics of the baseline inspection techniques for air pollution control equipment. This technique is based on the use of site specific data to evaluate shifts in operating conditions. Most major types of air pollution control devices and auxiliary systems are covered.

Inspection procedures, data collection, data recording and interpretation are explained. Review problems and questions are presented.

Major Topics

- Fundamentals of the baseline source inspection technique
- Inspection and evaluation of fabric filters
- Inspection and evaluation of electrostatic precipitators
- Inspection and evaluation of wet scrubbers
- Inspection and evaluation of carbon bed adsorbers
- Inspection and evaluation of incinerators
- Visible emissions evaluation
- Inspection safety
- Use of portable instruments
- Administrative and legal aspects of plant inspection

SI:448

Diagnosing Vegetation Injury Caused by Air Pollution

30 hours
3 CEUs

Course Description

This self-instructional course provides basic training in procedures helpful in identifying and verifying injury to plants caused by air pollutants. Types of vegetation known to be sensitive to certain pollutants and the means of identifying or excluding alternative pollutant symptoms are covered. This course consists of 35-mm slides, booklets, audio cassette tapes, and quizzes with answers at the end of each unit.

Major Topics

- Glossary of relevant terms
- Introduction to diagnosis of air pollution damage to vegetation
- Structure and function of plants in relation to air pollution injury
- Injury by photochemical oxidants, sulfur dioxide, and fluorides
- Injury by less common pollutants
- Interactions between pollutants and between pollutants and pathogens
- Mimicking symptoms
- Meteorology and air pollution injury to vegetation
- Diagnosis of suspected air pollution injury to vegetation

Note: The EPA handbook, "Diagnosing Vegetation Injury Caused by Air Pollution," is a useful companion for this course and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. GPO stock number 005-003-000882. Price is $8.75/copy. (Price subject to change).

SI:449

Source Sampling Programs for Programmable Calculators—EPA Reference Methods 2 through 5

15 hours
1.5 CEUs

Course Description

This course provides examples of source sampling calculator programs developed for the Texas Instruments TI-59 calculator. The course presents program listings, instructions for using the programs, and example problems. Two types of programs are presented—one for field calculations, the other for report calculations. The programs are intended to serve as guides for developing the user's own programs, but they can be used "as is" in sampling studies conducted for stationary sources. Additional programs for other hand-held programmable calculators and microcomputers may be developed in the future.

SI:453
Overview of PSD Regulations

15 hours
1.5 CEUs

Course Description
This 15-hour self-instructional course will provide you with a comprehensive overview of regulations governing the prevention of significant deterioration (PSD) of air quality. You will have an opportunity to view five slide/tape presentations and six flipbook/tape presentations covering applicability determination, best available control technology (BACT) analysis, air quality analysis, additional impacts analysis, and agency review. We have also included, for your reference, a copy of the *Workshop Manual* used in the Environmental Protection Agency's 1980 PSD workshops, a copy of Title I, Part C of the Clean Air Act (as amended August 1977), and the EPA PSD regulations as of July 1981.

SI:454
Fundaments of Effective Permit Drafting and Analysis

40 hours
4 CEUs

Course Description
This 40-hour course provides information on the major national air pollution source permitting programs. It was designed to provide technical training in methods of effective and efficient review, analysis and drafting of construction and operating permits. While the course is intended for personnel involved in permit operations it will be useful for inspection personnel who must review sources for compliance with one or more permits.

Major Topics
- Introduction to major permitting programs
- Methods of analysis
- Fundamentals of permit drafting
- Charts for tracking permit decisions
- Case studies and solutions to typical permit drafting problems

CC:471
General Quality Assurance Considerations for Ambient Air Monitoring

30 hours
3 CEUs

Course Description
This correspondence course presents general quality assurance considerations for ambient air monitoring.

Major Topics
- Quality assurance policy and principles
- Quality assurance for air quality monitoring systems

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

VI:472

Aerometric and Emissions Reporting System (AEROS)

No CEUs

Course Description

This course consists of 14 videotapes covering various aspects of the EPA AEROS air quality and emissions data handling systems. These include NEDS, SAROAD, HATREMS, SOTDAT, SIPS, EHIS, WSAP, SIEFA, CAASE, and REPS. The purpose of these tapes is to train personnel in the capabilities and uses of the systems, especially in the storage and retrieval of emissions and air quality data. Some of these tapes are also intended to train State and local agency personnel in data coding and input. New tapes may be added, or existing tapes revised, from time to time.

