



School of Construction & the Environment
Program: Bachelor of Technology in Ecological Restoration

Course Number: RENR 8106
Course Name: Wetland and estuary restoration

Prerequisites:

Diploma or Degree in Natural Resource Management or Science

Course is a prerequisite for:

Hours/Week:	3	Lecture:	3	Lab:		Total Hours:	45	Level:	Degree
						Total Weeks:	15	Credits:	3

Course Description:

This course covers the fundamentals of wetland and estuary form, function, classification and restoration in Canada. The wetland section of the course covers wetland classification, examines mechanisms of wetland loss and the importance of wetlands in storing carbon, and the physical, chemical and biological mechanisms by which constructed wetlands remove pollutants from urban storm water. The steps for building groundwater wetlands, surface water wetlands, wetlands with liners and floating wetland will be examined, in addition to the steps for building and maintaining constructed wetlands. The estuary section of the course covers estuary classification, reviews the high ecological importance of estuaries and reviews the physical, chemical and biological nature of estuaries. Procedures for restoring estuaries is covered, including dealing with invasive species, legacy contaminants and non-migratory Canada geese. The course will focus on re-establishing the carbon flux and storage in in the estuaries through re-planting of sub tidal eelgrass, emergent sedges and strategic placement of large woody debris.

Students will participate in a weekend field trip to design a wetland for construction the following year, construct a wetland, or monitor the performance of a recently constructed wetland.

Course Learning Outcomes

At the end of this course the student will be able to:

- Recognize the wetland regions in Canada, and Ramsar sites
- Understand the Canadian classification of wetland system, appreciate wetland loss, and the rationale behind wetland restoration

- Know the history of wetland drainage, soil taxonomy and texture, water chemistry and pollutant removal mechanisms
- Understand carbon storage and wetlands, and the details of carbon sequestration mechanisms and emerging markets
- Learn about the three main types of wetlands: restored, created and constructed, understand how to find places to build wetlands, and how to build a surface water wetland
- Learn how to build groundwater wetlands, wetlands with liners, and floating wetlands
- Know how to build a constructed wetland, and understand the mechanisms of pollutant removal
- Know the types of estuaries on the Pacific Coast of North America
- Understand the ecological importance of estuaries, and review causes of estuary losses
- Understand estuarine chemistry, physics, stratification and circulation
- Review of estuarine biota, carbon storage, eelgrass and sedge ecology, Canada geese management
- Appreciate the problems with restoring urban estuaries – heavy metals, oils, contaminated soils, urban drainage issues
- Understand the basics of estuary restoration techniques – physical, and large wood
- Understand the basic of estuary restoration techniques – biological aquatic and terrestrial

Evaluation

Weekly quizzes	25%	Comments: The student must achieve a minimum 50% passing grade on the final exam to pass in order to pass this course.
Midterm	35%	
Final Exam	40%	
Total	<u>100%</u>	

Text(s) and Equipment:

Required: *Student Resource Manual (provided)*

Wetland Restoration and Construction – A Technical Guide. 2011. T. R. Biebighauser.

Recommended: *Tidal Marsh Restoration - A Synthesis of Science and Management* (2012). Edited by Charles T. Roman and D.M Burdick. Society for Ecological Restoration. Island Press, Washington.

Course Record:

Developed by:	<u>Dr. K.I. Ashley</u>	Date:	<u>November 25, 2012</u>
	<u>Authoring Instructor</u>		