

## BIOL 346 Freshwater Ecosystems: September-December 2016

Course Schedule: Mondays and Thursdays 11:30 – 12:50 AM; Room COR A125

Instructor: Asit Mazumder, Office: 028a Cunningham, Email: mazumder@uvic.ca

### Course Summary:

This course will provide the basic understanding of the geological, physical, chemical, and biological processes that form and maintain freshwater ecosystems. Both theoretical and applied aspects of freshwater ecology will be covered, and the studies and experiments that have been used to test important theories and applications will be discussed. This course will also cover anthropogenic and environmental threats to and impacts on freshwater ecosystems.

### Course Outline and Schedule:

Sept 7, 2017	Describe course outline, marking scheme, introduction to the course, distribution of course materials
Sept 11, 2017	Lecture-1 Parts 1-3: Inland waters and their catchments; Development of Limnology: Freshwater as a unique and important substance
Sept 14, 2017	Lecture-2 Parts 4-6: Hydrology and Climate; Origin and Age of Lakes.
Sept 18, 2017	Lecture 3 Parts 7-9: Lakes and Catchment Morphometry; Rivers and Export of Materials from drainage basins and the atmosphere; Aquatic Systems and their catchments.
Sept 21, 2017	Lecture-4 Part 10: Light in Freshwater Ecosystems; Part 11: Temperature Cycles, Lake Stratification, and Heat Budget.
Sept 25, 2017	Lecture -5 Part 12: Water movements in lakes and reservoirs; Part 13: Salinity and Ionic compositions in freshwater ecosystems
Sept 28, 2017	Lecture-6 Part 14: Variability of inorganic carbon and pH in freshwater ecosystems and their implications. Parts 15-16: Variability in dissolved oxygen concentrations and their implications for organisms in freshwater ecosystems
Oct 02, 2017	Lecture-7 Parts 17-18: Nutrients (P and N) in freshwater ecosystems: loading and cycling and their implications
<b>Oct 05, 2017</b>	<b>Mid-term exam</b>
<b>Oct 10, 2017</b>	<b>Thanks Giving</b>
Oct 12, 2017	Lecture-8 Parts 19-20: Trace metals in freshwater ecosystems and their implications for ecosystem and human health; Sedimentations of materials in lake ecosystems.
Oct 16, 2017	Lecture-9 Part 21: Phytoplankton in lake ecosystems: their composition, size-distribution, seasonality, sedimentation, and implications for the health of lake ecosystems
Oct 19, 2017	Lecture-10 Part 22: Bacteria: their role and importance in FW ecosystems
Oct 23, 2017	Lecture-11 Part 23: Zooplankton: their composition and variability in FW ecosystems and their implications for the structure and function of lake ecosystems
Oct 26, 2017	Lecture-12: Parts 24-25: Benthic plants and zoobenthos in Lake ecosystems: their importance in wetlands, their distribution, composition and implications for ecosystem health, eutrophication and health of ecosystems
Oct 30, 2017	Lecture 13 Part 26: Fish and water birds in freshwater ecosystem.
Nov 2, 2017	Lecture 14 Part 27: Acid rain and acidification of lake ecosystems
Nov 6, 2017	Lecture-15 Part 28: Contaminants in freshwater ecosystems: implications for ecosystem and human health

Nov 9, 2017	Lecture-16 Part 29: Reservoir formation for drinking water and hydroelectric production: their implications for reservoir and downstream ecosystems
<b>Nov 13, 2017</b>	<b>Reading Break</b>
Nov 16, 2017	Lecture-17 Moss: Chapter 8 - Uses, abuses and restoration of headwater streams and rivers
Nov 20, 2017	Lecture 18 Moss: Chapter 15 - Uses, abuses and restoration of standing water
Nov 23, 2017	Lecture 19 Moss: Chapter 16 – Climate Change and the future of freshwaters
Nov 27, 2017	Lecture 20 Integration of physical, chemical and biological processes (not from the text book)
Nov 30, 2017	Lecture 21 Sustainable clean and healthy freshwater ecosystems (not from text books)

### **Course evaluation and distribution of marks:**

A) Mid-term exam (October 5th, 2017; will cover lecture materials, assigned reading materials if any covered during the 1<sup>st</sup> 7 lectures) – Mid-term exam will emphasize on the understanding of concepts, theories and definitions as well as factual information. **Total marks: 40%**

B) Final exam (To be scheduled by UVic; will cover lecture materials, assigned reading materials, oral presentations by guest lecturers (if any) during the 2<sup>nd</sup> half of the course) – Final Exam will emphasize on the understanding of concepts, theories and definitions as well as factual information. **Total marks: 60%**