Tapes Currently Available

- Introduction to NEDS (1 tape, 41 minutes)
- Emission Inventories Training Program (1 tape, 42 minutes)
- NEDS SCC and Emission Factor Update (1 tape, 14 minutes)
- AEROS Edit: Recordkeeping and Analysis (1 tape, 12 minutes)
- Computer Software Documentation Standards (1 tape, 28 minutes)
- Coding NEDS Forms for Selected Industries (5 tapes, 3 hours)
- Coding NEDS Forms for Area Sources (4 tapes, 2¼ hours)

SI:473

Introduction to Environmental Statistics

70 hours
7 CEUs

Course Description

This self-instructional package introduces the basic concepts of statistical analysis. It was designed for students with little formal education in statistics who must apply statistical techniques to analysis of environmental data. It also serves as a review and prerequisite for the advanced Course 426 *Statistical Evaluation Methods for Air Pollution Data.* The package is in seven modules and includes workbook, 35-mm slides, and audio cassette tapes.

Major Topics

- Descriptive statistics
- Hypothesis testing
- One and two sample t-tests of significant differences
- Analysis of variance
- Chi square techniques for tests of homogeneity of data sets

- Decision flow chart
- Quality control charts
- Guide to statistical problem solving

Desired Background
College-level training in mathematics

VI:475
Comprehensive Data Handling System (CDHS—AQDHS-II, EIS/P&R)

No CEUs

Course Description
The course consists of 12 videotapes, covering various aspects of the EPA-developed, State-installed air quality and emissions data handling systems. Viewing time is approximately twelve hours. The purpose of these tapes is to train State and local governmental air pollution control personnel in the operation and software maintenance of these computerized automatic data handling systems. New tapes may be added, or existing tapes revised, from time to time.

The publication, "Air Quality Data Handling System (AQDHS-II) Test Run Series Documentation" (EPA 450/4-79-010) is sent with the tapes. The student may also wish to acquire "The Air Quality Data Handling System User's Guide" (EPA 450/4-79-009); however, the Institute does not distribute this publication.

Desired Background
Familiarity with EPA emissions and air quality data systems and a working knowledge of electronic data storage and retrieval.

SI:476A
Transmissometer Systems—Operation and Maintenance

30 hours
3 CEUs

Course Description
This course is an advanced self-instructional study program designed to develop a working knowledge of transmissometer systems. It presents the detailed operating characteristics of commercially available transmissometers and the common maintenance techniques used to provide for continuing operation. A comprehensive discussion of regulatory specifications in terms of instrument design, installation, and performance testing addresses both existing regulatory programs and the implications of pending specifications.

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

SI:483A

Measuring the Emission of Organic Compounds to the Atmosphere

30 hours
3 CEUs

Course Description

This course is an advanced self-instructional study program designed to develop comprehensive knowledge in source measurement for volatile organic air pollutants. It presents a review of regulations affecting the emissions of organic compounds from industrial sources, a review of organic chemistry principles, and a review of gas chromatography used for organic analysis, and detailed discussions of EPA sampling and analysis techniques for organic compounds. Part I of SI:483A covers review material. Part II covers the individual EPA methods.

ST:491

New Source Performance Standards: Surface Coating Operations

2.5 hours
No CEUs

Course Description

This series of three slide-tape programs and one study guide will familiarize you with surface coating operations and the applicable New Source Performance Standards. Topics covered include typical processes, VOC emissions and control techniques, standards of performance, and performance tests.

