



Advanced Biofuels Course – List of lectures and their duration

As of 10.10.2017

Semester Mandatory Lectures

0. **About the Advanced Biofuels Course**, Donald Smith, McGill University. 00:03:14
 - 0.1. About the course
 - 0.2. About BFN

1. **Overview of biofuels**, Donald Smith, McGill University. 00:41:59
 - 1.1. What are biofuels?
 - 1.2. Why biofuels?
 - 1.3. Biofuels worldwide
 - 1.4. How is biomass converted to fuel?
 - 1.5. Sustainability

2. **Introduction to feedstocks**, Donald Smith, McGill University. 00:35:42
 - 2.1. Basics of plant life
 - 2.2. Energy crops for lignocellulosic biofuels
 - 2.3. Oil crops
 - 2.4. Agricultural Waste, Forestry Waste and Municipal Solid Waste
 - 2.5. Current and future opportunities

3. **Forestry and woody residues**, Évelyne Thiffault, Université Laval. 01:03:12
 - 3.1. Background
 - 3.2. Forest biomass: definition
 - 3.3. Forest biomass potentials
 - 3.4. Forest biofuels and carboneutrality
 - 3.5. Forest biofuels as part of the forest sector

4. **Energy crops**, Kevin Vessey, Saint-Mary's University 00:55:40
 - 4.1. Bioenergy feedstock categories
 - 4.2. Conversion technologies for each feedstock category
 - 4.3. Strategies for building better energy crop feedstocks
 - 4.4. Challenges in improving energy crop feedstocks (Plants and processes / Perceptions)
 - 4.5. Summary

5. **1st & 2nd generation biofuels and beyond**, Garret Munch, University of Western Ontario. 00:41:16
 - 5.1. Introduction to fuels
 - 5.2. Biodiesel
 - 5.3. Bioethanol
 - 5.4. 2nd generation bioethanol
 - 5.5. Looking forward
 - 5.6. Beyond ethanol

6. **Introduction to Utilization, Combustion and Emissions**, Jeff Bergthorson, McGill University. 00:51:59
 - 6.1. Types of engines
 - 6.2. Pollutant emissions linked with conventional fuels
 - 6.3. Pollutant emissions improvement when using biofuels
 - 6.4. Biojet emissions
 - 6.5. Conclusions

7. **Biomass and Bioproducts Quality**, Sean McKay, Biomass Quality Network. 00:52:28
 - 7.1. The bioproducts industry
 - 7.2. Biochemicals
 - 7.3. Bioenergy
 - 7.4. Biofuels
 - 7.5. Biomaterials

8. **Understanding Intellectual Property and its role in industry**, Jeremy Lawson, ROBIC. 00:46:43
 - 8.1. What is IP?
 - 8.2. What are the different forms of IP?
 - 8.3. Patent basics
 - 8.4. Biofuel patent activities
 - 8.5. Role of IP in biofuel industry

9. **Life Cycle Assessment and Sustainability**, Warren Mabee, Queen's University. 00:39:49
 - 9.1. Sustainable fuels
 - 9.2. Developing bio-based options
 - 9.3. Life cycle assessment
 - 9.4. Critical issues with life cycle assessment and biofuels
 - 9.5. Shifting to "broad" sustainability
 - 9.6. What do life cycle assessments measure?
 - 9.7. Final thoughts

10. **Policy Instruments for Advanced Biofuels Development**, Julia Bognar, University of Toronto. 01:09:23
 - 10.1. Policy objectives
 - 10.2. Types of policy instruments
 - 10.3. Policy instruments in practice
 - 10.4. Sustainability
 - 10.5. Policy uncertainty and the future of biofuels policies

Semester Optional Lectures

11. **Biomass pyrolysis into bio-oil, bio-char and gases. Products uses and upgrading**, Franco Berruti, University of Western Ontario. 01:34:45
 - 11.1. Introduction: what is pyrolysis?
 - 11.2. Pyrolysis products and their characteristics
 - 11.3. Feedstocks
 - 11.4. Process requirements
 - 11.5. Pyrolysis technologies
 - 11.6. Uses of bio-oil and bio-char
 - 11.7. Upgrading to value-added bio-fuels
 - 11.8. Pyrolysis for high value chemical products

12. **Biodiesel usage and solutions for environmental protection**, Patrick Smyth, DieselPure. 00:21:55
 - 12.1. Introduction to corrosion issues
 - 12.2. How Corrosion Affects the Diesel Infrastructure
 - 12.3. Corrosion findings from the experts
 - 12.4. Addressing emulsified water problems

13. **Case study: The early stages of technology commercialization, applied to Biomass Combustion for Greenhouse Carbon Dioxide Enrichment**, Mark Lefsrud, McGill University. 00:40:22
 - 13.1. Introduction
 - 13.2. Overview
 - 13.3. Goal
 - 13.4. Technology
 - 13.5. Funding

14. **Case study: Community-scale resource recovery and the biorefining approach**, Simon Barnabé, Université du Québec à Trois-Rivières. 00:51:12
 - 14.1. Biorefining facts and principles
 - 14.2. Biorefining approaches
 - 14.3. Social, Economic, Environment and Sustainability aspects of a community-scale biorefining approach
 - 14.4. Regional biorefining case studies (Agrosphere, La Tuque, Bécancour Bioindustrial park, Microalgae production)
 - 14.5. Conclusions

15. **BioCleanTech Opportunities in Canada**, Jamie Stephen, TorchLight Bio. 01:00:47
 - 15.1. BioCleanTech Opportunities in Canada
 - 15.2. Addressing Canada's Greenhouse Gas Emissions with BioCleantech
 - 15.3. BioCleantech Utilization in Existing Energy and Industrial Infrastructure
 - 15.4. Economics and Social Impacts of BioCleantech
 - 15.5. How can BioCleantech be used to Reduce GHG Emissions in Canada?
 - 15.6. Concluding thoughts



16. **Selling yourself – the ABCs of prospecting**, Jesse Vincent-Herscovici, Mitacs. 00:35:25
 - 16.1. Context
 - 16.2. ABCs of prospecting
 - 16.3. The hunt
 - 16.4. Relationship building

17. **Feedstock and resource pricing**, Maryline Vuillerod, Independent Consultant. 00:43:51
 - 17.1. Introduction to commodities pricing
 - 17.2. A look at conventional fuels price information
 - 17.3. Biofuels pricing, what is available
 - 17.4. Recap on Biofuels market dynamics
 - 17.5. Conclusions & success stories