UNIVERSITY OF TORONTO MISSISSAUGA

Master of Science in Sustainability Management

COURSE SSM2030H – Advanced Sustainability Management
2020-21

Instructor/Coordinator:
Prof. Shashi Kant
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Class Time: Monday 5.30PM to 8.30PM
Class Room: MScSM Class Room

Teaching Assistant:
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Course Description

The course is designed to provide knowledge and applications of advanced aspects/tools related to sustainability management. The course covers advanced aspects focused on carbon (GHG) measurement and accounting; life cycle assessments; and water efficiency and conservation in different sectors. Accordingly, the course is divided in three modules. In each module, the emphasis will be on application of advanced aspects/tools to sustainability management.

This course will equip students with the industry knowledge and essential skills to manage the risks and opportunities of transitioning an organization to the low carbon economy and prepare them for a sustainable future. The module I of the course will introduce the concept of GHG emissions sources, sinks, and reservoirs as well as how organizations are setting emission reduction targets and baselines to meet stakeholder expectations. The module II of the course will address the specifications of the assessment of the life cycle GHG emissions of goods and services and life cycle impact assessment. The module III of the course will provide a holistic approach to water footprint as well as inform students about the water use regulations in large buildings in Canada.

Instructional Approach:

This course is taught through the lectures, class-room discussions, case discussions, group discussions and presentations and guest lectures by experts. In many classes, a case will be presented and discussed. Students are required to read the required readings prior to coming to the class. In addition, short exercises will be done during class hours on relevant topics of the week.

Course Classification:

Science course

Academic Misconduct:

Students should note that copying, plagiarizing, or other forms of academic misconduct **will not be tolerated**. Any student caught engaging in such activities will be subject to academic discipline ranging from a mark of zero on the assignment, test or examination to dismissal from the university. Any student abetting or otherwise assisting in such misconduct will also be subject to academic penalties.

Normally, students will be required to submit their written assignments/projects to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site

Course Drop Deadline:

Please consult with the Program Coordinator and the Program Director if some unavoidable situation arises and you have to drop a required course of the program

Grading:

Learning in this course results primarily from in-class discussions and presentations as well as completion of a project. Final grade will be calculated as follows:

Components of Evaluation and their Weights

Component	Dates	Weight (%)
1. Module I – Carbon/GHG	January 4, 11, 18, & 25 2021	33.3
1. Module II – Life Cycle assessment	February 1, 8, 22, & March 1 2021	33.3
2. Module III – Water Efficiency and Impact	March 8, 15 22, & 29 2021	33.3
Total		**100**

Module's Evaluation: The course is divided in three modules and each module is taught by an instructor. Your participation in the class discussions, case study analysis and discussions, and understanding of the concepts taught in every module will be evaluated by the respected instructors. Hence, your presence in every class is critical for your success in this course; absence in any class may lead to zero marks for that class.

In addition, MScSM being a professional program, you should follow professional norms in all classes. The professional norms include be in time, finish your work on time, contribute to group work, present in the class when others are presenting, use of computer only for academic purpose, no whispering in the class, no use of cell phones and any other electronic device in the class, and many other norms. Please refer to the MScSM Handbook for other details of professionalism.

Any violation of professional norms in any class will result in deduction of marks for that class and module. The instructor may ask every student to submit his/her own professional norms report at the end of the class.

In every class, you should bring and display your name card; it is critical for your evaluation.

Course Schedule:

Module I: Carbon/GHG Measurement, Accounting, and Auditing
Guest Instructor - Ian Lipton, President, The Carbon Accounting Company

Evaluation Components:

Participation and attendance = 20% of final grade (a total of 10 possible points)

- Engagement during discussion of reading assignments in the first 10 minutes of each class, and engagement during the rest of the lecture in the form of raised-hand questions (1 point for each engagement out of 6 possible points)
- Attendance (1 point for each class attended out of 4 possible points)

Group Assignment = 80% of final grade (a total of 40 possible points)

January 4, 2021

- The Big Picture: Climate Crisis and what needs to happen
- What is carbon accounting and how does it fit in the Big Picture
- Contexts for national and subnational greenhouse gas inventories
- Contexts for corporate carbon inventories

Readings:

- Prof. Jem Bendell, Deep Adaptation: A Map for Navigating Climate Tragedy, IFLAS Occasional Paper 2, July 27, 2018, https://www.lifeworth.com/deepadaptation.pdf

January 11, 2021

- Frameworks, standards and protocols
- Greenhouse gas accounting and reporting principles
- Examples of carbon inventories
- Setting organizational boundaries
- Setting operational boundaries
- Tacking emissions over time
- Identifying and calculating emissions (part 1)

Readings:

- World Resources Institute and World Business Council for Sustainable Development, The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition, www.ghgprotocol.org/standards/corporate-standard Introduction and chapters 1 - 6.

January 18, 2021

- Identifying and calculating emissions (part 2)

- Emission sinks and reservoirs
- Transacting environmental attributes

Readings:

- World Resources Institute and World Business Council for Sustainable Development, The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition, www.ghgprotocol.org/standards/corporate-standard Chapters 7 - 11.

January 25, 2021

Case study: In small groups students will conduct a mock greenhouse gas inventory applying the principles and information discussed in the first three classes of this module. Case studies will be provided in class along with the relevant emissions factors.

