





Computer Science (COMP) 635

Green ICT Strategies (Revision 2)

Status: Replaced with new revision, see the [course listing](#)  for the current revision 

Delivery mode: [Grouped study](#) 


Credits: 3

Area of study: Information Systems

Prerequisites: None

Precluded: None

Faculty: [Faculty of Science and Technology](#) 

Notes: This is a graduate level course and students need to apply and be approved to one of the graduate programs or as a non-program [School of Computing and Information Systems](#)  graduate student in order to take this course. Minimum admission requirements must be met. Undergraduate students who do not meet admission requirements will not normally be permitted to take this course.

Instructor:

Dr. Stella George [↗](#)

Overview

This course will approach green ICT strategies from a professional perspective, providing instruction on how best to apply green ICT strategies in the working environment. *COMP 635* takes an information literacy approach by using open resources to facilitate the development of a professional body of knowledge. This removes the need for a textbook and allows the student to build his or her knowledge on continually available sources.

Green ICT (Green IT or Green Computing) is the study and practice of using computers and telecommunications in a way that maximizes positive environmental benefit and minimizes the negative impact. The energy efficiency of operating equipment is a major concern of Green ICT. The embodied energy and lifecycle of the materials used in the design, manufacture, reuse, and recycling of equipment and components are also concerns. Green ICT seeks to inform accepted management practices to achieve efficient and effective business interaction.

The course covers topics such as networking and distributed systems. It builds on themes such as standards and open systems, and uses tools such as Integrated Development Environments. It provides historical and hardware/software/mathematics foundations for the subject, and develops research and report-writing skills to prepare a project report.

Green ICT strategies is an emerging discipline. This course is drawn from practices being developed in the public and private sectors both in Canada and internationally. It introduces implementation methodologies and assessment tools that are currently being tested in the field.

Outline

The course consists of four major topics (modules). Each module has three sub-topics, (one sub-topic per week), and a week at the end of the course is reserved for review.

1. Module 1: Politics, Science and Business of Sustainability
 - Introduction to Green ICT Strategies
 - The Global ICT Footprint
 - Enabling ICT: Dematerialization, Smart Motor Systems, Logistics, Buildings and Grids
2. Module 2: Technical Strategy and Planning–Emerging Technology Monitoring
 - Energy Saving: Data Centres and Client Equipment
 - Materials Use
 - Methods and Tools
3. Module 3: Business/IS Strategy and Planning
 - Business Process Improvement
 - Improving Data Centre Energy Efficiency
 - Enterprise Architecture
4. Module 4: Procurement & Management Support
 - Procurement
 - Energy Star Program and Quality Management
 - Compliance Audit

Learning outcomes

Green ICT is an emerging discipline. This course is drawn from practices being developed in the public and private sectors. It introduces implementation methodologies and assessment tools currently being field tested. After completing this course the student will be able to

- understand the role of ICTs as they impact the global carbon footprint.
 - Explain how electricity used to run computers and telecommunications can contribute to greenhouse gas emissions.
 - Explain how cooling and lighting functions in data centers as well as power usage associated with backup devices contribute to energy consumption.

- Explain the role that transportation costs associated with employee travel contribute to greenhouse gas emissions.
- Explain the role of energy used to manufacture products.
- Explain impact of E-Waste on the environment.
- develop a model to track changes in consumption and generate feedback.
- estimate the carbon footprint of the ICT operations of an organization.
 - Use the greenhouse gas conversion factor to convert energy consumed in kWh to kg of equivalent carbon dioxide.
- assess ways to reduce the carbon footprint of an organization through changes to:
 - policies for procurement of ICT;
 - ICT operations; and
 - revisions of business processes.

Objectives

The objective of this course is to provide graduate students with an understanding of the role of ICTs and their impact on the global carbon footprint. This includes how to estimate the carbon footprint of the ICT operations of an organization and access ways to reduce the carbon footprint by changes to policies for procurement of ICT, changes to ICT operations and revising business processes.

Evaluation

To **receive credit** [↗](#) for COMP 635, you must achieve a cumulative course grade of **B- (70 percent)** [↗](#) or better. Your cumulative course grade will be based on the following assessment.

Activity	Weight
Participation in Weekly Discussions (threaded, blogs)	20%

Activity	Weight
Assignment 1	40%
Assignment 2	40%
Total	100%

Materials

Online Materials

COMP 635 is delivered through Athabasca University's learning management system (LMS), Moodle. All course activities and resources will be available through the course website. Course materials include discussion forums, learning materials, and assignments. Assignments will be submitted online. Readings are all accessed online through links from the site (there is no printed textbook).

Open Access

All learning materials for this course are freely available and have no copyright restrictions to access. This allows the course to be made available without restriction to anyone interested in studying the subject. In addition, all materials are accessible over the Internet and can be read onscreen.

Course Designer

Comp 635 was originally written and developed by Tom Worthington, an independent ICT consultant and an Adjunct Senior Lecturer in the Department of Computer Science at the Australian National University. Tom teaches website design, e-commerce, and professional ethics. He also has an interest in environmental design, and is the founding chair of the ACS Green ICT Group. In 1999, Tom was elected a Fellow of the Australian Computer Society for his contribution to the development of public Internet policy. He is a past president, Fellow, and Honorary Life Member of the Australian Computer Society, a voting member of the Association for Computing Machinery, and a member of the Institute of Electrical and Electronics Engineers. This course has been adapted under a Creative Commons license to reflect more Canadian content for delivery through Athabasca University.

Special Note

Students registered in this course will NOT be allowed to apply for a course extension due to the nature of the course activities.

Important links

- › [Future Course Offerings](#) 
- › [Important Dates and Deadlines](#) 
- › [MScIS Contact Information](#) 

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery methods may vary from their individualized study counterparts.

Opened in Revision 2, August 28, 2020

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View [previous revision](#) 