Titles in the series are:

- ST:491A Coil Coating
- ST:491B Metal Furniture
- ST:491C Large Appliances
- SI:491D Calculations for Selected Coating Operations

U.S. Environmental Protection Agency
Air Pollution Training Institute

1985-86 Chronological Schedule of Air Pollution Training Institute Courses

Dates	Course	Course Title	Days	Location	ATC
October 1985					
Oct. 1-4	445	Baseline Source Inspection Techniques	3 1 2	Research Triangle Park, NC	**
Oct. 21-25	401	Site Specific Monitoring	5	Research Triangle Park, NC	**
November 1985					
Nov. 13-15	446	Inspection Procedures and Safety	3	Research Triangle Park, NC	**
December 1985					
Dec. 9-12	470	Quality Assurance for Air Pollution Measurement Systems	4	Research Triangle Park, NC	3
Dec. 9-13	420*	Air Pollution Microscopy	4 1 2	Gainesville, FL	2
Dec. 10-13	445	Baseline Source Inspection Techniques	3 1 2	Richardson, TX	5
Dec. 16-19	400	Introduction to Air Toxics	3 1 2	San Luis Obispo, CA	7
January 1986					
Jan. 14-16	485*	Motor Vehicle Emissions Control - Antitampering and Misfueling	3	Cincinnati, OH	6
Jan. 14-17	400	Introduction to Air Toxics	3 1 2	New Brunswick, NJ	1
Jan. 27-29	454	Effective Permit Writing	3	Denver, CO	**
February 1986					
Feb. 3-7	411	Air Pollution Dispersion Models - Fundamental Concepts	4 1 2	Louisville, KY	3
Feb. 4-7	452	Principles and Practice of Air Pollution Control	3 1 2	Washington, DC	**
Feb. 19-21	486	Motor Vehicle Emissions Control - Quality Assurance for I/M Programs	3	Research Triangle Park, NC	6
March 1986					
Mar. 11-14	452	Principles and Practice of Air Pollution Control	3 1 2	Richardson, TX	5
Mar. 17-21	401	Site Specific Monitoring	5	New Brunswick, NJ	1
Mar. 24-27	474*	Continuous Emission Monitoring	4	Atlanta, GA	3
Mar. 24-28	426	Statistical Evaluation Methods for Air Pollution Data	4 1 2	Cincinnati, OH	3
April 1986					
Apr. 7-11	484*	Motor Vehicle Emission Control - Diagnosis and Repair	5	Fort Collins, CO	6
Apr. 15-18	400	Introduction to Air Toxics	3 1 2	Research Triangle Park, NC	**
Apr. 16-18	480	Control Measures for CO, O_3 and NO_x	3	New York, NY	3
Apr. 28-May 1	482	Sources and Control of Volatile Organic Air Pollutants	3 1 2	Los Angeles, CA	7
May 1986					
May 5-9	450*	Source Sampling for Particulate Pollutants	4 1 2	Gainesville, FL	2
May 13-16	413	Control of Particulate Emissions	4	Denver, CO	5
May 19-22	415	Control of Gaseous Emissions	4	Atlanta, GA	2
May 20-23	400	Introduction to Air Toxics	3 1 2	Chicago, IL	4
June 1986					
Jun. 3-6	413	Control of Particulate Emissions	4	New Brunswick, NJ	1
July 1986					
Jul. 7-11	435*	Atmospheric Sampling	4 1 2	New Brunswick, NJ	1
Jul. 21-25	427	Combustion Evaluation	4 1 2	Chicago, IL	4
Jul. 21-25	401	Site Specific Monitoring	5	San Luis Obispo, CA	7
August 1986					
Aug. 12-15	502	Hazardous Waste Incineration	4	San Luis Obispo, CA	7
Aug. 12-15	482	Sources and Control of Volatile Organic Air Pollutants	3 1 2	Chicago, IL	4
September 1986	No Courses Scheduled				

