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EPA Information Dissemination Project
1200 Chambers Road - Third Floor
Columbus, Ohio 43212

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Water

Water Quality Instructional Resources Information System



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INTRODUCTION

The EPA Instructional Resources Center

The purpose of the IRC is to systematically inventory and maintain current pollution control training and education materials and to disseminate these materials to governmental agencies, educational institutions and the private sector.

The materials maintained by the IRC are listed in a comprehensive computerized information base called the *Instructional Resources Information System (IRIS)*. *IRIS* categorizes each item according to several specific parameters including the title, author, source and an abstract. This information is available to assist in selecting materials for pollution control instructional uses.

A major service of the IRC is the *Lending Library*. The purpose of this component is to lend audiovisual instructional units to education and training organizations to support classroom activities. Slide/tape units, videocassette units and films are available for rent on a short-term basis. This *Water Quality Control AudioVisual Instructional Materials* catalog has been prepared to inform water quality control training personnel about supporting materials and services available from the *Lending Library*.

Instructional materials available from the Lending Library fall into two categories--audiovisual supportive materials and packaged courses. The following pages of this catalog provide information on audiovisual materials and packaged training courses that can be rented on a short-term basis from the *Lending Library*. Audiovisual materials are designed to supplement pollution control courses--they are not designed for independent learning. The packaged courses include a complete unit of printed and audiovisual materials to teach a specific pollution control topic or procedure.

Some materials are also available for purchase. These include publications, slide/tape units and videocassettes. For further information contact:

EPA Instructional Resources Center
1200 Chambers Road, Room 310
Columbus, OH 43212
(614) 422-6717

CATALOG FORMAT AND USE

Slide-tape units, videocassettes, and course modules are listed in separate sections, numerically by Catalog Number.

For your convenience the catalog is also organized into the following sections:

I. Title Index

Facilitates locating known titles. For the purpose of the alphabetical listing, articles such as "The" and "A" have been omitted.

II. Topical Index

Lists, by subject headings, all items in order by number.

III. Slide-Tape (XT) Instructional Units

Lists, by XT number, all slide-tape units except those included as part of a course module. Provides a description of each XT unit.

IV. Videocassette (VC) Instructional Programs

Lists, by VC number, all videocassette programs. Provides a description of each program.

V. Course Modules

Alphabetically lists course modules and provides a description of each.

Items listed in the catalog include information about the materials. Information is listed under the following categories:

1. Title.
2. Our catalog number (use for ordering).
3. Abstract describing the materials.
4. Information about the producer of the materials.
5. Date of production (or revision).
6. Intended audience.
7. Viewing time and format.
8. Printed materials included when sent on loan. The print materials must be purchased separately when purchasing slides or tapes. They are not included in the price of the A/V materials.
9. Notes, copyright, availability, rating. Staff have been reviewing the A/V materials and reviewing user evaluation forms. As time permits we are going through all the materials to improve the quality of the items and to let users know how others have evaluated the materials. Ratings are given from Category 1 (highest) to Category 4 (lowest). Category 1 and 2 items have received nearly good to excellent ratings from reviewers. Category 3 and 4 ratings mean these have been evaluated to need changes in content and/or audio/visual materials by at least a number of people.

We plan to modify items with the lower ratings as funds permit. We appreciate user evaluations and will continue to work to improve the materials and to provide user feedback regarding the materials. Please complete user evaluation forms when returning materials. They are being used!

SUPPLEMENTS TO THIS CATALOG

Supplements will be published periodically and will contain all new titles as well as titles withdrawn from circulation.

ORDERING INFORMATION

ORDERING RENTAL ITEMS

Rental items will be loaned on a "First come, first serve" basis. All loans are for a two week period. Requests should be received at least three weeks in advance of the preferred showing date.

To order items use the order forms in the back of the catalog. The information needed includes:

- Complete titles, as given in the catalog
- Catalog number
- Preferred showing dates (and alternative dates)
- Substitute titles, if requested item is unavailable
- Name and affiliation
- Shipping address
- Invoicing address
- Telephone number of contact person
- Purchase order number or authorizing signature

Additional order forms are available upon request.

Confirmations will be sent when the order is scheduled. If there is a scheduling problem, you will be contacted.

To extend a booking call (614) 422-6717 with your confirmation in hand. Showing-date extensions may be granted if others are not scheduled to use the film. Rental charges will be adjusted accordingly.

PREVIEW FOR PURCHASE

Previews of slides and videocassettes are available at the same rate as the rental charge.

RETURN PROCEDURE AND LATE CHARGE

Your shipping slip will indicate the date due back. Materials should be postmarked for return by that date. *Materials returned late will result in a late charge.*

Rentals are scheduled as closely as possible to allow for maximum use and adequate shipping time at the parcel post rate.

Please return via United Parcel Service (UPS) or by parcel post (3rd class), Special Handling. The user is responsible for return shipping charges.

Insure each videocassette (VC) and slide-tape (XT) for \$60.00 (replacement cost plus \$10.00 service fee).

Return videocassettes and slide sets (including original slide tray, script and cassette tape), in the shipping container(s) in which they were received.

Evaluation Forms are enclosed for each item rented. It is important that you complete the forms and return them with the rented items. The forms serve as a written record of your return of the items; they also provide valuable information for improving the materials.

LOSS AND DAMAGE

When items are lost in transit, the tracer must be initiated by the sender. The value of the lost item will be invoiced at the replacement cost. If an item is damaged do not attempt to repair it. Return all pieces and include a note of explanation.

Excessive damage or destruction requiring replacement will be the responsibility of the user, who will be charged accordingly.

Do not loan the program to others. Have a qualified operator run the projector. Make sure the projector is running properly before using.

RIGHTS PURCHASED

When an audiovisual program is rented or purchased, you have acquired the right to show it by direct projection only, without admission charge. No copies may be made without our written authorization to do so. Permission to telecast any program on either broadcast or closed-circuit television must be obtained from the holder of television rights, usually the producer of the program.

GEOGRAPHIC RESTRICTIONS

Items may be rented only to users within the United States and its territories, Canada, and Mexico. Requestors from outside this area may purchase videocassettes (VC) and slide-tape (XT) programs.

RENTAL COSTS

Rental costs include a charge of \$10.00 per item for most items (to pay for personnel costs for preparing materials for shipment and checking items on return) and postage to the user site. Users pay return postage when they ship. Rental fees are payable within 30 days after receiving the invoice. *Package Course rental fees are listed in the Package Course section. These rates are different.*

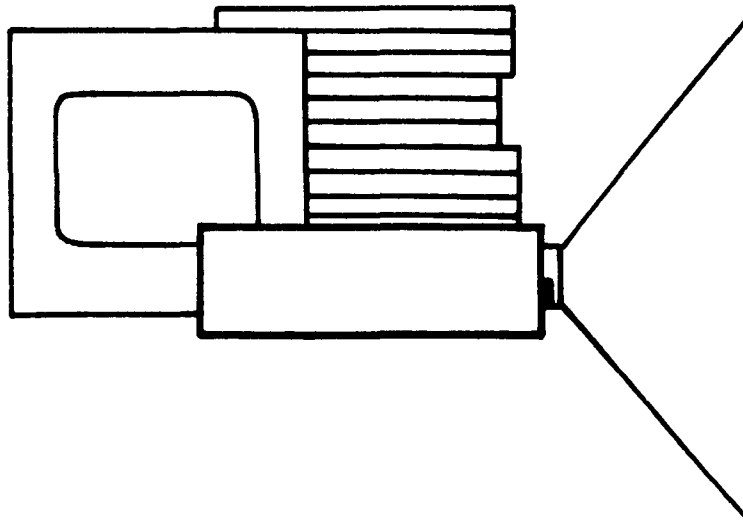
PURCHASING INFORMATION

Slide-Tapes (XT) units can be purchased for approximately \$0.40 per slide plus \$1.00 for duplicating the audiotape. Write or phone (614) 422-6717 for an estimate.

Videocassettes (VC) can be purchased for the cost of duplicating, the cost of the videocassettes provided, and a handling fee of approximately 15%. Write or phone for estimates.

Course modules and many other printed materials are available. In general, publications we xerox cost about \$1.00 per copy plus \$0.03 per page. Publications we carry in stock are less. Write or phone for estimates.

We must have a purchase order or an official letter for any A/V sales. Large orders may require a deposit.



SLIDE-TAPE (XT) INSTRUCTIONAL UNITS

The slide-tape instructional units were developed to support EPA training efforts in the area of *water quality, specifically wastewater and drinking water*. Users should review materials to assure compliance with state and local regulations or procedures which may vary from those presented.

Although the units were designed to be used as *supplemental* materials integrated into water quality training courses, many of the programs provide adequate coverage of a particular topic to be used as *self-instructional units*.

For more detailed and comprehensive coverage of specific topics refer to the section on "Course Modules."

Each XT unit consists of a set of 2" x 2" color slides in a Kodak slide carousel, a cassette tape and a script. The cassette tapes advanced the slides automatically when played on a slide-sync tape player that uses the Norelco system (1000 Hz inaudible cue on a separate track). For manual advance of the slides, the script should be used as a guide.

SUGGESTIONS FOR THE DISCUSSION LEADER

PREPARATION:

- See the catalog description of the intended audience for the unit.
- Preview the instructional unit.
- Review the unit topic.

References are listed in the catalog. The script and any associated information are sent with the unit. Questions about content should be directed to:

EPA Instructional Resources Center
1200 Chambers Road, Room 310
Columbus, OH 43212

- Give viewers sufficient notice of any preparatory assignments.

UTILIZATION:

- Tell the viewers about the content of the program and important points to notice while viewing. Tell them to concentrate on seeing and hearing rather than on taking notes during the presentation.
- Run the program. The tape playback can be stopped during the program, if desired.
- Conduct a discussion of the content. Particular slides can be projected if desired.
- If necessary, run the program again.

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1. UPGRADING BIOLOGICAL TREATMENT
2. XT-25
3. Uses case histories to describe proven methods for improving existing secondary wastewater treatment processes by improved operational control or design. The examples include a treatment plant using a trickling filter pretreatment system with activated sludge polishing to accomplish a 99% reduction of domestic sewage and meat packing wastes.
4. U.S. EPA
5. July, 1969.
6. Supervisory or experienced wastewater works operators, managers and design engineering personnel.
7. 28-minute tape and 65 slides.
8. Script.
9. Rating: Category 2.

1. ATOMIC ABSORPTION SPECTROSCOPY
2. XT-26
3. Explains the basic theory of Atomic Absorption Spectroscopy. Topics include the design fundamentals of the instrumentation involved, kinds of interferences that can be encountered and methods for eliminating those effects, methods for increasing sensitivity and the application of atomic absorption instrumentation for the analysis of trace metals in water.
4. U.S. EPA
5. September, 1969.
6. Experienced chemists, biologists and engineers responsible for performing or interpreting the chemical analyses of water quality.
7. 20-minute tape and 52 slides.
8. Script. Handouts 8 pages.
9. Rating: Category 2.

1. CHEMICAL OXYGEN DEMAND (COD) PROCEDURE
2. XT-27
3. Introduces the Chemical Oxygen Demand (COD) procedure. Explains the principles of the test, how it differs from the Biochemical Oxygen Demand (BOD) Test, the use of potassium dichromate as an oxidizing agent, use of blank and reflux condensers, role of ferrous ammonium sulfate and ferroin, sample preservation, applications of test results and COD/BOD ratios. Procedures based on Standard Methods, 14th Edition, 1975.
4. U.S. EPA
5. 1975.
6. Experienced chemists, biologists and engineers responsible for performing or interpreting chemical analyses of water.
7. 17-minute tape and 60 slides.
8. Script, quiz and answer key.
9. Rating: Category 4.

1. DETERMINATION OF PHENOLICS
2. XT-28
3. Presents basic information about phenols and their relationship to water quality. The analytical procedure used to determine the minimum amount of phenols in water samples is explained. Topics include the various forms and uses of phenol effects on water quality, interaction with chlorine, methods of sample preservation, and procedures for removal of common interferences in the analysis. Procedures based on Standard Methods, 14th Edition, 1975.
4. U.S. EPA
5. 1975.
6. Experienced chemists, biologists, and engineers responsible for performing or interpreting chemical analyses of water quality.
7. 17-minute tape and 64 slides.
8. Script, quiz and answer key, update sheet.
9. Rating: Category 3.

1. DISSOLVED OXYGEN DETERMINATION
2. XT-29
3. Explains analytical procedures for the determination of dissolved oxygen including sampling techniques; basic chemistry of the Winkler dissolved oxygen determination and the Alsterberg azide modification; methods for the addition of reagents; sample preservation and the basic calculations used in the determination. Includes photographs of relevant laboratory equipment. Procedures based on Standard Methods, 14th Edition, 1975, EPA Methods Manual, 1974.
5. 1976.
6. Beginning laboratory personnel performing chemical analyses.
7. 15-minute tape and 72 slides.
8. Script, quiz and answer key.
9. Rating: Category 4.

1. ULTIMATE DISPOSAL TO THE ENVIRONMENT
2. XT-30
3. Explores disposal possibilities for liquid and solid wastes. Discusses economic and environmental tradeoffs associated with the methods. Sludge disposal and the use of sludge for agriculture and for reclaiming mine spoil is considered in detail with on-site examples. A summary of disposal site choices and re-use possibilities for common elements and their compounds is included with an emphasis on the successful reclamation of water.
4. EPA Advanced Waste Treatment Research Lab.
5. September, 1971.
6. Anyone seeking an overview of the topic.
7. 42-minute tape and 37 slides.
8. Script; handouts, 12p.
9. Rating: Category 4.

1. MARGIN FOR SAFETY
2. XT-31
3. Identifies safe working practices for wastewater works personnel. Emphasizes the importance of good housekeeping, preventing accident situations in the plant and at field sites, and the proper use of personal protective gear.
4. Water Pollution Control Federation Safety Committee in consultation with Middle West Service Company's Bureau of Safety.
5. 1970.
6. All wastewater works personnel.
7. 18-minute tape and 45 slides.
8. Script, W.P.C.F. publication list.
9. Rating: Category 2.

