UNIVERSITY OF TORONTO

# University of Toronto
# New Graduate Program Proposal

| | |
|---|---|
| **Program Proposed:**<br>*Please specify exactly what is being proposed. Eg. degree, program* | **Master of Science in Sustainability Management Program (MScSM)** |
| **Graduate Unit (if applicable) where the program will reside:** *i.e. site of academic authority. Where a program is housed elsewhere, this should also be indicated.* | **Professional Graduate Program Centre** |
| **Faculty / Academic Division:** | **University of Toronto Mississauga** |
| **Faculty / Academic Division Contact:** | **Melissa Berger**<br>**Program and Planning Officer**<br>**Office of the Dean, UTM**<br>**melissa.berger@utoronto.ca** |
| **Graduate Unit/Institutional Contact:** | Amrita Daniere,<br>Vice Dean Graduate<br>University of Toronto Mississauga<br>*amrita.daniere@utoronto.ca* |
| **Anticipated start date of new program:** | **September 1, 2012** |
| **Version Date:** | **April 18, 2011** |

## 1. Table of Contents


Executive Summary ..... **3-4**
Program Rationale ..... **4-6**
Program Description and Content ..... **6-8**
Learning Outcomes ..... **9-14**
    Degree Level Expectations, Program Learning Outcomes and Program Structure ..... **10-14**
Assessment of Teaching and Learning ..... **15**
Need and Demand ..... **15-16**
Admissions Requirements ..... **16**
Resources ..... **16-19**
Quality and Other Indicators ..... **19**

Table 1. ..... **21-22**
Table 2. ..... **23-24**
Chart 1. ..... **25-26**
Chart 2. ..... **27**
Chart 3. ..... **28**
Appendix A ..... **29-40**
        Course Delivery Table ..... **37**
        Professional Graduate Programs Centre ..... **38-40**
Appendix B ..... **41-50**
Appendix C ..... **51-57**

## Section 2

# 1. Executive Summary

The Professional Graduate Program Centre (PGPC) at University of Toronto Mississauga (UTM) proposes the creation of a Master of Science in Sustainability Management (MScSM) Program to educate students about managing businesses and organizations in a way that balances environmental, economic and social needs. The administrative home of the program will be the PGPC while the academic/intellectual home of the program will be the Department of Geography at UTM. This program will be a twenty month (five-session) full-time Master of Science program. The objectives of the program are to provide all students with a solid foundation in environmental science and management proficiencies, allowing them to bridge their previous education with the multidisciplinary requirements of the program. The MScSM will complement existing graduate programs in Management and Environment at the University of Toronto and will build on strengths in environment, management, accounting and economics at UTM. The program responds to a substantial growth in interest in sustainability, socially responsible business practices and employment in so-called "green jobs."

The program will have two concentrations; one concentration will be in Management and the other will be in Science. Students will self-select into one of the concentrations based on their preferences. All students will complete a research paper (during Year 2 of the program) and participate in an internship placement (in the summer between Year 1 and Year 2 of the program). Research pursued by students will include a range of topics, such as the relationship between specific types of businesses and sustainability, the role of socially conscious investment, various techniques and practices related to reducing carbon use, alternative energy and new ways to implement sustainability practices in small businesses. Internship placements for students include national companies, such as Hewlett Packard Canada, and organizations, such as Green Enterprise Ontario, the Centre for Social Innovation, and Sustainable Agency (in Montréal), and other for-profit and not-for-profit organizations and agencies. Initial intake into the MScSM program is estimated at 15 students per year with growth to full capacity (~30 students per year) within five years.

The degree designation (MSc) is appropriate for graduate programs that contain a significant degree of science and technical training as well as a research requirement. A thorough scan of programs in North America and Europe with a similar orientation and requirements reveals that an MSc designation is consistent and appropriate for a program such as this one. The actual program name, Master of Science in Sustainability Management, describes in a succinct manner the subject matter and intellectual focus of the program.

The University of Toronto (UofT) is committed to initiatives that embrace a multidisciplinary approach to education and research. In addition, through efforts such as the University of Toronto Sustainability Office and the Centre for the Environment, the University has demonstrated its desire to create not only a sustainable campus but also prepare its students for a world that requires environmental knowledge and action. Furthermore, the implementation of graduate programs at University of Toronto Mississauga (UTM) is a priority and is highlighted in the University of Toronto's Towards 2030 Framework (www.towards2030.utoronto.ca). The MScSM program is consistent with these three objectives.

The program presented in this proposal is based on extensive research using primary and secondary data. For example, structured interviews with approximately 40 knowledgeable individuals from businesses, universities and organizations, indicated a high degree of support for the program, both from the perspective of students and potential employers. Three focus groups held with advanced environment, economics and management undergraduate students at UTM indicated that there is great interest among target group undergraduates in the proposed program. A thorough review of the literature identifies a growing need for job applicants who have a combination of skills based on a sophisticated understanding of the three pillars of sustainability. Our research was used to develop the course requirements, learning outcomes and identify key skills included in this proposal.

