

Water in the 21st Century: Many Challenges, Many Opportunities

Description and Requirements **The Certificate in Water Reclamation** at the University of Wisconsin-Madison

I. Objectives of the UW-Madison Certificate in Water Reclamation

The Certificate in Water Reclamation is a unique certificate program offered at the University of Wisconsin-Madison. It is designed so that participants and their organizations will expand their capabilities in a three-fold way:

1. **Technologies and Processes.** You'll expand your understanding and ability to evaluate, select, and improve the technologies and processes that are critical to the water reclamation industry. You'll use this knowledge to improve your present and future projects, systems, and facilities.
2. **Blended Knowledge.** Successful water reclamation is a joint effort of many contributors. You'll improve your ability to effectively communicate across multiple disciplines, including engineering, regulations, technology, operations, maintenance, finance, and management.
3. **Preparing for the Future.** Water reclamation is changing. Numerous challenges are emerging, and the needs of water professionals in the coming decades will be significantly different than those of the past. You'll gain insight into the trends that will be shaping the industry, and you'll help your company and colleagues to create the future.

The Certificate in Water Reclamation is built on UW-Madison's nationally recognized continuing education courses in water reclamation, engineering, and management. The instructors are recognized experts from academia, consulting, industry, and public sector agencies. Each course is designed to combine key principles, case studies, problem solving, and interactive discussions. Courses are regularly updated to include the most relevant practices and insights. Each course provides continuing education units recognized nationwide.

II. What's So Special About Water Reclamation?

1. **It Helps People.** Water reclamation involves protecting public health, improving our environment, and recovering essential resources. These are among the most valuable services that can be provided in any society, and they affect hundreds of millions of people every day in the U.S. alone.
2. **It's Multifaceted** – Water reclamation encompasses wastewater treatment, water reuse facilities, sewer collection systems, pumping stations, biosolids management, resource recovery programs, and more.

3. **It Fosters Economic Development** – A city or region that wishes to thrive and grow must be able to provide safe, reliable, dependable water and wastewater services to its residents, businesses, and institutions.
4. **It's Capital Intensive** – Water reclamation is a \$100 billion/year industry in the U.S. alone, including operation, maintenance, energy, new construction, and, increasingly, the upgrading of aging facilities. Wise long-term planning and use of asset management principles are essential.
5. **It's Technology Intensive** – The increasing role of automation, sensor technologies, data acquisition systems, and a wide array of water treatment equipment, is central to the operation and management of water reclamation systems.
6. **It's Decentralized** – There are more than 16,000 individual wastewater treatment and water reclamation utilities in the U.S. alone. Small or large, most are responsible for owning, financing, managing, and operating their own system, either with their own employees or through contracted services.
7. **It's Diverse** – Water reclamation professionals work for many different types of employers, including municipalities, engineering firms, regulators, government agencies, universities, and equipment providers. This field requires a wide range of technical and management disciplines.
8. **It's Facing Many Challenges (and Opportunities)** – Aging infrastructure, regional water shortages, wet weather overflow problems, water quality, growing populations, limited funding; these are just some of the challenges facing water reclamation professionals.
9. **It Needs You!** – If you're interested in water, technology, and improving public health and our environment, consider advancing your career and your company in the 21st Century. Consider the UW-Madison Certificate in Water Reclamation.

III. Who Should Enroll in the Certificate Program?

The Certificate in Water Reclamation is designed for a wide range of water professionals, including engineers, managers, consultants, operations and maintenance professionals, and others. They work in many types organizations, such as:

- Facility owners (utilities, sewerage districts, industries, etc.)
- Consulting and engineering firms
- Federal and state agencies
- Military bases
- Equipment and technology companies
- Contract operating firms
- Other water related organizations or companies

