



Chesapeake AWWA
American Water Works Association



**SIXTY SIXTH ANNUAL
SHORT COURSES
FOR
WATER & WASTEWATER
OPERATORS
May 31 – June 5, 2015**

HELD
AT

WASHINGTON COLLEGE
300 WASHINGTON AVE,
CHESTERTOWN, MARYLAND

*Sponsored
By*

Chesapeake Section, American Water Works Association

Chesapeake Water Environment Association

*Water and Waste Operators Association of
Maryland, Delaware and the District of Columbia*

66th SHORT COURSE PROGRAM & SCHEDULE

Sunday, May 31, 2015

- 4:00 p.m. to 6:00 p.m. Organization Check-in and Signup
Registration and Room Assignments
- 6:00 p.m. to 11:00 p.m. The Short Course will begin with a Buffet Dinner at 6 p.m. in the Main Dining Room located in Hodson Hall followed by a Meet and Greet beginning at 7:30.

Monday, June 1 through Thursday, June 4, 2015

- 7:00 a.m. to 8:00 a.m. Breakfast for Non-commuters
- 8:00 a.m. to Noon Training Sessions
- Noon to 1:00 p.m. Lunch for all Attendees and Trainers
- 1:00 p.m. to 5:00 p.m. Training Sessions
- 5:00 p.m. to 6:00 p.m. Dinner for Non-commuters

Friday, June 5, 2015

- 7:00 a.m. to 8:00 a.m. Check-out, Key Return
Breakfast for Non-commuters
- 8:00 a.m. to 11:00 a.m. Final Short Course Exam - All sessions
- OR**
- 9:00 a.m. to Noon Maryland Board of Water and Waste Systems Operators
Certification Exams for those scheduled*

Directions to Washington College

Washington College is located in historic Chestertown, Maryland on Maryland's Eastern Shore north of Centreville on US 213. The College is on the west side of the highway and is well marked. Directional signs to the Short Course will be provided.

Purpose

The Short Course for Water and Wastewater Operators offers training, information, and insights that will enable the water and wastewater systems personnel to operate their facilities in a more effective, safe, and economical manner. The courses offer new ideas and serve as a "refresher" for existing operators.

Questions/Problems

If there are any questions not answered in this brochure or problems encountered prior to registration, you can contact Jim Timmons (410) 396-9607, Monday through Friday 6:00 a.m. until 2:00 p.m., or Rachel Ellis (443) 924-4671, Monday through Friday, 8:00 a.m. – 5:00 p.m.

Washington College

The College's only function is to provide facilities for the courses. The College should not be contacted regarding registration or arrangements. All questions should be directed to the above named individuals or Short Committee members.

Course Registration

Advanced full-week registration is **\$550.00** and is due by **May 15, 2015**, Add \$50.00 for all registrations received **after May 15, 2015**, or performed on-site at the event. Registration fees include the Sunday evening dinner, all classroom instruction, course materials, lunches and refreshments at the breaks Monday through Thursday.

Short Course registration is now PAPERLESS! Mail-in registration will NOT be accepted.

How to Register:

1. Gather all required information **for each attendee being registered**
2. Link to our online registration system by visiting www.wwoa-cwea.com
3. Complete individual or group registrations
4. Pay – see below
5. Print your invoice – **no invoice will be mailed to you!**

Payment

- Pay online using credit card or EFT - you can register a group of attendees using one credit card.
- Pay by check. Checks should be made payable to Short Course, and mailed to the address shown in the Online Registration System. (Include all attendee names with your check).

Payments not made within 45 days of the course (July 20, 2015) will be charged an additional processing fee of \$ 50.00. Cancellations will be assessed a fee of \$10.00.

NOTE: Certificates of attendance will not be issued until full payment has been received.

On-Site Help

If you are a single day or late registrant, an instructor, or if you have any questions/problems during the week, you can find help in the Short Courses Staff Room located in Room 108 in the Daly Building from 7 a.m. to 5 p.m. The phone number is (410) 810-5030, during class hours 7 a.m. to 5 p.m. or you can ask any Short Course Committee member to assist you. Should someone need to reach you in an emergency the Public Safety Office phone number is (410) 778-7810. The 24-hour lockout/guest assistance number is (410)-699-1883

Maryland State Operator Certification Exam

This year the Maryland Board of Water and Waste Systems Operators will hold operator certification exams for all classes at the conclusion of the Short Course on Friday, June 5, 2015, from 9 a.m. to Noon. This exam is separate from the TRE credit exam given by each session of the Short Course.

Payment to attend the Short Course does not include the cost nor entitle you to take the Maryland Certification Exam! * You must apply separately to the Maryland Board to sit for the Maryland Certification Exam. The Board must receive the application for those wishing to take the Certification Exam at Washington College by May 15, 2015. **No more than 100 applications will be accepted for this exam.** Mail completed application to:

Board of Waterworks & Waste Systems Operators
P.O. Box 2057
Baltimore, MD 21230-1708

Any questions regarding the Certification Exam may be referred to Mr. Lawrence Robinson at 1(800) 633-6101, ext. 3167 or 1(410) 537-3167. **Note: The State exam will be held at 9:00 a.m. in Hynson Lounge located in Hodson Hall Commons.**

Payment for the Short Course does not include the cost of nor entitle you to take the Certification Exam!

Sponsorship/Scholarships

The Annual Water and Wastewater Operators Short Course is sponsored by the Short Course Committee, a group made up of representatives from the Water and Wastewater Operators of Maryland, Delaware, and the District of Columbia (WWOA), the Chesapeake Section, American Water Works Association (CSAWWA), and the Chesapeake Water Environment Association (CWEA). This training effort is sponsored by the professional membership organizations and the employers of the water and wastewater operating professionals. It is a volunteer organization. Should you wish to become a member please contact one of the Short Course Staff.

Scholarships may be offered through each organization to attend the Short Course. Members of each organization are eligible per the selection process of the organization.

Overnight Room Accommodations

Overnight accommodations will be available at a cost of \$35.00 per person per night. This fee includes an air conditioned room with a limited linen package. The rooms will be available from 4:00 p.m. Sunday, May 31 and must be vacated by 8 a.m. on Friday, June 5. **A refundable \$10.00 key deposit will be collected at the time of registration. However, students will be billed \$60.00 for lost keys.** Room and board cost includes the standard all-you-can-eat cafeteria

meals (breakfast and dinner) served in the Dining Facility at Hodson Hall. Lunch is included in the registration cost. Room and board for the week is \$275.00.

Meals for on-site accommodations begin with the Buffet dinner on Sunday evening, May 31, and end with breakfast on Friday morning, June 5. The serving times are:

Breakfast – 7 a.m. to 8 a.m.

Lunch – Noon to 1 p.m.

Dinner – 5 p.m. to 6 p.m.

Should you prefer to stay off campus, there are several motels nearby. Reservations must be made by you with the motel. If you wish to eat on campus, you must purchase the meal plan. The cost for breakfast and dinner on campus is \$120 for the week or \$30 per day.

Parking

Please observe all parking restrictions at the College. All vehicles improperly parked on grass or prohibited areas will be given a ticket or towed.

Smoking

Smoking is prohibited in all college buildings including residential halls, and outdoors within 25 feet of all college buildings. **Violations will result in a \$250.00 fine per occurrence.** Repeat violations may result in the loss of campus housing and/or campus visitation privileges.