Readings:

- Review your notes and the posted lecture notes in preparation for the in-class group assignment.

Module II: Life Cycle Assessments
Guest Instructor - Ian Lipton, President, The Carbon Accounting Company

Evaluation Components:

Participation and attendance = 20% of final grade (a total of 10 possible points)

- Engagement during discussion of reading assignments in the first 10 minutes of each class, and engagement during the rest of the lecture in the form of raised-hand questions (1 point for each engagement out of 6 possible points)
- Attendance (1 point for each class attended out of 4 possible points)

Group Assignment = 80% of final grade (a total of 40 possible points)

February 1, 2021

- Context of Life Cycle Assessment (LCA)
- Purpose of LCA
- Standards and protocols
- Some real-world examples of LCAs

Readings:

- British Standards Institute, Life Cycle Assessment Standard **PAS 2050:2011** *Specification for the Assessment of the Life Cycle Greenhouse Gas Emissions of Goods and Services*. Download your free copy here: https://shop.bsigroup.com/en/forms/PASs/PAS-2050/ Introduction and pages 1-12.

February 8, 2021

- Functional units
- Product system boundaries
- Boundary setting
- Process flow diagrams
- Energy, materials, and waste
- Sources of data
- LCA process under the PAS 2050 standard

Readings:

- **PAS 2050:2011,** pages 13-25.

February 22, 2021

- Life Cycle Impact Assessments (LCIA)
- Classification and characterization of inputs and outputs
    - Environmental
    - Social
- LCIA methodologies
- LCIA sample

Readings:

- Daniel H. Kim, *Introduction to Systems Thinking*. https://thesystemsthinker.com/wp-content/uploads/2016/03/Introduction-to-Systems-Thinking-IMS013Epk.pdf

March 1, 2021

Case study: In small groups students will conduct a mock LCA applying the principles and information discussed in the first three classes of this module. Case studies will be provided in class along with the relevant data.

Readings:

- Review your notes and the posted lecture notes in preparation for the in-class group assignment.

Module III: Water Efficiency and Impact
Guest Instructor: Eric Meliton Project Manager, Partners in Project Green (TRCA) and Principal Consultant (Echion Group Inc.)

Evaluation Components:

- Group assignment (pitch deck submission) = 60%
- Pitch presentation (group score) = 20%

- Participation grade for all four lectures (individual / attendance based) = 20%

Readings

- Municipal Water Efficiency Eco-Cluster: Summary Report and Case Studies (https://www.partnersinprojectgreen.com/resources/municipal-water-efficiency-eco-cluster-summary-report/)
- Alliance for Water Efficiency: Commercial, Industrial, Institutional (https://www.allianceforwaterefficiency.org/resources/cii)

References

- City of Guelph: Water Smart Business (https://guelph.ca/living/environment/rebates/watersmartbusiness/)
- Region of Peel: Water Smart Peel (http://www.peelregion.ca/watersmartpeel/)
- Region of Waterloo: Conserving Water (https://www.regionofwaterloo.ca/en/living-here/conserving-water.aspx)
- City of Toronto: Water Efficiency for Business (https://www.toronto.ca/services-payments/water-environment/how-to-use-less-water/water-efficiency-for-business/)
- York Region: Water Saving Incentives for Businesses (https://bit.ly/2kWQzWF)
- Province of Ontario: Reporting energy and water use in large buildings (https://www.ontario.ca/page/report-energy-water-use-large-buildings)
- Alliance for Water Stewardship: AWS Standard 2.0 (https://a4ws.org/the-aws-standard-2-0/)

March 8, 2021 (1 hour and 15 min lecture, 15 min break, 1 hour and 15 min group activity)

- Overview of water conservation and water efficiency initiatives in North America
- Background of industrial, commercial, and institutional (ICI) sector water efficiency
- Outline of ICI sector water audit - key elements and best practices
- Business case development of for water efficiency implementation opportunities (4 week assignment - assignment background, grading structure, group selection, selection of type of facility, etc.)

March 15, 2021 (1 hour and 15 min lecture, 15 min break, 1 hour and 15 min group activity)

- Compare and contrast between different types of water efficiency programs
- Discussion into incentive programs, rebates, capital grants, engagement programs
- Insights into challenges for ICI sector implementation
- Business case development of water efficiency implementation opportunities (4 week assignment - mock audit results, walk-through best practices, identification of supplemental funding alignment, etc.) TBD potential guest advisor for pitch deck development

March 22, 2021 (1 hour and 15 min lecture, 15 min break, 1 hour and 15 min group activity)

- Case studies of ICI sector implementation projects
- Calculating return on investment (ROI) payback for implementation
- How to establish implementation buy-in from stakeholders

- Business case development of water efficiency implementation opportunities (4th week assignment - ROI calculations based on audit results, prioritization based on type of company, development of pitch presentation for board/executive management, etc.) TBD potential guest advisor for pitch deck development

March 29, 2021 (1 hour and 15 min lecture, 15 min break, 1 hour and 15 min group activity)

- Future of water efficiency in Ontario / Canada / North America
- Innovative technologies, unique applications, and creative approaches
- Business case development of water efficiency implementation opportunities (4-week assignment - selection of judging panel, evaluation criteria, pitch deck submission, etc.)