



**SIXTY EIGHTH ANNUAL
SHORT COURSES
FOR
WATER & WASTEWATER
OPERATORS
June 4 – June 9, 2017**

HELD
AT

**MOUNT ST. MARY'S UNIVERSITY
16300 Old Emmitsburg Rd.
Emmitsburg, MD 21727**

*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*

68th SHORT COURSE PROGRAM & SCHEDULE

Sunday, June 4, 2017

Important Reminder: A refundable \$10.00 key cash deposit will be collected at the time of registration. However, students will be billed \$60.00 for lost keys.

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 Patriot Hall followed by a Meet and Greet beginning at 7:30 in the Mount Café which is adjacent to the Dining Room.

Monday, June 5 through Thursday, June 8, 2017

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 (Mon, Tues, & Thurs)

6:00 p.m. to 9:00 p.m. Picnic Dinner for Non-commuters (Wed)

Friday, June 9, 2017

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*

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.

Non-Discrimination Statement

The WWO Short Course Committee does not discriminate in its educational programs or activities on the basis of race, color, national or ethnic origin, ancestry, age religion or religious creed, disability or handicap, sex or gender (including pregnancy, sexual harassment and other sexual misconduct including acts of sexual violence such as rape, sexual assault, sexual exploitation and coercion), gender identity and/or expression. The Short Course will comply with state and federal laws such as M.G.L.c.151B, Title IX, Title VI and Title VII of the Civil Rights Acts, the Americans with Disabilities Act, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination in Employment Act, and other similar laws that prohibit discrimination.

Unlawful discrimination has no place at the Short Course and offends the organization’s core values which include a commitment to equal opportunity and inclusion. All Short Course Committee Members instructors, students, and staff members are expected to join with and uphold this commitment.

Questions/Problems

If there are any questions not answered in this brochure or problems encountered prior to registration, you can contact Rob Swann at pswan24@aacounty.org, or Rachel Ellis at info@wwoShortCourses.org.

Mount St Mary’s University

The University’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.

Directions to Mount St. Mary’s University

Mount St. Mary’s University is located at 16300 Old Emmitsburg Rd, Emmitsburg, MD 21727 which is located north of Frederick just off U.S. Route 15. The University facility is on the west side of the highway and is well marked. Directional signs to the Short Course will be provided.

***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 9, 2017 from 9 a.m. to Noon. This exam is not part of the actual Short Courses and 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 of Waterworks and Waste Systems Operators to sit for the Maryland Certification Exam.** The Board must receive the application for those wishing to take the Certification Exam at Mount St. Mary’s University by May 10, 2017. **No more than 125 applications will be accepted for this exam.** It is suggested that you register early for the State exam. The exam application form can be found at:

<http://www.mde.state.md.us/programs/Permits/WaterManagementPermits/WaterDischargePermits/Applications/boardofwaterworks/Documents/MDE-WMA-BWW-EXM.pdf>

Mail completed applications 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 Board staff at 1(800) 633-6101, ext. 3167 or (410) 537-3167.

Note: The State exam will be held on June 9th at 9:00 a.m. in the Cardinal Keeler Dining Room.

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). 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.

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.

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 police 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 9, 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 6.

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

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:
 - a. Email Address
 - b. Registration type: Member of one of the organizations (WWOA, CSAWWA, CWEA), or Non-member
 - c. If a member, which organization (WWOA, CSAWWA, CWEA)
 - d. Membership #
 - e. First Name, Last Name
 - f. Company/organization name
 - g. Address
 - h. Work Phone
 - i. Gender
 - j. Emergency contact phone #
 - k. Payment type: Credit card, check, or scholarship winner
 - l. If attendee plans to arrive on Sunday
 - m. If attendee plans to attend the Sunday buffet
 - n. Which course you the attendee plans to attend: i.e. Introduction to Water, Water 3&4, Advanced Water, Water Distribution, Advanced Water Distribution, Introduction/Intermediate Wastewater, Advanced Wastewater, Industrial Wastewater, Wastewater Collection, or Superintendent
 - o. Type of registration (Full week w/room & board, full week w/o room & board, or single day)
 - p. Credit card information (if using credit card for payment)
2. Connect to our online registration system by visiting www.WWOShortCourses.org
3. Complete individual or group registrations
4. Pay – see below
5. Print your invoice – **no invoice will be mailed to you!**