The MScSM requires resource commitments on the part of UTM. Although some of the elective courses will be taught by current graduate faculty members with Graduate Faculty (GF) membership in PGPC (who hold primary appointments in other graduate units such as Management, Geography, Economics, the Faculty of Forestry and the Department of Physical and Environmental Sciences), three new assistant professors at UTM with appropriate

qualifications will be hired to teach in the MScSM within the next three years. The program will also require a full-time program administrator. In addition, we have arranged to contract with the Arts and Science Co-Op Program at the University of Toronto Scarborough (UTSC) to administer the internship component of the MScSM program. The UTSC Co-Op Program has many years of experience in placing undergraduate and graduate students in internship opportunities and we have decided to draw on their expertise in this area. Furthermore, the program will have a tenured faculty director, who will be offered a stipend and course buyouts as appropriate. Finally, resources have been committed to hire practitioners (i.e. from businesses and organizations throughout the world) to guest-lecture or deliver workshops. In many cases, we will rely on UTM's and UTSC's state-of-the-art teleconferencing facilities to allow for international and national experts to participate in delivering material to the students.

## 2. Program Rationale

This program is designed for students who want a thorough understanding of the social and the physical science behind environmental policies so that they will not only be able to communicate clear and ambitious environmental objectives, but will also have the management skills to put those strategies into operation. We expect students to fall primarily into two major categories; the first group will be composed of students who seek a holistic approach to integrating knowledge about business and the environment, perhaps looking to open their own businesses in the "green economy," while the second group will be students who have a career already and seek to learn sustainability management skills with which they can return to their profession after obtaining an Master of Science in Sustainability Management degree.

In their first year of the program, students will take rigorous science courses as well as a variety of courses that develop quantitative and analytical skills to complement their knowledge regarding sustainability. MScSM students will all study environmental sustainability related to geology, biochemistry, biology, ecology and hydrology in four graduate-level science courses. All MScSM students are required to take 9.0 FCE; at least 6 (3.0 FCE) of these courses are scientific and/or quantitative in nature. Some students will graduate with 10 half credits in science and 8 in social science (the Science concentration) while others will graduate with at least 6 half credits in science and 12 half credits in social science (the Management concentration). In addition, students are required to produce a research-based paper that requires both scientific and strategic analysis. As such, this program is truly a Masters of Science.

The designation and name are consistent with the designation and names applied to similar programs with comparable requirements in North America and Europe, including the Master of Science in Sustainability Management at Columbia University (http://ce.columbia.edu/Sustainability-Management/Course-Descriptions), the Master of Science in Sustainability at Arizona State University (http://schoolofsustainability.asu.edu/future-students/graduate/master-science.php), the Master of Science in Environmental Management and Sustainability at the Illinois Institute of Technology (http://www.stuart.iit.edu/graduateprograms/ms/environmentalmanagement)/ and the Master of Science in Sustainable Development at the Model University of Vienna (http://www.modul.ac.at/pgm/msc/curriculum).

The need for such a program at the University of Toronto at this time is crucial. The growing importance of responding to global issues, such as climate change, alternative energy creation, economic insecurity, water shortages and ecological health, are communicated through every kind of media almost every day on every place on earth. Given these issues, there is a growing need and demand for new models of management.

One of many international efforts to bring attention to the need for changing current practices in businesses, organizations and institutions is led by the Tellus Institute, which has conducted over 3,500 research and policy projects throughout the world on environmental issues, resource planning and sustainable development. In their 2008 publication, "Great Transition: The Promise and Lure of the Times Ahead," Paul Raskin, the Founding Director and others, note the need for a new sustainability paradigm. They seek to challenge the status quo and create a reimagined pattern of globalization that protects the earth's resources as well as addresses human needs across the planet. They argue that a key element in creating the synergies that will drive a new sustainability paradigm is "wide public awareness of the need for change and the spread of values that underscore quality of life, human solidarity and environmental sustainability."

The responsibility for creating this critical element lies squarely with universities. It is clear that people in both the industrialized and developing nations are looking for new economic foundations. At the same time, the business leaders of the future need to have a basic understanding of environmental science in order to be effective sustainability stewards.

All the available data suggest that interest in environmental issues and courses among students is increasing across the board (see the netimpact.org webpage for an example of this).[1] Our primary research also indicates that a growing number of businesses are interested in students who have knowledge and training in environmental or 'green' perspectives and that there is already a shortage of graduate students with key sustainability science skills needed by businesses.[2]

Secondary research, gleaned from both academic and business publications, supports this conclusion. Team-based problem solving skills that integrate social, environmental and economic concerns are increasingly desired by businesses. According to Werbach (2009), sustainability oriented strategies serve to position companies at the forefront of innovation, thus insuring their resilience in times of changing realities. Based on findings from more than 1000 interviews with executives from large companies across the world, Greenspoon (2008) notes the increasing importance of sustainability for decision makers and concludes that, "as this importance […] grows, they will in turn seek out new employees with more than just the conventional core business skill-sets. Graduates who possess an understanding of the relationship between business, society and the natural world will become in increasingly high demand" (pp. 17-18).

The University of Toronto should be at the forefront of increasing awareness and providing businesses and organizations with solutions to long-term sustainability. We should be recognized as sustainability leaders by organizations such as Net Impact, a website that provides a ranking of graduate school programs in terms of engagement in social and environmental responsibility. Environmental science is telling us that we need to look for more holistic and long-term solutions that consider the ecology of resources in a balanced way. UofT has an opportunity to prepare our students for leadership positions by training them to be innovative, productive and sustainable. The University aims to lead in the design of sustainable management practices through research and teaching. The proposed MScSM program is a concrete and positive response to this objective.