Emergencies

If there is an **emergency** at home or work while you are staying at the College and you must be reached, the 24-hour Public Safety number is (410) 778-7810. A message will be taken and every attempt will be made to contact you

Conduct of Participants

Throughout the history of the Short Course most participants have conducted themselves in a most reasonable manner and are a credit to our profession. This is a reminder that all participants will act responsibly. Undesirable conduct will not be tolerated and will result in your removal from the site by campus security forces without refund. Notification to your employer and the cause for removal will follow.

In addition, anyone found unduly under the influence of alcohol, anyone found buying, selling, consuming, or possessing illegal narcotics and drugs will be required to leave this year's Short Course immediately and will be banned from all future Short Courses. Unduly under the influence will be in the judgment of any Short Course Committee member or University official.

Attendance and Training Credit Hours Earned

The policy of the Short Course Committee is that a student must attend at least 80% of the training (Short Course examination being included in the total time – the State examination does not count as class attendance) to receive credit for full attendance. All courses are subject to approval by the Maryland Board of Waterworks and Waste System Operators. Also, 80% or better attendance along with a passing grade on the final examination, results in 1.5 times the full attendance credit. Attendees with less than 80% attendance or single day attendees will receive a certificate of attendance with the actual hours attended. The Short Course Committee does not submit individual classes for TRE credits. Attendees have the option to submit the hours for approval.

If you are taking a State Certification exam on Friday, June 5, and you are also interested in taking the Short Course final exam, you may do so Thursday evening. Only individuals taking the State Certification exam will be eligible for this option. You must make arrangements with the course coordinator by Tuesday, June 2.

All participants must sign their own name to the attendance sheets during the class to receive credit. NO EXCEPTIONS.

Disclaimer

The Introductory Water and the Introductory and Intermediate Wastewater Sessions are designed for those persons just entering the field and persons holding temporary operator licenses. Attendance at this course in no way implies a guarantee that those participating in the sessions are assured of passing the State Certification exam. However, the information covered in the sessions should be helpful with some parts of the certification exam. Fully certified operators should take the more advanced sessions for re-certification credit however all sessions are submitted for TRE credits.

Sunday Evening Meet & Greet

On Sunday, May 31, 2015, the Short Course will begin with a Buffet Dinner and Meet and Greet in the Main Dining Facility in Hodson Hall. The buffet will be served from 6:00 p.m. until 7:30 with a Meet and Greet to follow until 11:00 p.m.

Evening Recreational Activities (Hodson Hall)

Monday	7:00 - 11 p.m.	Nacho Grande Night, Karaoke and Televised Sports in the Game Room
Tuesday	7:00 - 11 p.m.	Pizza Night, DJ and Televised Sports in the Game Room
Wednesday	7:00 - 11 p.m.	Wing Night, Karaoke and Televised Sports in the Game Room
Thursday	Study Night	Study Night, No Activities Scheduled

Session Highlights

Introductory Water

The Introductory Water Course is provided for those who work at any class water treatment plant but is primarily designed for those who operate Class 1 & 2 plants with disinfection/chlorination, pH control, and fluoridation. Generally these are small surface water and groundwater plants. The curriculum involves applied mathematics; basic concepts in water production and treatment, as well as maintenance and safety aspects associated with water treatment systems.

This course is Maryland Board/TRE # 5671-15-03.

Water – Classes 3 & 4

The Water Class 3 & 4 is designed for those who operate plants with chlorination, pH control, flocculation, fluoridation, filtration, and iron removal utilizing ion exchange or contact oxidation processes (Class 3); and chlorination, pH control, fluoridation, aeration, coagulation, sedimentation, and filtration for both surface water treatment and complex iron removal (Class 4). Generally these are larger water plants. A person taking this course will have at least two or three years of operating experience and/or have completed a basic/introductory water course. This course is Maryland Board/TRE # 5675-15-03.

Advanced Water Topics

The Advanced Water Topics curriculum is designed for water treatment plant operators. The course work is designed to investigate water treatment subjects and issues in greater detail than would be covered in introductory classes. Persons taking this course should be a certified operator with approximately four years or more experience in water treatment technology, and have completed basic introductory water courses.

This course is Maryland Board/TRE # 5680-15-03.

Water Distribution Systems

The Water Distribution Systems Courses are designed for those who operate and maintain a water distribution system. They are for both the beginner and seasoned operator, and will cover basic and advanced concepts. This course is Maryland Board/TRE # 5672-15-03.

Introductory / Intermediate Wastewater

The course is designed for the temporary certified operator with basic wastewater skills. The operator taking this course will generally have one to three years of operating experience. Information covered in this session should be helpful with some parts of the certification exams, but in no way assures one of passing. Due to a large majority of operators at this experience level taking the State certification exams, no final exam has been given for this session in previous years. This year we will again offer an exam for those not taking the State Certification test. This will limit the session to 32 TRE credit hours for those taking certification, but will allow for 32 plus 1.5x (16) credit hours for those passing the short course exam (for a total of 48 credit hours). Attendees have the option to take the State certification exam to be given on Friday, June 6. Pre-registration for the State certification exam is mandatory and is the sole responsibility of each operator. This course will make use of instructor hand outs and note taking by the attendee. This course is Maryland Board/TRE # 5673-15-03.

Advanced Wastewater

This session is designed for certified wastewater operators. The person taking this class will have two or more years of experience and have completed a basic or introductory wastewater

course. In addition, it serves as a refresher course for the seasoned veteran operator. **Experienced operators taking the certification exam should enroll for the Introductory/Intermediate Wastewater course. Although some of these sessions are designed to review standard advanced wastewater process control, many of the sessions will discuss recent advancements in technology in an effort to expand the veteran operator's knowledge beyond his/her own facility.**

This course is Maryland Board/TRE # 5676-15-03.

Wastewater Collection Systems

The Wastewater Collection Systems Courses are designed for those who operate and maintain a wastewater collection system. They are for both the beginner and seasoned operator, and will cover basic and advanced concepts. This course is Maryland Board/TRE # 5671-15-03

Industrial Waste Treatment

The Industrial Waste Treatment Course is designed to cover a broad range of topics in the field. Review sessions for safety and chemistry are provided. The technology discussed will apply for both direct industrial waste dischargers and indirect dischargers to Publicly Owned Treatment Works (POTWs). The sessions during the first three days concentrate on chemical/physical processes and topics of general applicability.

The 3-day session is Maryland Board/TRE # for 24 hours. 5679-15-03.

The class on Thursday focuses on biological treatment processes to address training requirements for Industrial Wastewater Works and Pretreatment Plants of Class 4, Biological Lagoons, and Class 5, Activated Sludge.

The biological treatment class is approved Maryland Board/TRE #for 8 hours. 5678-15-03.

Treatment Facility Maintenance

This course is designed for an operator or flexible worker at any water, wastewater or biosolids facility to understand the why and when of equipment maintenance. With the industry shift toward combining operational and maintenance duties, operators are now expected to perform general maintenance on the equipment they are operating. The student will be exposed to equipment maintenance basics and safety training as well.

This course is Maryland Board/TRE # 5677-15-03.

Superintendents/Managers

The Managers/Superintendents Course is designed for certified water and wastewater managers, supervisors, superintendents and experienced operators who have taken basic and advanced courses. Each session for this course has been submitted separately for Maryland Board/TRE approval. This course was designed to meet the needs of managers and superintendent's re-certification and although some sessions have been approved for other operators' certification, it may not satisfy all of those requirements.

