

- **SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY****SAULT STE. MARIE, ONTARIO**

Sault College

**COURSE OUTLINE**

**COURSE TITLE:** WATER DISTRIBUTION SYSTEMS

**CODE NO. :** WTR240 **SEMESTER:** IV

**PROGRAM:** ENVIRONMENTAL TECHNICIAN-WATER

**AUTHOR:** DAVID TROWBRIDGE

**DATE:** JAN 2007 **PREVIOUS OUTLINE DATED:** JAN '06

**APPROVED:**

	DEAN	DATE
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**TOTAL CREDITS:** FOUR

**PREREQUISITE(S):** WTR 241 CERTIFICATION PREPARATION

**HOURS/WEEK:** FOUR

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School of Technology, Skilled Trades & Natural Resources and Business  
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**I. COURSE DESCRIPTION:**

The objective of this course is to develop the knowledge and skills to effectively operate and maintain water distribution systems. The main topics include: components and types of water distribution systems, system hydraulics, safety, inspections, operation and maintenance and pump types and characteristics.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. Explain the responsibilities of distribution system operators.

Potential Elements of the Performance:

- Identify the role of distribution system operators in ensuring the proper delivery of domestic water supplies
- Explain the legal responsibilities applicable to water distribution operators
- List the training requirements determined by current regulations

2. Identify and explain the types and purpose of public distribution systems.

Potential Elements of the Performance:

- Describe a water distribution system
- Explain and draw the hydraulic grade line for a distribution system
- Identify the common water distribution network types
- Identify common components of distribution systems
- List the types and applications of the pumping equipment commonly used
- Describe the common valves and valving systems
- List the types and attributes of current industry standard water metering devices

3. Describe correct design and operating procedures

Potential Elements of the Performance:

- Identify causes of abnormal conditions using proper troubleshooting techniques

- Explain interaction with other processes and the total water treatment process
- Identify the types of pipeline materials used in drinking water systems along with specific applications and advantages/disadvantages
- Identify considerations which are applicable to distribution system design
- Explain the purpose, construction and operation of pump stations
- List types and applications of typical water storage facilities
- Accurately calculate capacities and volumes, head and pressures and flow rates
- Describe the disinfection process and the chemicals used in water distribution systems
- Calculate chemical dosage, chlorine demand to ensure proper disinfection

4. Determine and demonstrate safe work procedures

Potential Elements of the Performance:

- List correct procedures relating to traffic safety
- List correct procedures relating to maintenance access points
- Describe and demonstrate correct use of personal safety equipment
- Apply procedures required in confined space entry
- List factors related to electrical safety

5. Explain concepts and procedures to inspect and test distribution systems

Potential Elements of the Performance:

- List reasons for inspecting and testing systems
- Describe correct procedures for inspection of distribution systems
- Discuss the role and application of closed-circuit television inspection
- Describe the purpose of and procedures in pipeline testing
- Outline the appropriate sampling procedure to ensure safe water distribution

6. Describe operation and maintenance procedures

Potential Elements of the Performance:

- Identify types and causes of water main stoppages
- Select proper methods to clear stoppages and clean mains
- Determine equipment and personnel requirements for various cleaning scenarios
- Set up and operate cleaning equipment safely according to accepted practice
- Record essential data related to the clearing and cleaning process
- Describe a preventative maintenance program

**III. TOPICS:**

1. Operators role and responsibilities
2. Purpose of distribution systems
3. Design considerations
4. Distribution system safety
5. Inspection and testing
6. Operation and maintenance

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Operation and Maintenance of Water Distribution Systems, Volume 1  
California State University, Sacramento, Department of Civil Engineering  
Office of Water Programs

**V. EVALUATION PROCESS/GRADING SYSTEM:**

Quizzes and assignments	30 %
Midterm test	35 %
Final test	<u>35 %</u>
Total	100%

The following semester grades will be assigned to students in postsecondary courses:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00

WATER DISTRIBUTION  
SYSTEMSWTR240

A	80 – 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

**VI. SPECIAL NOTES:**Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493 so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean’s secretary. Students will be required to provide a transcript and course outline related to the course in question.