Summary: The Graduate Affairs Committee meeting March 21, 2013 considered a new course proposal by Steve Easterbrook (see Systems Thinking for Global Problems below). This course has been taught twice as part of the Munk School's Dynamics of Global Change program. The DGC program has ended. Steve E. proposes to convert this course into a regular CSC graduate course. The breadth credit was proposed to be Methodology 4 (Human-centered and interdisciplinary computing), and Research Area 15 (Interdisciplinary computer science).

From the minutes of Graduate Affairs Committee meeting March 21, 2013:

Wayne pointed out that other departments offer similar courses, and it is important to verify that the proposed course does not have too big an overlap with existing courses.

The committee agreed that Steve should submit the course again to the whole committee for discussion and voting, after due diligence in verifying little overlap with courses from other departments, and with the understanding that no student could get credit for both the new course and [the climate change course] CSC 2602H.

Response: Steve has checked and found no significant overlap. Also note that this had been an SGS approved graduate course under the previous number DGC2003H. This DGC course has been discontinued.

Steve has agreed that there should be an exclusion between CSC 2602H and this new course.

Systems Thinking for Global Problems
http://www.cs.toronto.edu/~sme/DGC2003H/

Description: The dynamics of global change are complex, and demand new ways of conceptualizing and analyzing the inter-relationships between multiple global systems. In this course, we will explore the role of systems thinking as a conceptual toolkit for studying the relationships between problems such as globalization, climate change, energy, health & wellbeing, and food security. Throughout the course, we will use global climate change as a central case study, and use systems thinking to study how climate change interacts with many other pressing global challenges.

Suggested breadth categories: Methodology 4, and RA15.

The course will cover:

The origins of systems thinking. In particular:
- General Systems Theory (Bertalanffy) for understanding biological systems;
- Cybernetics (Wiener) for exploring feedback and control in living organisms, machines, and organizations;
- Systems Dynamics Models (Forrester) for analyzing non-linear behaviour in complex systems.
- Computational modelling of non-linear feedbacks in complex adaptive systems.
- Philosophical roots of systems thinking as a counterpoint to the reductionism used widely across the natural sciences
- Application of systems thinking to study the dynamics of & interactions between current global challenges.
- Emergent concepts from systems thinking, such as limits to growth, planetary boundaries, tipping points, system resilience, and chaos theory.
- Use of systems thinking to explore competing perspectives, trans-disciplinary synthesis, and modeling of global dynamics.

Course Requirements: Class participation; 1 oral presentation; 1 term paper

Key texts:

Course website:
http://www.cs.toronto.edu/~sme/DGC2003H/

Note: CSC2602: Topics in Analysis and Computation in Continuous Models:
Computational Models of Climate Change.
http://www.cs.toronto.edu/~sme/CSC2602/