The decision to establish a Master of Science in Sustainability Management at UTM grew out of recognition that the campus was an appropriate, even ideal, intellectual home  UTM's mandate, *Grow Smart, Grow Green*, reflects the determination of this campus to be at the forefront of training students to be environmentally proactive. In addition, UofT's Towards 2030 Framework includes endorsement of growth in graduate programs at UTM, especially programs with academic integrity that are also professionally relevant. The Report on Long Term Enrolment Strategy, prepared by the Task Force 2, states that, "There is a strong desire at UTM and UTSC for increasing the number of graduate students performing research, taking courses and living on campus…" As a terminal research-based degree, the MScSM is designed to prepare people for critical professional positions in a particular niche while maintaining high intellectual standards. As such, the MScSM program is consistent with these aspirations and with the long-term strategy of UTM.

In addition to working with the Chairs of Geography, Economics and Management at UTM, we have also involved the Vice Principal of Research at UTM in our initial discussions about the design of the MScSM program. We have met with key representatives at the Rotman School of Management, the Centre of Environment, the Faculty of Forestry and the Department of Geography on the St. George campus as well as the Department of Physical and Environmental Sciences at UTSC. Representatives from these academic units were very positive and supportive of the proposed program. We received suggestions about graduate faculty within these units who are interested in teaching or supervising students in the MScSM program. In addition, we used these consultations to identify opportunities to create synergies between the MScSM program and these other units, particularly in terms of courses that might be offered jointly by the MScSM program and other units.[3]

---

[1] According to their website, "Net Impact is an international nonprofit organization with a mission to inspire, educate, and equip individuals to use the power of business to create a more socially and environmentally sustainable world." They have many student chapters at university campuses and have grown rapidly from 59 chapters in 2001 to 260 chapter in 2009 - www.netimpact.org/associations/4342/files/About_Net_Impact_2009.pdf.

[2] Pollin, Robert and Jeannettee Wicks-Lim, "Job Opportunities for the Green Economy: A State-by-State Picture of Occupations that Gain from Green Investments," Political Economy Research Institute, University of Massachusetts Amherst, June 2008.

[3] We also held a consultative meeting early in the process with representatives from the Provost's Office and the School of Graduate Studies to obtain feedback and advice regarding how best to proceed with a more detailed elaboration of the proposed program.

One of the results of the strong endorsement we received for the program is confirmation of the interest among existing graduate faculty across the three campuses to participate in the program. Several existing graduate faculty members in departments at UTM are willing to offer an MScSM graduate course every year. These faculty will be cross-appointed to PGPC as graduate faculty prior to the start of the program. In addition, we have arranged for MScSM students to be able to enrol in science courses (for which they are qualified) that are offered at UTSC as part of the MEnvSci program and for students enrolled in the MEnvSci program to be able to register in any of the MSM electives that have room and are of interest to students in that program. We have also included, with their permission, several graduate courses offered at the Centre for the Environment and the Graduate Department of Economics among the electives for students in the MScSM program. Several faculty members from the Faculty of Forestry have expressed interest in creating graduate courses of interest to MScSM students. Furthermore, we have identified opportunities to offer courses jointly with the Michael Lee-Chin Family Institute for Corporate Citizenship, the institute charged with offering courses on corporate citizenship strategy at the Rotman School of Management.

The MScSM program has offered to provide financial resources as needed to ensure that MScSM students do not burden other units with too many students in instances where a number of MScSM students opt to take an elective course offered by another graduate unit. The remainder of the MScSM courses will be taught by the new full-time graduate faculty hired to teach in the program or by sessional instructors (who will be appointed as GF to the PGPC) drawn from the broader community of qualified practitioners and sustainability scientists. A number of practitioners have already offered to participate in various ways with delivering our curriculum. Some of these individuals will be able to visit campus and provide traditional courses. Others will take advantage of carbon-neutral media to teach and interact with students in the program from their places of business located throughout the world, including, for example, Auriel Capital Management and Good Energies.

## 3. Program Description and Content

The MScSM curriculum is unique in Ontario because it is a science-based program that is also professionally relevant. The program responds to the needs of forward-thinking businesses and organizations. The program content is based on extensive consultation with both academics teaching in similar programs and professionals, such as sustainability officers or managing directors, who have an in-depth understanding of the need for both science and management skills in businesses and organizations. We have canvassed and analysed the course requirements of other relatively similar programs in North America to ensure that the required or core courses of MScSM cover the most important topics that students must know in order to meet the requirements of the program (see Table 1 and Table 2).

In total, the MScSM program will consist of ten required core courses and six elective courses. The first core course, Principles of Sustainability Management is worth a full credit and will be taken by all students in the program during the fall of Year 1. Eight of the other required core courses are half credit courses. Specifically, these courses cover environmental decision making, environmental and ecosystem science, environmental economics, strategies for sustainability management and environmental regulation, law and policy. Another core course is a capstone course (worth a half credit), which will require students to work in groups on a sustainable management project. This course will be taken in the second semester of Year 2. In addition, the students will complete a yearlong research course (worth a full credit), taken in Year 2 by all students in the program. Finally, all students will complete an internship during the summer between Year 1 and Year 2 (Please see Charts 1 and 2 and Appendix A).