Course Registration

Registration Packages	Members Through May 4, 2017	Non-Members Through May 4, 2017	Members After May 4, 2017	Non-Members After May 4, 2017
Full Week – Complete Pkg. (classes, meals, lodging)	\$595	\$620	\$650	\$675
Full Week – Classes & lunch only	\$325	\$350	\$375	\$400
Single Day (includes lunch)	\$90	\$95	\$95	\$100
Breakfast & Dinner only	\$120/week \$30/day	\$120/week, \$30/day	\$120/week \$30/day	\$120/week \$30/day
Lodging only	\$50/night	\$50/night	\$50/night	\$50/night

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 24, 2017) will be charged an additional processing fee of \$ 50.00. Cancellations will be assessed a fee of \$25.00.

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

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 (301) 447-5357. A message will be taken and every attempt will be made to contact you.

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 Headquarters in Room 215 of the Knott Academic Center from 7 a.m. to 5 p.m. The phone number is (301) 447-5870, during the hours of 7 a.m. to 5 p.m., or you can ask a Short Course Committee member to assist you. After hours, please call Short Course Chairperson, Rob Swann at (410) 474-8809.

Overnight Room Accommodations

Overnight accommodations will be available at a cost of \$50.00 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, June 4 and must be vacated by 8 a.m. on Friday, June 9. **A refundable \$10.00 cash 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 cafeteria meals (breakfast and dinner) served in Patriot Hall. Lunch is included in the registration cost for all attendees.

Meals for on-site accommodations begin with the Buffet dinner on Sunday evening, June 4, and end with breakfast on Friday morning, June 9. 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. (Wednesday – 6 p.m. to 9 p.m.)

All bedrooms are private however you will be sharing an apartment with other attendees. We will make every effort to help you stay with someone you know, but there are no guarantees. If you would like to share an apartment with other attendee(s), you can pay their key deposit when paying yours, and they will receive their key after checking in. Please coordinate with them so they are aware that you have already signed up for a room for them. If you chose not to reserve their room(s), you will be paired up with other attendees on a first-come, first-served basis. 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 breakfast and/or dinner on campus, you must purchase a meal plan.

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 15 feet of all college buildings. **Violations may result in fines which will be the responsibility of the person smoking.** Repeat violations may result in the loss of campus housing and/or campus visitation privileges.

Sunday Evening Meet & Greet

On Sunday, June 4, 2017, the Short Course will begin with a Buffet Dinner and Meet and Greet in Patriot 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 @ Mount Café

Monday	7:00 - 11 p.m.	Pizza Night, Music and Televised Sports
Tuesday	7:00 - 11 p.m.	Wings Night, Karaoke and Televised Sports
Wednesday	6:00 - 11 p.m.	Picnic Night, Music and Televised Sports
Thursday	Study Night	No Activities Scheduled

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.

Delaware Operator License Holders

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

SESSION LISTINGS

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 #6080-17-03.

MONDAY

8:00 – 8:30 a.m. **Overview** – Course Coordinator, Mike Kropp - 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 a.m.– Noon **Basic Instrumentation** – Instructor, Pradeep Kumar, Anne Arundel County DPW
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 a.m. – Noon **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.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **State Water Examination Review** – Instructors, Eddie Cope - Anne Arundel County DPW and Jay Price – City of Baltimore DPW
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 9, 2017 State exams.

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 a.m. – Noon **Well Systems** – Instructor, Mike Kropp - Anne Arundel County DPW
This course is intended for superintendents and operators of public water systems that utilize groundwater wells as a source of supply. Topics to be covered include groundwater hydrogeology; types of wells and drilling

techniques; well pumps, motors, and control systems; well pump station design; operational strategies; well maintenance and rehabilitation alternatives; water quality monitoring; performance monitoring and troubleshooting; and sanitary risks and protection.

Noon – 1:00 p.m.

LUNCH

1:00 – 5:00 p.m.

Chlorination Technology – Instructor, Terry Bradley – City Of Bowie
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.

6:00 - 9:00 p.m.

DINNER

THURSDAY

8:00 a.m. – Noon

Distribution Systems – Instructor, Billy Dove – City of Baltimore DPW
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, detention 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

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 should 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 #6081-17-03.

