Course Coordinator | Dr. Warren Mabee | Email: warren.mabee@queensu.ca
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Office | D201 Mackintosh-Corry Hall | Phone: 533-6000 xtn 77092
Contact Time | Two 1.5 hour lectures per week | Week 4
Format | Lectures and discussions in the classroom setting | Week 8
Class assessment | Writing assignment - poster topic | 10% | Week 4
 | Mid-term examination | 25% | Week 8
 | Group poster assignment | 30% | Week 11
 | Final exam | 35% | End-of-term exam period

COURSE OVERVIEW

This course focuses on developing new renewable energy options using the biomass supplies found across Canada. Students will review bioenergy options and their integration in traditional agricultural and forestry systems. The technologies available for bioenergy production are explored, as are the typical feedstocks and outputs associated with each. As a case study, we will consider the region of southeastern Ontario. Bioenergy developments that currently exist within the region will be examined, and future development will be explored using international examples of emerging bioenergy systems. Value-added options for biorefining, including the combination of material, chemical, and energy products with environmental services such as phytoremediation and carbon sequestration, are discussed. This course highlights the potential that bioenergy has for a country like Canada, and includes a short discussion of policy tools that might be used to support this emerging sector.

LEARNING OUTCOMES

- To provide an in-depth understanding of the current technologies available for bioenergy production, and the current level of bioenergy use around the world associated with each technology
- To explore in depth the potential for Canada's forests and farms to support bioenergy production, with a special focus on the eastern Ontario case study, as well as an understanding of how bioenergy fits within total energy production
- To understand the potential for new technologies to deliver new, value-added products in a biorefining application and what that means for employment and the environment
- To understand the potential and appropriate uses of policy in supporting a new resource-based sector in Canada

COURSE TOPICS

Introduction to bioenergy issues; traditional and modern agriculture; traditional and emerging forest harvest systems; Canada's energy sector - fossil fuels and renewables, electricity and transport; energy crops - perennials and trees for biomass production; an introduction to the bioeconomy; bioenergy systems - heat, power, and fuel production; environmental services including phytoremediation and carbon sequestration; policy incentives and programs to support the bioeconomy.

SELECTED COURSE TEXTS & READINGS