1. THE SAFE WAY
2. XT-32
3. Demonstrates the performance of routine duties in wastewater works in a safe way. Topics include manholes, electrical equipment, sampling, contaminated water, air tools, steep stairways, vehicular traffic, excavations, bar screens, wire ropes, flammable materials and chemicals, wastewater samples and personal protection gear.
4. Water Pollution Control Federation Safety Committee in consultation with the Middle West Service Company's Bureau of Safety.
5. 1970.
6. All wastewater works personnel.
7. 14-minute tape and 39 slides.
8. Script, W.P.C.F. publication list.
9. Rating: Category 2.

1. ANAEROBIC DIGESTION AND ANALYTICAL CONTROL
2. XT-34
3. Discusses the anaerobic decomposition processes used to treat organic materials in wastes including the following: the digestion processes of liquefaction and gasification of organic sludges; the three-stage digestion process of acid fermentation; acid regression and alkaline fermentation; the characteristics of facultative and methane-forming organisms; and criteria for evaluating the performance of a digester.
4. U.S. EPA
5. June, 1972.
6. Experienced wastewater treatment plant operators who wish to upgrade plant performance and to increase their own knowledge and skills.
7. 13-minute tape and 62 slides.
8. Script.
9. Rating: Category 2.

1. LET'S INVENTORY YOUR CHLORINE HANDLING PRACTICES
2. XT-35
3. Discusses the proper handling of chlorine. Topics include the physical and chemical characteristics of chlorine; safety requirements for typical chlorine feed systems; chlorine emergency procedures, including self-contained breathing apparatus; in-plant operating procedures for safe handling of chlorine; and sources of additional information.
4. Water and Supply Unit, Division of Engineering, Ohio Department of Health.
5. November, 1970.
6. All personnel in water supply and wastewater treatment plants.
7. 32-minute tape and 80 slides.
8. Script.
9. Rating: Category 3.

1. RESIDUAL CHLORINE AND CHLORINE DEMANDS
2. XT-37
3. Presents the basic principles of chlorination practices in treatment plants. Topics include reactions of chlorine with water and wastewater, sanitary significance of chlorine residuals, and analytical procedures for the determination of chlorine and chlorine residuals in treatment plant effluents.
4. U.S. EPA
5. 1974.
6. Beginning wastewater treatment plant operators.
7. 12-minute tape and 56 slides.
8. Script.
9. Rating: Category 3.

1. SAFETY PROGRAM GUIDE
2. XT-38
3. Explains how to establish an effective safety program including the role of management, record-keeping, accident investigation and evaluation procedures, causes of accidents, protective equipment required, establishing safety rules and procedures, elements of employee training programs and suggestions for motivating employees.
4. Water Pollution Control Federation Safety Committee in consultation with Middle West Service Company's Bureau of Safety.
5. 1969.
6. Wastewater works management and supervisory personnel.
7. 20-minute tape and 39 slides.
8. Script, W.P.C.F. publication list.
9. Rating: Category 2.

1. WHY A SAFETY PROGRAM IN EVERY WATER POLLUTION CONTROL WORKS
 2. XT-39
 3. Demonstrates the need to establish an effective safety program by discussing the components of effective management, including efficient operations, knowledge of job requirements, good public relations, effective cost control, and good employee relations. Gives sources for further information.
 4. Water Pollution Control Federation Safety Committee in consultation with the Middle West Service Company's Bureau of Safety.
 5. 1969.
 6. Wastewater works supervisory personnel and management.
 7. 12-minute tape and 27 slides.
 8. Script, W.P.C.F. publication list.
 9. Rating: Category 2.
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1. OPERATIONAL CONTROL TESTS FOR THE ACTIVATED SLUDGE PROCESS--PART I: VISUAL OBSERVATIONS
 2. XT-40
 3. Part One of a three-part lesson series on operational control tests for the activated sludge process which includes sludge conditioning, process status and effluent quality. Illustrates the accurate reading of meters and visual observations to be made both at the aerator (foam characteristics, sludge color and odor) and at the final clarifiers (clarity, evidences of bulking and of septic solids). Provisional interpretations made from these observations and a detailed discussion of the effective use of a sludge blanket finder are presented.
 4. U.S. EPA
 5. 1971.
 6. Experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.
 7. 16-minute tape and 50 slides.
 8. Script.
 9. Rating: Category 3.
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1. OPERATIONAL CONTROL TESTS FOR THE ACTIVATED SLUDGE PROCESS--PART II: COLLECTING AND HANDLING SAMPLES
 2. XT-41
 3. Part Two of a three-part lesson series on operational control tests for the activated sludge process. This part is a detailed discussion of the preferred techniques involved in conducting settlometer tests to determine settling characteristics and in centrifuging samples to determine the concentration of the mixed liquor and return sludge. Handling the related samples is included along with provisional interpretations and applications of the tests presented.

4. U.S. EPA.
 5. January, 1971.
 6. Experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.
 7. 17-minute tape and 47 slides.
 8. Script.
 9. Rating: Category 2.
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1. OPERATIONAL CONTROL TESTS FOR THE ACTIVATED SLUDGE PROCESS--PART III: INTERPRETING RESULTS
 2. XT-42
 3. Concludes the three-part series on operational control tests for the activated sludge process. Topics include developing settling and concentration curves from settlometer and centrifuge test results, techniques for conducting turbidity tests and significance of results, developing progressive trend charts of process characteristics, and a summary of the tests and control adjustments presented in the series.
 4. U.S. EPA
 5. January, 1971.
 6. Experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.
 7. 22-minute tape and 67 slides.
 8. Script.
 9. Rating: Category 2.
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1. DISSOLVED OXYGEN ANALYSIS--ACTIVATED SLUDGE CONTROL TESTING
 2. XT-43
 3. Outlines the basic procedure and application of electronic measurement of dissolved oxygen (DO) in activated sludge treatment performance control. Reviews DO and its changes in relation to process control and performance. Case examples are cited to support this quick and valid control technique for interpreting sludge conditions in response to stabilization, feed, or load ratio.
 4. U.S. EPA.
 5. April, 1971.
 6. Advanced wastewater treatment plant operators or plant control supervisors.
 7. 34-minute tape and 73 slides.
 8. Script; lesson plan; correction sheet; Ludzack, F. J., Dissolved Oxygen Testing Procedure, 4p., supplement.
 9. Rating: Category 2. Prices for instruments are not accurate.

1. THE DETERMINATION OF PHOSPHORUS
 2. XT-44
 3. Presents the reasons for determining phosphorus, an explanation of phosphorus terminology, and the Office of Water Programs analytical procedures. Discussion of procedure includes basic chemistry involved, sensitivity range, sample collection and preservation, filtration and digestion, pH, reagent preparation, color development and spectrophotometric determination, care of glassware and possible interferences. Procedures based on EPA Methods Manual, 1974.
 4. U.S. EPA
 5. 1976.
 6. Beginning chemistry laboratory personnel.
 7. 15-minute tape and 65 slides.
 8. Script, quiz and answer key.
 9. Rating: Category 4.
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1. TAPE-SLIDE PRESENTATIONS--HOW TO MAKE THEM
 2. XT-45
 3. Describes how to develop a slide-tape presentation and use the audiovisual equipment. Topics include statistics on the effectiveness of combining visual materials and sound, basic equipment required, five steps to produce a program, incorporating sound effects, guidelines for planning slides, and equipment available for specific uses of the finished program.
 4. Elco Optisonics Division of the Elco Corporation.
 5. 1970.
 6. Anyone interested in producing slide-tape presentations.
 7. 10-minute tape and 80 slides.
 8. No script included.
 9. Rating: Category 4.
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1. GRAPHICAL ANALYSIS VIA NORMAL PROBABILITY PAPER
 2. XT-47
 3. Introduces graphical analysis of data for normal distribution, using normal probability paper. Explains how to plot data on normal paper and ascertain if it is normal, how to estimate the mean and the standard deviation for normal data, and how to identify why some nonlinear graphs are not normal.
 4. U.S. EPA.
 5. September, 1971.
 6. Anyone having to determine normal distribution of data or interested in graphical analysis, techniques. Viewers should have the following prerequisites:
 - (1) introductory knowledge about the normal curve;
 - (2) ability to plot data on a coordinate system;
 - (3) ability to draw a line of best fit through the plotted data.
 7. 18-minute tape and 38 slides.
 8. Script; instructions and problem solution for discussion leader, 2p.; handouts, 9p.
 9. Rating: Category 1.

1. DETERMINATION OF CHEMICAL OXYGEN DEMAND (COD)
 2. XT-48
 3. Presents the laboratory technique involved in test procedures for all levels of COD. The sequence of topics is method summary, sample handling and preservation, interferences, apparatus, preparation of reagents, step-wise procedure of calculations, correction for high chloride and treatment of mercury-containing test wastes. Procedures are based on EPA Methods Manual, 1974.
 4. U.S. EPA
 5. 1974.
 6. Beginning laboratory personnel and wastewater treatment plant operators.
 7. 22-minute tape and 80 slides.
 8. Script; Dean, Robert B., et al., Disposal of Mercury Wastes from Water Laboratories, October, 1971, 2p; Maag, G. W., et al., Recovery of Mercury in Solution, 1972, 1p., abstract; Burns, E. R., et al., Correction for Chloride Interference in the Chemical Oxygen Demand Test, December, 1965, 6p.
 9. Rating: Category 4.
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1. BASIC STATISTICS--PART I
 2. XT-49
 3. Part One of a two-part series. Topics include analytical results as samples of a number population; requirements for valid data; construction of frequency tables, histograms and polygons; normal distribution curves; use of normal probability paper; and definition and determination of the mode, median, and mean as measures of central tendency.
 4. U.S. EPA
 5. June, 1972.
 6. Laboratory personnel and others who need basic information about graphical techniques for summarizing data and the determination of central tendency statistics.
 7. 20-minute tape and 46 slides.
 8. Script; instructions and problem solutions for discussion leader, 2p; handouts, 12p.
 9. Rating: Category 2.
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1. BASIC STATISTICS--PART II
 2. XT-50
 3. Part Two of a two-part series. Topics include definitions and step-by-step instructions to calculate dispersion statistics (the range, deviation, variance, and standard deviation); contrasts among them and criteria for choosing which to calculate; application of mean and standard deviation as estimates of normal distribution parameters; and a summary of Parts I and II.

4. U.S. EPA
5. June, 1972.
6. Chemistry laboratory personnel and others who need basic information about the calculation of dispersion statistics.
7. 30-minute tape and 59 slides.
8. Script; instructions and problem solutions for discussion leader, 2p; Statistics for Chemists, 9p. outline; worksheet, 1p.; and problem sheet for viewers, 1p. The instructor must reproduce the outline and worksheets for each viewer.
9. Rating: Category 2.

1. USE OF THE SPECTRONIC 20 SPECTROPHOTOMETER
2. XT-51
3. Demonstrates the stepwise use of the spectrophotometer including warm-up procedures, adjustments prior to use, making measurements and changing the photo tube. Bausch and Lomb Instrument Manual was used in this demonstration.
4. U.S. EPA.
5. January, 1972.
6. Beginning laboratory personnel and wastewater treatment plant operators.
7. 10-minute tape and 35 slides.
8. Script.
9. Rating: Category 3.

1. THE DETERMINATION OF BIOCHEMICAL OXYGEN DEMAND
2. XT-54
3. An introduction to the BOD Test. Topics include reasons for making the determination, the preparation of dilution water, seeding techniques, sample pretreatment and dilution, and calculations. Procedures based on Standard Methods, 14th Edition, 1975, and EPA Methods Manual, 1974.
4. U.S. EPA
5. 1974.
6. Beginning laboratory personnel and wastewater treatment plant operators.
7. 13-minute tape and 71 slides.
8. Script.
9. Rating: Category 3.

1. DETERMINATION OF GREASE AND OIL
2. XT-56
3. Demonstrates the laboratory procedure to determine grease and oil. Topics include terminology, problems caused by grease and oil in wastewater treatment, sampling and preservation, apparatus, the stepwise procedure and calculations. Procedures based on EPA Methods Manual, 1974.
4. U.S. EPA

5. 1973; Revised 1978.
 6. Beginning laboratory personnel and wastewater treatment plant operators.
 7. 15-minute tape and 54 slides.
 8. Script.
 9. Rating: Category 3.
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1. DETERMINATION OF SUSPENDED SOLIDS
 2. XT-57
 3. Illustrates the laboratory procedure to determine suspended solids. Topics include importance of suspended solids to water quality, sampling, apparatus, the stepwise procedure and calculations. Procedures based on EPA Methods Manual, 1974 and Standard Methods, 14th Edition, 1975.
 4. U.S. EPA
 5. 1973; Revised June, 1976.
 6. Beginning laboratory personnel and wastewater treatment plant operators.
 7. 10-minute tape and 40 slides
 8. Script.
 9. Rating: Category 3.
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1. DETERMINATION OF TOTAL ORGANIC CARBON (TOC)
 2. XT-59
 3. Introduces the Total Organic Carbon determination. Topics include steps in the determination, sample collection and pretreatment, the functions of instrument components and preparation of the calibration graph. Procedures based on EPA Methods Manual, 1974 and Standard Methods, 14th Edition, 1975.
 4. U.S. EPA
 5. 1973; Revised 1978.
 6. Beginning laboratory personnel and wastewater treatment plant operators.
 7. 13-minute tape and 62 slides.
 8. Script.
 9. Rating: Category 3.
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1. PROCESS CONTROL DEMANDS--PART I
 2. XT-60
 3. Introduction to a two-part series on operational control of an activated sludge process. A plant schematic is used to present the effects of return sludge flow adjustments on sludge concentrations, sludge detention times, process equilibrium, sludge characteristics, and final effluent quality.
 4. U.S. EPA
 5. December, 1972.
 6. Experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.
 7. 10-minute tape and 36 slides.
 8. Script.
 9. Rating: Category 4.

1. PROCESS CONTROL DEMANDS--PART II
 2. XT-61
 3. This is the second part in a two-part series. The unit presents the derivation of mixing formulae to develop the return sludge flow demand formula used in operational control of an activated sludge process. A schematic is used to illustrate components of the formulae and to develop a final mass balance ratio of return sludge concentration to mixed liquor concentration in terms of clarifier sludge percentage. Simple mixing formulae are then derived for each of the three factors along with example calculations.
 4. U.S. EPA
 5. December, 1972.
 6. Experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.
 7. 15-minute tape and 40 slides.
 8. Script.
 9. Rating: Category 4.
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1. ALKALINITY
 2. XT-66
 3. A general consideration of alkalinity in water supplies including sources and effects, summary of laboratory determinations, classification systems for hydroxide, carbonate and bicarbonate, and applications of alkalinity data. Procedures based on Standard Methods, 14th Edition, 1975 and EPA Methods Manual, 1974.
 4. U.S. EPA
 5. 1973; Revised 1977.
 6. Professional chemists and sanitary engineers.
 7. 11-minute tape and 66 slides.
 8. Script.
 9. Rating: Category 2.