Delaware Operator License Holders

Certified Delaware Operators can submit MDE approved courses for credit with Delaware.

Session Listings

Introductory Water

Course Coordinator: Rob Swann

MONDAY

8:00 – 8:30 a.m. **Overview** – Instructor, Rob Swann, Anne Arundel County DPW

An overview of the Introductory Water program will be presented and course objectives discussed. Textbooks will be distributed and the TRE requirements will be outlined. This course will cover the materials, which will be helpful to students new to the water industry as well as those who will be taking the Class 1 or 2 State Certification Exam for Water Treatment.

8:30 – Noon **Basic Instrumentation** – Instructor, Gary Anderson – Sherwood Logan and Associates, Inc.

This course is offered as a basic overview of the concepts and techniques for four of the most often encountered measurements found in water treatment plants; temperature, pressure, level, and flow. The class will learn the theory behind each measurement and become familiar with the diversity of instrumentation available.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Water Treatment Processes** – Instructor, Eddie Cope – Anne Arundel County DPW

This session will cover various water treatment processes including coagulation, sedimentation, disinfection, fluoridation, iron and manganese removal, softening, taste and odor control, and corrosion control. Water sources, chemicals used in water treatment and plant operations will also be discussed.

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 – 10 a.m. **Applied Mathematics** – Instructor, Scott Harmon – Anne Arundel County DPW

This session will focus on basic mathematics and application fundamentals to the water treatment industry. Upon completion of this course, personnel should be able to perform calculations needed to verify various plant processes. Examples include chemical dosing, retention time, pressure backwash flow rates and horsepower pump rates.

10:00 a.m. – Noon **Ultraviolet Light Disinfection** – Instructor, Perry Violet - WSSC

This session is designed to introduce Operational and Maintenance personnel to the concept of using ultraviolet light to disinfect drinking water. The UV disinfection process will be discussed, including operational demands and problems, measurement of UV, and the disinfection validation process. Various components of a UV process will be identified, as well as operation and maintenance issues of the UV process.

OR

10:00 a.m. – Noon **Water 3&4 State Examination Review** – Instructors, Eddie Cope - Anne Arundel County DPW & Jay Price –City of Baltimore DPW

This session is designed to review topics that may help those taking the Water 3 or 4 State examinations.

Note: This is a fast paced review that is open only to those registered for the June 5, 2015 State Certification exam.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **State Water Examination Review** – Instructors, Eddie Cope - Anne Arundel County DPW & Jay Price – City of Baltimore

This session is designed to review topics that may help those taking any of the State Water exams.

Note: This is a fast paced review that is open only to those registered for the June 5, 2015 State exam.

Or

1:00 – 5:00 p.m. **Pump Maintenance** – Instructor, Steve Justice - Geiger Pumps
An overview of mechanical maintenance on motors and pumps in the workplace is provided. Packing pumps, motor replacements and other topics will be discussed thoroughly.

5:00 – 6:00 p.m. **DINNER**

WEDNESDAY

8:00 – Noon **Filtration processes-** Instructor, Ben Thompson- Anne Arundel County DPW

This filtration class will discuss multiple filtration systems and their key components. Proper filter operation and maintenance practices will be looked at to ensure your filters are running properly. Lastly the class will evaluate filter surveillance and troubleshooting techniques.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Chlorination Technology** – Instructor, Terry Bradley – Anne Arundel County DPW

Session will cover the review of various disinfection technologies and discussion of the main types of chlorine application systems. Additional course topics are safety procedures for storage and use of chlorine tanks, current disinfection technologies, and the major physical and chemical characteristics of disinfection chlorine.

5:00 - 6:00 p.m. **DINNER**

THURSDAY

8:00 – Noon **Distribution Systems** – Instructor, Billy Dove - WSSC

The class will discuss water distribution systems. Among the topics discussed will be various types of water storage, hydraulic concepts of pressure and force, pressure reducing valves, booster pumps, and the importance of tank turnover, chlorination, and disinfection byproducts.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Applied Mathematics (continued)** – Instructor, Scott Harmon – Anne Arundel County DPW

This session will focus on basic mathematics and application fundamentals to the water treatment industry. Upon completion of this course, personnel should be able to perform calculations needed to verify various plant processes. Examples include chemical dosing, retention time, pressure backwash flow rates and horsepower pump rates.

5:00 – 6:00 p.m. **DINNER**

FRIDAY

8:00 – 11:30 a.m. **Final Short Course Exam**

WATER CLASSES 3 & 4

Course Coordinators: JC Langley & Dinesh Bahadursingh

MONDAY

8:00 – 8:30 a.m. **Overview** - Course Coordinators, JC Langley – WSSC & Dinesh Bahadursingh - WSSC

An overview of the Water 3 & 4 course will be presented; course objectives and TRE requirements will be discussed.

8:30 a.m. – Noon **Chlorine Use & Safe Handling** – Instructor, Terry Bradley - Anne Arundel County DPW

This session will cover the use and safe handling of chlorine. Included in this discussion will be waterborne diseases, water-chlorine chemistry, disinfection methods, and operational factors that affect the disinfection process. Also included will be inspection of equipment, personal safety, health precautions, and emergency procedures.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Water Treatment Processes** – Instructor, Eddie Cope - Anne Arundel County DPW

This session will cover various water treatment processes including coagulation, sedimentation, disinfection, fluoridation, iron and manganese removal, softening, taste and odor control, and corrosion control. Water sources, chemicals used in water treatment and plant operations will also be discussed.

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 – 10:00 a.m. **Filtration Processes** - Instructor, Perry Violet - WSSC

This session will give the participant an introduction to operation and maintenance of various types of filters, including granular media and gravity filtration. In addition, design and operation of gravity and pressure filters will be discussed.

10:00 a.m. – Noon **Ultraviolet Light Disinfection** – Instructor, Perry Violet - WSSC

This session is designed to introduce Operational and Maintenance personnel to the concept of using ultraviolet light to disinfect drinking water. The UV disinfection process will be discussed, including operational demands and problems, measurement of UV, and the disinfection validation process. Various components of a UV process will be identified, as well as operation and maintenance issues of the UV process.

OR

10:00 a.m. – Noon **Water 3 & 4 State Examination Review** – Instructors, Eddie Cope - Anne Arundel County DPW & Jay Price – City of Baltimore DPW

This session is designed to review topics that may help those taking the Water 3 or 4 State examinations.

Note: This is a fast paced review that is open only to those registered for the June 5, 2015 State Certification exam.

Noon – 1:00 p.m.

LUNCH

1:00 – 5:00 p.m.

Pump Maintenance – Instructor, Steve Justice - Geiger Pumps

An overview of mechanical maintenance on motors and pumps in the workplace is provided. Packing pumps, motor replacements and other topics will be discussed thoroughly.

OR

1:00 – 5:00 p.m.

Water 3 & 4 State Examination Review – Instructors, Eddie Cope - Anne Arundel County DPW & Jay Price – City of Baltimore DPW

This session is designed to review topics that may help those taking the Water 3 or 4 State examinations.

Note: This is a fast paced review that is open only to those registered for the June 5, 2015 State Certification exam.

5:00 – 6:00 p.m.