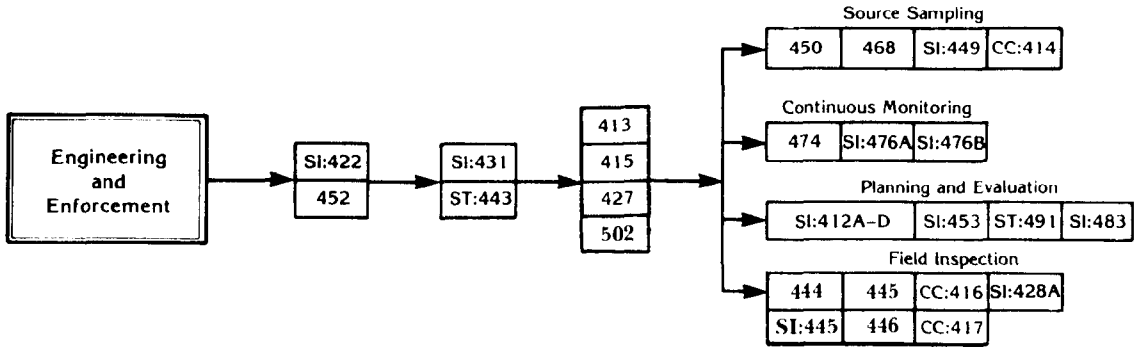
*Laboratory Course

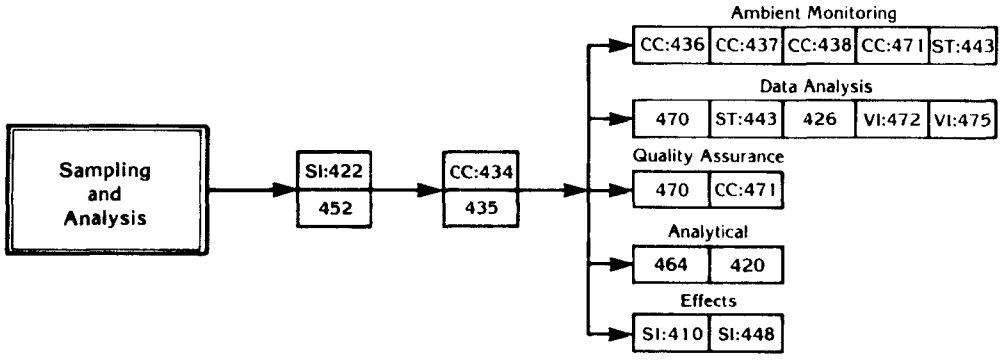
**Course conducted under the supervision of the Manpower and Technical Information Branch, US EPA, Research Triangle Park, NC

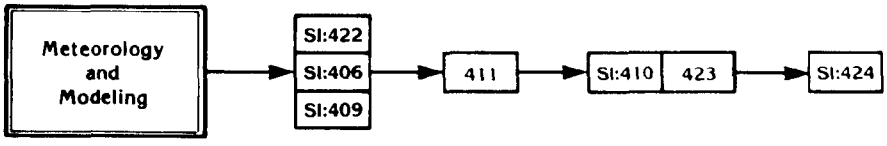
(ATC) Course conducted by Area Training Center under EPA grant

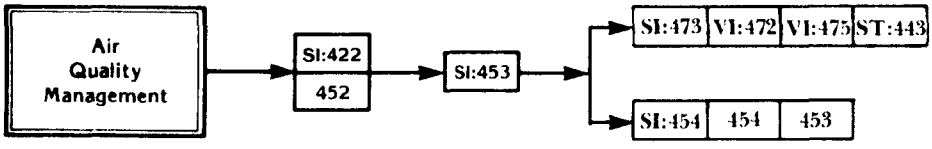
1. Rutgers University
   New Brunswick, New Jersey
2. University of Florida
   Gainesville, Florida
3. University of Cincinnati
   Cincinnati, Ohio
4. Illinois Institute of Technology
   Chicago, Illinois
5. University of Texas at Dallas
   Dallas, Texas
6. Colorado State University
   Fort Collins, Colorado
7. California Polytechnic State University
   San Luis Obispo, California

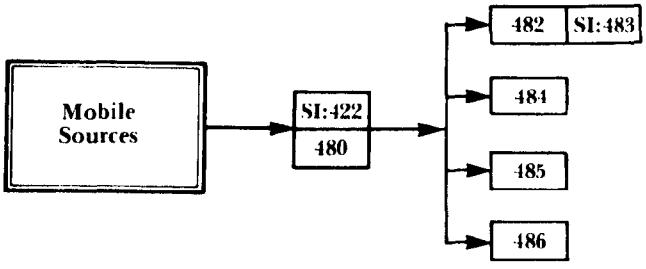
APTI Curriculum Guide

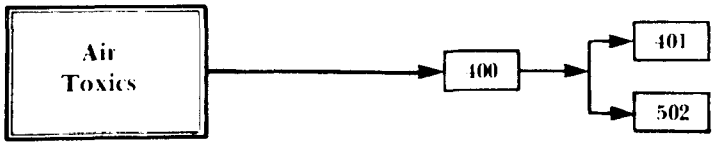












EPA

United States
Environmental Protection
Agency

Air Pollution
Training
Institute

APPLICATION FOR TRAINING

(See Instructions on Back)