1. DETERMINATION OF AMMONIA NITROGEN
 2. XT-67
 3. Presents the distillation procedure for wastewater samples containing 1.0 to 25.0 mg/l of ammonia concentrations. Topics include a summary of methods, the required laboratory apparatus and reagents, the stepwise procedure, and an example of calculating ammonia nitrogen from test results. Procedures based on EPA Methods Manual, 1974.
 4. U.S. EPA
 5. Revised September, 1978.
 6. Beginning laboratory personnel and wastewater treatment plant operators.
 7. 8-minute tape and 45 slides.
 8. Script.
 9. Rating: Category 3.
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1. DETERMINATION OF ALKALINITY
 2. XT-68
 3. Demonstrates the laboratory procedure to determine alkalinity electrometrically to an end point of pH 4.5. Topics include alkalinity fundamentals, titration curves, sampling, apparatus, the stepwise procedure, calculation formula, and applications of alkalinity data. Procedures based on USEPA Methods Manual, 1974 and Standard Methods, 14th Edition, 1975.
 4. U.S. EPA
 5. 1973; Revised July, 1981.
 6. Beginning laboratory personnel and wastewater treatment plant operators.
 7. 12-minute tape and 74 slides.
 8. Script.
 9. Rating: Category 4.
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1. pH METER--LABORATORY OPERATION
 2. XT-69
 3. Introduces the theoretical concepts of pH measurement. Designed to be shown as supplemental information for laboratory session on pH measurements in Environmental Monitoring Procedures course for wastewater treatment plant operators. Sequence shows set-up, calibration and operational procedures for portable type pH meter. Procedures based on Standard Methods, 14th Edition, 1975.
 4. U.S. EPA.
 5. 1975.
 6. Wastewater treatment plant operators learning to perform this operation.
 7. 11-minute tape and 50 slides.
 8. Script.
 9. Rating: Category 4.

1. FLUORIDE ANALYTICAL PROCEDURES
 2. XT-80
 3. Explains the Environmental Protection Agency approved analytical methods as published in the 14th Edition of Standard Methods and the EPA Methods Manual, 1974. Distillation procedures, the SPADNS photometric method, and the electrode method are discussed.
 4. U.S. EPA
 5. Revised 1978.
 6. Operators who are adding fluoride or who are responsible for the analytical testing of potable or wastewaters.
 7. 20-minute tape and 46 slides.
 8. Script.
 9. Rating: Category 3.
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1. PUBLIC HEALTH ASPECTS OF WATER FLUORIDATION
 2. XT-81
 3. Examines the public health benefits and the myths about the fluoridation of water supplies. Produced in conjunction with the Dental Health Division of the Public Health Service.
 4. U.S. EPA and Dental Health Division of the Public Health Service.
 5. 1974.
 6. Drinking water plant operators or concerned citizens.
 7. 22-minute tape and 41 slides.
 8. Script.
 9. Rating: Category 4.
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1. DETERMINATION OF DISSOLVED OXYGEN--POLAROGRAPHIC PROBE METHOD
 2. XT-83
 3. Describes basic procedure for set-up, calibration and use of YSI oxygen meter for the determination of dissolved oxygen in a sample of wastewater treatment plant effluent. References used are Standard Methods, 14th Edition, 1975, Yellow Springs Instrument Co. Instruction Manual (Model 54).
 4. U.S. EPA
 5. 1975.
 6. Wastewater treatment plant operators learning to perform this procedure. Designed to be shown as supplemental information for laboratory session on dissolved oxygen measurements in Effluent Monitoring Procedures Course.
 7. 6-minute tape and 31 slides.
 8. Script.
 9. Rating: Category 4.

1. SIMPLIFIED GEOMETRIC MEAN--PARTS 1, 2, 3
 2. XT-85
 3. This three-part series teaches the procedure for the calculation of the geometric mean of fecal coliform counts using logarithms. The programs are designed to be stopped at specified intervals to allow students to practice the calculations. Two checks for gross error are given.
 - 85.1 compares the arithmetic with geometric mean and outlines the procedure to calculate the geometric mean when logarithms are used.
 - 85.2 explains how to get the antilog of a positive number.
 - 85.3 explains how to calculate the geometric means of coliform counts.
 4. U.S. EPA
 5. 1975.
 6. Persons who can apply the basic skills of addition, subtraction, multiplication and division, but who are not familiar with logarithms. XT-86 should be used instead of XT-85 if students have more advanced mathematical skills.
 7. XT85.1--22-minute tape and 35 slides; XT85.2--15-minute tape and 27 slides; XT85.3--10-minute tape and 25 slides; total: 47 minutes and 87 slides.
 8. One script for each part; handouts, 8 p.
 9. Rating: Category 2.
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1. GEOMETRIC MEAN--PARTS 1, 2, 3
 2. XT-86
 3. This three-part series teaches the procedure for the calculation of the geometric mean of fecal coliform counts using logarithms. The programs are designed to be stopped at specified intervals to allow students to practice the calculations. Two checks for gross error are given.
 - 86.1 compares arithmetic with geometric mean and outlines the procedure to calculate the geometric mean when logarithms are used.
 - 86.2 explains how to get the antilog of a positive number.
 - 86.3 explains how to calculate the geometric means of coliform counts.
 4. U.S. EPA
 5. 1975.
 6. Persons who can calculate simple averages. Prior ability to use logarithms is helpful but not mandatory. XT-85 should be used instead of XT-86 if a more basic presentation is needed.
 7. XT-86.1--16-minute tape and 28 slides; XT-86.2--12-minute tape and 26 slides; XT-86.3--8-minute tape and 24 slides; total: 35 minutes and 78 slides.
 8. One script for each part; handouts, 8p.
 9. Rating: Category 2.

1. ENGINEERING ASPECTS OF WATER FLUORIDATION
 2. XT-89
 3. Introduction to water supply operators on the addition of fluorides to a water supply. Examines the physical characteristics of fluoride compounds, safe handling and storage of chemicals, and the types of feeding equipment.
 4. U.S. EPA
 5. 1974.
 6. Operators and supervisors of water treatment plants or anyone interested in controlled fluoridation.
 7. 24-minute tape and 60 slides.
 8. Script.
 9. Rating: Category 3.
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1. ODOR DETECTION IN DRINKING WATER
 2. XT-91
 3. Demonstrates the recommended procedure for determining the odor of water and how to express findings as the threshold odor number. Procedures based on EPA Methods, 1974 and Standard Methods, 14th Edition, 1975.
 4. U.S. EPA
 5. 1977.
 6. Operators or laboratory personnel working in water treatment plants.
 7. 16-minute tape and 47 slides; available as 16-minute 3/4" U-Matic Videocassette (VC-68).
 8. Script.
 9. Rating: Category 1.
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1. FLAMELESS ATOMIC ABSORPTION DETERMINATION OF MERCURY (Coleman MAS-50)
 2. XT-92
 3. Presents the laboratory procedure to use the Coleman MAS-50 system for the determination of mercury by the cold vapor or flameless technique. Both the instrumental and chemical portions of the procedure are discussed. Procedures based on EPA Methods Manual, 1974, and Coleman Instrument Company Instrument Manual.
 4. U.S. EPA
 5. 1977.
 6. Water and wastewater treatment plant operators learning to perform this procedure.
 7. 14-minute tape and 37 slides.
 8. Script.

1. DETERMINATION OF TOTAL RESIDUAL CHLORINE IODOMETRIC TITRATION METHOD
 2. XT-93
 3. Illustrates the laboratory procedure to determine total residual chlorine using the idometric titration method. Topics included are chemicals used for chlorination, effects on the pH of the effluent, chemical species produced by their use, reactions with ammonia, methods for analysis, reasons for chlorination of wastewater treatment plant effluents, and calculations used in the determination. Procedures based on EPA Methods Manual, 1974, and Standard Methods, 14th Edition, 1975.
 4. U.S. EPA
 5. 1977.
 6. Beginning laboratory personnel and wastewater treatment plant operators.
 7. 10-minute tape and 42 slides.
 8. Script.
 9. Rating: Category 3.
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1. GRAB SAMPLING FOR BACTERIOLOGICAL ANALYSIS
 2. XT-95
 3. Describes the method used to obtain a single sample from a water source for use in bacteriological analysis. Step-by-step procedures are given for the preparation of sampling bottles and collection of the sample.
 4. U.S. EPA
 6. Persons with responsibilities for collection of samples for bacteriological analysis.
 7. 10-minute tape and 17 slides.
 8. Script.
 9. Rating: Category 2.
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1. EROSION AND SEDIMENT CONTROL
 2. VC or XT 96.1 - 96.13
 3. The objective is to define and explain methods to accomplish erosion and sediment control in urban and developing areas. Among the topics covered are runoff rate attenuation, vegetative soil stabilization, and traps for solids. A series of technical presentations and a certification plan for erosion and sediment control specialists is presented.
 4. Prepared through joint sponsorship of the Water Resources Administration, State of Maryland, and the U.S. EPA by Hittman Associates, Inc.
 5. June, 1976.
 6. Contractors, foremen, highway and transportation officials; inspectors, architects, and erosion and sediment control specialists.
 7. Program consists of 13 modules which may be used as self-contained learning modules or in any combination which meets your educational needs. A summary at the end of each lesson can be used as an abbreviated presentation. The units are available as slide-tape or 3/4" U-Matic videocassette programs.
 Total time: 7 hours, 32 minutes.
 Total slides: 2782.

XT-96.1 The Goals, Objectives and Principles of Erosion and Sediment Control.

Examines the major goals, objectives and principles of erosion and sediment control. 25 minute tape and 118 slides.

XT-96.2 Parts a and b. Soils.

Explains the formation and composition of soils, and the classification of soils and factors related to erosion and sediment control.

Part a. 20 minute tape and 101 slides.

Part b. 24 minute tape and 129 slides.

XT-96.3 Parts a and b. Runoff Relationships.

Describes the basics of precipitation, including the hydrologic cycle, floods, floodplains, and watersheds; the importance of running water as an agent of erosion and sedimentation; the factors that affect the amount of surface runoff; and the affect of human activities on the amount of surface runoff.

Part a. 20 minute tape and 107 slides.

Part b. 18 minute tape and 111 slides.

XT-96.4 Parts a, b, and c. Erosion and Sedimentation.

Identifies the significance of erosion and sedimentation, the different types and categories of erosion, the relationships between erosion and sedimentation, the mechanics of erosion and sedimentation, and the methods of measuring soil loss.

Part a. 16 minute tape and 111 slides.

Part b. 14 minute tape and 99 slides.

Part c. 20 minute tape and 122 slides.

XT-96.5 Parts a, b, and c. Plant Materials.

Demonstrates the importance of plant materials; the classification of plant materials; the basic structure and functions of various plants, especially grasses and legumes; the planning requirements for the use of plant materials; and maintenance.

Part a. 15 minute tape and 119 slides.

Part b. 15 minute tape and 112 slides.

Part c. 10 minute tape and 74 slides.

XT-96.6 Parts a and b. Control of Runoff During Construction

Identifies what stormwater runoff is and why it must be prevented, the three major causes of runoff during construction, the three special grading practices used to control runoff, the different kinds and uses of diversion structures, and the different types of disposal structures and their uses.

Part a. 17 minute tape and 99 slides.

Part b. 14 minute tape and 80 slides.

XT-96.7 Parts a, b, and c. Vegetative Soil Stabilization.

Illustrates the difference between critical and non-critical areas, the major types of plant materials and their uses, the factors to be considered in selecting plant materials, and soil conditioning, planting, and plant maintenance techniques.

Part a. 14 minute tape and 86 slides.

Part b. 24 minute tape and 105 slides.

Part c. 20 minute tape and 105 slides.

XT-96.8 Parts a, b, and c. Stream Erosion Control.

Examines the principles of stream erosion and channel erosion control, factors that affect the amount and rate of stream erosion, vegetative stream stabilization with or without secondary reinforcement, structural channel stabilization, stormwater management, and the necessity of maintenance.

Part a. 14 minute tape and 82 slides.

Part b. 16 minute tape and 91 slides.

Part c. 14 minute tape and 77 slides.

XT-96.9 Parts a and b. Temporary Soil Stabilization.

Discusses the need for temporary soil stabilization, the proper use of vegetative materials for temporary soil stabilization, and the factors in determining which method of temporary stabilization should be used.

Part a. 10 minute tape and 64 slides.

Part b. 16 minute tape and 111 slides.

XT-96.10 Parts a and b. Control of Sediment Generated On Construction Sites.

Explains the various kinds of sediment control structures and functions, and the importance of proper construction and regular maintenance.

Part a. 11 minute tape and 80 slides.

Part b. 15 minute tape and 96 slides.

XT-96.11 Parts a and b. Erosion and Sediment Control Planning and Implementation.

Identifies the necessity of erosion and sediment control planning and implementation, the responsibilities of preliminary planning and design, the costs of controlled vs. uncontrolled development, sources of information and tools used for site planning, important aspects of erosion and sediment control planning.

Part a. 20 minute tape and 109 slides.

Part b. 17 minute tape and 93 slides.

XT-96.12 Parts a and b. Wooded-Site Development.

Examines the structure and growth of trees, the selection of appropriate trees for preservation during development of wooded sites, ways that trees are injured during woodlot development and methods to protect them, and ways to heal tree wounds.

Part a. 13 minute tape and 75 slides.

Part b. 16 minute tape and 100 slides.

XT-96.13 Foreman/Inspector Responsibilities.

Outlines the roles of the foreman and inspector, the responsibilities of the foreman-inspector team, and the concept of "social control" or "enforcement." 21 minute tape and 126 slides.