There are several innovative aspects of the MScSM program. As noted earlier, the program has two separate concentrations; students can focus on science or management. Students electing to focus on science will be required to complete two additional courses from the list of financial/economic and social electives and four additional courses from the list of environmental/sustainability science electives. Conversely, students focusing on management will be required to take two of their electives from the list of environmental/sustainability courses and four from the list of financial/economic and social electives. Chart 1 provides an outline of the academic structure of the MScSM program. These requirements will ensure that every graduate is able to integrate their knowledge across the three main areas of sustainability, i.e. economic, social and environmental sustainability.

Every course in the MScSM program will require students to think critically, engage in creative activities and communicate their ideas effectively. The ability to communicate complex ideas about the environment in clear language that can bridge the understanding and perspectives of various stakeholders is a key element of the program. As such, these skills will be taught and reinforced throughout the curriculum. The research course (XXX1010Y5) warrants particular discussion. The students will conduct their research and produce their research paper with the guidance of both a professional writer and a faculty supervisor. The students will meet regularly as a class with the professional writer to learn more about writing, presentation skills, communicating complex ideas to different audiences and to discuss the research/writing process with each other. In addition, students will work individually with faculty supervisors to ensure that the work meets high academic standards required of scholarly research at the University of Toronto. This is a model that works well in the Master of Science in Planning (MScPl) program at UofT. MScPl students taking the research course are routinely able to conduct scholarly research as well as complete and present their research paper within a six-month period.

Every student will spend at least two months in the summer between Year 1 and Year 2 in an internship placement working on a sustainable management project or issue with a business or organizational partner. Hewlett Packard Canada, Green Enterprise Ontario, the Centre for Social Innovation, MaRS Discovery District, and Jantzi-Sustainalytics have already expressed a strong interest in and willingness to provide internship opportunities for our students (please see Chart 3 for a brief description of these organizations). Many of these internships will be paid opportunities. In addition, there are several government programs available to support MScSM students who obtain internships in the energy and environmental technology sectors. For example, the Ontario Centre of Excellence (OCE) has a First Job Program to connect highly skilled graduate students with Ontario companies in the research and development of new products, services or processes. Small and medium companies in Ontario receive up to fifty percent funding of a graduate intern's salary up to a maximum of $40,000. This provides a substantial incentive to Ontario companies to recruit MScSM students, who in turn, could use this opportunity to further develop their leadership and entrepreneurship skills. Through the OCE Connection program, for example, MScSM students can gain consulting experiences through applying their technical and professional skills to solve a real world problem faced by small and medium enterprises. Students can serve as a consultant/subcontractor for an Ontario company (the industry partner) and the OCE will provide up to $3,500 per team of students (or $500 per student) to support their project activities. The industry partner must then match or exceed the amount in cash or in-kind. Through the course of their project, MScSM students would be able to develop important project management, report writing and problem solving skills. Successful completion of the internship is a required element of the program. Students are expected to search out and obtain their own placement, but will be assisted by a dedicated placement officer arranged through the UTSC Co-Op Program, both in terms of personal preparation and the search for appropriate positions.

The normal program length is twenty months. Students will start the program in September and complete all the program requirements by the end of April of the second year in the program. Chart 2 summarizes the sequencing and timing of the MScSM program. Given the 4 or 5 courses per semester load, the careful scheduling of both core and elective courses in both Years 1 and 2, the research course and capstone course in Year 2, and the internship requirement (in the summer between Year 1 and 2), students should be able to complete the program within twenty months. These requirements are similar to other MSc programs at UofT as well as comparable environmental and business graduate programs at other universities.

The material will be taught primarily through on-campus lectures and seminars in traditional classrooms. Some of the science courses will require lab work and, therefore, those elements of the courses will take place in comprehensively equipped laboratory classrooms. A number of the elective courses will take place on either the St. George or UTSC campuses. Our intention is to take advantage of the technology that exists at both UTM and UTSC and allow MScSM students to attend lectures/seminars mounted at UTSC via electronic media. Lab work associated with science electives will take place at UTM under the supervision of the faculty member teaching the course and qualified graduate Teaching Assistants. In addition to traditional courses, the MScSM program will frequently arrange additional educational activities including workshops and guest lectures presented by practitioners or academics from other universities. These will either take place on campus or via electronic telecommunications (in keeping with the general philosophy of the MScSM program). Finally, the program will work with certain professional organizations to provide access to workshops and seminars that will permit students to be eligible to seek certification, for example, in Global Reporting and Carbon Accounting, as convenient.

There are several graduate programs in Ontario that have some similarity to the proposed MScSM program. None of these other programs are science **and** management-based. The program that comes closest in terms of orientation is the Masters in Environment and Business offered at University of Waterloo. The MEB does not train graduate students in this program in science but rather emphasizes financial, accounting and management skills from a 'green' perspective. The MEB admitted its first students in September of 2010 and is offered on a part-time only basis and is delivered primarily on-line. In addition, the program takes three years to complete and is designed for working professionals rather than recent university graduates. Ryerson University and the University of Western Ontario offer somewhat comparable programs. Ryerson's Masters in Applied Environmental Science and Management is a two year program that does not seek to integrate science and business education to the same extent as the MScSM. Ryerson's offering takes an environmental systems approach to the analysis of environmental issues and organizations, but requires much less common coursework than the proposed MScSM. Nor does Ryerson include an internship component or a capstone project based on designing an actual product or project for a real company. Western offers a one year Masters degree in Environment and Sustainability. This degree is primarily focused on sustainability consulting work and does not require science education.

