

**Clackamas Community College**  
Online Course/Outline Submission System

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### Section #1 General Course Information

**Department:** Engineering Science

**Submitter**

First Name: **Matt**

Last Name: **LaForce**

Phone: **3148**

Email: **laforce**

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**Course Prefix and Number:** WET - 010

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**# Credits:** 3

**Contact hours**

Lecture (# of hours): 33

Lec/lab (# of hours):

Lab (# of hours):

Total course hours: 33

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

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**Course Title:** Wastewater Operations I

**Course Description:**

For professional upgrade only. Does not meet the requirements for the college certificate or the associates of science degree. Introduction to the fundamentals of wastewater operations. Includes collections systems, preliminary and primary treatment, waste characteristics including organic removals, and solids profiles.

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**Type of Course:** Career Technical Supplementary

Can this course be repeated for credit in a degree?

**No**

What is the target audience/industry for this class?

**professionals who work in industry**

Are there prerequisites to this course?

**No**

Are there corequisites to this course?

**No**

Are there any requirements or recommendations for students taken this course?

**No**

Are there similar courses existing in other programs or disciplines at CCC?

**No**

Will this class use library resources?

**Yes**

**Have you talked with a librarian regarding that impact?**

**No**

Is there any other potential impact on another department?

**No**

Does this course belong on the Related Instruction list?

**No**

**GRADING METHOD:**

A-F or Pass/No Pass

**Audit: Yes**

When do you plan to offer this course?

**✓ Fall**

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

**No**

Will this course appear in the college catalog?

**Yes**

Will this course appear in the schedule?

**Yes**

**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. identify the concepts and equipment involved with Primary Wastewater Treatment,
2. become familiar with how wastewater is categorized both for its strength (BOD and TSS) and treatability,
3. understand the "solids profile" and "organic profile" of wastes.

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***This course does not include assessable General Education outcomes.***

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**Major Topic Outline:**

1. Monitoring of Flows.
  - a. Flumes, i.e. Palmer Bowlus.
  - b. Flow Continuity: Velocity x Area Approach,  $Q = AV$ .
  - c. Manning's Equation discussion for open channel flow.
2. Sanitary Wastewater Composition.
  - a. "Solids" Profiling: TS, TSS, TDS, etc.
  - b. "Organic" Composition: BOD/COD/TOC.
  - c. pH, Acid/Alkaline, 0-14 scale.
  - d. Organic vs. Inorganic Contaminants in Wastewater.
  - e. Compatible vs. Incompatible Contaminants in Wastewater.
3. Collection System Basics/Description.
  - a. Domestic Wastewater.
  - b. Industrial Wastewater.
  - c. Sanitary Wastewater.
  - d. Combined Sewage Systems and CSO/SSO definitions/explanations.
  - e. Storm Sewers and Surface Runoff.
4. Pumping Stations.
  - a. P/S Placement and its importance as a part of the Sewerage System.
  - b. Design Descriptions.
5. Bar Screens and Bar Racks; both manual and mechanical.
6. Comminutors and Barminutors.
7. Flow Equalization/ On-line or Off-line.
8. Flowrate/ Indication, Recording, Totalizing.
9. Grit Removal Systems and Rock Pockets.
  - a. Grit Channels, Sutro and Flow Proportional control.
  - b. Aerated.
  - c. Swirl Concentration, i.e. Pista-Grit.
10. Description of the four types of sedimentation.
11. Process of Sedimentation vs. Clarification.
12. Clarifier/Sedimentation Basins.
  - a. Circular shaped basins.
    - a1. Center Feed.
    - a2. Periphery Feed (Rim Feed).
  - b. Rectangular.
  - c. Square.
13. Screening Process and Screenings (debris).

**Does the content of this class relate to job skills in any of the following areas:**

- |                                      |           |
|--------------------------------------|-----------|
| 1. Increased energy efficiency       | <b>No</b> |
| 2. Produce renewable energy          | <b>No</b> |
| 3. Prevent environmental degradation | <b>No</b> |

4. Clean up natural environment **No**

5. Supports green services **No**

Percent of course: 0%

First term to be offered:

**Specify term: Fall 2015**

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