MONDAY

- 8:00 – 8:30 a.m. **Overview** - Course Coordinator, 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 **Chlorination Technology** – Instructor, Terry Bradley – City of Bowie
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 a.m. – 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. **Water 3 & 4 State Examination Review** – Instructors, Eddie Cope - Anne Arundel County DPW and 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 9, 2017 State Certification exams.

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 a.m. – Noon **Water 3 & 4 State Examination Review** – Instructors, Eddie Cope - Anne Arundel County DPW and 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 9, 2017 State Certification exams.

OR

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.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Distribution Systems** – Instructor, Billy Dove – City of Baltimore DPW
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.

6:00 – 9:00 p.m. **DINNER**

THURSDAY

8:00 a.m. – Noon **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.

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, 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 Treatment

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 #6082-17-03.

MONDAY

8:00 - 8:50 a.m. **Overview** – Course Coordinator, Scott Harmon - Anne Arundel County
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.

9:00 a.m. - Noon **Legionella Causes and Treatment** – Instructor, Steve Fox – Hydrocorp
This course is designed to meet the needs of the water/wastewater professional by focusing on the essentials of developing and managing an effective Legionella control program. Topics include: legal authority, policies, record keeping, training and liabilities and responsibilities.

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

1:00 - 5:00 p.m. **Backflow Prevention** – Instructors, Steve Fox – Hydrocorp and Kristy McAndrew – Charles County DPW
This course is designed to meet the needs of the water/wastewater professional by focusing on the essentials of developing and managing an effective cross-connection control program. Topics include: legal authority, policies, record keeping, training and education, assembly standards, the elements of a good ordinance, and liabilities and responsibilities. In addition this course will also touch on Methods, Devices and Assemblies used in Cross Connection Control and ways to choose the proper containment or Isolations component.

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

TUESDAY

- 8:00 a.m. - 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 Assoc.
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 a.m. - 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.
- Noon -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
- 6:00 - 9:00 p.m. **DINNER**

THURSDAY

- 8:00 a.m. - Noon **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.

Noon – 1:00 p.m. **LUNCH**

1:00 - 5:00 p.m. **Instrumentation and Controls for the Operator – TBD**
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

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 #6083-17-03.

MONDAY

8:00 – 8:30 a.m. **Orientation** – Course Coordinator, 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 a.m. – 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 a.m. - Noon **Math Skills** – Instructor, Wanda Ketner – WSSC
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 linear measurements, area and volume measurements.
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 5:00p.m. **Math Skills (continued)** – Instructor, Wanda Ketner – WSSC
- 5:00 – 6:00 p.m. **DINNER**

WEDNESDAY

- 8:00 a.m. – Noon **Centrifugal Pumps and Components** – Instructor, Billy Dove – City of Baltimore DPW
This 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, the importance of tank turnover, chlorination, and disinfection byproducts, and routine maintenance.
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 5:00p.m. **Centrifugal Pumps and Components (continued)** – Instructor, Billy Dove – City of Baltimore DPW
- 6:00 - 9:00 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 – City of Baltimore DPW
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 – City of Baltimore DPW
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**

Advanced Water Distribution *New this year

The Advanced Water Distribution courses are designed for veteran distribution operators that maintain and operator a water distribution system. This course will cover advanced topics and build off topics covered in the Water Distribution Course. Topics in this course include Basic Instrumentation, Energy Management, Backflow Prevention, Hydraulic Modeling and Water Quality. Persons taking this course should be a certified operator or have completed the Water Distribution Course. This course is Maryland Board TRE #6084-17-03.

MONDAY

8:00 – 8:30 a.m. **Overview** – Course Coordinator, John Luu – WSSC
An overview of the Advanced Water Distribution course will be presented, course objectives and TRE requirements will be discussed.

8:30 a.m. – Noon **Basic Instrumentation** – Instructor, Pradeep Kumar, Anne Arundel County DPW
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 to 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Backflow Prevention** – Instructor, Steve Fox – Hydrocorp and Kristy McAndrew – Charles County DPW
This course is designed to meet the needs of water/wastewater professionals by focusing on the essentials of developing and managing an effective cross-connection control program. Topics include: legal authority, policies, record keeping, training and education, assembly standards, the elements of a good ordinance, and liabilities and responsibilities. In addition this course will also touch on Methods, Devices and Assemblies used in Cross Connection Control and Ways to choose the proper containments of Isolations component.