The Province's Quality Assurance Framework requires that students complete a minimum of 2/3 courses at the graduate level. However, the University of Toronto requires graduate students to complete all of their course requirements from amongst graduate level courses. The MScSM program is clearly in conformity with this requirement as all the proposed required and elective courses that comprise the program are graduate courses. Please see Appendix A for a listing of all the courses that will be available to MScSM students as well as a program description and program requirements as they will appear in the Graduate Calendar.

## 4. Fields [Optional]

Not applicable

## 5. Learning Outcomes

*The learning outcomes of this program have been incorporated into the response to "**6. Program Structure, L**earning Outcomes, and Degree Learning Expectations*" (Please refer to the next section).

## 6. Degree Level Expectations, Program Learning Outcomes and Program Structure

| **MASTER'S DEGREE LEVEL EXPECTATIONS** (based on the Ontario Council of Academic Vice Presidents (OCAV) DLE's) | **MASTER'S PROGRAM LEARNING OBJECTIVES AND OUTCOMES** | **HOW THE PROGRAM DESIGN AND REQUIREMENT ELEMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES** |
|---|---|---|
| **EXPECTATIONS:**<br>This Masters in Sustainability Management is awarded to students who have demonstrated: | | |
| **1. Depth and Breadth of Knowledge**<br><br>A systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of the academic discipline, field of study, or area of professional practice. | This is reflected in students who are able to:<br>• identify and evaluate the three pillars of economic, environmental and social sustainability<br>• demonstrate sufficient financial literacy to understand the ramifications of the sustainability strategies and projects they will be assessing and advocating<br>• apply his or her knowledge of sustainability to<br>  ○ identify and capitalize on new opportunities for businesses to grow without compromising the needs of future generations<br>  ○ transform existing ecological and environmental problems faced by businesses into opportunities through building value and balancing financial, environmental, and social performance | Through coursework performed in the core courses (which are completed primarily in the first year of the MScSM program), students will acquire a strong foundation in sustainability science and environmental management; this knowledge will provide students with the ability to identify potential environment opportunities and threats in the business environment. Through XXX1010Y5 Principles of Sustainability Management, students will acquire a critical understanding of the core principles of sustainability and the functions of management. This includes the three pillars of economics, environmental and social sustainability; transformative and superficial sustainability management strategies; theoretical approaches to environmental economics; and corporate social responsibility. In XXX1020H5 Decision Making for Sustainability Management, students will learn how to analyze current environmental problems (including deforestation, biodiversity loss, and climate change) using a set of decision making tools including environmental audits, resource consumption accounting, environmental risk assessments, and the Global Reporting Initiative Sustainability Framework. In addition, XXX1040H5 Managerial Economics for Sustainability Management will ensure that students learn a variety of economic techniques to analyze values, markets and trade of environmental goods and services. Both XXX1020H5 and XXX1040H5 assume students are capable of performing basic mathematical and statistical operations (this is clearly stated as an admission requirement for the MScSM program). Furthermore, students will be able to reinforce their understanding of sustainability management in XXX1080H5 Strategies for Sustainability Management where they will be challenged to apply their knowledge to solve real problems faced by businesses through a |

| | | |
|---|---|---|
| | | series of case studies.<br><br>Students will gain a scientific background of environmental problems and processes through XXX1030H5 Environmental Science (environmental sustainability related to geology, biochemistry, biology, ecology and hydrology) and their understanding will advance to the systems-level in XXX1050H5 Ecosystem Science.<br><br>In XXX1070H5 Environmental Law and Policy, students will study Canadian and international environmental law where they will understand how to practice sustainability vigilantly within a legal context.<br><br>Students will further expand the depth and breadth of their knowledge in sustainability management as a result of taking six elective courses. Apart from course-work, students will have the opportunity to build on the knowledge they acquired in the core program and apply them to conducting research and laboratory experiments.<br><br>The program will also arrange numerous workshops and guest lectures for students to understand current best practices as well as the latest innovations in energy and environmental technology. |
| **2. Research and Scholarship**<br><br>A conceptual understanding and methodological competence that i) enables a working comprehension of how established techniques of research and inquiry are used to create and interpret knowledge in the discipline; ii) enables a critical evaluation of current research and advanced research and scholarship in the discipline or area of professional competence; and iii) enables a treatment of complex issues and judgments based on | This is reflected in students who are able to:<br>• identify and use an appropriate set of research skills commensurate with his or her chosen concentration (in management or science) to answer a predefined research question<br>• critically evaluate existing literature and synthesize relevant research to identify new approaches to environmental and sustainable business problems | Students will progressively understand research methodologies used in inquiries associated with the two concentrations of studies in the MScSM program.<br><br>Throughout the program, students will develop competencies in accounting and reporting methodologies, which include financial/ROI analyses (cost-benefit measurement techniques, capital budget project decision making, and financial reporting), GHG and sustainability auditing, and environmental risk assessment.<br><br>Financial/ROI analyses will be introduced in XXX1020H5 Decision Making for Sustainability Management and the analytical skills will be advanced through ENV1707H1 Environmental Finance and Sustainable Investing. |

