

## New Course: BIOL 423 Plant Stress Ecophysiology

### Are you wondering...

- how plants can survive (and sometimes even thrive) in harsh environments such as the arctic tundra, alpine scree slopes, rushing creek bottoms, coastal surf zones, sand dunes, marshes, highly disturbed roadsides, or mining debris sites?
- which factors are limiting plant production in fields and forests?
- how crop performance and ecosystem composition will change due to stresses imposed by greenhouse-gas induced climate changes?
- how much biodiesel we can (should) produce in Canada in the future?



These are examples for questions many of you might ask yourself. In this course we will study ecophysiology and read recent research articles to see which answers plant scientists can currently provide for them.



### Course summary

In this course we will study how plants are adapted to extreme environments, why only certain plant species have these adaptations, and how they are performing in their habitat. In other words, our goal will be to integrate the historically separated fields of physiology and ecology that tend to deal with processes either at the molecular to whole-plant or community levels. This new course will explore recent research progress answering important questions on functional trade-offs between physiological and ecological adaptations.

### Course details

**Prerequisites:** BIOL 351 or equivalent courses. BIOL 406 and/or BIOL 467 are recommended.

**Times:** MWF 12-1 in SCARF 1020

**Start:** Term 2 starting January 5<sup>th</sup>

**Credits:** 3

**Style:** mix of lectures, student presentations, group work for problem-based learning

**Evaluation:** final and mid-term exams, class participation, assignment in form of a mini-review paper

**Instructor:** Dr. Reinhard Jetter

**Contact:** jetter@interchange.ubc.ca



## Emphasis & audience

This course is designed for 4th year undergraduate students with background in plant physiology, and some fundamental knowledge in biochemistry and/or ecology. It is also designed for graduate students working on projects in one of the above areas. The course is broadly targeted, so as to be appropriate for students not just in the one obvious specialty of plant physiology, but also for students wishing to integrate their interests in ecology and/or biochemistry with physiological aspects. Students in forestry/agricultural sciences/horticulture will certainly also see this as an area of application; exceptions to the prerequisites for those students could be made on a case-by-case basis.



## Topics

Nutrient stress (Salt, Heavy metals, Mineral nutrient deprivation, Nitrogen/Phosphorus, Carnivory)

Light and atmospheric pollutant stress (Excessive PAR, UV, Shading, Air pollutants)

Water stress (Drought, Flooding)

Competition combined with nutrient/light/water stress

Pathogens combined with nutrient/light/water stress

Herbivory combined with nutrient/light/water stress

## Learning outcomes

By the end of the course, students will be able to:

1. formulate how extreme conditions affect plant performance;
2. explain mechanisms employed by plants to cope with adverse conditions;
3. integrate how these mechanisms can interfere or synergistically enhance each other.