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 a.m. – Noon **Chlorination, Dechlorination, DBP's and Tank Maintenance** – Instructor, Billy Dove – City of Baltimore DPW
This class will cover various water distribution processes and their purpose. Topics covered will be Disinfection Byproducts and their dangers, keys to proper tank maintenance and chlorinating/dechlorinating water.

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Centrifugal Pumps and Specialty Valves** – Instructor, Billy Dove – City of Baltimore DPW
Topics presented in this session include hydraulics of pumps as applied to the waterworks industry, pump operations and routine maintenance. This course will also cover various specialty valves found in the water distribution system.

5:00 – 6:00 p.m. **DINNER**

WEDNESDAY

8:00 a.m. – Noon **Hydraulic Modeling** – Instructor, Jonathan Cohen – Baltimore County Public Works
The purpose of this course is to explain the fundamentals of Hydraulic Modeling as it pertains to the water distribution system. Understanding how the model of the systems works can be a useful tool for operations and maintenance.

Noon – 1:00 p.m. **LUNCH**

1:00 – 3:00 p.m. **Water Chemistry/Quality** – Instructor, Deborah Pitts - City of Baltimore DPW
This class will cover basic chemistry as it relates to water and the evolution of water quality standards and regulations.

3:00 – 5:00 p.m. **Energy Management** – Instructor, John Luu – WSSC
This session will cover energy management as it relates to a water distribution system. Among the topics discussed will be energy sources/generation, electrical devices designed to reduce energy costs and strategies to reduce energy costs while still being able to maintain the water system.

6:00 – 9:00 p.m. **DINNER**

THURSDAY

8:00 a.m. – Noon **Applied Math** – Instructor, Jay Price – City of Baltimore DPW
This session will focus on mathematics and applications fundamental to the water distribution system. Upon completion of this course, personnel should be able to perform calculations needed to verify data in the distribution system. Examples include calculating chemical dosing, disinfection CT, water hammer, detention times and water velocity.

Noon – 1:00 p.m. **LUNCH**

1:00 – 3:00 p.m. **Unidirectional Flushing** – Instructor, Cliff Wilson – WACHS
This course will cover the purpose of Unidirectional Flushing and its effectiveness on the water distribution system. An effective UDF program can improve water quality, remove sediments and also improve flows and pressures. Included topics in this discussion will be water velocities, changes in water quality and flushing strategies

3:00 – 5:00 p.m. **Course Review** – Instructor, John Luu – WSSC
This session will be a review of the week’s material in preparation for the Short Course final exam.

5:00 – 6:00 p.m. **DINNER**

FRIDAY

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

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 9th. 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 #6085-17-03.

MONDAY

8:00 – 9:00 a.m. **Orientation** – Course Coordinator, Marshall Phillips – City of Baltimore
During this period, course materials will be distributed, the TRE requirements discussed and an overview of the curriculum outlined.

9:00 a.m. – Noon **Advanced Treatment** – Instructor, William Shreve – Director, DPW, Charles County, MD
Methods of nutrient removal, sand filtration, and other advanced treatment processes will be discussed.

OR

Introduction to Wastewater Treatment – Instructor, Marshall Phillips – City of Baltimore
An introductory look at all usual processes of wastewater treatment in a municipal sewage plant. (This session will not present certification exam level information)

Noon – 1:00 p.m. **LUNCH**

1:00 – 5:00 p.m. **Intermediate Math** - Instructor, Bill Farrell – MEI / RTS / Prostart
Computation of typical wastewater problems will be emphasized. Detention times, flow rates, dosage rates, loading rates, and other typical wastewater formulas will be covered as needed for certification prep.

5:00 – 6:00 p.m. **DINNER**

TUESDAY

- 8:00 – Noon **Activated Sludge Process Control** – Instructor, Marty Johnson – WSSC
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.
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 3:00 p.m. **Disinfection** – Instructor, Earl Ludy – Somerset County Sanitary District
This course will identify and discuss different types of disinfection, including advantages and disadvantages of each method.
- 3:00 – 5:00 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 a.m. – Noon **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.
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 5:00 p.m. **Sludge Thickening & Digestion** – Instructor, Bill Farrell – MEI / RTS / Prostart
Aerobic and anaerobic digestion will be discussed, including advantages and disadvantages of each. Process monitoring and troubleshooting will be emphasized.
- 6:00 - 9:00 p.m. **DINNER**

THURSDAY

- 8:00 a.m. – Noon **Wastewater Overview** – Instructor, Marshall Phillips – City of Baltimore- Back River W.W.T.P
Q&A on topics covered during the week so far, as well as pre-test review relating to certification topics will be discussed.
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 5:00 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

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. This course is Maryland Board/TRE #6086-17-03. Tuesday’s class has also been approved for Superintendent certification renewal credits (Maryland Board/TRE #6087-17-03).

