

**Water Quality Science**
**Associate of Applied Science | 60 credits**

Campus: Vermilion

**First Year**

<b>FALL SEMESTER 2023 – 17 credits</b>	<b>Prerequisites</b>	<b>Credits</b>	<b>Hr Lc/Lb</b>
BIOL 1561 – General Biology of Cells (MnTC Goal 3)	(CLR)	4	(3/2)
CHEM 1200 – Introduction to Chemistry (MnTC Goals 3 & 10)	(MATH 0200)	4	(3/2)
<u>OR</u> CHEM 1521 – General Chemistry 1 (MnTC Goal 3)	(MATH 1220)		
WQAL 1651 – Water Treatment	(CLR, CLW, MATH 0100)	3	
WQAL 1652 – Wastewater Treatment	(CLR, CLW, MATH 0100)	3	
WQAL(WSHD) 1656 – Environmental Compliance	(CLR, CLW, MATH 0100)	3	
<b>SPRING SEMESTER 2024 – 14 credits</b>	<b>Prerequisites</b>	<b>Credits</b>	<b>Hr Lc/Lb</b>
BIOL 1562 – General Biology of Organisms (MnTC Goals 3 & 10)	(BIOL1561)	4	(3/2)
WQAL(WSHD) 1255 – Water Resource Field Visits		2	(0/4)
WQAL 1257 – System Hydraulics	(CLR, CLW, MATH 0200)	3	(2/2)
WQAL(WSHD) 2265 – Water and Wastewater Analysis 1	(CHEM 1200 or CHEM 1521)	5	(2/6)
<b>SUMMER TERM 2024 – 2 credits</b>	<b>Prerequisites</b>	<b>Credits</b>	<b>Hr Lc/Lb</b>
WQAL 2220 – Water Resources Internship	(WQAL 1651, WQAL 1652, WQAL 2265; 2.0 GPA)	2	

**Second Year**

<b>FALL SEMESTER 2024 – 13 credits</b>	<b>Prerequisites</b>	<b>Credits</b>	<b>Hr Lc/Lb</b>
ENGL 1231 – College Composition 1 (MnTC Goal 1)	(CLW)	4	
NRT/WSHD 2258 – Soils and Hydrology	(BIOL 1200 or BIOL 1561)	3	(2/2)
POLS 1320 – State and Local Government (fall) (MnTC Goals 5 & 9)	(CLR)	3	
WQAL 2269 – Water and Wastewater Analysis 2	(WQAL 2265)	3	(1/4)
<b>SPRING SEMESTER 2025 – 14 credits</b>	<b>Prerequisites</b>	<b>Credits</b>	<b>Hr Lc/Lb</b>
BIOL/NRT 2455 – Limnology (MnTC Goal 3?)	(BIOL 1200 or BIOL 1561)	3	(2/2)
MATH 1200 – Liberal Arts Math (MnTC Goal 4)	(MATH 0200)	3	
<u>OR</u> MATH 1220 – College Algebra (MnTC Goal 4)	(MATH 0300)		
NRT 2315 – Introduction to Geographic Information Systems	(NRT 1211 or WQAL 1656)	2	(1/2)
PHIL 1230 – Ethics (MnTC Goals 6 & 9)	(CLR, CLW)	3	
<u>OR</u> SOC 1200 – Introduction to Sociology (MnTC Goals 5 & 7)	(CLR)		
WQAL(WSHD) 2267 – Watershed Management	(WQAL/WSHD1656; NRT2315 or concurrently)	3	(2/2)

**Additional Recommended Courses**

Students planning to transfer should take both CHEM 1521 General Chemistry 1 and CHEM 1522 General Chemistry 2.

**Program Description**

The Water Quality Science program is designed to prepare students for entry-level positions with the potential and skills to advance to supervisory and management positions in water operations, wastewater treatment, environmental laboratory work, equipment maintenance, public health work, and environmental engineering technical work. Upon completion of this degree program, students are eligible to take the Minnesota Class D Water and Wastewater Operators license examination. Completion of the required two-credit Water Resources Internship allows application of the full educational equivalency of two years' experience toward Minnesota Department of Health and Minnesota Pollution Control Agency Class D Operations Licensure. Graduates may also elect to continue their education toward a baccalaureate degree.

**Occupational Titles**

Water quality work opportunities are excellent and are only projected to improve. Everyone needs clean water and the demand for qualified employees is in high demand and projections for the foreseeable future are excellent. Employment opportunities currently exceed supply. Work normally focuses on providing clean water – for public drinking, and solving

pollution issues in cities, industries, and other manufacturing and human activities. Occupational titles include Water Treatment Operator, Wastewater Treatment Operator, Water Consultant, and positions are available in regulatory work, chemical/process manufacturing, education, and research.

### Program Learning Outcomes

Graduates of this program will:

1. Demonstrate the principles and responsibilities of managing water resources
2. Obtain and utilize local, state and federal laws to demonstrate how policy changes affect the environment
3. Ability to work as an individual and in teams to collect information, identify possible alternatives and select the best solution to hydrologic/hydraulic situations
4. Ability to describe important water concepts relating to laboratory analyses, water/wastewater operations, hydraulic principles, watersheds, and environmental law and policy
5. Ability to apply technology and fundamental principles of water resource technology through research reports, laboratory procedures, and field applications
6. Ability to use the scientific method: hypothesize, test, evaluate and select an appropriate solution through theory and practical applications.

### Transfer and Articulation Agreements

An Articulation Agreement with University of Minnesota – Crookston is in the renewal process, and an Articulation Agreement with Bemidji State University is in progress. Also, a specific Transfer Guide has been created by the University of Wisconsin–Stevens Point to facilitate transfer of this Vermilion degree to one of several related programs there.

### Program Faculty Contact

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