8. Student course manual, 334 pp. and instructors guide, 68 pp.
 9. Rating: Categories are different for different parts ranging from 1 to 3.
-
1. LAND APPLICATION OF WASTES: AN EDUCATIONAL PROGRAM
 2. XT-98.0-98.21
 3. The objective of this program is to develop a better understanding of the capacity of the soil to assimilate wastes. Completion of this course will enable participants to compare alternative cost estimates, primary designs, and to locate potential land treatment sites for specific application. Land application of municipal, industrial and agricultural wastes is addressed. Knowledge from several disciplines is incorporated, including sanitary, environmental and agricultural engineering; agronomy; soil science; economics and law.
 4. Developed by Cornell University under an EPA grant.
 6. Engineers, scientists, planners, waste management specialists and other practitioners in environmental protection.
 7. Program consists of 22 modules, each containing a printed study guide and 16 modules accompanied by audio-tutorial units (A-T); available as slide-tape or 3/4" U-Matic videocassette program. The course is divided into two levels of specificity. Level 1 Modules present general information on all topics relevant to land application of wastes, stressing interrelationships between fundamental concepts.

	No. of Slides	Time (minutes)
*VC or XT-98.0 **Introduction	69	30
98.1 Societal and Legal Constraints		
VC or XT-98.2**Site Evaluation: General Criteria Information Sources	53	35
VC or XT-98.3**Soil as a Treatment Medium	65	28
VC or XT-98.4**Treatment Systems. Effluent Qualities and Costs	52	28
VC or XT-98.5**Waste Characteristics	34	20
VC or XT-98.6**Design Procedures for Land Application of Wastes	38	23
VC or XT-98.7**The Role of Vegetative Cover	64	25

Level 1 Modules may be completed in 3-1/2 to 9-1/2 hours of study time.

Level 2 Modules present more detailed information needed to determine design parameters such as hydraulic loads, application rate, land area needed, and costs.

	No. of Slides	Time (minutes)
VC or XT-98.8 **Climate and Wastewater Storage	59	48
98.9 Pathogens		
98.10 Costing Land Application Systems		
98.11 Potentially Toxic Elements		
VC or XT-98.12**Waste Application Systems	73	30
VC or XT-98.13**Noncrop and Forest Systems	61	32
XT-98.14 Case Studies		
VC or XT-98.15**Nitrogen Considerations	65	40
XT-98.16 Legal Aspects		
VC or XT-98.17**Organic Matter	45	19
VC or XT-98.18**Monitoring at Land Application Sites	53	32
VC or XT-98.19**Phosphorus Consider- ations	42	17
VC or XT-98.20**Crop Selection and Management Alternatives	58	38
VC or XT-98.21**Drainage for Land Application Sites	38	30

* Audio-tutorial (A-T) units available in slide-tape or 3/4" U-Matic videocassette format.

** Indicates modules available as audio-tutorial units.

Coverage of material in each module requires 1/2 to 3 hours of study time.

Coverage of material in each module requires 1/2 to 3 hours of study time.

8. Each A-T unit includes a written script. Several units include supplementary booklets for study.
9. Although each module is considered a self-contained learning unit, the modules are designed to be an integral part of the entire educational program with extensive cross-referencing.

The educational program is designed to be completed over a 4-1/2 day period, in a workshop setting, using not only the modules but guest lecturers, intensive staff-participant and participant-participant interaction as well.

For workshops up to four complete sets of materials may be obtained if scheduled at least 2 months in advance. You will need one set of the A-T units for each 5 persons in the course.

1. SAMPLING WASTEWATER
2. XT-104
3. Discusses sampling points in a treatment plant and a stream, NPDES sampling requirements, grab and composite samples, labeling, containers and preservation techniques. Example calculations for collecting a composite sample are presented.
4. New York State Department of Environmental Conservation.
5. January, 1979.
6. Beginning level laboratory personnel and those who will have to collect samples. Procedures based on EPA Methods Manual, 1974.
7. 15-minute tape and 64 slides.
8. Script.
9. Rating: Category 4.

1. HEALTH AND SAFETY IN THE LABORATORY
 2. XT-115
 3. Illustrates safety procedures in the chemical laboratory. Topics include proper handling of acids, solvents and compressed gases; reagent labeling; respirators; housekeeping; and hoods.
 4. U.S. EPA and J. T. Baker Company.
 5. 1979.
 6. Persons working in a chemical laboratory.
 7. 15-minute tape and 63 slides.
 8. Script.
 9. Rating: Category 1.
-
1. THE DETERMINATION OF pH, PART I
 2. XT-118
 3. Part I of a two-part series is an elementary introduction to the concepts of pH. The sequence discusses the definitions of acids and bases, and their physical and chemical properties, ways of expressing hydrogen ion concentration, the pH and pOH scales, and pH values for common liquids. (Part II deals with the calibration and use of several types of pH meters.) Procedures based on Standard Methods, 14th Edition, 1975 and "A Study of Water Quality." Dr. Charles E. Renn, LaMotte Chemical Co.
 4. U.S. EPA
 5. February, 1980.
 6. Supplemental use by those instructing others about pH and for persons who have little knowledge about pH.
 7. 11-minute tape and 49 slides.
 8. Script.
-
1. INNOVATIVE AND ALTERNATIVE TECHNOLOGIES FOR MUNICIPAL WASTEWATER TREATMENT
 2. XT-120
 3. Discusses the use of alternative and innovative technology for the treatment of the nation's municipal wastewater in accordance with the Clean Water Act of 1977. Criteria are given for classifying a technology as "alternative" and/or "innovative." Several alternatives to conventional treatment and discharge are discussed including a detailed example of land application of wastes.
 4. Environmental Extension Project, Oklahoma State University
 5. July, 1979.
 6. Federal and State Review Authorities administering the Construction Grants Program, and engineering and planning personnel preparing facility plans.
 7. 20-minute tape and 80 slides.
 8. Script.

1. URBAN STORMWATER RUNOFF
2. XT-121
3. Outlines some of the problems and methods of controlling urban stormwater runoff. Included are sources of stormwater pollution, comparison of runoff problems with other sources, specific methods of control within cities, and methods of prevention in developing areas.
4. Institute of State and Regional Affairs, The Pennsylvania State University
5. 1981.
6. Instructors in water quality, State Highway and local Public Works Departments, public awareness groups, and community planners.
7. 15-minute tape and 74 slides.
8. Script; 4 special slides showing detailed charts pertinent to Urban Stormwater Runoff may be used to augment slide presentation; Instructor Guide.

1. WETLANDS: A CASE FOR PROTECTION
2. XT-122
3. Examines the value and destruction of our nation's wetlands. The major values of flood control, shoreline protection, groundwater replenishment, water purification, food production and animal habitat are described. Briefly explains U.S. EPA and U.S. Army Corps of Engineers involvement in wetland protection through the Dredge and Fill Permit Program.
4. U.S. EPA
6. General interest.
7. 12-minute tape and 80 slides; also available on 3/4" U-Matic videocassette (VC-114).
9. Slides numbers 11, 26, 28, 30, 31, 32, 37, 39, 42, 62, 70 and 71 are copyrighted and may not be reproduced.

1. LAND TREATMENT OF MUNICIPAL WASTEWATER
2. XT-130
3. Discusses the land treatment of municipal wastewater using the methods of irrigation, rapid infiltration and overland flow. The factors which influence the selection of particular methods are examined.
4. U.S. EPA
6. Wastewater treatment instructors, persons involved in the Construction Grants Program, consulting engineers, community planners, and concerned citizens.
7. 15-minute tape and 80 slides.
8. Script, brochure.

1. LAND APPLICATION OF MUNICIPAL SLUDGE TO FARMLAND
(SHORT AND LONG VERSIONS)
 2. XT-132.A and XT-132.B
 3. The programs categorize the results of ongoing studies on land disposal of sludge on farms in Ohio. XT-132.A is the shorter version and gives a brief overview of the research projects. XT-132.B gives greater detail to economic considerations and conditions necessary for land disposal of sludge. It outlines the responsibility of both the landowner and the sewage treatment plant personnel for continuous monitoring and analysis of change in nutrient levels, sludge, water, soil and plants.
 6. Wastewater treatment instructors, community planners and concerned citizens.
 7. XT-132.A: 5-minute tape and 24 slides;
XT-132.B: 18-minute tape and 54 slides.
 8. Script.
-
1. ON-SITE WASTEWATER SYSTEMS
 2. XT-134
 3. Describes technologies for treating and disposing of wastewater from individual homes, small communities, commercial enterprises and others not served by a central sewage collection system. How to obtain Federal and State Construction Grants is explained.
 4. Environmental Extension Project, Oklahoma State University.
 6. Persons responsible for planning and financing on-site wastewater systems.
 7. 14-minute tape and 71 slides.
 8. Script.
-
1. CONTROL CHARTS FOR ACCURACY
 2. XT-143
 3. Presents an overview of control charts including their role in laboratory quality assurance programs, the Shewhart theory of charts to monitor manufacturing processes, and contrasts variables in industrial processes with those in environmental analyses. Topics include the discussion of recovery control, gathering data, calculations, constructing a chart, verification of initializing data, use of charts and cautions.
 4. U S. EPA
 5. July, 1981.
 6. Chemistry laboratory personnel and others who need an introduction to the role of control charts in a laboratory quality assurance program and to the construction and use of a control chart for accuracy.
 7. 14-minute tape and 66 slides.
 8. Script.

1. SLUDGE TREATMENT AND DISPOSAL COURSE #166
2. XT-144-XT-165
3. Included are all the materials necessary to present a course on sludge treatment and disposal.
4. Linn-Benton Community College, Albany, Oregon
5. 1981.
6. Wastewater treatment operators, environmental engineers and students, concerned citizens.
7. Consists of 24 modules, a pre-course package, and a summary. Thirteen of the modules are currently available and may be used as self-contained learning modules or in combination with other modules. The course can be used by students in a self-paced instructional program as well as in a classroom situation (see below).

XT-144 PLANNING CONSIDERATIONS (PC)

This module forms an outline for Course #166 which is amplified in succeeding sections. Briefly described are the sources of solids in wastewater and the handling and disposal methods. The technical, social and economic criteria used to select a program are discussed in detail. 21 minute tape and 61 slides.

XT-145 SLUDGE CHARACTERISTICS (SC)

An introductory module includes the types of sludge, sludge characteristics and methods of measuring these characteristics. 19 minute tape and 67 slides.

XT-146 SLUDGE CONDITIONING (CN)

Describes sludge conditioning equipment and steps to prepare sludge for water removal including chemical, heat treatment and elutriation (washing) methods of sludge conditioning. 17 minute tape and 52 slides.

XT-147 GRAVITY THICKENING (GT)

Describes the gravity thickening process, the components typically found on a thickener. information on process control, safety and other basic information on the process. 17 minute tape and 61 slides.

XT-148 FLOTATION THICKENING (FT)

Discusses dissolved air flotation thickening, the fundamentals of process control and the typical components found in a thickener. 18 minute tape and 61 slides.

XT-149 AEROBIC DIGESTION (AR)

Explains the theory of the aerobic digestion process, reviews the factors affecting process operation and discusses the typical digester's components. 17 minute tape and 60 slides.

XT-150.1 ANAEROBIC DIGESTION I (AT)

Part 1 of a two-part series on the basic theory and operation of anaerobic digesters. The two parts should be viewed consecutively. Discusses the sources of sludge, reasons for treatment, functions of the digestion system, the biological process, basic digester components and products of the digestion process. 13 minute tape and 50 slides.

XT-150.2 ANAEROBIC DIGESTION II (AO)

Part 2 of a two-part series on anaerobic digesters. The two parts should be viewed consecutively. Discusses the classification of digesters by function, roof design and temperature, the effects of sludge temperature and ways to control that temperature. 19 minute tape and 75 slides.

XT-151 DRYING BEDS (DB)

Discusses the use of drying beds for dewatering sludge including the theory, structure and operation of drying beds. 14 minute tape and 53 slides.

XT-152 CENTRIFUGATION (CT)

Discusses the three basic centrifuges, their theory of operation the quality of cake and centrate along with operational control testing. 16 minute tape and 61 slides.

XT-156 VACUUM FILTRATION (VT)

Describes a typical filter cycle, components and their function, process control parameters, expected performance and safety. 23 minute tape and 69 slides.

XT-157.1 SLUDGE INCINERATION-MULTIPLE HEARTH FURNACE (MH)

Explains sludge incineration using the multiple hearth furnace. Topics include component identification, function process control fundamentals, theory of incineration, safety and other responsibilities of furnace operation. 22 minute tape and 66 slides.

XT-158 SANITARY LANDFILL (LF)

Explains the complete process of disposal of sludge by landfill including sludge suitability, site selection, method selection and operation, site closure and ultimate reuse. 22 minute tape and 71 slides.

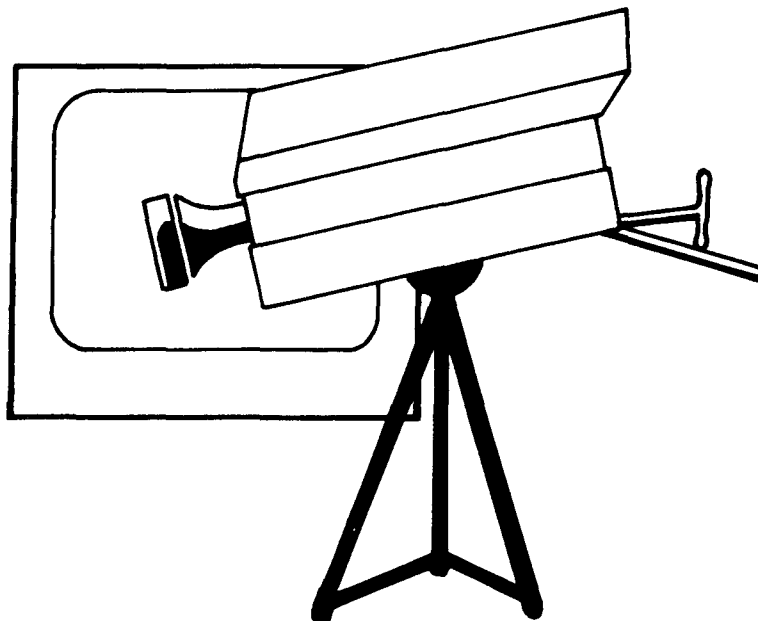
8. All modules include a slide-tape presentation, script, course objectives, lecture outline, student workbook, worksheets and answers to worksheets.
9. Rating: Category 1
The following modules are in the development stage:

Pre-Course Package

Course Summary

Heat Treatment (HT)	XT-153
Belt Filtration (BF)	XT-154
Filter Presses (FP)	XT-155
Incineration-Fluidized Bed (FB)	XT-157.2
Land Application (LA)	XT-159
Sludge Lagoons (SL)	XT-160
Lab Procedures (LP)	XT-161
Heat Drying (HD)	XT-162
Gravity Concentration (GC)	XT-163
Composting (CO)	XT-164
Stabilization (ST)	XT-165

They are not available at this time.