DINNER

WEDNESDAY

- 8:00 – Noon **Applied Mathematics** – Instructor, Jay Price – City of Baltimore DPW
- This session will focus on basic mathematics and applications fundamental to the water treatment. Upon completion of this course, personnel should be able to perform calculations needed to verify various plant processes. Examples include chemical dosing, detention time, pressure calculations, backwash flow rates, and temperature conversions.
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 5:00 p.m. **Coagulation, Flocculation & Sedimentation** – Instructor, Scott Harmon - Anne Arundel County DPW
- Session will cover the first three steps of conventional water treatment process; including rapid mixing, types of flocculation, and sedimentation will be discussed.
- 5:00 – 6:00 p.m. **DINNER**

THURSDAY

- 8:00 – Noon **Distribution Systems** – Instructor, Billy Dove – WSSC
- The class will discuss water distribution systems. Among the topics discussed will be various types of water storage, hydraulic concepts of pressure and force, pressure reducing valves, booster pumps, and the importance of tank turnover, chlorination, and disinfection byproducts.
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 3:00 p.m. **Ozone Disinfection** – Instructor, Doug Grimes - Fairfax Water
- This session is designed to introduce Operational and Maintenance personnel to the concept of using ozone to treat drinking water. Attendees will be briefed on the history of ozone usage. The entire ozone treatment process will be discussed, including storing liquid oxygen, generating ozone on site, measurement of ozone residual, calculation of disinfection credit, and destructing excess ozone. Various components of the ozone process will be identified, as well as operation and maintenance of the ozone process.

3:00 – 5:00 p.m. **Water 3&4 Course Review** – Instructor, J.C. Langley – WSSC & Dinesh Bahadursingh - WSSC

This session will be a review of the week’s material in preparation for Short Course final exam.

5:00 – 6:00 p.m. **DINNER**

FRIDAY

8:00 – 11:00 a.m. **Final Short Course Exam**

ADVANCED WATER TOPICS

Course Coordinators: Scott Harmon & Jay Price

MONDAY

8:00 - 8:15 a.m. **Overview** - Instructors, Scott Harmon - Anne Arundel County and Jay Price – Baltimore City DPW

An overview of the Advanced Water program will be presented and course objectives discussed. Course materials will be distributed and TRE requirements will be discussed.

8:15 – 11:50 a.m. **Optimizing Energy Utilization and Production** – Instructor, Bob Wimmer – Black & Veatch

Summary: This course will provide Superintendents and experienced Operators with the knowledge and experience to optimize Energy Utilization and Production. The course will focus on changes to equipment, operating strategies and procedures to maximize energy utilization and production. The course will also address procurement options and energy contracts and how they impact operations and implementation of energy optimization.

12:00 - 1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **Energy Management for Water and Wastewater - Instructor, Rob Taylor- WSSC**

This course will provide Superintendents and experienced Plant Operators with the knowledge and experience to optimize energy usage and provide a good understanding of supply and demand side energy management. The course will focus on electricity usage, tracking and efficiency performance measurement, pumps and pumping systems, aeration systems, and energy performance contracting. The course will also provide a background in renewable energy – hydro, wind, solar, and biogas- as it relates to plant

performance and cost reduction. Actual plant case studies will be used to provide examples.

5:00 - 6:00 p.m. **DINNER**

TUESDAY

8:00 - Noon **Preparing for and responding to a terrorism incident from a Public Works perspective** – Instructor, Pete Steps - Anne Arundel County

What is terrorism? What is a PTE? What is a CBRNE incident? This course answers these questions and others. Topics discussed in this session will pertain to weapons of mass destruction, how to perform a vulnerability assessment of your facility and more.

12:00 - 1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **Advanced Filtration Processes: Theory and Practices** – Instructor, Patrick Foley -Sherwood Logan and Associates, Inc.

With increased emphasis being placed on optimum filter performance by recent legislation, this session will cover all aspects of advanced filtration processes including granular media and gravity filtration. Included in this four hour session will be new design and rehabilitation of existing filters, media selection and design for particle removal, types of filter layouts, instrumentation and control, filter maintenance for optimum performance, and troubleshooting when operations require. Comparisons will be made of different methods of backwashing and students will be able to observe cross sections of pilot filters during backwashing. Different types of underdrains and filter media will be available for hands on demonstration.

5:00 - 6:00 p.m. **DINNER**

WEDNESDAY

8:00 - Noon **Membrane Filtration and Reverse Osmosis Treatment Technologies -** Instructor, Ben Movahed - Watek Engineering

The theory and application behind operation and maintenance of Membrane Filtration and Reverse Osmosis Treatment systems. Problems associated with Membrane and Reverse Osmosis units will be discussed along with lab demonstrations which will be conducted.

12:00-1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **Pumps** – Instructor, Jeremy Marine – Geiger Pumps

This course is designed to provide water professionals with a solid

technical overview of hydraulics as well as a review of pump types, applications, advantages and disadvantages. Commonly used pumps for water treatment will be discussed. Issues surrounding mechanical seals and packing will also be covered

5:00 - 6:00 p.m. **DINNER**

THURSDAY

8:00 - Noon **The Evolution of a Project: Water Treatment Plant Expansion, from Planning to Final Acceptance**– Instructor, Sharon Cole – Anne Arundel County

Operators sometimes aren't involved in the project development process until they have to operate a new facility. That is typically too late to get the product that you want - and that is where operations staff make field modifications to suit their needs. This class will discuss the planning and document creation that leads to a desired construction. Language for special provisions, reading specifications, how to read project plans and the understanding of "or equal" will be highlighted. Other components that will be presented are training (how much and by whom), warranties, operation and maintenance manuals, acceptance/performance, project and construction management by engineers.

12:00 – 1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **Instrumentation and Controls for the Operator** – Instructor, Gary Anderson- Sherwood Logan and Associates, Inc.

This class introduces the fundamentals of measuring, displaying and controlling important plant operating parameters such as levels, pressures, flows and dosages. Class discussions will center on automatic systems that actuate and adjust valve positions, motor speeds and chemical feeders.

5:00 - 6:00 p.m. **DINNER**

FRIDAY

8:00-11:00 a.m. **Final Short Course Examination**

WATER DISTRIBUTION

Course Coordinator: David Wilkins

MONDAY

8:00 – 8:30 a.m. **Orientation** – Instructor, David Wilkins - WSSC

An overview of the Water Distribution program will be presented and course objective discussed, and TRE requirements will be discussed.

8:30 – Noon. **Safety** - Instructor, Pete Steps – Anne Arundel County DPW

The purpose of this course is to refresh and/or improve your safety skills. This course will emphasize construction safety. Topics will include confined space entry, trenching safety and the Right to Know.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Water Treatment Processes** – Instructor, Eddie Cope – Anne Arundel County DPW

This session will cover various water treatment processes including coagulation, sedimentation, disinfection, fluoridation, iron and manganese removal, softening, taste and odor control, and corrosion control. Water sources, chemicals used in water treatment and plant operations will also be discussed.

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 - Noon **Math Skills** – Instructor, Rob Swann – Anne Arundel County DWP

The purpose of this course is to refresh and/or improve your math skills in the area of distribution math as it relates to water calculations. You will learn how to compare ratios and proportion, solve for the unknown, and explore liner measurements, area and volume measurements.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00p.m. **Distribution Systems** – Instructor, Billy Dove - WSSC

The class will discuss water distribution systems. Among the topics discussed will be various types of water storage, hydraulic concepts of pressure and force, pressure reducing valves, booster pumps, and the importance of tank turnover, chlorination, and disinfection byproducts.

