

Fall 2015

ENCE 4322

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ENCE 4322/5322
DESIGN OF WATER SUPPLY AND SEWER SYSTEMS
Required

CATALOG DESCRIPTION

ENCE 4322/5322 Design Of Water Supply And Sewer Systems **3 cr.**

Design of water supply systems including surface water intakes, groundwater wells, pumping, pipelines, storage reservoirs, and water distribution systems. Design of urban drainage systems including: sanitary sewer systems, storm water collection systems, sewage pumping stations, and appurtenances and special structures. Graduate students enrolled in 5322 must carry out additional work to earn the graduate credit.

PREREQUISITES

ENCE 3318 or ENME 3720.

TEXTBOOKS AND OTHER MATERIAL

1. *Water Supply and Wastewater Removal, 3rd Edition*, by Nazih K. Shammam, and Lawrence K. Wang, John Wiley, 2011. *(Required)*
2. Driscoll, *Ground Water and Wells*, U.S. Filter/Johnson Screens, St. Paul, MN (1986). *(Reference)*.

STUDENT LEARNING OBJECTIVES

After successfully completing this course each student will be able to:

1. Design groundwater wells and surface water intake structures for drinking water supply systems.
2. Select pumping equipment required to specific water supply applications.
3. Prepare the preliminary design of water supply main, including valves and appurtenances.
4. Prepare the preliminary design of a water distribution system, including the service reservoir.
5. Solve problems related to water supply and sewer system design.
6. Prepare the preliminary design of wastewater collection systems using design principles, recommendations, and standards normally applied in civil engineering practice.
7. Prepare the preliminary design of a sewage pumping station.

COURSE TOPICS

DESIGN OF WATER SUPPLY SYSTEMS			
Date	Chapter	Topic	Readings (Shammas & Wang)
8/20	Basic design criteria	System components, design period, design	Chapters 1, 4
8/25		Population forecasting, unit water consumption, service area	
8/27	Surface water	Surface waters. Calculation of impoundment storage volume	Sections 2.1-2.6
9/1		Annual series, probability method	
9/3		Design of surface water intake structures.	
9/8	Groundwater	Properties of aquifers	Chapter 3
9/10		Review of basic groundwater hydraulics	
9/15		Non-equilibrium formulas	
9/17		Kinds of wells	
9/22		Deep well design criteria	
9/24		Deep well design example	
9/29			
10/1	First exam, through groundwater		
10/6, 8, 13, 20	Pumping	Definitions, pump characteristic curves, parallel and series operation. Design example	Sections 8.1-8.2
10/22	Water conveyance		Chapter 5
10/27	Water Distribution	Water storage: Service reservoirs. Distribution systems: conceptual design, hydraulics. Design recommendations	Chapter 6, sections 8.3-8.6
10/29			
11/3	Second exam: Through water distribution		
DESIGN OF URBAN DRAINAGE SYSTEMS			
11/5	Sanitary sewer systems	Sanitary sewer systems: quantities of sewage, layout	Sections 14.7-14.9
11/10		Flow in partially filled sewers, transitions	Sections 13.4-13.8, handouts
11/12		Design of sanitary sewer systems. Appurtenances	
11/17		Sewage pumping stations	
11/19, 24, 26, 10/1,3	Storm sewer systems	Quantity of runoff	Sections 11.7-11.18
		Intensity duration curves, The rational method	
12/8	10:00 AM-12:00 PM	Final exam: Comprehensive	

CLASS SCHEDULE

Class Meetings: EN 317 TTh 11:00 – 12:15

INSTRUCTOR CONTACT INFORMATION AND OFFICE HOURS

Enrique J. La Motta, Ph.D., P.E.

Office hours: TTh 2:00 – 4:30 pm, EN 815

E-mail address: elamotta@uno.edu

Phone: 280-6093

CRITERIA FOR GRADING, GRADING STANDARDS

There will be three exams (two mid-term tests and the final exam, each with the same weight), worth 70 percent of the grade, and at least six assignments, worth 30 percent of the grade. The assignments are not optional; they are mandatory. For every day of late submission of an assignment you will lose 10 points (in a 100-point scale).

The final letter grade is computed as follows: The overall numerical grade will be divided by the highest score in class, so that the best possible normalized score will be 100 points. If the normalized score is more than 90 points the grade will be an A; from 80 - 89, the grade will be a B; from 70 – 79, the grade will be a C; from 60 - 69, D; below 60, F.

TENTATIVE DUE DATES FOR ASSIGNMENTS, EXAMS

ASSIGNMENT/EXAM	TOPIC	TENTATIVE DUE DATE
1	Reservoirs	9/10
2	Groundwater	9/24
3	Pump system curves	10/22
4	Pipelines	11/5
5	Sanitary sewers	11/17
6	Rational method	12/3
First test	Through groundwater	10/1
Second test	Through water distribution	11/3
Final exam	Comprehensive	12/8

ATTENDANCE POLICY

Attendance is required. If you cannot attend class for some reason, call the instructor or the Engineering administrative assistant and explain why.