1. Name of Applicant (First, Middle, Last)
   Mr.
   Mrs.
   Miss

2. Title of Course Desired

3. Course Number

4. Place Where Given

5. Course Dates

6. Sponsor or Employer (name, address)

City State Zip Code
Phone No.

7. Mailing Address (if different from # 6)

City State Zip Code
Phone No.

8. Profession or Occupation

9. A. Total Years Experience in Profession _____
   B. Total Years Experience in Air Pollution _____

10. Position Title

11. Brief Description of Your Present Position or Experience which Satisfies Prerequisites

12. Previous Air Pollution Control Training Courses Attended:

Titles	Dates	Location

13. High School Graduate
    ☐ Yes ☐ No

14. Number of Years Education Completed Beyond High School

15. College or University Education

Name of Institution	Date Attended	Major	Degree

16. Signature of Applicant

17. Date

18. Signature of Approving Officer (Where Applicable)

19. Title

20. Date

21. Agency Use Only
    Amt. Rec'd. _____ Date _____ Billing Info. _____

TUITION FEE (WHERE APPLICABLE) SHOULD ACCOMPANY COMPLETED APPLICATION. Checks should be made payable to: U.S. Environmental Protection Agency. Applicants from Federal agencies may send a purchase order or other acceptable financial commitment.

EPA(RTP)410

Please send in whole page; do not cut out application form.

Applications for Courses

Please mail your application and fee payment (if applicable - see section on tuition fees) at least 45 days before the course starting date. The registration cutoff for courses without pre-course study is 10 days prior to the offering; for courses with pre-course study the cutoff is 45 days prior to the beginning of class. Because courses fill rapidly (some as much as 6 months in advance), you should send your application as early as possible.

Telephone applications are not accepted.

Mail all applications to:

Registrar
Air Pollution Training Institute
Environmental Research Center, MD 17
Research Triangle Park, NC 27711

Approval of Applications

Applications are reviewed by the appropriate Course Directors. The criterion for approval is satisfaction of course prerequisites. Therefore you must indicate on the application form how you satisfy the prerequisites through your position and experience. If you do not provide this information, or if you do not satisfy prerequisites, your application will not be approved.

Confirmation

Written notice of acceptance or non-acceptance is normally mailed within 10 days after your application is received. Please do not telephone to check on your application. You will receive pre-course materials, if any, 4 to 6 weeks prior to the course starting date.

Cancellations/Substitutions

If you find that you cannot attend a course for which you are registered, please notify the Registrar in writing as soon as possible. APTI courses often have waiting lists, and your failure to cancel in advance means that another qualified applicant cannot take your place. To receive a refund of fees, you must cancel in writing at least 10 days prior to the course start date.

Substitutions cannot be made except through the normal application and approval procedures.

Fees

Employees of the U.S. Environmental Protection Agency and non-Federal employees of regional, state, and local government agencies are exempt from tuition fees. All other students must pay fees according to the following schedule:

Course Length	Lecture Course	Laboratory Course
3 days	$ 66.00	$105.00
3½ days	$ 77.00	$122.50
4 days	$ 88.00	$140.00
4½ days	$ 99.00	$157.50
5 days	$110.00	$175.00

Applicants employed by commercial firms must send a check or money order payable to the U.S. Environmental Protection Agency with the application form. EPA cannot bill individuals or companies.

Non-EPA Federal employees must send a check or money order with applications, or they may send billing instructions. The former is preferable.

If you are subject to tuition fees, you **must** send payment or billing instructions (as appropriate); otherwise your application will be returned to you without further consideration. No exceptions can be made.

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