5:00 – 6:00 p.m. **DINNER**

WEDNESDAY

8:00 – Noon **Centrifugal Pumps and Components** – Instructor, Steve Elder

Topics presented in this session include hydraulics of pumps as applied to the waterworks industry, pump operation and routine maintenance.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00p.m. **Centrifugal Pumps and Components (continued)** – Instructor, Steve Elder

5:00 - 6:00 p.m. **DINNER**

THURSDAY

8:00 – Noon **Valves and Hydrants** – Instructors, Mark Snyder and Mike Schakowsky – Mueller Co

The course will cover the safe operation and maintenance of fire hydrants and valves. Instruction will include a detailed description of parts and repairs to include the disassembly and assembly of valves and fire hydrants.

Noon – 1:00 p.m. **LUNCH**

1:00 – 3:00 p.m. **Course Review-** Instructor, Billy Dove - WSSC

This session will be a review of the week’s material in preparation for short course and/or the State test, along with some techniques on how to take a test.

3:00 – 5:00 p.m. **Session Review & Test Taking Techniques** – Instructor, Billy Dove - WSSC

This session will be a review of the week’s material in preparation for short course and/or the State test, along with some techniques on how to take a test.

5:00 – 6:00 p.m. **DINNER**

FRIDAY

8:00 – 11:00 a.m. **Final Short Course Exam**

WASTEWATER COLLECTION

Course Coordinators: Tom Newquist Sr. and Wayne Reed

MONDAY

8:00 – 8:30 a.m. **Overview** – Instructors, Tom Newquist Sr. – City of Annapolis, Wayne Reed – DCWATER

An overview of the wastewater collection program will be presented and course objective discussed, and TRE requirements will be discussed.

- 8:30 - 9:30 a.m. **Force Main Inspection and Assessment** - Instructor, Travis Wagner, Vice President, Pure Technologies
- The presentation will cover the risk based approach for the evaluation of wastewater force mains using non-destructive techniques and technologies in addition to advanced analytical methods. These techniques have been used by numerous force main owners throughout North America including local utilities. Case studies and lessons learned will be presented.
- 9:30 – 10:30 a.m. **Manhole Rehab** – Instructor, Robert, “Bob” Stockmaster, Vice President of Sales and Marketing, RFS Associates
- Attendees will learn the significance of manhole frame – chimney leakage, other manhole leakage sources and how to identify them. Costs associated with treating excess flows, maintenance and other potential problems also will be covered, A variety of repair methods will be discussed, including the most recent technologies to enter the industry. Industry standards covering design life, product performance and acceptance testing will be reviewed to help ensure a successful manhole rehabilitation project.
- 10:30 – 11: 30 a.m. **Collection System Basic Hydraulics** – Instructor, Jeff Pelletier, Principal Engineer – MWH Americas
- Provide an overview of basic hydraulic principles that apply to gravity sewer flows as well as to pressure flows and pumping stations. For gravity systems, Manning’s Equation will be discussed and for pressure system’s, Bernoulli’s Principle will be explained. Example problems that require the application of these principles will be solved during the class.
- 11:30 – Noon **Review** – Instructor. Aaron Hughes, Project Engineer – Greeley and Hansen
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 2:00 p.m. **Flow Monitoring** – Instructor, Jerome Vest, Project Manager, GOEL
- Elements of open channel flow measurements (area and velocity, flumes, weirs) and flows through force mains (magnetic meters, pumps running timers) will be presented as a basis to establish baseline infiltration and peak wet weather flows.
- 2:00 – 3:00 p.m. **Sewer Lateral Lining by CIPP Method** – Muminu Badmus, Manager. DCWATER
- CIPP will allow rehabilitation of defective underground laterals with minimal excavation. It eliminates traffic control, road / pavement cutting, backfilling, repaving, landscaping, traffic inconveniences (for residents), permanent restoration, time spent on the job (Hours vs. Days). The method is quicker, more cost effective and is conducted with significantly less disruption to the surface conditions. It is an alternative method to conventional excavation.

3:00 – 4:00 p.m. **SSES//Private Property I/I** – Instructor, Paul Sayan, Technical Director
– Louis Berger Water Services,

The presentation will explain the purpose of the SSES investigations including flow monitoring, CCTV and manhole inspections, smoke and dye testing. The presentation will also discuss how SSES investigations are related to private property inflow/ infiltration and general guidance to develop and implement a private property I/I reduction problem.

4:00 – 5:00 p.m. **Wastewater Pumping and Operations** – Wayne Reed Sr., General Foreman, DCWATER

Wastewater pumping and operations presentation will discuss wet well maintenance for settling, grease and odor control. Discussions will carry into the different types of wastewater pumping stations from temporary can type stations to more custom built stations with mechanical and support equipment for the pumping and screening operations.

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 – Noon **Disinfection & Chemical Feed Applications** – Instructor, Paula Martin, Water Treatment Plant Superintendent (ret.)

Effective chemical application is essential to the treatment of water and wastewater. This course will start with an open discussion of chemical feed applications in both the water and wastewater treatment fields.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Math Application** – Instructor, Paula Martin, Water Treatment Plant Superintendent, ret.

A workshop focusing on calculating chemical feed dosages will follow. The workshop includes calculating the capacity of tanks, flow rates, and chemical dosages for disinfection, de-chlorination, odor control, coagulation, and corrosion control. Students will progress at their own pace through multiple and progressively more difficult quizzes.

5:00 – 6:00 p.m. **DINNER**

WEDNESDAY

8:00 – Noon **Centrifugal Pumps and Components** – Instructor, Steve Elder

Topics presented in this session include hydraulics of pumps as applied to the waterworks industry, pump operation and routine maintenance.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Centrifugal Pumps and Components (continued)** – Instructor, Steve Elder, Delon Hampton & Associates (DHA)

5:00 – 6:00 p.m. **DINNER**

THURSDAY

8:00 – Noon **Basic Chlorine and Chlorine Cylinder Program** – Instructor, Susan McCauley - Maryland Environmental Services

OSHA permit required confined space; lock out tag out, basic chlorine, chlorine cylinder program, excavation and trench in safety.

Noon – 1:00 p.m. **LUNCH**

1:00 – 3:00 p.m. **OSHA Permit Required Confined Space; Lock out Tag out and Excavation and Trench in Safety** – Instructor, Susan McCauley - Maryland Environmental Services

3:00 - 5:00 p.m. **Exam Review** - Instructor, Don Sprinkle

5:00 – 6:00 p.m. **DINNER**

FRIDAY

8:00 – 11:00 a.m. **Final Short Course Exam**

Industrial Waste Treatment – Physical

Course Coordinator: Ed Williams

MONDAY

8:00 – 9:00 a.m. **Course Objectives & Orientation** – Instructor, Ed Williams – Harford County DPW,

This session will provide an introduction to the course with an explanation of its objectives and attendance requirements. Each session covered in this course will be discussed along with resources available for review of course materials, and the examination format.

9:00 – 10:00 a.m. **Overview of Municipal/Industrial Pretreatment, Local Limit Development, Monitoring Requirements and Compliance Enforcement** – Instructor, Ed Williams - Harford County DPW

This session will provide a brief overview of the regulations governing treatment and how pretreatment is implemented in the State of Maryland. Discussions will include general and specific prohibitions, standards, and consequence of being classified as an SIU and reporting requirements.

