

GPHY 203- Water Resources and Management

Course Instructor	Dr. Melissa Lafreniere	Email: Melissa.lafreniere@queensu.ca
Office	D124 Macintosh-Corry Hall	
Contact Time	Three 1-hour lectures per week	Phone: 533-6000 ext 78720
Format	Lectures and assignments	
Class Assessment	Quizzes	40%
	Assignments	30%
	Final Exam	30%

COURSE OVERVIEW

Water is becoming ever more scarce due resources are coming under increasing pressure due to increasing rising levels of demand and pollution pressures. This course examines dimensions of the world's need for this critical resource. Topics include water distribution and availability, water quality, different water uses and demands, water treatment, and approaches to water management and allocation.

LEARNING OUTCOMES

- Identify and explain the processes that determine the global distribution of water, and the principle sources of freshwater that are used to meet human demands.
- Formulate water budgets and perform calculations to quantify the inputs of water, water storage, and demands for water use.
- Explain what is meant by water scarcity and water quality from human and ecological perspectives.
- Identify the different demands for freshwater resources and discuss the pollution that can result from these uses (drinking water, agricultural, urban, energy demands, fisheries, and industrial uses).
- Explain the principles of drinking water supply and treatment systems.
- Identify and discuss the ecological and economic benefits and impacts of different water resource developments (e.g. dams, reservoirs, and large scale diversion or distribution systems).

COURSE TOPICS

- 1) History of water development and global distribution of water resources
- 2) The hydrological cycle and basic hydrologic principles
- 3) Surface and ground water resources
- 4) Water quality
- 5) Drinking water standards and provision
- 6) Waste water treatment
- 7) Irrigation and municipal water resource development
- 8) Dams and navigation
- 9) In stream ecological Issues and cumulative effects
- 10) Economics of water and competing uses
- 11) Water issues in the developed world: diversions, exports, cross border issues, climate change
- 12) Water issues in the developing world: water quality, water for food, infrastructure for growing populations

COURSE READINGS

Cech, T. V. 2010 Principles of Water Resources: history, development, management and policy, 3rd Ed. John Wiley & Sons, Inc.
[E-book or print copy is available]