| | | |
|---|---|---|
| established principles and techniques; **and,** on the basis of that competence, has shown at least one of the following: i) the development and support of a sustained argument in written form; or ii) originality in the application of knowledge | | The theoretical and empirical research methods in GHG and sustainability auditing are explored in XXX1020H5 Decision Making for Sustainability Management and MGT2918H1 Corporate Citizenship Strategy.<br><br>Environmental risk assessments will be introduced in XXX1020H5 Decision Making for Sustainability Management, and this skill will be advanced in EES1117H3 Climate Change and Impact Assessment, EES1107H3 Remediation Methods, and ENV1704H1 Environmental Risk Analysis and Management.<br><br>In addition, students will learn the necessary frameworks for analyzing environmental policies and regulations. Policy analysis and development will be explored by students in XXX1070H5 Environmental Law and Policy, and will be further studied in ENV1002H1 Environmental Policy.<br><br>Students will be required to exercise judgment in applying proper methodologies in assignments and research projects extensively through all the courses, most notably in MSM1050Y5 Capstone Course and MSM1060Y5 Research Paper. |
| **3. Level of Application of Knowledge**<br><br>Competence in the research process by applying an existing body of knowledge in the critical analysis of a new question or a specific problem or issue in a new setting. | This is reflected in students who are able to:<br>• creatively apply knowledge, together with a practical understanding of how established techniques of research are used to assess, develop and interpret sustainable business performance | Students are required to actively apply the knowledge and skills they acquired to individually complete a summer internship on a sustainability project with a business partner. This could involve performing environmental risk assessments for a government organization, evaluating sustainability performance in a business, or developing sustainability project proposals for non-profit organizations.<br><br>In addition, through XXX1090H5 Capstone Course, students will be able to demonstrate their ability to synthesize knowledge from the program into a practical, creative and group-based research project based on a real-world problem.<br><br>Numerous core courses (such as XXX1080H5 Strategies for Sustainability Management) will involve a combination of case studies and presentations by guest speakers where students can then realize the applicability of their knowledge and skills |

| | | |
|---|---|---|
| | | (acquired through the program) to real world problems. |
| **4. Professional Capacity/Autonomy**<br><br>a. The qualities and transferable skills necessary for employment requiring the exercise of initiative and of personal responsibility and accountability; b. the intellectual independence required for continuing professional development; c. the ethical behaviour consistent with academic integrity and use of appropriate guidelines and procedures for responsible conduct of research; and d. the ability to appreciate the broader implications of applying knowledge to particular contexts. | This is reflected in students who are able to:<br>• exercise an analytical and systems-thinking approach to critically evaluate operational decisions internal and external to an organization for its impact on society and the natural environment<br>• proactively manage sustainability-related changes in an organization and autonomously lead in the planning and implementation of projects at professional levels | Through extensive course-work in the MScSM program, students will learn the professional guidelines, standard practices and the legal/regulatory environment governing the scope of their practice in sustainability management. The program will provide students with access to workshops and seminars run by certain professional organizations that will allow them to be eligible to seek certification in Global Reporting Initiative (GRI). GRI qualifies an individual to conduct analyses and submit reports on environmental and social statistics to international agencies and governmental organizations. As well, the MScSM courses can help prepare students to seek certification in Carbon Accounting, where they can then perform corporate-level GHG emission reporting and become proficient in using common GHG software products.<br><br>In XXX1010Y5 Principles of Sustainability Management and XXX1080H5 Strategies for Sustainability Management, students will learn to challenge the status quo and adopt the new roles required to facilitate organizational and social transformation toward sustainability.<br><br>Participation in the internship as well as in-class case study presentations will require students to demonstrate professional conduct and demeanour in a business setting.<br><br>Furthermore, students will receive guidance from a professional writer and a faculty supervisor in XXX1100Y5 Research Paper. The students will be able to learn more about professional writing and presentation skills from the professional writer. As well, the faculty supervisors would assist the student in developing the capacity to produce work that meets high academic standards required of scholarly research at the University of Toronto. |

| | | |
|---|---|---|
| **5. Level of Communications Skills**<br><br>The ability to communicate ideas, issues and conclusions clearly. | This is reflected in students who are able to:<br><br>• be able to express ideas, issues and conclusions with clarity and accuracy, both orally and in writing<br>• effectively use communication technology particularly carbon-neutral forms of media<br>• communicate and effectively negotiate with a wide-range of audiences (including organizational shareholders, consumers, communities, suppliers, global partners, and the management team) | A key element of the MScSM program is to develop students' ability to communicate complex ideas about the environment in a clear language, which can bridge the understanding and perspectives of various stakeholders.<br><br>Particularly in XXX1060H5 Managing Sustainable Organizations, students will learn to communicate environmental ideas and thought effectively to a wide range of internal and external stakeholders. As well, students will be able to develop cultural competencies and multicultural perspectives on sustainable management issues in the global marketplace.<br><br>XXX2010H5 Marketing in Sustainability Management will teach students how to effectively communicate new environmental products and go-to-market strategies to consumers and businesses.<br><br>Student will be able to demonstrate their communication skills through the various forms of academic evaluations in the MScSM program; these include written papers, in-class presentations, negotiation exercises, and interactive learning experiences (i.e. group work in XXX1090H5 Capstone Course and participation in workshops and seminars). |

UNIVERSITY OF TORONTO

## 7. Assessment of Teaching and Learning

Student achievement in the MScSM program will be assessed using a variety of measures that include selected combinations of tests, exams and written assignments, such as essays, research papers, reflective journals, critical evaluation reports and self and group project evaluations; an internship-based report; and oral presentations using electronic technology such as PowerPoint or Keynote. Particular attention will be paid to exploring and developing both self-assessment and collaborative assessment as well as ensuring that students in the program receive evaluation of their work from both academics and professionals working in the field of environmental science and sustainability management.