10:00 – Noon **Overview of the Operator Certification Program Requirements** –
Instructors, Lee Haskins, Lawrence Robinson – Maryland Department of
the Environment (MDE)

This session will provide an overview of the operator certification requirements for waste treatment and pretreatment facilities with special emphasis on recent updates. Course participants will be provided an opportunity to participate in a question and answer session.

Noon – 1:00 p.m. **LUNCH**

1:00 – 2:00 p.m. **Overview of Municipal/Industrial Pretreatment, Local Limit
Development, Monitoring Requirements and Compliance
Enforcement** (continued)

2:00 – 4:00 p.m. **Prevention & Response to Violations** – Instructor, Ed Williams –
Harford DPW

This class will discuss the most common causes of violations, investigative methods to develop a plausible response and plan of corrective measures as well as preventive methods. Proper Planning Prevents Poor Performance.

4:00 – 5:00 p.m. **Review of Days Topics** – Instructor, Ed Williams– Harford County DPW

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 – 10:00 a.m. **Filtration Processes** – Instructor, Joel Caudill – Harford County DPW

This session covers the history, design, maintenance and operation of filters to include multi – media filters. Math will be focused on in this session as it pertains to Process Filtration calculations.

10:00 – Noon **Chemical Feed** – Instructor, Joel Caudill – Harford County DPW

This session covers use of chemicals in the treatment of wastewater. Topics will include the chemicals used, application points and calculating chemical feed rates.

Noon – 1:00 p.m. **LUNCH**

1:00 – 3:00 p.m. **Pumps** – Instructor, Steve Justice – Geiger Pumps Inc.

Topic will cover the role of pumps in wastewater, routine maintenance and trouble shooting.

3:00 – 5:00 p.m. **Disinfection** – Instructor, Earl Ludy – Somerset County Sanitary

This course will identify and discuss different types of disinfection, including advantages and disadvantages of each method.

5:00 – 6:00 p.m. **DINNER**

WEDNESDAY

8:00 – Noon **Metals Precipitation** – Instructor, Ed Williams

This course is designed to provide operations-oriented personnel with metals treatment responsibility, the opportunity to interact with similar personnel and to receive training in the theories, methods and practices of treating metals via precipitation in wastewater. The class will cover: 1) Sources of metals, (Contamination by metals of streams & sludges). 2) Chemical Concepts (pH theory & practice), (Coagulation & precipitation). 3) Treatment Facilities, (Pollution prevention/waste minimization), (Typical chemical processes, instrumentation & Process control & operation). 4) Interactive activities, (description of student facilities).

Noon – 1:00 p.m. **LUNCH**

1:00 – 3:00 p.m. **Safety – MSDS and LOTO** – Instructor, Jim Hynes, Collection System Superintendent Harford County DPW

MSDS, Right to Know Law OSHA (29 CFR 1910.1200) and MOSH (COMR 09.12.33.04) will be discussed. LOTO – having a successful Lock-Out/ Tag-Out program.

3:00 – 4:00 p.m. **Course Review** – Instructor, Ed Williams – Harford Co DPW

4:00 – 5:00 p.m. **Final Exam** – Physical/Chemical Treatment

5:00 - 6:00 p.m. **DINNER**

THURSDAY

8:00 – 9:00 a.m. **Principles of Biological Treatment** – Instructor, Chris Younger, Wastewater Superintendent - Harford County

This section will cover the wastewater characterization, an introduction to biological treatment systems, and basic microbiology.

9:00 – 10:00 a.m. **Anaerobic Treatment Processes** – Instructor, Chris Younger, Wastewater Superintendent - Harford County

The principles of anaerobic treatment will be reviewed. This session will include a discussion of the different types of anaerobic systems, selection criteria, and the advantages and disadvantages of each type. Basic calculations specific to these systems will be covered. An overview of equipment and layouts associated with anaerobic systems will be presented along with a discussion of system O&M issues.

10:00 – 11:00 a.m. **Aerobic Treatment I** – Instructor, Chris Younger, Wastewater Superintendent - Harford County

The principles of aerobic treatment will be reviewed. This session will include a discussion of the activated sludge theory, and reactor configurations; complete mix, plug flow and batch. Basic calculations specific to these systems will be covered.

11:00 – Noon **Fixed Film Systems** – Instructor, Ed Williams - Harford County DPW

The application of fixed film systems for treatment will be reviewed. This session will include a discussion of the different types of fixed film treatment systems, selection criteria, and the advantages and disadvantages of each type. An overview of equipment and layouts associated with fixed film systems will be presented along with a discussion of system O&M issues.

Noon – 1:00 p.m. **LUNCH**

1:00 – 2:00 p.m. **Fixed Film Systems** – (continued)

2:00 – 3:00 p.m. **Sludge Handling & Disposal** – Instructor, Instructor, Instructor, Chris Younger, Wastewater Superintendent - Harford County

Topics included in this session will be sludge thickening stabilization, dewatering, storage and disposal. Chemicals used as aids in these processes will be discussed.

3:00 – 4:00 p.m. **Course Review** – Instructor, Ed Williams – Harford Co DPW

4:00 – 5:00 p.m. **Final Exam** – Biological Treatment

5:00 – 6:00 p.m. **DINNER**

Introductory/Intermediate Wastewater

Course Coordinators: Marshall Phillips and Jim Hynes

MONDAY

8:00 – 8:50 a.m. **Orientation** – Instructors, Marshall Phillips – City of Baltimore, Instructor, Jim Hynes – Harford County DPW

During this period, course materials will be distributed, the TRE requirements discussed and an overview of the curriculum outlined.

9:00 – 11:50 a.m. **Advanced Treatment** – Instructor, William Shreve – Director, DPW, Charles County, MD

Methods of nutrient removal, sand filtration, and other advanced treatment processes will be discussed.

12:00 – 1:00 p.m. **LUNCH**

1:00 – 4:50 p.m. **Intermediate Math** - Instructor, Don Sprinkle – Howard County

Computation of typical wastewater problems will be emphasized. Detention times, flow rates, dosage rates, loading rates, and other typical wastewater formulas will be covered.

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 – 11:50 a.m. **Activated Sludge Process Control** – Instructor, Lenny Gold – Gold & Associates

This session will teach specific techniques for monitoring and controlling activated sludge processes. Trend charting, microscope examination of biomass, and other process control techniques will be taught. Case study analysis of activated sludge process problems will be undertaken on a time-available basis.

12:00 – 1:00 p.m. **LUNCH**

1:00 – 2:50 p.m. **Disinfection** – Instructor, Earl Ludy – Somerset County Sanitary Distribution

This course will identify and discuss different types of disinfection, including advantages and disadvantages of each method.

3:00 – 4:50 p.m. **Safety** – Instructor, Burt Sklar – Chugach at Ft. Meade

Proper use of safety equipment, working in confined spaces, lockout programs, chlorine handling and chemical safety will be covered.

5:00 – 6:00 p.m. **DINNER**

WEDNESDAY

8:00 – 11:50 a.m. **Pumps** – Instructor, John Weis – MM Engineering

Topics to be covered include pumps and their role in wastewater, as well as routine maintenance and trouble shooting.

12:00 – 1:00 p.m. **LUNCH**

1:00 – 4:50 p.m. **Sludge Thickening & Digestion** – Instructor, Bill Farrell – Ross Technical Services/ Prostart

Aerobic and anaerobic digestion will be discussed, including advantages and disadvantages of each. Process monitoring and troubleshooting will be emphasized.