VIDEOCASSETTE (VC) INSTRUCTIONAL PROGRAMS

The videocassette instructional units support EPA training efforts in the area of water quality, *specifically wastewater and drinking water.*

Users should review the units to assure compliance with state and local regulations or procedures which may vary from those presented.

Although designed to be used as *supplemental* materials integrated into water quality training courses, many of the programs may be used as self-instructional units.

All videocassettes are available in *1/2" or 3/4" U-Matic, V-Matic Format only.*

Users need a *1/2" or 3/4" U-Matic or V-Matic Videocassette playback unit* connected to a television monitor to view the VC units. Programs available as 16mm films are so noted under format.

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1. BURET: CONSTRUCTION AND USE
2. VC-4
3. The general physical features of a buret are discussed; graduation marks, stopcock and tip. Buret filling techniques are demonstrated. An acid-base titration using phenolphthalein indicator emphasizes titration technique.
5. 1973.
6. Laboratory technicians unfamiliar with buret use.
7. 3/4" U-Matic Videocassette, color; 15 minutes.
8. None
9. Rating: Category 2.

1. WINKLER DISSOLVED OXYGEN DETERMINATION
2. VC-5
3. A dissolved oxygen determination, using a Winkler titration (azide modification) is demonstrated.
5. 1973.
6. Persons who are familiar with titrations in general, but not with a Winkler titration.
7. 3/4" U-Matic Videocassette, color; 15 minutes.
8. None

1. LABORATORY BRIEFING: CHEMICAL OXYGEN DEMAND (COD) TITRATION PROCEDURES
2. VC-6
3. Demonstrates the technique for titrating a digested sample to determine the chemical oxygen demand.
5. 1973.
6. For use as a lab briefing.
7. 3/4" U-Matic Videocassette, color; 15 minutes.
8. None

1. PLANKTON AND EUTROPHICATION
2. VC-7
3. Defines and explains the problem and symptoms of eutrophication.
5. 1973.
6. Biology students and laboratory personnel identifying plankton.
7. 3/4" U-Matic Videocassette, color; 15 minutes.
8. None
9. Rating: Category 1.

1. MICROSCOPIC EXAMINATION OF ACTIVATED SLUDGE
2. VC-8
3. Demonstrates using the microscope to learn the basic types of protozoa and rotifers and relate this community of living organisms to operating conditions and effluent quality. Included is the viewing of live organisms as the plant operator sees them through a microscope.
5. 1978.
6. Wastewater treatment plant operators.
7. 3/4" U-Matic Videocassette, color; 9 minutes.
8. None
9. Rating: Category 1.

1. FLUORIDE DETERMINATION IN WATER - SPADNS METHOD
 2. VC-9
 3. Demonstrates the SPADNS method for determining fluoride in drinking water.
 5. 1973.
 6. Laboratory personnel who analyze drinking water using the SPADNS Method.
 7. 3/4" U-Matic Videocassette, color; 25 minutes.
 8. None
 9. Rating: Category 2.
-
1. B C AND THE CLAMS
 2. VC-10
 3. Presents an overview of bivalve structure and function and the resulting problem of biological magnification including toxic substances in the environment.
 5. 1973.
 6. For use in training course in water microbiology.
 7. 3/4" U-Matic Videocassette, black and white; 25 minutes.
 8. None
 9. Rating: Category 3.
-
1. STREAM BIOTA: RIFFLE ORGANISMS
 2. VC-11
 3. This is a detailed and close-up study of typical benthic stream communities. It illustrates the types of benthic stream animals and simple procedures for collecting, examining, and preserving samples.
 5. 1973.
 6. For use in teaching water quality studies.
 7. 3/4" U-Matic Videocassette, black and white; 8 minutes.
 8. None
 9. Rating: Category 1.
-
1. MPN PROCEDURES: EQUIPMENT AND SUPPLIES
 2. VC-12 - Part I
 3. Demonstrates the laboratory procedures, including supplies and necessary equipment for the MPN test to determine total and fecal coliform density in wastewater treatment plant effluent.

The four parts of this unit can be used (1) as supplementary material to reinforce classroom instruction; (2) for individualized instruction, provided that a knowledgeable individual is available to clarify instructions; and/or (3) as a demonstration prior to the laboratory for applied instruction. MPN procedures are continued in VC-13, with five additional procedures in the test.

5. 1973.
6. Wastewater treatment personnel using total and fecal coliform tests by the MPN method.

7. 3/4" U-Matic Videocassette, color; 60 minutes.
 - Part A - Equipment and supplies (23 minutes)
 - Part B - Data sheets for laboratory (7 minutes)
 - Part C - Tube labeling (5 minutes)
 - Part D - Inoculating sample (5 minutes).
8. None
9. Rating: Category 1.
1. MPN PROCEDURES: TESTS
2. VC-13 - Part II
3. Part II of the MPN Procedures presented in VC-12 demonstrates five additional procedures for determining the total and fecal coliform density in wastewater treatment plant effluent.

The five parts of this unit can be used (1) as supplementary material to reinforce classroom instruction; (2) for individualized instruction, provided that a knowledgeable individual is available to clarify instructions; and/or (3) as a demonstration prior to going to the laboratory for applied instruction.

5. 1973.
6. Wastewater treatment personnel using total and fecal coliform tests by the MPN method.
7. 3/4" U-Matic Videocassette, color; 60 minutes
 - Part E - 24-hour procedures (16 minutes)
 - Part F - 48-hour procedures (12 minutes)
 - Part G - 72- and 96-hour procedures (3 minutes)
 - Part H - Codifying results (5 minutes)
 - Part I - MPN table and calculations (15 minutes).
8. None
9. Rating: Category 1.

1. AQUATIC ECOSYSTEMS
2. VC-20
3. The four basic parts and energy flow of an ecosystem are graphically illustrated. Includes all basic aquatic communities and close-ups of live organisms in a closed ecosystem.
5. 1974.
6. Introductory level, general interest.
7. 3/4 U-Matic Videocassette, color; 10 minutes.
8. None
9. Rating: Category 2.

1. SUSPENDED SOLIDS
2. VC-21
3. Part A - Preparing the Filter Disc presents the equipment and technique for this procedure.

Part B - Procedure presents recording sample identity, filtration and rinsing, and putting the disc with residue into an oven. Both the membrane filter assembly and the Gooch crucible are used in this demonstration.
4. U.S. EPA

5. 1974.
6. Designed as laboratory instruction for Effluent Monitoring Procedures: Basic Parameters For Municipal Effluent, Course 164.1; laboratory personnel involved with Total Suspended Solids determination.
7. 3/4" U-Matic Videocassette, color; 28 minutes.
Part A - 15 minutes
Part B - 13 minutes
8. None

1. WATER RESOURCES AND NEEDS
2. VC-22
3. Illustrates the hydrologic cycle, its relationship to water supply, uses and distribution of water.
5. 1974.
6. General interest.
7. 3/4" U-Matic Videocassette, color; 20 minutes.
8. None
9. Rating: Category 1.

1. INFRARED SPECTROSCOPY: AgCl WINDOW, NaCl WINDOW
2. VC-23
3. Part A explains the AgCl Window including the Wilks infrared liquid mini-cell, cell filling, and means for varying cell path length.
Part B explains the NaCl Window including an infrared sodium chloride sandwich cell and a demonstration of cell filling.
5. 1973
6. Laboratory personnel having a basic understanding of infrared laboratory procedures.
7. 3/4" U-Matic Videocassette, color; 13 minutes.
Part A - 7 minutes and Part B - 6 minutes.
8. None
9. Rating: Category 2.

1. ANALYSIS OF PLANKTON
2. VC-24
3. Reviews techniques for plankton analysis.
5. 1973.
6. Persons involved with plankton analysis.
7. 3/4" U-Matic Videocassette, black and white; 30 minutes.
8. None
9. Rating: Category 3.

1. ALGAE AS AN INDICATION OF POLLUTION
2. VC-25
3. Explores Dr. Palmer's pollution index using algae as indicators.
5. 1973.
6. Persons involved with plankton analysis.
7. 3/4" U-Matic Videocassette, color; 30 minutes.
8. None
9. Rating: Category 3.

1. SEWAGE
2. VC-26
3. An overview of typical activated sludge microorganisms showing the types and variety of typical forms and indicator organisms.
5. 1973.
6. Persons involved with bacteriological analysis of drinking water.
7. 3/4" U-Matic Videocassette, black and white; 15 minutes.
8. None
9. Rating: Category .

1. BIOASSAY PROCEDURE
2. VC-27
3. Presents a detailed demonstration of a full scale (96 hour) static bioassay test using industrial wastewater samples. How to interpret the results and use them in determining a management policy for a particular effluent are discussed.
5. 1973.
6. Laboratory personnel interested in overview of the Bioassay technique.
7. 3/4" U-Matic Videocassette, color; 25 minutes.
8. None
9. Rating: Category 2.

1. ATOMIC ABSORPTION INSTRUMENTATION - LAB BRIEFING
2. VC-29
3. Demonstrates the operation and calibration of the Atomic Absorption Spectrophotometer.
4. U.S. EPA
5. 1973
6. Laboratory briefing for students learning chemical analysis.
7. 3/4" U-Matic Videocassette, color; 7 minutes.
8. None
9. Rating: Category 2.

1. DETERMINATION OF DISSOLVED OXYGEN: TITRATION OF SAMPLE
2. VC-38
3. The dissolved oxygen content of a water sample contained in a 300 ml B.O.D. bottle is determined by means of a Winkler titration - azide modification. Emphasis is placed on recognition of the titration end point. Calculations are shown.
4. U.S. EPA
5. 1974
6. Designed as laboratory instruction for EFFLUENT MONITORING PROCEDURES: BASIC PARAMETERS FOR MUNICIPAL EFFLUENT, Package Course (PC) 164.1; laboratory personnel involved with DO determination.
7. 3/4" U-Matic Videocassette, color; 27 minutes.
8. None

1. DETERMINATION OF DISSOLVED OXYGEN: STANDARDIZATION OF SODIUM THIOSULFATE
 2. VC-39
 3. Approximately 0.0375 N sodium thiosulfate is standardized against 0.0375 N potassium biiodate. Calculations are shown.
 4. U.S. EPA
 5. 1974
 6. Designed for use in EFFLUENT MONITORING PROCEDURES: BASIC PARAMETERS FOR MUNICIPAL EFFLUENT, Package Course (PC) 164.1; laboratory personnel involved in DO determination.
 7. 3/4" U-Matic Videocassette, color; 27 minutes.
 8. None
 9. Rating: Category 1.
-
1. DETERMINATION OF FIVE DAY BIOCHEMICAL OXYGEN DEMAND (BOD): SAMPLE DILUTION
 2. VC-40
 3. Two techniques are shown:
 1. Dilution of a BOD sample in a graduated cylinder. Nutrient salt solutions and buffer are added. Emphasis is placed on mixing techniques.
 2. Filling of BOD bottles by siphoning from the graduated cylinder.
 5. 1974.
 6. Although designed specifically for use in training course SELF-MONITORING PROCEDURES: BASIC PARAMETERS FOR MUNICIPAL EFFLUENTS (164.1), it may be useful to others teaching the subject.
 7. 3/4" U-Matic Videocassette, color; 23 minutes.
 8. None
 9. Rating: Category 2.
-
1. DETERMINATION OF DISSOLVED OXYGEN USING A DISSOLVED OXYGEN METER - PARTS A AND B
 2. VC-41
 3. The use of the Weston & Stack Model 300 dissolved oxygen meter is explained, including a battery check, cleaning of electrodes, membrane installation, and calibration methods.
 5. 1974.
 6. Although designed specifically for use in the training course, SELF-MONITORING PROCEDURES: BASIC PARAMETERS FOR MUNICIPAL EFFLUENTS (164.1), it may be useful to others teaching the subject.
 7. Two 3/4" U-Matic Videocassettes, color; Part A - 26 minutes, Part B - 38 minutes.
 8. None
 9. Rating: Category 2.

1. SETTLEABLE SOLIDS - PARTS A, B, C, AND D
2. VC-42
3. A classroom briefing for laboratory procedure to determine settleable solids in milligrams per liter Imhoff Settling Cone.
5. 1974.
6. Beginning wastewater treatment plant operators.
7. 3/4" U-Matic Videocassette, color; 15 minutes.
8. None
9. Rating: Category 1.

1. DETERMINATION OF OIL AND GREASE: BASIC SKILLS, SEPARATORY FUNNEL
2. VC-55
3. Part One demonstrates entry level skills needed for use with the effluent monitoring procedure including the use of pH sensitive paper, use of partial and total immersion thermometers, and folding and placing filter paper in a 60° funnel.
Part Two demonstrates the use of a separatory funnel to extract a water sample with Freon. Special attention is given to safety, separation of the water and solvent layers, and manipulation of the stopcock to separate the two layers.
4. U.S. EPA
5. 1976
6. Designed as laboratory instruction for EFFLUENT MONITORING PROCEDURES: NUTRIENTS, Package Course (PC) 164.3; laboratory personnel using the separatory funnel.
7. 3/4" U-Matic Videocassette, color; 30 minutes.
Part 1 - 17 minutes
Part 2 - 13 minutes.
8. None
9. Rating: Category 1.