IV. How to Earn the UW-Madison Certificate in Water Reclamation

1. **Start.** Start by enrolling in any individual course shown in the List of Eligible Courses for the Certificate in Water Reclamation.
2. **Complete any five of the eligible courses listed.** Note that:
 - Courses can be completed in any sequence.
 - Courses can be selected to fit your specific interests and schedule.
 - Plan to complete your Certificate requirements within five years or less.
 - Listed courses that were previously completed in 2014 or later can be counted retroactively, with approval of the program director.
 - No additional registration fees are required for the Certificate in Water Reclamation. Participants pay only the regular fees for each course.
 - Any questions on eligible courses? Contact program director Ned Paschke, ned.paschke@wisc.edu.
3. **Prepare a case study paper.** Prepare and submit an acceptable case study paper.
 - Collaborate with the program director to select a topic relevant to water reclamation and applicable to your own individual career and interests.
 - Examples could include:
 - i. A case study of an actual project, system, or facility
 - ii. An examination of a specific process or technology
 - iii. A discussion of a management or technical challenge
 - iv. A current issue or challenge developing in water reclamation
 - v. A combination or variation of the above
 - Purpose – to strengthen your own knowledge, and to share this with others
 - Length - typically 4 to 8 pages (plus any figures or attachments).
 - Audience - aim for a general audience who may not be familiar with this topic.
 - Suggested Outline (or similar):
 - i. Background – Define the topic, summarize its history, and explain why/how this topic is relevant in the field of water reclamation.
 - ii. Your involvement. Explain your involvement with this topic, and summarize the types of work or research that you did.
 - iii. Analysis and Insights. Explain key aspects of this issue and insights that you've gained.
 - iv. Conclusions. Summarize any key findings or recommendations.
 - Submit your paper to the program director for review and approval
4. **Completion.** After satisfactory completion of the five courses and the submitting a satisfactory Case Study Paper to the Program Director, the Certificate in Water Reclamation will be awarded to the Participant.
5. **Questions.** Contact Director Ned Paschke (ned.paschke@wisc.edu) or Associate Gail Geib (gail.geib@wisc.edu).

ELIGIBLE COURSES - CERTIFICATE IN WATER RECLAMATION

Course topics and offerings schedules are periodically adjusted based on industry demand. See epd.wisc.edu/WR2019 for current course offerings and schedules.

Wastewater Treatment Processes and Technologies. epd.wisc.edu/RA01043

Learn the key processes, latest technologies, and current regulations to help you design, manage and improve your current and future wastewater facilities and projects.

The Role of Microorganisms in Wastewater Treatment. epd.wisc.edu/RA01533

This course will help you to understand and manage biological processes and improve your wastewater treatment projects and facilities.

Nutrient Removal Engineering: Phosphorus & Nitrogen in Wastewater Treatment.

epd.wisc.edu/RA01245

Learn the principles and latest technologies to help manage phosphorus and nitrogen nutrients in your own system and projects.

Water Reclamation: Emerging Trends, Challenges and Opportunities. epd.wisc.edu/RA01534

Discussions and workshops led by a team of national experts will help you and your company anticipate and manage the challenges and opportunities that lie ahead in water reclamation.

Sanitary Sewer Engineering and Collection System Management. epd.wisc.edu/RA01050

Learn how to analyze and solve sewer related problems, and how to upgrade, manage, and improve your collection system.

Instrumentation and Control for Water and Wastewater Processes. epd.wisc.edu/RA01428

Learn the important principles, trends, and technologies to improve instrumentation and control systems in your water and wastewater facilities and processes.

Wastewater Pumping Systems and Lift Stations. epd.wisc.edu/RA00240

Learn the latest practices and technologies to help you to design, upgrade, and operate reliable and cost-effective pumping systems, lift stations, and forcemains.

Understanding Water Chemistry for Practical Application. epd.wisc.edu/RA00880

Learn how to apply the principles of water chemistry in surface water, drinking water, wastewater, groundwater and industrial applications in this must-have course.

Essentials of Drinking Water Treatment. epd.wisc.edu/RA01015

Gain a working knowledge of technical principles, water regulations, recent technology developments, and case studies, so you can improve your water treatment facilities, operations, and future projects.

Advanced Asset Management Practices for Water and Wastewater. epd.wisc.edu/RA01294

Learn how to evaluate, prioritize and manage water and wastewater assets wisely, improving the long-term physical and financial health of your system.

Essentials of Hydraulics for Civil and Environmental Professionals. epd.wisc.edu/RA01106

Learn to solve hydraulic problems associated with water supply systems, wastewater facilities, groundwater, wells, stormwater, reservoirs, and pumping facilities.