5:00 - 6:00 p.m. **DINNER**

THURSDAY

8:00 – 11:50 a.m. **Wastewater Overview** – Instructor, Marshall Phillips – City of Baltimore- Back River W.W.T.P. and Jim Hynes – Harford County DPW

Q&A on topics covered during the week so far, as well as pre-test review relating to certification topics will be discussed.

12:00 – 1:00 p.m. **LUNCH**

1:00 –4:50 p.m. **Wastewater Lab** – Instructor, Dale Baker – Garrett County

Lecture, demonstration and hands-on training on pH, temperature, DO using meters and Winkler method, chlorine using amperometric titration, and DPD-FS end spectrophotometer.

5:00 –6:00 p.m. **DINNER**

FRIDAY

9:00 – 12:00 a.m. **State Certification Examination**

Advanced Wastewater

Course Coordinator: Bill Graves

MONDAY

8:00- 9:00 a.m. **Overview** – Instructors, Bill Graves - Harford County
An overview of the Advanced Wastewater program will be presented and course objectives discussed. Course logistics and TRE requirements will be discussed.

9:00 – Noon **Side Stream Treatment.** - Tiffany Bain – Geiger Pumps.
This course will discuss the challenges associated with recycling side streams into the treatment process and discuss various options for treatment of the streams.

Noon - 1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **Fermentation and the ENR Process** – Instructor, Bob Wimmer – Process Specialist B&V Water

Fermentation provides an opportunity for WWTPs to provide supplemental carbon for ENR processes by utilizing carbon present in primary sludge. While the principals of fermentation are well defined the operation of primary sludge fermenters provide special challenges to

operations staff. This class will review the fundamentals of fermentation and special techniques for stable operation.

5:00 - 6:00 p.m. **DINNER**

TUESDAY

8:00 – Noon **Nutrient Removal Using Polymer** – Instructor- Smith Turner-Polydyne

This course will cover removing nutrient loading from an operational perspective and review of chemical precipitation and removal of regulated nutrients encountered by wastewater operators with a look at flocculent structures being used.

Noon - 1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **A Virtual Tour of an Advanced Wastewater Treatment Plant** –
Instructor, Ronald Moler III - WSSC

In this class we will be taking a virtual tour of an advanced wastewater treatment plant. We will start at the plant's pump station and discuss the preliminary treatment processes. Then we will move onto secondary treatment, here we will discuss BNR, ENR, and Biological & Chemical phosphorus removal. We will follow the flow pattern and the purpose of each zone in a LME and 5 stage bardenpho treatment process. Then we will move onto tertiary treatment where we will discuss filtration and disinfection. We will end the virtual tour at the plants effluent outfall.

5:00 - 6:00 p.m. **DINNER**

WEDNESDAY

8:00 – Noon **An In-Depth Look at ENR** – Instructor, Marty Johnson - WSSC

This 2-day course is designed to give the operator highly-detailed training on the biology and chemistry behind Enhanced Nutrient Removal. Operation and control of various treatment plant processes will be discussed. Training will also include diagnosing the plant performance and optimization through monitoring, testing, equipment changes, and chemical addition. Interpretation of data and operational problems/remedies will be presented.

Noon - 1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **An In-Depth Look at ENR (continued)** – Instructor, Marty Johnson -
WSSC

5:00 - 6:00 p.m. **DINNER**

THURSDAY

- 8:00 – Noon **An In-Depth Look at ENR (continued)** – Instructor, Marty Johnson - WSSC
- Noon - 1:00 p.m. **LUNCH**
- 1:00 – 4:00 p.m. **An In-Depth Look at ENR (continued)** – Instructor, Marty Johnson - WSSC
- 4:00 - 5:00 p.m. **Course Review**
- 5:00 - 6:00 p.m. **DINNER**

FRIDAY

- 8:00 – 11:00 a.m. **Final Short Course Examination**

Treatment Facility Maintenance

Course Coordinators: Conrad Shows and Angela Ballard-Landers

MONDAY

- 8:00 - 8:30 a.m. **Course Overview** – Instructor, Conrad Shows – DCWASA (retired), Angela Ballard-Landers - WSSC
- An overview of the maintenance programs in the workplace is presented and course objectives and TRE requirements will be discussed.
- 8:30 - Noon **Safety** - Instructor, Pete Steps – Anne Arundel County DPW
- The purpose of this course is to refresh and/or improve your safety skills. This course will emphasize construction safety. Topics will include confined space entry, trenching safety and the Right to Know.
- Noon - 1:00 p.m. **LUNCH**
- 1:00 – 5:00 p.m. **Instrumentation Maintenance Practices** – Instructor, Gary Anderson – Sherwood Logan and Associates, Inc.
- This course is offered as a basic overview of the concepts and techniques for four of the most often encountered measurements found in water treatment plants; temperature, pressure, level, and flow. The class will learn the theory behind each measurement and become familiar with the diversity of instrumentation available.
- 5:00 - 6:00 p.m. **DINNER**

TUESDAY

- 8:00 - Noon **Troubleshooting Centrifugal Pumps Using Gauges** –

Instructors, Dwight Swan, Roger Stauffer – Envirep/TLC
Environmental

This class will introduce how gauges are used to troubleshoot centrifugal pump problems. The students will learn how to read gauges, convert vacuum/pressure units, install suction/discharge gauges, and calculate Total Dynamic Head. The instructor will show how to troubleshoot and identify a problem (forcemain, pump, or suction pipe) as it relates to the suction/discharge gauge readings.

Noon - 1:00 p.m.

LUNCH

1:00 - 5:00 p.m.

Electrical Pump Control Panel Components and Basic Pump Control Panel Electrical Troubleshooting –

Instructors, Dwight Swan, Roger Stauffer – Envirep/TLC
Environmental

This class will provide an introduction to pump control panels, discuss electrical terminology and review (with samples) many electrical devices commonly installed in pump control panels, and describe the component's basic function. The student will learn basic electrical troubleshooting of pump control panels such as checking fuses, reading a multimeter, checking and resetting motor overload heaters, resetting circuit breakers, setting level controller setpoints, and clearing/resetting alarms.

5:00 - 6:00 p.m.

DINNER

WEDNESDAY

8:00 – Noon

Basic Electricity – Instructor, David Hall, WSSC

An overview of the various meters used in electrical maintenance. Basic principles, proper usage, and safety procedures are discussed.

Noon - 1:00 p.m.

LUNCH

1:00 – 5:00 p.m.

Advanced Electricity – Instructor, David Hall, WSSC

This course will cover in more detail advanced electrical maintenance, electrical terms, using electrical measuring instruments, and troubleshooting electrical circuits. Students will also receive hands-on training instruction. The course will also provide an overview of industrial electrical hazards.

5:00 - 6:00 p.m.

DINNER

THURSDAY

8:00 - Noon

HVAC – Instructor, David Hall – WSSC

HVAC presentation will cover ventilation systems, heating systems, and air conditioning systems. Training will explain the equipment and/parts and their function needed to maintain a set temperature through 4 seasons or clearing a hazardous environment in an enclosed space. Explain the energy types and theory of operation for ventilating, heating, and air conditioning systems. Discussions on how to troubleshoot an HVAC System and the safety measures involved when dealing with these systems.

Noon - 1:00 p.m.

LUNCH

1:00 – 5:00 p.m.

Trades Maintenance – Instructors, Barry Arter, Allen Gibson, Walter VanAlstine, Mahesh Amin - WSSC

This course will review the maintenance role of a multi-skilled Trades shop within the water and wastewater industry. Typical machining, welding, and carpentry projects will be reviewed along with demonstrations of advanced trades capabilities and equipment.