1. DETERMINATION OF OIL AND GREASE: DISTILLATION SET UP
2. VC-56
3. Demonstrates the assembly of a distillation apparatus for the removal of the Freon solvent. Several distillation "heads" are shown.
4. U.S. EPA
5. 1976
6. Designed as laboratory instruction for EFFLUENT MONITORING PROCEDURES: NUTRIENTS, Package Course (PC) 164.3; laboratory personnel involved with distillation of oil and grease.
7. 3/4" U-Matic Videocassette, color; 15 minutes.
8. None

1. USE OF A SPECTROPHOTOMETER
 2. VC-57
 3. Use of a Baush and Lomb Spectronic 20 spectrophotometer is demonstrated. Special attention is given to techniques for placing the instrument into operation, taking absorbance readings, and changing the phototube.
 4. U.S. EPA
 5. 1976
 6. Designed as laboratory instruction for EFFLUENT MONITORING PROCEDURES: NUTRIENTS, Package Course (PC) 164.3; laboratory personnel who use a spectrophotometer.
 7. 3/4" U-Matic Videocassette, color; 21 minutes.
 8. None
 9. Rating: Category 2.
-
1. EROSION AND SEDIMENT CONTROL COURSE MODULE
 2. VC-96.1 to VC-96.13
 3. Refer to XT-96.1 to XT-96.13 for specific titles, running time of programs and other details.
-
1. LAND APPLICATION OF WASTES: AN EDUCATIONAL PROGRAM
 2. VC-98.0 to VC-98.21
 3. Refer to XT-98.0 to XT-98.21 for specific titles, running time of programs and other details.
-
1. MICROSCOPE USAGE FOR PROCESS CONTROL
 2. VC-105
 3. Demonstrates basic microscope controls, sample handling, and organism identification. Common organisms found in activated sludge systems are shown.
 4. U.S. EPA
 5. 1980
 6. Wastewater treatment plant operators and laboratory personnel.
 7. 3/4" U-Matic, color; 18 minutes.
 8. None
 9. Rating: Category 1.
-
1. WATER SAMPLING TECHNIQUES
 2. VC-106
 3. Demonstrates the proper collection of drinking water samples to avoid contamination of the samples. Sampling techniques for radioactive, organic and inorganic contaminants and coliform bacteria are clearly illustrated. The sampling procedures are consistent with those specified in the National Interium Primary Drinking Water Regulations, and conform to those practiced by the U.S. Environmental Protection Agency.
 4. U.S. EPA
 6. Water treatment plant samplers, operators, and laboratory personnel.
 7. 3/4" U-Matic Videocassette, color; 20 minutes.
 8. None
 9. Rating: Category 1.

1. MECHANICAL MAINTENANCE TRAINING PROGRAM
2. VC-107, 108, 109, 110, 111, 127, and 128
3. The objective is to quickly and uniformly bring maintenance personnel up-to-date on accepted maintenance practices. The modules present essential theory, explanations, and demonstrations of maintenance techniques and activities.
4. Industrial Training Corporation.
5. 1979
6. Personnel with a minimum of mechanical maintenance experience as well as experienced mechanics refreshing their maintenance skills.
7. Program consists of five modules designed to be used in conjunction with classroom discussion and hands-on assignments. Each module consists of 3/4" U-Matic Videocassettes; Instructor's Discussion Guide, including lesson plans, quizzes and examinations; a Student Workbook; and overhead transparencies.
8. Included materials are listed separately under specific modules.
9. Rating: Category 1. All materials are copyrighted by the Industrial Training Corporation and Planning Research Corporation and may not be reproduced. Purchase information may be obtained from the Industrial Training Corporation, 14616 Southlawn Lane, Rockville, MD 20850.

PACKING AND SEALS MODULE:

- VC-107.1 Valve Packing, 45 minutes;
- VC-107.2 Pump Packing and Mechanical Seals, 61 minutes.

BEARING AND LUBRICATION MODULE:

- VC-108.1 Plain Journal Bearings, 56 minutes;
- VC-108.2 Anti-Friction Bearings, 44 minutes;
- VC-108.3 Thrust Bearing, 56 minutes.

CENTRIFUGAL PUMPS MODULE:

- VC-109.1 Pump Disassembly, 53 minutes;
- VC-109.2 Rotor Repair, 40 minutes;
- VC-109.3 Rotor Reassembly, 45 minutes;
- VC-109.4 Pump Assembly, 24 minutes.

VALVES MODULE:

- VC-110.1 Gate Valves, 54 minutes;
- VC-110.2 Globe Valves, 40 minutes;
- VC-110.3 Control Valves and Valve Replacement, 35 minutes;
- VC-110.4 Diaphragm, Butterfly Valves, and Hydrostatic Testing, 48 minutes.

AIR COMPRESSORS MODULE:

- VC-111.1 Reciprocating Compressors - Valve Maintenance, 40 minutes;
- VC-111.2 Reciprocating Compressors - Cylinder Maintenance, 52 minutes;
- VC-111.3 Rotary Screw Compressors, 57 minutes.

RIGGING AND LIFTING MODULE:

- VC-127.1 Hand-operated Hoists, 46 minutes;
- VC-127.2 Power-operated Hoists and Cranes, 48 minutes;
- VC-127.3 Forklifts and Mobile Cranes, 61 minutes;
- VC-127.4 Ladders and Scaffolds, 58 minutes.

MECHANICAL DRIVES, COUPLING AND ALIGNMENT MODULE:

- VC-128.1 Couplings, Alignment, and Belts, 54 minutes;
- VC-128.2 Chains, Speed Reducers, Vibration, 41 minutes.

1. THE ALTERNATIVE IS CONSERVATION
2. VC-113
3. Designed to stimulate discussion and participation on the issue of preserving water resources. Presents water supply and wastewater problems in eight different communities around the country and discusses ideas for solving the problems.
4. Urban Scientific and Educational Research Inc. (USER)
6. General interest junior high students to adults; citizen advisory and activist groups, water quality personnel.
7. 3/4" U-Matic Videocassette, color; 20 minutes. Available as 16mm rental film from USER, 30 Bates Rd., Watertown, MA 02172.
8. None
9. Rating: Category 1. Copyrighted by the Urban Scientific and Educational Research Inc. and may not be reproduced.

1. THE USE OF WASTEWATER SLUDGE ON FARMLANDS
2. VC-117 (Public) and VC-118 (Technical)
3. Demonstrates the best known method of using municipal wastewater sludge as fertilizer on farmland. Topics include sludge characteristics, application rates, site management, environmental monitoring, and effects on crops. This Ohio State University demonstration project includes an epidemiological study of the effects of sludge application on the health of farm workers and livestock.
4. U.S. EPA in cooperation with The Ohio Farm Bureau and The Ohio State University.
6. VC-117 (public) is a more general presentation intended for the general public.
VC-118 (technical) presents more technical information for people involved with the process.
7. 3/4" U-Matic Videocassettes, color; VC-117 - 24 minutes;
VC-118 - 21 minutes.
8. None
9. Rating: Category 1.

1. UNIVERSITY OF WYOMING PROGRAMMED TRAINING UNITS FOR WATER/
WASTEWATER OPERATIONS
2. VC-150 thru VC-164
3. Each unit in this section consists of four different parts:
 - . The Videocassette presents the subject matter to the operator;
 - . The Workbook Notes are provided to guide the operator through the unit and include sketches, problem examples and tables;
 - . The Practice Problems show the operator applications of subject matter for use after studying the tape and workbook notes. The Academic Tests are used to determine if the operator has achieved the objectives of the unit.

Although the operator can proceed at his/her own pace, a group leader should oversee the operator's progress and clarify information where needed. Workbook Notes should be reproduced for each participant.

4. University of Wyoming.
6. Water and wastewater operators
7. 3/4" U-Matic Videocassettes, color; time varies.
8. See 3 above.
9. Rating: Categories vary.

1. MATHEMATICS 1, 2, 3, 4, and 5
2. VC-150.1
3. Explains the following:
Lesson 1 to add, subtract multiply, and divide whole and decimal numbers and use significant numbers; Lesson 2 to add, subtract, multiply, and divide fractions and change mixed numbers to improper fractions; Lesson 3 to interchange fractions to decimals and percents and to solve simple equations containing percents; Lesson 4 to compute the median and mean of a set of numbers; and Lesson 5 to compute the area of a rectangle, triangle and a circle, and explain the units associated with an area measurement.
7. 58 minutes.
9. Rating: Category 2.

1. MATHEMATICS 6, 7
2. VC-150.2
3. Lesson 6 shows how to convert cubic feet and gallons, gallons and pounds of water, mgd and cfs. Also shows how to compute distance, velocity or time given two values; Lesson 7 computes a chemical dosage in pounds per day (or month) given the chemical application in ppm and the average flow in mgd.
7. 25 minutes
9. Rating: Category 2.

1. MATHEMATICS 8, 9, 10
 2. VC-150.3
 3. Lesson 8 computes the volume of a rectangle solid (box) and a cylinder, and defines the units associated with volume; Lesson 9 computes the volume of a cone and a sphere, and converts cubic feet to gallons; Lesson 10 defines the units of specific weight, how it is affected by temperature and explains how to compute specific weight given the specific gravity.
 7. 39 minutes
 9. Rating: Category 1.
-
1. MATHEMATICS 11, 12
 2. VC-150.4
 3. Lesson 12 uses the dosage formula (MATHEMATICS 7) in computing chemical cost and explains the conversion factor between grains per gallon and parts per million; Lesson 12 shows how to compute detention times given flow rate and tank dimensions.
 7. 48 minutes
 9. Rating: Category 1.
-
1. CHEMISTRY 1, 2, 3
 2. VC-151.1
 3. Lesson 1 defines an element and an atom, and explains symbols and valences of common elements; Lesson 2 defines a compound and outlines rules for balancing equations using several examples; Lesson 3 explains how to recognize a radical, presents a table of common radicals and their electrical charges and examples of chemical equations with radicals.
 7. 41 minutes
 9. Rating: Category 3.
-
1. CHEMISTRY 4, 5
 2. VC-151.2
 - Lesson 4 explains dissolution, how compounds dissolve in water to form ions, water as a universal solvent and gives examples of dissolution equations; Lesson 5 explains the pH scale and distinguishes acids from bases and their characteristic reactions in water.
 7. 26 minutes
 9. Rating: Category 3
-
1. CHEMISTRY 6, 7, 8, 9
 2. VC-151.3
 3. Lesson 6 discusses common prefixes and units in the cgs (metric) system and their conversion to English units with tables showing units of length, volume, and weight, and formulas for the conversion of units; in Lesson 7 the relationships are given between water volume and weight in the cgs system with examples of conversion from $\mu\text{g/ml}$ to mg/l . Lesson 8 lists the common atomic weights and how to use them in determining molecular weight; and Lesson 9 discusses Conservation of Mass with examples of how to apply molecular weights to chemical equations.
 7. 44 minutes
 9. Rating: Category 3

1. CHEMISTRY--TESTING 1, 2, 3
 2. VC-152.1
 3. Lesson 1 identifies the major features of an analytical balance and how to weigh an object; Lesson 2 shows procedures and calculations involved in the test for Total Solids; and Lesson 3 explains the major parts of a pH meter, buffer solutions and step-by-step procedures to use a pH meter including standardization.
 7. 42 minutes
 9. Rating: Category 3
-
1. CHEMISTRY--TESTING 4, 5
 2. VC-152.2
 3. Lesson 4 gives a list of equipment plus a step-by-step procedure for determining alkalinity by electrometric titration. Shows calculation for a 100 ml sample to determine alkalinity and an introduction to the units of alkalinity. Lesson 5 shows the importance of cleaning laboratory equipment and the practices used.
 7. 23 minutes.
 9. Rating: Category 4.
-
1. CHEMISTRY--TESTING 6, 7, 8
 2. VC-152.3
 3. Lesson 6 explains dissolved oxygen and how it changes with temperature and elevation. A brief explanation is given to the Winkler Test with a list of equipment and chemicals needed for the Azide Modification. Lesson 7 demonstrates the step-by-step procedure for fixing oxygen in the BOD bottle. Lesson 8 explains the procedure for completing the determination of the DO and gives sample calculations.
 7. 43 minutes.
 9. Rating: Category 4.
-
1. CHEMISTRY--TESTING 9, 10
 2. VC-152.4
 3. Lesson 9 demonstrates the construction and uses of different types of glassware commonly encountered in a chemistry laboratory including beakers, bottles, crucibles, flasks, filtration apparatus, graduates, burets and pipets. Lesson 10 shows how to correctly measure liquids in laboratory glassware, how to use a pipet bulb with three valves, and how to correctly transfer liquids.
 7. 25 minutes.
 9. Rating: Category 4.
-
1. CHEMISTRY--TESTING 11, 12
 2. VC-152.5
 3. Lesson 11 demonstrates the Imhoff cone test for the volume measurement of settleable solids; Lesson 12 demonstrates the test for suspended solids.
 7. 25 minutes.
 9. Rating: Category 4.

1. MICROBIOLOGY 1, 2, 3
2. VC 153.1
3. Lesson 1 presents the general characteristics of bacteria including size, shape and growth needs plus defining aerobic, anaerobic and facultative bacteria. Lesson 2 explains indicator organisms and lists ideal characteristics. Lesson 3 examines coliform bacteria and its advantages and disadvantages as an indicator organism.
7. 26 minutes.
9. Rating: Category 4.

1. HYDRAULICS 1, 2, 3, 4
2. VC-154.1
3. Lesson 1 explains the use of the basic flow equation $Q = A V$ for a pipe flow problem; in Lesson 2 the use of the flow equation is applied to problems other than pipe flow; Lesson 3 explains the use of the pressure equation $P = h$; and Lesson 4 shows problem solving of pressure problems using $P = h$.
7. 26 minutes
9. Rating: Category 3.

1. WATER TREATMENT 1, 2, 3, 4
2. VC-156.1
3. Lesson 1 considers the basic orientation to water treatment, compares differences between simple and complex types of treatment plants and discusses various factors to be considered in plant design; Lesson 2 discusses the purpose and general operation of a flocculation-coagulation unit process with illustration of major systems; Lesson 3 discusses the purpose and general operation of a rapid-sand filter unit as a backup to the clarifier; and Lesson 4 explains chlorination, flow measurement, clear well and fluoridation.
7. 50 minutes
9. Rating: Category 2.

1. WATER TREATMENT 5, 6, 7, 8
2. VC-156.2
3. Lesson 5 discusses the use of a conveyor belt to facilitate handling of bagged chemicals, the use of dust collectors on the hopper of the chemical feeder, safety, respirators, hopper loading and bag disposal; Lesson 6 shows how a gravimetric gate type belt feeder works; Lesson 7 presents the operation and maintenance of a gravimetric gate type belt feeder; and Lesson 8 discusses the general operation and tips on the maintenance of coagulation-flocculation units.
7. 61 minutes
9. Rating: Category 2.