MScSM students will be evaluated according to how well they have completed the work requested of them in terms of both the substance and content of their response and the clarity of their expression. In addition, in at least one, if not more courses, students will be asked to solve a problem as a team (XXX1090 Capstone course: The Sustainable Enterprise). In the case of XXX1090, each student group will design a sustainable enterprise and present their project to their peers, the faculty members in the program and invited practitioners who will assess their enterprise based on both environmental and financial criteria. In addition, students will be evaluated on the creativity or originality of their ideas and their ability to work successfully as a group. The use of both faculty and peer assessments of interaction and leadership skills will be used to evaluate these key achievements. Students in XXX courses will also be evaluated on both their oral and written communication skills given that instruction on presentation skills, exposition and professional communication will be emphasized throughout the curriculum. Successful completion of the internship is based on an assessment completed by the student's work supervisor and the satisfactory completion of a brief written project report on the results of a project executed while on placement. Finally, as noted earlier, MScSM students will be evaluated by both a professional writer and an MScSM faculty member in terms of the quality of their research ability, writing skill and professional presentation abilities as part of the Research Paper course (XXX1010Y).

## 8. Need and Demand

We anticipate that student demand for the MScSM degree will start strong and grow. The program fills a unique niche in Canadian universities and extensive discussions with leaders in the field of sustainability management across North America indicate that demand for programs that compare to, or are complementary to, the proposed MScSM is growing significantly. We interviewed a number of academics involved in delivering joint business and environment programs and, without exception, all of these programs are experiencing substantial growth. It was not unusual for academic programs to report a jump of 100% in applications from year to year. Comments from academics about the proposed program were uniformly positive and enthusiastic about creation of a graduate program that combined practical training in the three pillars of sustainability with research and internship opportunities.

As an example of growing demand, an interview with a faculty member of a highly ranked business school in Canada indicated that the number of graduate students electing to attend a course designed to explore business and sustainability issues has tripled from 35 to 100 in the past three years. Furthermore, at UTM, enrolment in the first year undergraduate introductory course in Environment has doubled from 400 to 800 in the past three years and continues to attract a long waiting list. Focus groups held at UTM among senior undergraduate students registered in management, economics and environment courses indicated that the MScSM program was seen as exciting, innovative, well-conceived and an attractive option for graduate studies interested in both science and management from a sustainability perspective.

The potential employability of the MScSM graduates has been analyzed through numerous business, government, and research reports as well as in-depth consultations with academic and industrial stakeholders. These results were used to guide the design of the MScSM program, in an effort to equip graduates with the knowledge and skills demanded by employers so that they can remain competitive in the labour market.

We predict there will be significant growth in employment opportunities for prospective graduates with sustainability

management education; this is primarily driven by three factors: 1) an increase in the demand for sustainability skills by businesses; 2) Ontario's commitment to the Innovation Agenda; and 3) a shortage of sustainability skills among current business graduates. Despite evidence for a decline in corporate social responsibility jobs worldwide, which coincides with the current worldwide recession, examining Canadian labour market trends indicate a growing green economy with a prolific level of green jobs across many sectors. Please see Appendix B for a complete discussion of our analysis.

MScSM students will start the program in early September and continue to study full-time for 20 months. They will complete their program requirements at the end of April of their second year in the program

### *Graduate Enrolment Projections*

| *Year in program* | *Academic year* | *Academic year* | *Academic year* | *Academic year* | *Academic year* | *Academic year* | *Academic year* |
|---|---|---|---|---|---|---|---|
| | *2012-13* | *2013-14* | *2014-15* | *2015-16* | *2016-17* | *2017-18* | *2018-19* |
| *1* | *15* | *20* | *25* | *30* | *30* | *30* | *30* |
| *2* | | *15* | *20* | *25* | *30* | *30* | *30* |
| *Total* | *15* | *35* | *45* | *55* | *60* | *60* | *60* |

The program will reach steady state in 2016-17 as five more students are admitted each year to the program starting with 15 students in the fall of 2012.

## 9. Admission Requirements

These are the minimum admission requirements for the MScSM program:

Applicants to the Masters in Sustainability Management program must have completed an appropriate undergraduate degree from a recognized university, in environmental sciences, management/commerce, or a related field (such as physical or human geography, earth sciences, life sciences, economics or environmental studies) with a standing equivalent to at least a mid-B in the final year of the program

Successful completion of 0.5 FCE or equivalent undergraduate statistics or mathematics courses.

Please refer to Appendix A: Professional Graduate Program Centre, page 40 for a description of the Calendar Copy.