5:00 - 6:00 p.m.

DINNER

FRIDAY

8:00 – 11:00 a.m.

Treatment Facility Maintenance Examination

Managers/Superintendents

Course Coordinators: Winfield McKell and Michael Lewis

MONDAY

8:00 – 11:50 a.m. **Optimizing Energy Utilization and Production** – Instructor, Bob Wimmer – Black & Veatch

Summary: This course will provide Superintendents and Chief Operators with the knowledge and experience to optimize Energy Utilization and Production. The course will focus on changes to equipment, operating strategies and procedures to maximize energy utilization and production. The course will also address procurement options and energy contracts and how they impact operations and implementation of energy optimization.

Course Outline:

1. Introduction and definition of Terms (50 minutes)
 - a. Equate different terminology for equivalent processes
 - b. Power Use in Plants
 - c. Power Production in Plants
2. Optimization of Pumping (25 minutes)
 - a. Pumping System Design
 - b. Use of VFDs
 - c. Pump Sizing
 - d. Changing Operational Approach
3. Aeration Optimization (25 minute section)
 - a. Operational Strategy
 - b. ENR Impacts
 - c. Optimization of Control Strategy
 - d. Blower Optimization
 - e. Diffusers
 - f. Aeration Control
4. Energy Production (25 minute section)
 - a. Discussion of Terms
 - b. Types of Production
 - c. Optimization of Control Strategy
 - d. Biofuels
5. Power Purchase Contracts (25 minutes section)
 - a. Example of Power Purchase Contracts
 - b. Demand Charges
 - c. Opportunities for reducing purchase costs
 - d. Time of Use Impacts
6. Project Implementation (25 minutes section)
 - a. ESCO Contracts
 - b. O&M funded projects
 - c. On line Power Monitoring
 - d. Grants and Alternative Funding
7. Open Discussion (25 minutes)

Noon – 1:00 p.m. **LUNCH**

1:00 – 4:50 p.m.

Energy Management for Water and Wastewater - Instructor, Rob Taylor- WSSC

This course will provide Superintendents and Chief Plant Operators with the knowledge and experience to optimize energy usage and provide a good understanding of supply and demand side energy management. The course will focus on electricity usage, tracking and efficiency performance measurement, pumps and pumping systems, aeration systems, and energy performance contracting. The course will also provide a background in renewable energy – hydro, wind, solar, and biogas- as it relates to plant performance and cost reduction. Actual plant case studies will be used to provide examples.

Course Outline:

1. Introduction/Goals of Energy Management (5 minutes)
2. How Energy is Used in Plants Today- WFP, WWTP (5 minutes)
3. Basic Energy Terminology/Power Fundamentals (10 minutes)
4. Energy Tracking System (20 minutes)
 - a. Invoice Verification
 - b. Cost & Usage tracking
 - c. Performance Tracking
 - d. SCADA Interface
 - e. Case Study- WSSC's Energy Information System
5. Demand Side- Energy Conservation (110 minutes)
 - a. Pumps
 - i. Pumping Basics
 - ii. Affinity Laws
 - iii. Pump Curves
 - iv. VFDs
 - v. Impeller size, pump speed, flow, head, HP relationships
 - vi. Improving Efficiencies
 - vii. Pump efficiency analysis case study- Potomac (EIS)
 - b. Aeration
 - i. Blowers
 - ii. DO Control
 - iii. Bubble size and effect on aeration efficiency
 - iv. Improving Efficiencies
 - c. Generator Peak Shaving and Load Shifting
 - i. Paralleling
 - ii. PJM Economic Dispatch Program
 - d. Load Shifting Opportunities
6. Supply Side- Energy Procurement (15 minutes)
 - a. Electrical De-regulation
 - b. Market Fundamentals
 - c. PJM RTO
 - d. Electric Rate Structures

- i. Flat Energy Rate
 - ii. Flat Demand Rate
 - iii. Ratchet Rates
 - iv. Power Factor Adjustment
 - e. Real-time vs. fixed cost/kWh tradeoffs & benefits
 - f. Blocks & LMP advantages
7. Energy Performance Contracting (15 minutes)
 - a. Definition
 - b. How it works/Benefits
 - c. Who Has Used it
 - d. Case Study- WSSC Potomac Pump Upgrade
 - e. Monitoring & Verification
8. Renewable Energy (60 minutes)
 - a. Net Metering
 - b. Hydro
 - i. Case study- WSSC Turbines @ Duckett Dam
 - c. Wind
 - i. Case Study- WSSC Wind Program
 - ii. Solar
 - iii. WSSC Solar PPA
 - d. Biogas (Anaerobic Digestion- Combined heat & Power)
 - i. City of Baltimore: Back River AD/CHP

TUESDAY

8:00 am – 4:50pm **Leadership Through Customer Service – Instructor, Angela Ballard-Landers – WSSC**

Course Objectives:

- *Improve supervisory skills by understanding good leadership behaviors*
- *Learning the difference between Leadership and Management*
- *Polishing Interpersonal Skills and Communication Skills*
- *Handling Your and Other People's Stress*
- *Empowering, Motivating and Inspiring Others*
- *Leading by Example*

AM

- I. *What is Customer Service – 1 hour*
- II. *Communicating Clearly and Listening Actively – 2 hours*
- III. *Coaching and Feedback – 1 hour*

PM

- V. *Managing Conflict – 2 hours*
- VI. *Building Trust and Improving Employee Morale – 2 hours*

WEDNESDAY

8:00am – 11:50am **Drinking Water System Challenges – Instructor, Hans Hairston, WSSC**

The purpose of this course is to discuss the challenges and obstacles that the water industry faces now and in the future concerning water treatment, regulations and technology.

Course Outline

- I. Drinking Water System Management Overview (50 min) w/ 10 min Break
- II. Identifying Challenges at your Water System (50 min) w/ 10 min Break
- III. Industry Challenges at Drinking Water Systems (50 min) w/ 10 min Break
- IV. Drinking Water System Challenge In Class Exercise (50 min) w/ 10 min Q&A Session

Noon – 1:00 p.m. **LUNCH**

1:00pm – 4:50pm **Managing for the First Time Manager– Instructor, Perry A. Violet – WSSC**

The purpose of this Managing for the First Time Manager training is to provide the attendee with the skills and knowledge needed to effectively and efficiently coordinate his/her workforce.

Course Outline

- I. Self- Assessment and Decision Making for Staff Development exercises: The objective is to help the attendee to better understand behaviors and how they can affect working relationships.
- II. Why first Time Managers Fail: This session will focus on some of the reasons first time managers fail. The discussion will cover areas such as poor communication, failing to build trust, and proper training for first time managers.
- III. Myths and Tips for first Time Managers: This segment will cover some myths about first time manager as well as tips for the first time manager while transitioning into the position
- IV. Balancing Personable with Professional in the Work Place: The objective is to find a balance between personable and professional in the work place. We will discuss 10 proven ways to avoid a lapse in judgment.
- V. Discussing the importance of leadership qualities and styles: This session will identify and discuss different leadership qualities and styles.

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Short Course Instructors

We offer our thanks to each instructor who is giving of their time and effort without monetary compensation to convey this beneficial information to the respective students. Also, thanks to the companies who have allowed the instructors time to participate in the Short Course. You will find the names of the instructors with the classes they are teaching.