1. WATER TREATMENT 9, 10, 11
 2. VC-156.3
 3. Lesson 9 presents the general operation, use and maintenance of clarifiers and sedimentation basins. Lessons 10 and 11 explain the general operation, use and maintenance of a rapid sand filter, and the preparation and backwash of filters.
 7. 48 minutes.
 9. Rating: Category 4.
-
1. WASTEWATER TREATMENT 1, 2, 3
 2. VC-157.1
 3. Lesson 1 explains the reasons for treating wastewater, the composition and types of sewage and terminology used in wastewater treatment; Lesson 2 outlines the purposes of bar screens, grit chambers, flow measurement and the comminutor; Lesson 3 describes the purposes of the clarifier, digester and sludge drying beds.
 7. 42 minutes
 9. Rating: Category 2.
-
1. WASTEWATER TREATMENT 4, 5, 6
 2. VC-157.2
 3. Lesson 4 discusses secondary treatment and the operation of a trickling filter; Lesson 5 shows the operation of an activated sludge system; and Lesson 6 summarizes primary and secondary treatment plants.
 7. 27 minutes
 9. Rating: Category 2
-
1. WASTE STABILIZATION LAGOON 1, 2
 2. VC-158.1
 3. Lesson 1 explains the basic operation of aerobic and facultative systems; Lesson 2 shows the operations and maintenance of anaerobic and aerated lagoons.
 7. 16 minutes.
 9. Rating: Category 2.
-
1. CHLORINATION 1, 2
 2. VC-159.1
 3. Lesson 1 identifies the basic properties of chlorine, the reasons for chlorination, and basic first aid and safety procedures; Lesson 2 explains the operation of hypochlorinators and gas chlorinators.
 7. 21 minutes
 9. Rating: Category 3

1. CHLORINATION 3, 4, 5, 6
2. VC-159.2
3. Lesson 3 describes the use of the Fisher-Porter vacuum paced type of chlorinator; Lesson 4 explains the various parts of the Fisher-Porter chlorinator; Lesson 5 shows the set-up of the 100 pound and 1 ton chlorine containers; Lesson 6 discusses the swimming pool type of Fisher-Porter chlorine meter, its use and maintenance.
7. 36 minutes
9. Rating: Category 3

1. SAFETY 1, 2, 3
2. VC-160.1
3. Lesson 1 explains the hazards of toxic gases and how to test for them; Lesson 2 shows the hazards of combustible gases and how to test for them; and in Lesson 3 the use and limitations of respirators and gas masks is shown.
7. 42 minutes
9. Rating: Category 3.

1. SAFETY 4
2. VC-160.2
3. Lesson 4 gives a step-by-step procedure of the use, care and maintenance of self-contained breathing apparatus.
7. 15 minutes
9. Rating: Category 3

1. MAINTENANCE 1, 2, 3, 4, 5
2. VC-161.1
3. In Lesson 1 the major parts of a centrifugal pump are explained; Lesson 2 examines the operations of rotation and a water bleed system in the pump; in Lesson 3 the methods and procedures of preventative maintenance are demonstrated; Lesson 4 shows procedures and methods of lubrication; and Lesson 5 shows step-by-step procedures for breaking down, inspecting, repairing and reassembling a centrifugal pump.
7. 60 minutes
9. Rating: Category 3.

1. MAINTENANCE 6, 7
2. VC-161.2
3. In Lesson 6 the major parts of a gate valve and its operation and maintenance are described; Lesson 7 continues with valves, showing the use, operation and maintenance of a plug valve, regulator valve and special high pressure valve.
7. 41 minutes
9. Rating: Category 3.

1. MICROBIOLOGY TESTING 1, 2, 3
 2. VC-162.1
 3. Lesson 1 presents the general procedure and the equipment needed for testing for coliforms using the MF test. Lesson 2 demonstrates the proper procedure for washing and preparing the equipment for the MF test for sterilization. In Lesson 3 the correct procedures for preparing the buffered dilution water for the test are demonstrated.
 7. 38 minutes.
 9. Rating: Category 4.
-
1. MICROBIOLOGY TESTING 5, 6, and 12
 2. VC-162.2
 3. Lesson 5 shows the proper methods of sample taking in a stream or a household tap. Lesson 6 discusses sample size and dilution and the associated mathematics of each situation. Lesson 12 demonstrates coliform incubation procedures including a warm air and water bath incubators.
 7. 40 minutes.
-
1. MICROBIOLOGY TESTING 4, 7, 8
 2. VC-162.3
 3. Lesson 4 shows the preparation of the M-endo MF broth for the coliform test. Lesson 7 demonstrates the proper procedure to perform the MF total coliform testing using sterile techniques. In Lesson 8 colony counting of total coliform is discussed.
 7. 52 minutes.
-
1. MICROBIOLOGY TESTING 9, 10, 11
 2. VC-162.4
 3. Lesson 9 demonstrates the proper techniques for preparing the M-FC broth and rosolic acid solution for the fecal coliform test. Lesson 10 shows how to perform the test for fecal coliforms. In Lesson 11 the proper procedures are demonstrated for fecal coliform colony counting.
 7. 38 minutes
-
1. FLUORIDATION 1, 2, 3, 4, 5
 2. VC-163.1
 3. Lesson 1 gives the history and general information regarding fluoridation of water supplies; Lesson 2 describes the major compounds used in fluoridation and the characteristics of each; in Lesson 3 the major parts, operation and maintenance of an upflow saturator are discussed; Lesson 4 explains the major parts, operation and maintenance of the downflow saturator; and Lesson 5 examines procedures for safety and protection in handling fluoride compounds.
 7. 42 minutes.
 9. Rating: Category 2.

1. TRICKLING FILTERS 1, 2, 3, 4, 5, 6
2. VC-164.1
3. Lesson 1 introduces the trickling filter and its major parts; Lesson 2 explains the biological action of the process; in Lesson 3 the importance of daily and periodic checks and how to deal with problems of uneven distribution and ponding is explained; Lesson 4 examines odor, freezing and filter fly problems; in Lesson 5 maintenance for distributor arms, bearings and mercury seals are described; and Lesson 6 presents hydraulic and organic loadings and how to compute them for trickling filters.
7. 41 minutes.
9. Rating: Category 1.

PACKAGE COURSES (PC) AND MODULES

Package courses have been prepared in response to a need for consistency in water quality training and demonstrating standard laboratory procedures. They also serve as useful references for those developing training courses and materials.

Each of the courses consists of the following: (1) an instructor's guide or staff manual containing information on course planning and worksheets (IPW) which specify instructional objectives, entry level behavior, audio and/or visual aids, suggestions for presenting the topic, equipment and supplies required, a quiz and answer key; (2) a training or student reference manual; (3) slides, slide-tape instructional units, videocassette instructional units and/or overhead transparencies.

All items, print and non-print, need to be ordered separately. If questions, call (614) 422-6717.

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1. INORGANIC ANALYSES IN WATER QUALITY CONTROL PROGRAMS
2. PC-100.4
3. Presents methods of analyzing inorganic pollutants as approved in the Federal Register. Topics include test procedures for acidity, alkalinity, hardness, chlorine, total phosphorus, fluoride, nitrate and nitrite nitrogen, total and suspended solids, turbidity, and specific conductance. Sample handling; compliance methodology, accuracy, precision and error of data; and elements of quality assurance programs are covered with an emphasis on laboratory operations.
4. U.S. EPA - NTOTC
5. 1981.
6. Chemists and technicians who are required to analyze organics for NPDES, NIPPWR, and other water quality programs. Participants should have completed one year of college level inorganic chemistry, one course in quantitative analysis, and should have basic laboratory skills including the use of analytical balances, volumetric glassware and titration assemblies.
7. Slide-tape instructional units (XT):

XT-44 Determination of Phosphorus;
 XT-51 Use of the Spectronic 20 Spectrophotometer;
 XT-80 Fluoride Analytical Procedures.

Slides (X):

X- 8 Use of a Spectrophotometer, 16 slides;
 X- 9 Calibration Graphs, 6 slides;
 X-17 Sample Handling, 8 slides;
 X-18 Volumetric Analysis, 30 slides;
 X-20 Alkalinity, 28 slides;
 X-21 Chlorine, 36 slides;
 X-22 Hardness, 23 slides;
 X-23 Nitrate and Nitrite Nitrogen, 20 slides;
 X-24 Precision, 20 slides;
 X-25 Accuracy, 14 slides;
 X-26 Quality Assurance, 5 slides;
 X-27 Laboratory Safety, 40 slides;
 X-28 Solids, 32 slides;
 X-29 Specific Conductance, 15 slides;
 X-30 Turbidity, 10 slides.

Overhead transparencies (OT):

OT-11 pH, 7.

8. INORGANIC ANALYSES IN WATER QUALITY CONTROL PROGRAMS - TRAINING MANUAL, 178 pages, EPA 430/1-81-015, IRIS: EW 003 226;
 INORGANIC ANALYSES IN WATER QUALITY CONTROL PROGRAMS - INSTRUCTOR'S GUIDE, 253 pages, EPA 430/1-81-016, IRIS EW 007 281
9. A 5-day course.

1. ORGANIC ANALYSES IN WATER QUALITY CONTROL PROGRAMS.
2. PC-100.5
3. Presents analyses for selected organic pollutants listed as approved in the Federal Register. Topics include NPDES methodology, laboratory safety, dissolved oxygen (Winkler), 5-day BOD, total organic carbon, oil and grease (separatory funnel extraction), surfactants (MBAS), total Kjeldahl and organic nitrogen (nesslerization), phenol (4-AAP), PCB's, pesticides, and control of analytical performance. Laboratory procedures are emphasized.
4. U.S. EPA
5. 1980.
6. Chemists and technicians who are required to analyze organics for NPDES, NIPDWR regulations and other water quality programs. Participants should have a basic knowledge of organic chemistry, quantitative analyses, and basic laboratory skills including the use of volumetric glassware and titration assemblies.
7. Slide-tape instructional units:

XT-27 Chemical Oxygen Demand (COD);
 XT-28 Determination of Phenolics;
 XT-29 Dissolved Oxygen Determination;
 XT-51 Use of a Spectronic 20 Spectrophotometer;
 XT-54 Determination of Biochemical Oxygen Demand;
 XT-56 Determination of Grease and Oil;
 XT-59 Determination of Total Organic Carbon (TOC);
 XT-67 Determination of Ammonia Nitrogen.

Slides (X):

X- 8 Use of a Spectrophotometer, 16 slides;
 X- 9 Calibration Graphs, 6 slides;
 X-17 Sample Handling, 8 slides;
 X-24 Precision, 20 slides;
 X-25 Accuracy, 14 slides;
 X-26 Quality Assurance, 5 slides;
 X-27 Laboratory Safety Practices, 40 slides;
 X-31 Dissolved Oxygen - General Considerations, 7 slides;
 X-32 YSL DO Meter, 29 slides;
 X-34 Surfactants, 20 slides;
 X-35 Kjeldahl Nitrogen, 10 slides;
 X-36 Gas Chromatography, 5 slides;
 X-37 Phenols, 4 slides.

8. ORGANIC ANALYSIS IN WATER QUALITY CONTROL PROGRAMS - TRAINING MANUAL, 209 pages, EPA 430/1-80-001, IRIS: EW 007 166; ORGANIC ANALYSES IN WATER QUALITY CONTROL PROGRAMS - INSTRUCTOR'S GUIDE, 312 pages, EPA 430/1-80-012, IRIS: EW 006 966.
9. A 5-day course.

1. BACTERIOLOGICAL METHODS IN WATER QUALITY CONTROL PROGRAMS.
2. PC-120.4
3. Presents sampling, analysis and data handling for bacteriological samples as required by the Federal Register for effluent monitoring and other water quality programs. Topics include characteristics, occurrence and significance of bacterial indicators of pollution; criteria and standards of bacteriological water quality; sampling programs; collection and handling of samples; standard laboratory test procedures for total and fecal coliforms and fecal streptococci; calculating, summarizing and reporting laboratory data; and analytical quality control procedures.
4. U.S. EPA - NTOTC
5. 1980.
6. Laboratory personnel should be able to perform basic bacteriological procedures such as sample inoculations, transfers, and weighings.
7. Slide-tape Instructional Units (XT):

XT-86 Geometric Means: Fecal Coliform.

Slides (X):

X-21 Chlorine, 36 slides;
 X-30 Turbidity, 10 slides;
 X-33 MF Colony Counting, 17 slides;
 X-38 Collection and Handling of Bacteriological Samples,
 14 slides;
 X-39 Bacteriological Indicators, 53 slides;
 X-40 Examination of water for Coliform and Fecal
 Streptococcal Groups (MPN), 40 slides;
 X-41 Membrane Filter, 12 slides.

8. BACTERIOLOGICAL METHODS IN WATER QUALITY CONTROL PROGRAMS - TRAINING MANUAL, 159 pages, EPA 430/1-80-004, IRIS: EW 006 092; BACTERIOLOGICAL METHODS IN WATER QUALITY CONTROL PROGRAMS - INSTRUCTOR'S GUIDE, 194 pages, EPA 430/1-80-015, IRIS: EW 007 159.
9. A 5-day course.

1. A COURSE ON OPERATIONAL CONSIDERATIONS IN WASTEWATER TREATMENT PLANT DESIGN.
2. PC-163
3. Examines fourteen areas of considerations for upgrading the design of wastewater plant facilities. Information is furnished for modifying plant design to compensate for current organic and hydraulic overloads and/or to meet more stringent treatment requirements. The manual serves as a source of reference for establishing criteria for upgrading wastewater treatment plants.
4. Kirkwood Community College, Cedar Rapids, Iowa.
5. 1978.
6. Persons involved in the design and/or evaluation of wastewater treatment plant as a design consulting engineering or a state or federal agency regulatory agent.
7. 703 slides in plastic pages.
8. A COURSE ON OPERATIONAL CONSIDERATIONS IN WASTEWATER TREATMENT PLANT DESIGN - STUDENT MANUAL, IRIS: EW 007 352; A COURSE ON OPERATIONAL CONSIDERATIONS IN WASTEWATER TREATMENT PLANT DESIGN - INSTRUCTOR MANUAL, IRIS: EW 007 353.
9. The course is currently being revised and should be available after June 1982.

