

WUS 101 – Fundamentals of Water Treatment
Monday Nights – Spring 2012
January 23 to May 14, 2012

Ticket # 54430 -- 7:00- 10:10PM Mondays, Room E-203

Office Hours: Room U-83— Mon 3:20-5:20PM, Tue 5:00-7:00 PM, Wed. 4:45-5:15 PM,
& Thur 6:15 –6:45PM

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webpage: www.sccollege.edu/water ; www.sccollege.edu/jgates

Course description: Basic Water Treatment Fundamentals, Conventional water treatment processes, practical application of mathematics to determine areas, volumes, rates of flow, velocity, horsepower, and chemical dosages used in utility operation. Basic hydraulics for operating and controlling water flow in settling basins, filters, pipelines, pumping stations reservoirs, and treatment plants.

Student Outcomes: As a result of completing Water Treatment 101, students will be able to:

1. Be able to state basic drinking water quality parameters for: total hardness, Total Dissolved Solids (TDS), conductivity, and biotic life contained in imported and groundwater supplies used in California.
2. Be able to list at least four unit processes used in a conventional water treatment facility.

Required Text: Water Treatment Plant Operation, Vol 1, latest edition, California State University Sacramento (CSUS) by Dr. Ken Kerri (Project Director)

Go to: <http://www.owp.csus.edu/drinkingwater.htm> for information.

Recommended Texts: 1. Basic Science Concepts and Applications, 2nd edition, AWWA, 2. Water Treatment Operator Handbook, Pizzi, AWWA, 3. Water Treatment, Principles and Practices of Water Supply Operations, 2nd edition. 4. Applied Math for Water Distribution, treatment & wastewater operators, Gates.

Go to: <http://www.awwa.org/bookstore/productlist.cfm?cat=0> for AWWA bookstore information.

Three-point attendance quizzes will be administered at the end of each class session for a total value of 42-points. Please bring a simple calculator to class each week.

<u>DATE</u>	<u>Week</u>	<u>TOPIC</u>
Jan 23	1	Introductions, course overview, grading policy, College Certificate program, California Department of Health Services (DHS) mandated licensing programs, DHS exam application process. Go to: www.sccollege.edu/watersci , then hit “water licensing programs” on the left to access the CDPH link. Page down to the Treatment applications and qualifications. Deadline to apply for May 19th CDPH Treatment exam is March 1. Homework: Read Chapter 1 (Kerri) answer questions in each assigned chapter. Read Chap 2 Word Glossary and reacquaint yourself with the Hydrologic cycle.
Jan 30	2	The Treatment “Train”, What do water treatment operators do? Hydrological cycle—Sunspot activity, NOAA satellites, Three basic water rights, DPH Range of Knowledge (ROK) listing., Sanitation survey, Physical, chemical, biological, radiological characteristics of contaminants. Homework: Read: <i>The Safe Drinking Water Act</i> (pg 29-30), <i>Sources and Treatment of Water Table 2.1—page 32</i> , complete Chap 2 Questions and suggested answers on page 33. Read Chap 3 Word Glossary. What does dimictic mean?
Feb 3		Friday Hot Topics class 8 AM to 4:50PM – Backflow Devices (ticket 58002)
Feb 6	3	Student activities: Make-up (3) questions from the “Words” list in chap 3. The best stump the class questions get extra credit. Lecture: California Title 22, EPA water quality regulations, Glossary terms, Best Available Technology (BAT), fall turnover, water quality variables, reservoir management methods. <i>Practice chapter questions and answers on pages 84/85.</i> Homework: Read Chapter 3 pages 40-68.
Feb 13	4	Student activities: Make-up (3) standardized test questions from Questions on pages 47-51. Lecture: Littoral zones, Algal Blooms, pH, stratifications, Methods of reservoir management. Quiz #1 Chapters 2&3 “Words”. Homework: Read <i>Laboratory and Monitoring programs pg 74 and Intake structures pages 75-82.</i> Read Chapter 4 “Words”(What does Alkalinity mean?).
Feb 20		President’s Day --- No Class
Feb 24		Friday -- Water Distribution Test Prep: 8AM to 4:50PM
Feb 27	5	Quiz review. Student activities: Work math hand-outs associated with dosages and detention times. Lecture: Coagulation and Flocculation, Chemical coagulants, Flocc formation, Jar-test, optimal dosages (see pg 115), Alkalinity, Detention Time, Turbidity, process troubleshooting, Enhanced Coagulation, water quality indicators. Homework: Read lesson 1 answers on page 133-134, Read Chapter 5 “Words”. Research YouTube.com for filtration plant videos (extra credit given for submittals).