Note: 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.

MONDAY

- 8:00 - 9:00 a.m. **Overview** – Instructors, Darryl Noakes – AECOM
An overview of the Advanced Wastewater program will be presented and course objectives discussed. Course logistics and TRE requirements will be discussed.
- 9:00 a.m. – Noon **Biological Components of Wastewater** - Instructor, Cynthia Bland, REM, CEP – PEER Consultants, P.C.
This 1-day course will review the wide variety of pathogens that are present in wastewater, sludge, foam, compost, aerosols and contaminated surfaces and present potential and actual risks to wastewater personnel. Pathogens reviewed include viruses, bacteria, fungi, protozoa and helminthes (worms) as well as allergens, endotoxins and exotoxins. Topics presented include: an overview of relevant history, hazards and organisms; aerosols, compost, foam and sludge; disease transmission and the body's defenses; removal, inactivation and destruction of pathogens; hygiene measures, protective equipment and immunizations. The course will also cover organism identification and the effects of the presence, absence, mobility, and organism type on wastewater process control as well as microscopic features will be included as an overview of sampling.
- Noon - 1:00 p.m. **LUNCH**
- 1:00 – 5:00 p.m. **Biological Components of Wastewater (continued)** -Instructor, Cynthia Bland, REM, CEP – PEER Consultants, P.C.
- 5:00 - 6:00 p.m. **DINNER**

TUESDAY

- 8:00 a.m. – Noon **Asset Management** – Instructor, Anthony Rocco – Howard County Dept. of Utilities
Asset management is the process of creating and managing water & wastewater infrastructure assets necessary to ensure ongoing, cost effective delivery of services to customers. This 1-day course identifies decision support tools, techniques, and methods that water and wastewater

agencies can use to implement an Asset Management Program as a way for these agencies to save money, secure funding, and protect their assets while still providing quality service to their customers. Asset management planning requires facilities to reduce the risk of system and service failure by incorporating regular maintenance, renewal and replacement of assets into their plans. By discussing these key asset management concepts facilities will be able to develop a list of recommended resources for implementing an asset management program.

- Noon - 1:00 p.m. **LUNCH**
- 1:00 - 5:00 p.m. **Asset Management (continued)** – Instructor, Anthony Rocco – Howard County Dept. of Utilities
- 5:00 - 6:00 p.m. **DINNER**

WEDNESDAY

- 9:00 a.m. – 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 also 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
- 6:00 - 9:00 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**

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. Thursday's class 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 physical treatment course (Monday – Wednesday) is Maryland Board/TRE #6089-17-03. The biological treatment course (Thursday) is Maryland Board/TRE #6090-17-03.

MONDAY

- 8:00 – 9:00 a.m. **Course Objectives & Orientation** – Course Coordinator, 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 a.m. – Noon **Overview of the Operator Certification Program Requirements** – Instructor, Lawrence Robinson – Maryland Department of the Environment (MDE) Retired! Or Ed Williams - Harford Co.DPW
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 County 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** – Ed Williams – Harford County DPW

5:00 – 6:00 p.m. **DINNER**

TUESDAY

8:00 a.m. – Noon **Chemical Feed** – Instructor, Smith Turner - Polydyne
This session covers use of chemicals in the treatment of wastewater. Topics will include the chemicals used, application points and calculating chemical feed rates. Discussion of nutrient and solids removal

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 District
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 – Harford County DPW
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, Michael Lewis - WSSC
MSDS, Right to Know Law OSHA (29 CFR 1910.1200) and MOSH (COMR 09.12.33.04) will be discussed, as will Having a successful Lock-Out/ Tag-Out program.

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

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

6:00 - 9:00 p.m. **DINNER**

THURSDAY

8:00 – 9:00 a.m. **Principles of Biological Treatment** – Instructor, Chris Younger - Harford County DPW
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 - Harford County DPW
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 a.m. – Noon. **Aerobic Treatment I** – Instructor, Chris Younger - Harford County DPW
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.
- Noon –1:00 p.m. **LUNCH**
- 1:00 – 2:00 p.m. **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.
- 2:00 – 3:00 p.m. **Sludge Handling & Disposal** – Instructor, Ed Williams - Harford County DPW
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 County DPW
- 4:00 – 5:00 p.m. **Final Exam** – Biological Treatment
- 5:00 – 6:00 p.m. **DINNER**

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 #6088-17-03.