1. EFFLUENT MONITORING PROCEDURES (EMP): BASIC PARAMETERS FOR MUNICIPAL EFFLUENTS
2. PC-164.1
3. Explains NPDES approved procedures for measuring 5-day BOD; Dissolved Oxygen; pH; fecal coliform, including calculation of the geometric means of the counts; residual chlorine, suspended and settleable solids and open channel flow.
4. U.S. EPA - NTOTC.
5. 1977.
6. Wastewater treatment plant operators or technicians who are required to monitor effluent discharges under a National Pollutant Discharge Elimination System (NPDES) Permit and have little experience with the procedures.
7. Slide-tape Instructional Units (XT):

XT-29 Dissolved Oxygen Determination;
XT-37 Residual Chlorine and Chlorine Demand;
XT-54 Determination of Biochemical Oxygen Demand;
XT-69 pH Meter-Laboratory Operation;
XT-83 Determination of DO - Polarographic Probe Method;
XT-85 Simplified Geometric Mean: Fecal Coliform;
XT-86 Geometric Mean: Fecal Coliform;
XT-93 Determination of total Residual Chlorine: Iodometric Titration Method.

3/4" U-Matic Videocassette Instructional Units (VC):

VC-12 MPN Procedures: Equipment and Supplies;
VC-13 MPN Procedures: Tests;
VC-21 Suspended Solids;
VC-38 Determination of DO: Standardization of Sodium Thiosulfate;
VC-39 Determination of DO: Titration of Sample;
VC-40 Determination of 5-day Biochemical Oxygen Demand;
VC-41 Determination of Dissolved Oxygen Using a DO Meter;
VC-42 Settleable Solids.

Slides (X):

X- 6 Parts of Weston/Stack DO Meter, 28 slides;
X-11 Bacteriological Sampling, 6 slides;
X-12 Equipment and Supply Requirements, 17 slides;
X-13 Preparation of Culture Medium, 12 slides;
X-14 Filtration Procedures, 15 slides;
X-15 Colony Counting, 19 slides;
X-16 Parshall Flume, 2 slides.

Overhead Transparencies (OT):

- OT- 1 Azide Modification, 6;
- OT- 2 BOD-5, 14;
- OT- 3 Fecal Coliform Test-Multiple Tube Method, 15;
- OT- 4 Total Suspended Solids, 7;
- OT- 5 Chlorine - Amperometric Titration, 10;
- OT- 6 Parshall Flume, 6;
- OT-11 pH Determination, 7;
- OT-12 Sharp-Crested Weir, 5;
- OT-13 Fecal Coliform Test - Membrane Filter, 2;
- OT-14 Report of Self-Monitoring Data, 7.

- 8. SELF-MONITORING PROCEDURES: BASIC PARAMETERS FOR MUNICIPAL EFFLUENTS - STUDENT REFERENCE MANUAL, 375 pages, EPA 430/1-77-003, IRIS: EW 003 471 (current as of 1/79); EFFLUENT MONITORING PROCEDURES: BASIC PARAMETERS FOR MUNICIPAL EFFLUENTS - STAFF GUIDE, 272 pages, EPA 430/1-77-008, IRIS: EW 002 918.
- 9. A 5-day course.

- 1. EFFLUENT MONITORING PROCEDURES (EMP): METALS ANALYSIS
- 2. PC-164.2
- 3. Explains procedures for four types of analytical methods (spectrophotometry, volumetric analysis, atomic absorption, flame photometry) used to determine metals in water samples. The digestion procedure to pretreat a sample for total metal determinations is conducted as part of the calcium lab exercise.
- 4. U.S. EPA - NTOTC
- 5. 1977.
- 6. Wastewater treatment plant operators or technicians who are required to monitor effluent discharges under a National Pollutant Discharge Elimination System (NPDES) Permit and have little experience with the procedures.
- 7. Slide-tape Instructional Units (XT):

- XT-26 Atomic Absorption;
- XT-92 Flameless Atomic Absorption Determination of Mercury (Coleman MAS-50).

3/4" U-Matic Videocassette Instructional Units (VC):

- VC-29 Atomic Absorption Instrumentation - Lab Briefing.

- 8. EFFLUENT MONITORING PROCEDURES: METALS ANALYSES - STUDENT REFERENCE MANUAL, 200 pages, EPA 430/1-77-010, IRIS: EW 002 917. EFFLUENT MONITORING PROCEDURES: METALS ANALYSES - STAFF GUIDE, 138 pages, EPA 430/1-77-006, IRIS: EW 002 919.
- 9. A 4-1/2-day course.

1. EFFLUENT MONITORING PROCEDURES (EMP): NUTRIENTS
2. PC-164.3
3. Explains NPDES approved procedures for measuring total phosphorus, chemical oxygen demand, Kjeldahl (total) nitrogen, ammonia, organic nitrogen, nitrate-nitrite, oil and grease, and procedures for related skills such as using a spectrophotometer and preparing a calibration graph.
4. U.S. EPA - NTOTC
5. 1977.
6. Wastewater treatment plant operators or technicians who are required to monitor effluent discharges under a National Pollutant Discharge Elimination System (NPDES) permit and have little experience with the procedures.
7. Slide-tape Instructional Units (XT):

XT-44 Determination of Phosphorus;
 XT-51 Use of the Spectronic 20 Spectrophotometer;
 XT-56 Determination of Grease and Oil;
 XT-67 Determination of Ammonia Nitrogen.

3/4" U-Matic Videocassette Instructional Units (VC):

VC-55 Determination of Oil and Grease: Basic Skills, Separatory Funnel;
 VC-56 Determination of Oil and Grease: Distillation Set-up.
 VC-57 Use of a Spectrophotometer;
 VC-58 The Preparation of the Cadmium Reduction Column.

Slides (X):

X- 7 Determination of Chemical Oxygen Demand, 34 slides;
 X- 8 Use of a Spectrophotometer, 16 slides;
 X- 9 Preparation of Calibration Graphs, 6 slides;
 X-10 Determination of Ammonia by an Ammonia Selective Ion Electrode, 6 slides.

Overhead Transparencies (OT):

OT- 7 Determination of Total Phosphorus or of Orthophosphate, Single Reagent Method, 7;
 OT- 8 Determination of Chemical Oxygen Demand, 4;
 OT- 9 Determination of Total Kjeldahl Nitrogen, 9;
 OT-10 Determination of Nitrate-Nitrite Nitrogen and of Nitrate Nitrogen, cadmium Reduction Method, 11.

8. EFFLUENT MONITORING PROCEDURES: NUTRIENTS - STUDENT REFERENCE MANUAL, 314 pages, EPA 430/1-76-006, IRIS: EW 002 921; EFFLUENT MONITORING PROCEDURES: NUTRIENTS - STAFF GUIDE, 213 pages, EPA 430/1-77-007, IRIS: EW 002 916.
9. A 4-1/2-day Course.

1. EFFLUENT MONITORING PROCEDURES (EMP): BASIC LABORATORY SKILLS
2. PC-164.6
3. Reviews basic mathematics and explains laboratory operations such as weighing, solution preparation, volumetric analysis, naming compounds, record keeping, and basic microbiological techniques.
4. U.S. EPA - NTOTC
5. 1978.
6. Wastewater treatment plant operators or technicians who are required to monitor effluent discharges under a National Pollutant Discharge Elimination Systems (NPDES) Permit and have little experience with the laboratory work.
7. 3/4" U-Matic Videocassette Instructional Units (VC):
 - VC- 4 Buret Construction and Use;
 - VC- 5 Winkler Dissolved Oxygen Determination;
 - VC-12 MPN Procedures: Equipment and Supplies;
 - VC-39 Determination of DO: Standardization of Sodium Thiosulfate.
8. EFFLUENT MONITORING PROCEDURES: BASIC LABORATORY SKILLS - STUDENT REFERENCE MANUAL, 127 pages, EPA 430/1-77-011, IRIS: EW 002 920; EFFLUENT MONITORING PROCEDURES: BASIC LABORATORY SKILLS - STAFF GUIDE, 213 pages, EPA 430/1-78-005, IRIS: EW 003 164.
9. A 5-day study.

1. TROUBLESHOOTING OPERATION & MAINTENANCE (O&M) PROBLEMS IN WASTEWATER TREATMENT PLANTS.
2. PC-179.2
3. This 15-unit course explains how to train water pollution control personnel in the process of troubleshooting and problem solving for operational problems. Educational techniques include case studies, discussions, record analysis, role playing, simulations, and small group interaction and lectures. The units include sewer use control, pre/primary treatment, fixed media biological systems, oxidation lagoons, laboratory practices, flow measurement, chemical additions, management behavior, activated sludge, solids handling, land treatment and disinfection.
4. Environmental Resources Training Center of Southern Illinois University.
5. December, 1979.
6. Wastewater treatment plant operations and management personnel; local, state and federal regulatory agency personnel; private sector operations' consultants; design consultants for equipment manufacturers; and instructors of wastewater technology courses.
7. 877 slides.
8. A COURSE ON TROUBLESHOOTING O & M PROBLEMS IN WASTEWATER TREATMENT PLANTS - INSTRUCTOR'S MANUAL, 212 pages, IRIS: EW 006 962.

A COURSE ON TROUBLESHOOTING O & M PROBLEMS IN WASTEWATER TREATMENT FACILITIES - INSTRUCTOR'S NOTEBOOK, 1702 pages, IRIS: EW 006 469.

A COURSE ON TROUBLESHOOTING O & M PROBLEMS IN WASTEWATER TREATMENT FACILITIES - TRAINEE NOTEBOOK, 333 pages, IRIS: EW 006 984.

A COURSE ON TROUBLESHOOTING O & M PROBLEMS IN WASTEWATER TREATMENT FACILITIES - OVERHEAD TRANSPARENCY MASTERS - INSTRUCTOR'S NOTEBOOK, 109 pages, IRIS: EW 006 983.

9. Rating: Category 2. Some slides are contrasty or have an overall color shift. The entire course contains 44-1/4 hours of lecture material. During field tests, one or more units have been eliminated to decrease the instructional time to 35 hours, or a 5-day workshop.

NOTE: The slides may be rented for \$50.00. Non-print items are available at additional cost. A single copy of each item (all four items) can be rented for \$20.00. Non-print items can also be purchased. Call (614) 422-6717 for purchase prices of print material.

1. DETERMINATION OF RESIDUAL CHLORINE AND TURBIDITY IN DRINKING WATER
2. PC 301.1
3. Presents the analytical methods for residual chlorine and turbidity. Topics include sample handling, permissible concentration levels, substitution of residual chlorine for bacteriological work, and public notification.
4. U. S. EPA - EMSL
5. 1978.
6. Water treatment plant operators with little experience with analytical procedures for residual chlorine and turbidity.
7. Slides (X):

X-42 Federal (State) Requirements for Compliance on Chlorine and Turbidity, 19 slides;

X-43 Analysis for Residual Chlorine, 16 slides;

X-44 Analysis for Turbidity, 20 slides.

8. DETERMINATION OF RESIDUAL CHLORINE AND TURBIDITY IN DRINKING WATER - STUDENT MANUAL, 64 pages, EPA 430/1-78-010, IRIS: EW 006 956; DETERMINATION OF RESIDUAL CHLORINE AND TURBIDITY IN DRINKING WATER - INSTRUCTOR'S MANUAL, EPA 430/1-78-010, IRIS: EW 006 956.
9. A 1-day course.

1. WORKING FOR CLEAN WATER: AN INFORMATION PROGRAM FOR CITIZEN ADVISORY GROUPS.
2. XT-120, 121, 134, 168-178; VC 113; MP-16, 57
3. Designed to help advisory groups improve decision-making in water quality planning.
4. Institute of State and Regional Affairs, The Pennsylvania State University, Middletown, PA.
5. 1981.
6. Citizen advisory groups, governmental officials, public school and college students, wastewater treatment authority members.
7. Eighteen handbooks, each discussing a different topic, are units (chapters) in a three volume set of printed materials. The unit titles and associated audiovisual presentations (slide-tape, videocassette, or 16-mm film) are outlined below:

VOLUME 1

Chapter 1 - ROLE OF ADVISORY GROUPS

XT-168 - Role of Advisory Groups, 10 minute tape and 69 slides.

Chapter 2 - PUBLIC PARTICIPATION

XT-169 - The Bellevue Experience A Public Participation Puzzle,
14 minute tape and 80 slides.

Chapter 3 - FACILITY PLANNING IN THE CONSTRUCTION GRANTS PROGRAM

XT-170 - Overview of Facility Planning,
14 minute tape and 63 slides.

Chapter 4 - MUNICIPAL WASTEWATER PROCESSES OVERVIEW

XT-171 - Municipal Wastewater Treatment (Processes),
16 minute tape and 79 slides.

Chapter 5 - MUNICIPAL WASTEWATER PROCESSES: DETAILS

XT-171 - Municipal Wastewater Treatment (Processes),
16 minute tape and 79 slides.

Chapter 6 - SMALL SYSTEMS

XT-134 - Onsite Wastewater Treatment Systems,
12 minute tape and 69 slides.

VOLUME 2

Chapter 7 - INNOVATIVE AND ALTERNATIVE TECHNOLOGIES

XT-120 - Innovative and Alternative Technologies for Municipal Wastewater Management,
14 minute tape and 66 slides.

Chapter 8 - WATER CONSERVATION AND REUSE

VC-113 - The Alternative in Conservation,
20 minute 3/4" U-Matic Videocassette.

Chapter 9 - LAND TREATMENT

XT-172 - Land Treatment of Municipal Wastewater,
14 minute tape and 77 slides.

Chapter 10 - COST-EFFECTIVENESS ANALYSIS

XT-173 - Cost-Effectiveness Analysis,
11 minute tape and 70 slides.

Chapter 11 - ENVIRONMENTAL ASSESSMENT

XT-174 - Environmental Assessment,
11 minute tapes and 70 slides.

Chapter 12 - FINANCIAL MANAGEMENT

XT-175 - Financial Management,
16 minute tape and 78 slides.

VOLUME 3

Chapter 13 - MULTIPLE USE

XT-176 - Clean Water Recreation,
13 minute tape and 80 slides.

Chapter 14 - INDUSTRIAL PRETREATMENT

XT-177 - Industrial Pretreatment,
12 minute tape and 65 slides.

Chapter 15 - WASTEWATER FACILITIES OPERATIONS AND MANAGEMENT

MP-57 - Investment to Protect,
20 minute 16mm film.

Chapter 16 - URBAN STORMWATER RUNOFF

XT-121 Urban Storm Water Runoff,
12 minute tape and 80 slides.

Chapter 17 - NONPOINT SOURCE POLLUTION: AGRICULTURE,
FORESTRY, AND MINING.

XT-178 - Rural Nonpoint Source of Pollution,
9 minute tape and 52 slides.

Chapter 18 - GROUNDWATER CONTAMINATION

MP-16 - Groundwater - "America's Buried Treasure."
13 minute 16mm film.

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