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Mar 1		Deadline to submit an application to the DPH water treatment exam
Mar 5	6	Student activities: Show student YouTube videos. Lecture: Sedimentation processes, tube settlers, launders, sludge collection, Lime dosages, Corrosion control and PM procedures. Math review for Midterm. Sedimentation process, Particle sizes, launders, basin maintenance, overflow rates, sludge removal processes. Homework: <i>Read Chap 6 Filtration -- Words plus Questions and answers on pages 253-255 Study for midterm.</i>
Mar 12	7	Midterm exam (Chapters 2-5 Words and Math)
Mar 19-23		Spring Break – no classes
Mar 26	8	Midterm Exam review. Student activities: Change the values in each math problem on pages 226-227 and solve. Lecture: Filtration systems. Pressure, gravity, surface washers, breakthrough, backwash criteria. Filtration systems math. Homework: Read pages 238-248 , and chapter 7 Words.
Mar 28/29		Children’s Water Education Festival. Contact www.ocwd.com to volunteer
Apr 2	9	Midterm review, filtration details and operations
Apr 9	10	Diemer plant tour located on Valley View in Yorba Linda. Meet at the Yorba Linda Community center on Imperial Highway and Casa Loma street Yorba Linda at 6:45PM.
Apr 16	11	Quiz #2: Chapter 6 Filtration Q and A quiz. Lecture: Check online ROK for compliance, chlorine video, Disinfection types, waterborne diseases, sampling requirements, HOCl/pH curve, Breakpoint chlorination curve, Chloramination, Nitrification. Homework: <i>Read Operation of Chlorination Equipment pages 291-324.</i>
Apr 23	12	Quiz #3:Chlorine properties. Chlorine equipment, Safety kits, Operation of other disinfection processes, Homework: <i>Read Disinfection lesson #3 pages 326-360:</i>

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Apr 30 **13** **Student activities:** Form clusters and prepare (3) great questions to stump the class. Include UV, Ozone, and other disinfectants. **Lecture:** Practice water treatment exams, questions and math. Chlorination equipment, safety. Plant Operation, regulations, daily tasks, flow regulation, storage of chemicals, first aid procedures. **Homework:** Remember as much of the test as possible for possible extra credit!

May 7 **14** **Student activities:** State exam review. Work math problems on test. **Lecture:** Math Conversion sheet review and handout. Plant operation , Primary and Secondary, chemical types and characteristics (page 473) safe handling of chemicals. Chapter 11 Lab procedures. Sampling, bacteriological positives (MPN), **Course Review**.

May 14 **15** **Final exam**

<u>Grading policy:</u>	Quizzes	20%	A = 90-100%
	Attendance quizzes (max 3-points/each)	10%	B = 80-89%
	Midterm	30%	C = 65-79%
	Final	40%	D = below 65%

Make-up quizzes will not be allowed. However, Extra credit may be granted for missed quizzes. Prior arrangements are required to determine extra credit. Extra credit will apply only for borderline cases. See or call instructor during office hours.

→ Incomplete grades will not be granted unless a sudden catastrophic event occurs. *Students should arrange vacation times to avoid attendance problems and missing tests.* Students should make arrangement for personal transportation to attend field trips, if needed. Instructor may assign make-up work for absences caused by employers or catastrophic events.

● A student has to receive a "C" letter grade or better for each class to qualify for a program certificate of completion. Seven class completions are required for a specific certificate in the Water Utility Science program. See program brochure for details.

☺ The hallmark of any class is regularly **attending** and performing **homework assignments**. Each listing on the course syllabus contains reading assignments for the next class session. All reading assignments shall be completed BEFORE class each week. All college classes require that a student read assigned materials before class. For every hour in class, assignments are to cover 2-hours outside the class. California educational law requires that a 3-unit course contains at least **6-hours** of study outside of class.

Communication between the instructor and student is essential for success. Additional assignments may be given to students who cannot avoid an absence due to work. The

college policy is, if you miss three consecutive class sessions, the instructor may drop you. However, it is your responsibility to drop the class.

© Students are reminded that career educational classes are regular college courses and are not seminars. **As such, note taking is essential.** If assistance is needed in how to take class notes, please notify instructor. Tests will be developed from text and class notes.

Cell phones: Please notify instructor at the beginning of class if you are on call at work. All others shall place phone on vibrate or off during class. Cell phone texting is NOT allowed while in class.

Use of iPods in class are NOT allowed unless approved by the instructor. Class attendance points will be deducted for unapproved iPod use in class. Students are not allowed to have hoods on during class sessions.

Laptop computer use. Please obtain instructor's permission before class if you plan to turn a laptop on in class.

- All students should have ability to access the Internet via home, the college library, computer center, or city libraries. Research using www.dogpile.com or www.google.com will be stressed in this class.

- Students are encouraged to become members of the American Water Works Association by joining with a "student" rate of approximately \$40 per year. (check for latest rates) Go to: www.ca-nv-awwa.org to join. Also, join the free subscription with Brown and Caldwell Consultants at: www.bcwaternews.com

Tips for Success in this course:

- Keep a positive attitude!
- Attend ALL class sessions.
- Take class notes on a separate spiral notebook especially for how problems are solved and for class session announcements.
- Get homework information and class notes from another student, if you miss a class.
- Do not get behind!!

Please ASK FOR HELP early and often!!!

Accommodations for Disabilities:

Students with verifiable disabilities who want to request academic accommodations are responsible for notifying their instructor and Disabled Students Programs and Service (DSPS) as early as possible in the semester. To arrange for accommodations, contact DSPS by phone (628-4860) or (714-639-9742 – TTY for deaf/hearing impaired) or stop by the DSPS center (E-105) newly located in the "E" building on the first floor.