

Clackamas Community College

Online Course/Outline Submission System

Show changes since last approval in red

WET-120 Wastewater Operations II

General education certified: Yes No

- Writing
- Oral Communication
- Arts and Letters
- Science & Computer Science
- Mathematics
- Social Science
- Cultural Literacy
- Health & Physical Education

Approved Date (mm/dd/yyyy): / /

Section #1 General Course Information

Department: Engineering Science

Submitter

First Name: **Matthew**

Last Name: **LaForce**

Phone: **3148**

Email: **laforce**

Course Prefix and Number: WET - 120

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.

Course Title: Wastewater Operations II

Course Description:

Secondary wastewater treatment alternatives with municipal application. Fixed and suspended film systems with the associated clarification process will be presented.

Type of Course: Career Technical Preparatory

Is this class challengeable?

Yes

Can this course be repeated for credit in a degree?

No

Is general education certification being sought at this time?

No

Does this course map to any general education outcome(s)?

No

Is this course part of an AAS or related certificate of completion?

Yes

Name of degree(s) and/or certificate(s): Water Quality AAS

Are there prerequisites to this course?

Yes

Pre-reqs: WET-110

Have you consulted with the appropriate chair if the pre-req is in another program?

No

Are there corequisites to this course?

Yes

Co-reqs: MTH-082C

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?

Winter

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. define the principles involved with the fixed film processes, trickling Filters, rotating Biological Contactors, and activated Bio-filters;
2. define the principles and practices in the operation of suspended film processes, activated Sludge and ponds and Lagoons;
3. define the problem solving methods that allow for quantification of the operational strategies as applied to the biological treatment of wastewater, resolution of pounds formula, and mass flux of waste materials, sludge Ages (SATSS, SABOD \rightarrow) and organic Loading Rate (OLR), mean Cell Residence Time (MCRT) and food to Micro-organism Ration (F/M), hydraulic formulas that include: recirculation Ratio (Rr), hydraulic Loading/Overflow Rates (HLR, HOR), surface Loading/Overflow Rate (SLR, SOR), weir Loading/Overflow Rate (WLR, WOR).

This course does not include assessable General Education outcomes.

Major Topic Outline:

1. Understand the principles involved with the FIXED film processes:
 - a. Trickling Filters (TF)
 - b. Rotating Biological Contactors (RBC)
 - b1. Mechanically Operated
 - b2. Air actuated
 - b3. Submerged
 - c. Activated Bio-Filters (ABF)
2. Understand the principles and practices in the operation of SUSPENDED film processes:
 - a. Packaged Plants and Oxidation Ditches
 - b. Conventional Activated Sludge Process
 - c. Modifications to the A/S Process
 - d. Lagoons and Ponds
 - d1. Facultative Lagoons
 - d2. Anaerobic Ponds
3. Understand biological volume reduction of sludges and the solids handling process.
 - a. Aerobic and Anaerobic Sludge Treatment

- b. Solids/Sludge Processing Equipment
- 4. Understand the problem solving methods that allow for resolution of:
 - a. Pounds Formula, Mass Flux of Material
 - b. Sludge Ages, SATSS, SABOD
 - c. Mean Cell Residence Time, MCRT
 - d. Food to Micro-organism Ratio, F/M
 - e. Recirculation Ratio, Rr
 - f. Hydraulic Loading / Overflow Rate, HLR, HOR
 - g. Organic Loading Rate, OLR
 - h. Surface Loading / Overflow Rate, SLR, SOR
 - i. Weir Loading / Overflow Rate, WLR, WOR.

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

- | | |
|--------------------------------------|----|
| 1. Increased energy efficiency | No |
| 2. Produce renewable energy | No |
| 3. Prevent environmental degradation | No |
| 4. Clean up natural environment | No |
| 5. Supports green services | No |

Percent of course: 0%

First term to be offered:

Next available term after approval

:
