University of Wisconsin-Green Bay

Academic Program Learning Outcomes and Curriculum Map

Water Science

Section

1

Academic Program

Student Learning Outcomes

1. Students will demonstrate knowledge of the role water plays in the lithosphere, hydrosphere, cryosphere, atmosphere, and biosphere, with emphasis on interactions between these reservoirs.

2. Students will apply the scientific method to investigations of hydrologic processes, Earth systems, and interactions among the various physical and biological realms utilizing standard scientific field and laboratory methods.

3. Students will demonstrate an understanding of the hydrology of streams and lake systems and the role water has in landscape‑forming processes that act on the Earth's surface.

4. Students will demonstrate an understanding of the processes of and importance of groundwater flow and aquifer systems.

5. Students will demonstrate an understanding of chemical interactions that occur in various hydrologic settings and their importance to water resources, geologic and biological systems, and water/wastewater treatment.

6. Students will demonstrate an understanding of the role water plays in atmospheric systems and the climate system.

7. Students will demonstrate an understanding of the interactions between water systems and ecosystems.

8. Students will demonstrate an understanding of the challenge of maintaining surface and ground water quality.

9. Students will apply their knowledge base and research skills to current issues pertaining to water resources, management, and remediation, with emphasis on related economic, social, and public policy dimensions.

10. Students will analyze, interpret, and report on laboratory and field findings using appropriate statistical techniques and computer applications.

Section

2

Academic Program

Curriculum Map

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| *Water Science Program Curriculum Map* | | | | | | | | | | |
| **Program Level**  **Student**  **Learning Outcomes** | **PLO1**  Role water plays in various reservoirs | **PLO2**  Field and Lab application of scientific method to physical/bio | **PLO3**  Hydrology of streams and lakes and landscape processes | **PLO4**  Groundwater flow and aquifer systems | **PLO5**  Chemical interactions in water resources, geo & bio systems, climate | **PLO6**  The role water plays in atmospheric and climate systems | **PLO7**  Interaction between water systems and ecosystems | **PLO8**  Challenges maintaining surface and groundwater quality | **PLO9**  Apply skills to current issues of water resources, management, remediation on economic, social, and policy | **PLO10**  Analyze, interpret, report field and lab results using statistical and computer applications |
| Program Course 1  **Intro to Water Sci** | B |  | B | B | B | B | B | B | B |  |
| Program Course 2  **Principles of Biol.** | B |  |  |  |  |  | B |  |  | B |
| Program Course 3  **Physical Geology** | B | B | B | B | B | B |  | B | B | B |
| Program Course 4  **Ocean of Air** | D |  |  |  |  | D |  |  |  |  |
| Program Course 5  **Hydrology** | P |  | P | B | B | B |  | B |  |  |
| Program Course 6  **Water/Wastewater Treatment** | B | B |  |  | P |  | B | P |  |  |
| Program Course 7  **Environmental Systems** | D | D | D | D | P | B | D | D | D | D |
| Program Course 8  **Hydrogeology** | P | P | P | P | P |  |  | D | D | P |
| Program Course 9  **Stream Ecology** | P | P | D |  | D |  | P | B |  | P |
| Program Course 10  **Limnology** | P | P | D |  | P |  | P | B |  | P |
| Program Course 11  **Groundwater: Resources & Regs.** | D |  |  | D | P |  |  | P | P |  |
| Program Course 12  **Water Res. Policy & Management** | B |  |  | B |  |  |  | P | P |  |
| Program Course 13  **Environmental GIS** |  |  |  |  |  |  |  |  |  | P |
| Program Course 14  **Geochem. of Natural Waters** | D | D | D | B | P |  |  |  |  |  |
| Program Course 15  **Stable Isotopes** | D | P | D |  | B |  | D |  |  |  |
| Program Course 16  **Environ. Microbio.** |  | D |  |  | D |  | P | B |  | D |
| Program Course 17  **Nat. Res. Econom.** | B |  |  |  |  |  |  |  | D |  |
| Program Course 18  **Pollution Prevention** |  |  |  |  |  |  |  | P | D |  |
| Program Course 19  **Regional Climatol.** | D |  |  |  |  | P |  |  |  |  |
| Program Course 20  **Ichthyology** | B | D |  |  |  |  | D |  |  | D |
| *Legend: Program course supports achievement of a PLO at (B)-Beginner, (D)-Developing, or (P)-Proficient level.* | | | | | | | | |  |  |