ACADEMIC DISHONESTY POLICY

Students are expected to conduct themselves according to the principles of academic integrity as defined in the statement on Academic Dishonesty in the UNO Student Code of Conduct. Any student or group found to have committed an act of academic dishonesty shall have their case

turned over to the Office of Student Accountability and Advocacy for disciplinary action, which may result in penalties as severe as indefinite suspension from the University. Academic dishonesty includes, but is not limited to: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, fabrication, or misrepresentation, and being an accessory to an act of academic dishonesty.

The new policy on Academic Dishonesty is available online at:
http://www.studentaffairs.uno.edu/studentpolicies/policymanual/academic_dishonesty.cfm

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students who seek accommodations for disabilities must contact the Office of Disability Services prior to discussing their individual needs for accommodation with their instructors.

EXTRA WORK FOR RECEIVING GRADUATE CREDIT IN 4000-LEVEL CLASSES

Students enrolled in ENCE 5322 will be responsible for the material contained in Chapters 17 (Trenchless Technology and Sewer System Rehabilitation) and 18 (Alternative Wastewater Collection Systems) of the textbook. Special assignments, and questions and problems dealing with these two chapters will be given in the final exam.

Important Dates*

Last day to adjust schedule w/out fee 08/18/2015
 Semester Classes Begin 08/19/2015
 Last day to adjust schedule w/fee,
 or withdraw with 100% refund 08/25/2015
 Last day to apply for December commencement 09/25/2015
 Final day to drop a course or resign 10/14/2015
 Mid-semester examinations 10/05-10/09/2015
 Final examinations 12/07-12/11/2015
 Commencement 12/18/2015
 *Note: check Registrar's website for Saturday and A/B sessions,
 and for items not listed here: <http://www.registrar.uno.edu>

Fall Semester Holidays

Labor Day 09/07/2015
 Mid-semester break 10/15-10/16/2015
 Thanksgiving 11/26-11/27/2015

Withdrawal Policy – Undergraduate only

Students are responsible for initiating action to resign from the University (withdraw from all courses) or from a course on or before dates indicated in the current Important dates calendar. Students who fail to resign by the published final date for such action will be retained on the class rolls even though they may be absent for the remainder of the semester and be graded as if they were in attendance. Failure to attend classes does not constitute a resignation. Check the dates on the Registrar's website, <http://www.registrar.uno.edu>. Please consult The Bulletin for charges associated with dropping and adding courses.

Incomplete Policy – Undergraduate only

The grade of I means *incomplete* and is given for work of passing quality but which, because of circumstances beyond the student's control, is not complete. The issuance of the grade of I is at the discretion of the faculty member teaching the course. For all graduate and undergraduate students, a grade of I becomes a grade of F if it is not converted before the deadline for adding courses for credit (as printed in the Important Dates Calendar) of the next regular semester including summer semester.

Repeat Policy

When a student is permitted to repeat a course for credit, the last grade earned shall be the one which determines course acceptability for degree credit. A student who has earned a C or better in a course may not repeat that course unless, (1) the catalog description indicates that the course may be repeated for credit, or (2) the student's Dean gives prior approval for documented extenuating circumstances.

Graduate Policies

Graduate policies often vary from undergraduate policies. To view the applicable policies for graduate students, see the Graduate Student Handbook: <http://www.uno.edu/grad/documents/GraduateStudentHandbookk2014.pdf>

Academic Dishonesty Policy

<http://www.uno.edu/student-affairs-enrollment-management/documents/academic-dishonesty-policy-rev2014.pdf>

Safety Awareness Facts and Education

Title IX makes it clear that violence and harassment based on sex and gender is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here: <http://www.uno.edu/student-affairs-enrollment-management/>

UNO Counseling Services and UNO Cares

UNO offers care and support for students in any type of distress. Counseling Services assist students in addressing mental health concerns through assessment, short-term counseling, and career testing and counseling. Find out more at <http://www.uno.edu/counseling-services/>. First-year students often have unique concerns, and UNO Cares is designed to address those students succeed. Contact UNO Cares through <http://www.uno.edu/fye/uno-cares.aspx>.

Emergency Procedures

Sign up for emergency notifications via text and/or email at E2Campus Notification: <http://www.uno.edu/ehso/emergency-communications/index.aspx>. All emergency and safety procedures are explained at the Emergency Health and Safety Office: <http://www.uno.edu/ehso/>.

Diversity at UNO

As the most diverse public university in the state, UNO maintains a Diversity Affairs division to support the university's efforts towards creating an environment of healthy respect, tolerance, and appreciation for the people from all walks of life, and the expression of intellectual point of view and personal lifestyle. The Office of Diversity Affairs promotes these values through a wide range of programming and activities. <http://diversity.uno.edu/index.cfm>

Learning and Support Services

Help is within reach in the form of learning support services, including tutoring in writing and math and other supplemental instruction. Visit the Learning Resource Center in LA 334, or learn more at <http://www.uno.edu/lrc/>.

Affirmative Action and Equal Opportunity

UNO is an equal opportunity employer. The Human Resource Management department has more information on UNO's compliance with federal and state regulations regarding EEOC in its Policies and Resources website: <http://www.uno.edu/human-resource-management/policies.aspx>