MONDAY

- 8:00 – 8:30 a.m. **Overview** – Course Coordinators, Tom Newquist – City of Annapolis, and Wayne Reed – MD Rural Water Association
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 – 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, Robin Wolf – RFS
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 – 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 a.m.– Noon **Review** – Instructor. Aaron Hughes – Greeley and Hanson
- Noon – 1:00 p.m. **LUNCH**
- 1:00 – 2:00 p.m. **Flow Monitoring** – Instructor, Andy Fitsimmons – WSSC
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. **An Introduction to Asset Management** – Instructor, Gian Cossa – DCWATER
Asset Management is a comprehensive business program advocated by the US EPA and the utility industry to optimize infrastructure sustainability. It is essentially the practice of managing infrastructure capital assets to minimize the total cost of acquiring, operating and maintaining them, while improving service levels. The process involves incorporating detailed asset inventories, data management, related business processes and long-range financial planning to drive decision-making by optimizing the ability to prioritize capital program projects and preventive maintenance work.
- 3:00 – 4:00 p.m. **SSES//Private Property I/I** – Instructor, Paul Sayan – 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** – Instructor, Wayne Reed – Maryland Rural Water Association
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 - Retired
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 - Retired
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 – Delon Hampton & Associates (DHA)
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)

6:00 – 9:00 p.m. **DINNER**

THURSDAY

8:00 – Noon **Basic Chlorine and Chlorine Cylinder Program** – Instructor, Farris Moore – DC Water
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, Farisse Moore – DC Water
- 3:00 - 5:00 p.m. **Exam Review** – Instructor, Wayne Reed – MD Rural Water Association
- 5:00 – 6:00 p.m. **DINNER**

FRIDAY

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

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. This course was designed to meet the needs of managers and superintendent's re-certification and may be approved for other operators' certification as well. Each of the two 4-hour courses are approved for Superintendent license renewal credits.

Energy Management for Water and Wastewater class is Maryland Board/TRE #6091-17-03.

Biosolids Management in Maryland & Technology class is Maryland Board/TRE #6092-17-03.

TUESDAY

- 8:00 a.m. – Noon **Energy Management for Water and Wastewater - Instructor, TBD**
 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.
- Noon - 1:00 p.m. **LUNCH**
- 1:00 – 5:00 p.m. **Biosolids Management in Maryland & Technology** – Instructor, Bob Wimmer – The Energy Systems Group
 This course will provide Superintendents and Chief Operators with the knowledge and experience to address changes in the Maryland Biosolids Regulations and Nutrient Management Plans. The course will focus on how the new regulations impact biosolids management and the stabilization options to meet the new regulations. The course will also address new technologies that can be used to address issues associated with P in biosolids.

2017 Water & Wastewater Operators Short Course Committee Members

Chairperson:	Rob Swann (CSAWWA), Anne Arundel County DPW
Chairperson-Elect:	Scott Harmon (CSAWWA, CWEA), Anne Arundel County DPW
Treasurer:	Noelle Anuszkiewicz (CWEA), Anne Arundel County DPW
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Water Distribution:	David Wilkins (CSAWWA), WSSC John Luu (CWEA), WSSC
Wastewater Treatment:	Marshall Phillips (WWOA), Baltimore City DPW Darryl Noakes (CWEA), AECOM
Industrial Wastewater:	Ed Williams (CWEA), Harford County
Wastewater Collections:	Tom Newquist (WWOA), City of Annapolis Wayne Reed (CWEA), Maryland Rural Water
Superintendents:	Winfield McKell (WWOA), WSSC Michael Lewis (CSAWWA), WSSC
Admin. Coordinators:	Bill Farrell (CWEA/WWOA, CSAWWA), MEI/RTS/Prostart Clark Howells (CWEA), Baltimore City DPW Conrad Shows (WWOA), DC Water (Retired) Ivy Swann (WWOA)
College Liaisons:	Jim Timmons (WWOA), Baltimore City DPW (Retired) Jay Price (CSAWWA), Baltimore City DPW

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.