

## GEOGRAPHY AND PLANNING

## GPHY 310 – Landscape Ecology



<b>Course Instructor</b>	<b>Dr. Ryan Danby</b>	<b>Email:</b> ryan.danby@queensu.ca
<b>Office</b>	MCD131 & Biosci 3244	
<b>Contact Time</b>	Lectures: Tue 12:30 & Thu 11:30 in Kingston Hall 208 Labs: Wed 8:30-10:30 or Fri 11:30-13:30 in Mac-Corry E223	
<b>Format</b>	2 x 1hr lectures each week; 1 x 2hr lab each week	
<b>Class Assessment</b>	40% assessment based on lecture quizzes and reading summaries; 40% based on lab assignments and reports; 20% based on take-home final exam	

**COURSE OVERVIEW**

Landscape ecology is an interdisciplinary field that combines aspects of geography and ecology. Ecosystems are patterned on the Earth's surface by a variety of interacting physical, biological and human processes. The arrangement and dynamics of these ecosystems influence a broad array of ecological processes, such as the dispersal and persistence of plants and animals; the spread and impact of natural disturbances; and the flow of water, energy and nutrients. The focus of landscape ecology is on understanding the interactions between these patterns and processes, particularly at large spatial scales.

**LEARNING OUTCOMES**

Students will explore the methods, theories, approaches and practical applications of landscape ecology as a framework for understanding the dynamics of landscapes. This will be achieved through a combination of weekly lectures, group discussions pertaining to assigned readings, and interactive learning sessions in the GIS computer lab using maps and spatial data.

**COURSE TOPICS**

**1. Foundations of Landscape Ecology** (i) History and scope of landscape ecology; (ii) The important concept of scale; (iii) Measuring landscape pattern.

**2. Agents of Landscape Pattern:** (i) Physical environment (climate, soils, topography); (ii) Biotic processes (competition, facilitation, herbivory, predation); (iii) Natural disturbances (forest fires, floods, insects, etc.); (iv) Human influences (land use and development).

**3. Influences of Landscape Pattern:** (i) Wildlife metapopulations and their dynamics; (ii) Communities and biodiversity; (iii) Ecosystem processes.

**4. Applications of Landscape Ecology** (i) Parks and protected areas; (ii) Networks and connectivity conservation.

**COURSE READINGS****Textbook:**

Turner M & Gardner R. 2016. Landscape Ecology in Theory and Practice. 2<sup>nd</sup> Edition. Springer, New York.

**Primary Literature:**

A selection of readings from the primary scientific literature (all available through the library) will accompany readings from the textbook in some weeks.