

# Clackamas Community College

## Online Course/Outline Submission System

Show changes since last approval in red

WET-109 Backflow Assembly Operation and Testing

General education certified:  Yes  No

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

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

### Section #1 General Course Information

**Department:** Engineering Science

**Submitter**

First Name: **Matt**

Last Name: **Laforce**

Phone: **3813**

Email: **laforce**

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**Course Prefix and Number:** WET - 109

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**# Credits:** 3

**Contact hours**

Lecture (# of hours): **22**

Lec/lab (# of hours):

Lab (# of hours): **33**

Total course hours: 55

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:** Backflow Assembly Operation and Testing

**Course Description:**

Lecture course with lab component that focused on backflow assembly hydraulics, operations, installation, and testing.

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**Type of Course:** Career Technical Preparatory

Is this class challengeable?

No

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):** AAS Water & Environmental Technology and 1-Year Water & Environmental Technology Certificate

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?

Summer

Fall

Winter

Spring

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. operate, install, and repair backflow assemblies according to state mandated requirements;
2. demonstrate applied knowledge of basic hydraulics of fluid flow and pressure differentials as applied to backflow assembly operation, function, and test procedures.

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This course does not include assessable General Education outcomes.

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**Major Topic Outline:**

1. Explore basic hydraulic concepts: understanding backpressure and backsiphonage.
2. Explain the Venturi effect and Bernoulli's principle.
3. Assessing health hazards (biological, chemical, acute and chronic toxicity).
4. Explain how public water systems require protection from cross connection hazards.
5. Discuss the specifications of RP assemblies installation, maintenance, and repair.
  - a. Explain hydraulic and mechanical principles of RP assembly operation.
  - b. Explain testing procedures for the RP assembly using a differential pressure gauge.
6. Discuss requirements for backflow device and assembly installation.
  - a. Hydraulic and hydrostatic requirements of the Foundation for Cross Connection Control.
7. Discuss the specifications of Double Check (DCV) assemblies installation, maintenance, and repair.
  - a. Specifications of DCV assemblies.
  - b. Explore hydraulic and mechanical principles of DCV assembly operations.
  - c. Explain testing procedures for the DCV assembly using a differential pressure gauge.
8. Explain the role and function of plumbing code for backflow protection.
9. Discuss the specifications of air gap protection.
  - a. Applications and limitations of air gap protection.
10. Discuss the specifications of atmospheric vacuum breaker (AVB) devices.
  - a. Explore hydraulic and mechanical principles of AVB operation.
  - b. Explain installation and use requirements.
11. Discuss the specifications of pressure vacuum breakers (PVB).
  - a. Explore hydraulic and mechanical principles of PVB operations.
  - b. Explain installation and use requirements.
  - c. Explain testing procedures for the PVB assembly using a differential pressure gauge.
12. State exam and hands on proctoring of all assembly test procedures.

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

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|---------------------------------|----|
| 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

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