

## Course Objectives/Course Outline

### Spokane Community College

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**Course Title: Applied Research in Water / Wastewater Operations**  
**Prefix and Course Number: ENVS 234**

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*Applied Research courses are project based learning experiences - occupational experience with real world responsibilities*

Applied Research performed by Environmental Sciences Department's Center for Applied Technology and Environmental Research (CATER) will enable students to demonstrate their skills by applying them to **real-world tangible projects**.

Applied Research courses emphasize critical thinking skills and understanding the big picture. Outcomes include:

- Problem solving and personal accountability will be required as students define problems, gather applicable information, perform analysis and produce professional reporting.
- Students and instructors will work in collaborative teams on projects with public and private entities.
- Prepare scientific findings for publication within the Center Environmental Research and of a caliber suitable for professional publications and conferences.
- Understand operational practices and record keeping for wastewater treatment facilities and water distribution and collection systems.
- Develop basic working knowledge of the principles of mechanical equipment including design, installation, operation, maintenance, repair, overhaul, and replacement typically used in water and wastewater operations.
- Able to perform basic preventative maintenance inspections and repairs.
- Proficient in utilizing spreadsheet programs to store and track operational data.
- Able to prioritize safe work practices and identify work place hazards.

#### Applied Research in Water / Wastewater Operations - Course Outline

- I. Basics of Performing Applied Research in Environmental Sciences
  - a. Define the Problem
    - i. Research background information pertaining to project(s)
    - ii. Develop a conceptual model of the problem and environmental setting
    - iii. Plan work to be done
  - b. Gather Information
    - i. Gather specific information needed to achieve project work planned
    - ii. Data collection
  - c. Data Analysis / Installation
    - i. Process and analyze data gathered and determine if additional data or information are warranted
    - ii. Installation and/or additional on-site work
  - d. Reporting
    - i. Create professional articles, posters or presentations documenting the work
    - ii. Provide electronic records of the data collected and results of analysis performed.
- II. Applied Research in Water / Wastewater Operations - projects may include:

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- a. Treatment basics and emerging technologies/methodologies
- b. Distribution / collection systems
- c. Storm water conveyance and storage management
- d. SCADA