

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

EnE 664 Physical and Chemical Treatment Fall 2024

Course Description (from the course catalog):

Physical and chemical quality of water for human consumption, with focus on design aspects of physical and chemical operations and processes employed in the treatment of water and wastewater. Topics include coagulation, flocculation, solid-liquid separation, filtration, precipitation, adsorption, gas transfer, and disinfection. Includes a brief overview of key principles from physics and chemistry.

Co-requisite or Pre-requisite:

Prerequisite: <u>ENE 663</u>. (May be taken concurrently.)

Course Section: 101

Canvas: FA24-ENE664101

Lectures: Mondays, 6:00 PM – 8:50 PM EST/EDT in Cullimore Lecture Hall 3

Instructor: Dr. William Pennock

Office: Colton 268

Office Hours: Wednesdays & Fridays 12:00-1:30 PM in Colton 268 or on Zoom **(PMI: 849 648 1466)**, or by appointment (scheduled by e-mail)

Email: whp3@njit.edu

<u>Text</u>:

M. M. Benjamin & D. F. Lawler, *Water Quality Engineering: Physical / Chemical Treatment Processes*, Wiley, ISBN: 978-1-118-16965-0 (available at <u>library.njit.edu</u>)

References:

J. C. Crittenden et al., *MWH's Water Treatment: Principles and Design,* 3rd Edition, Wiley, Print ISBN: 9780470405390, Online ISBN: 9781118131473 (available at <u>library.njit.edu</u>)

M. L. Weber-Shirk et al., *The AguaClara Textbook*, v1.4.37, <u>https://aguaclara.github.io/Textbook/</u>

Communication:

Communication by the Instructor will be done through Canvas. It is your responsibility to check email, and the course page on Canvas regularly. Items Required for this Course:

- 1. Computer and/or printer to access course notes
- 2. Scanner (or phone with ability to scan)
- 3. Calculator

Week	Date	Торіс	Reading (B&L)	Reading (MWH)
1	9/9	Introduction & Water Quality		1-1—1-5 2-1—2-8
				3-1,3-2,3-8
2	9/16	Regulations & Water Treatment Overview (90% Withdrawal)		4-1-4-6
3	9/23	Mass Balances	1.1,1.2,1.5	6-1,6-2
4	9/30	Reactor Models & Kinetics (50% Withdrawal)	2.1–2.6, 3.1–3.7 (4.2–4.6 optional)	6-3–6-9
5	10/7	Coagulation & Precipitation	11.1–11.11	9-1—9-5
6	10/14	Mixing and Flocculation	12.1–12.9	6-10 9-6—9-7
7	10/21	Sedimentation and Flotation (25% Withdrawal)	13.1–13.10	10-1—10-9
8	10/28	Midterm Exam		
9	11/4	Filtration	14.1–14.10	11-1—11-8 12-1—12-8 17-1—17-7
10	11/11	Adsorption & Ion-Exchange (Last Day to Withdraw)	7.1–7.5	15-1—15-6 16-1—16-8
11	11/18	Gas Transfer	5.1–5.8	14-1–14-3
12	11/25	Disinfection and Oxidation	10.1–10.8	13-1—13-9 18-1—18-5 19-1—19-5
13	12/2	Corrosion Control	9.1–9.6	22-1—22-13
14	12/9	Final Presentations		
Exam Period	TBD	Final Exam		

Grading Policy:

- **Homework:** 15%
- Midterm Exam: 25%
- **Report:** 15%
- Presentation: 15%
- Final Exam: 30%
- Attendance/Participation: Students within 2% of a letter grade can be promoted up to the next highest grade level or demoted to the next lowest grade level based on their attendance and participation in class.

Grading Scale:

- A: 100-90
- B+: 89.9-85
- B: 84.9-80
- C+: 79.9-75
- C: 74.9-70
- F: Below 70

Attendance and Participation:

Attendance is important to remain engaged with your courses and your learning community. Please do your best to be fully present during lectures and avoid distractions for yourself and for fellow students. As noted above, attendance and participation have an important influence on your grade. If a student must miss a class or an exam, please contact the professor to discuss the issue at least **24 hours prior to** the class or exam. Students will not be allowed to make up exams or quizzes if the professor is not contacted prior to the class. If a student had a serious medical issue, death in the family, or other excusable emergency absence, the student is required to obtain an excused absence from the Dean of Students prior to asking for a make-up.

Assignment Policy:

All assignments are due by 11:59:59 PM on Wednesdays, unless otherwise specified. Late assignments will automatically be deducted 10% per day they are late and will not be accepted after 48 hours.

Students with Disabilities:

NJIT is committed to providing students with documented disabilities equal access to programs and activities. If you have, or believe that you may have, a physical, medical, psychological, or learning disability that may require accommodations, please contact the <u>Office of Accessibility Resources and Services</u>.

Additional Support:

Graduate studies provide many new challenges and opportunities, and many students experience some form of distress as a result. If you feel overwhelmed or would like to talk with someone about your mental or emotional state, please reach out to C-CAPS or the Dean of Students.

Withdrawals:

In order to ensure consistency and fairness in application of the NJIT policy on withdrawals, student requests for withdrawals after the deadline will not be permitted unless extenuating circumstances

Exam Policy:

Exams will be conducted in-person during class times designated by the university. Both the midterm and the final exam are cumulative. Refer to the Attendance and Participation policy for make-up exams.

Academic Integrity:

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <u>NJIT Academic</u> <u>Integrity Code</u>.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at <u>dos@njit.edu</u>.

Generative AI:

Student use of artificial intelligence (AI) is permitted in this course for certain assignments and activities, such as for the final paper and presentation as an aid. Please note that generative AI has the capacity to hallucinate, to plagiarize, and to fail to cite sources. It is expected that students will have the majority input into the project, as this is an opportunity for human learning. If and when students use AI in this course, the AI must be cited as is shown within the <u>NJIT Library AI citation</u> page for AI. It is not permitted to be used in exams, just as Internet and search engine access are also prohibited to ensure student comprehension is what is being tested. If you have any questions or concerns about AI technology use in this class, please reach out to your instructor prior to submitting any assignments.

Syllabus Information:

The dates and topics of the syllabus are subject to change at the discretion of the professor.

Copyright:

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