## 10.Resources:

**A. Faculty**

As is the case for two of the existing graduate programs based at UTM, the administrative graduate unit for the MScSM program will be the PGPC. The academic home department will be the Department of Geography at UTM. The part-time Director of the program, drawn from tenured faculty committed to teaching in the program, will report to the Chair of Geography at UTM. Resources for program management will be provided and managed through Geography (i.e., administrative staff salaries, sessional expenses, TA costs, telephone bills, and computers) while the Director and the Chair will work through the PCPG to administer the program in terms of its relationship with the School of Graduate Studies.

As noted earlier, UTM will hire three new assistant and/or associate professors to teach in the MScSM program as part of their primary responsibilities. These three positions have been approved, in principal, for searches to occur in 2011, 2012 and 2013. There are several reasons for new hires but the most important factor is that the University does not have many faculty who have training in the nexus between sustainability and management. Indeed, this is a new field and, as such, requires new faculty. In addition, several of the existing faculty, listed in the table below, who are most qualified to teach in the program have significant pre-existing commitments. During the first two years of the program, we will rely on existing UofT faculty and qualified sessional instructors (who will hold GF memberships in PGPC) to deliver a number of the core courses. Many of the elective courses are already approved graduate courses open to all qualified graduate students at UofT and taught on a regular basis by graduate faculty.

The first position (to be searched before September 2012) is in the area of Management and Sustainability with a focus

on Environmental Economics and Finance. The tenure-stream faculty member hired for this position will be based in the Management Department at UTM and contribute at least 50% of their time to the MScSM program. This individual will help deliver several core courses, such as XXX1020, which covers environmental decision making, environmental leadership, ethics, and culture, as well as negotiation and conflict resolution. He/She will also be teaching XXX1040, which pertains to environmental finance and sustainability.

The second position (to be searched before September 2013) is in the area of Environmental Science. The tenure-stream faculty hired for this position will be appointed in Geography/Environment and contribute at least 50% of their time to the MScSM program. This individual will contribute to courses such as XXX1030 and XXX1050, that cover environmental and ecosystem sciences.

The third position (to be searched before September 2014) is in the area of Environmental Science and Sustainability Management. The tenure-stream faculty member hired for this joint position will be based in Geography and Management and contribute at least 50% of their time to the MScSM program. This individual will deliver material in core courses such as XXX1010, XXX1080, and XXX1090, which combine material from both management and sustainability.

A number of extremely qualified, and very diverse, faculty at both UTM and the other two UofT campuses have expressed interest in contributing to teaching and/or supervising in the MScSM program. Most of the faculty are tenured or have permanent positions at the University of Toronto. They are generally very experienced and highly regarded supervisors of graduate students at both the MSc and PhD levels. They will all have graduate faculty membership in PGPC prior to teaching graduate students in the MScSM program. In addition, they tend to be multidisciplinary in both their training and subsequent research and teaching. The faculty range from a Full Professor who regularly teaches Environmental Economics at the undergraduate level (Aivazian), to an Associate Professor who teaches Environmental Management at UTM (Conway), to an award-winning Lecturer based at the Rotman School of Management who is an expert in social enterprise and non-profit businesses (Armstrong). As the attached CVs demonstrate, the faculty who are willing and able to contribute to the MScSM program are active researchers and dynamic teachers.

One of the faculty members who has expressed the greatest interest in the MScSM (Kant) has actually been part of an academic institution that pioneered an interdisciplinary approach to the study of conservation and economics in India (the Indian Institute of Forest Management in Bhopal: http://www.iifm.ac.in). Professor Kant, who was awarded the prestigious Queen's Award for Forestry in 2008, is the Editor-in-chief of a book series on Sustainability, Economics and Natural Resources published by Springer. Professor Hoffman, a political scientist based at UTSC, is co-investigator on a SSHRC grant studying governance and legitimacy in carbon markets and political legitimacy. He is the author of a forthcoming book, published by Oxford University Press, called, *Climate Governance at the Crossroads: Experimenting with a Global Response After Kyoto*. Another key participant in the program is Dr. Li from UTM who is an expert in the area of environmental accounting. He has an international reputation in this field and has recently published papers in highly regarded management journals, such as the *Journal of Accounting and Public Policy*, on the consequences of proactive environmental strategies on company financial performance. We believe that the group of faculty already associated with the MScSM program combined with the planned faculty hires will provide the exceptional intellectual and creative environment required to deliver the MScSM program to graduate students at UofT.

Please refer to Appendix A for a tentative course delivery table outlining the teaching assignments for the first 4 years (2012-2016) in the MScSM program.

*Table: Faculty Complement (please list alphabetically)*

| ***Name*** | ***Home Department/ Unit*** | ***Rank*** | ***SGS Status (e.g. Associate/Full privileges*** | ***Commitment to other programs (please list)*** | ***Nature of contribution to program (T, CI, TS, C;PS)**** |
|---|---|---|---|---|---|
| **Tenured** | | | | | |
| *Aivazian, Varouj* | *Economics* | *Full* | *Full* | *MBA; MFE* | *TS* |
| *Brooks, Len* | *Management* | *Full* | *Full* | *MMPA;DIFA;MBA* | *CI* |

| | | | | | |
|---|---|---|---|---|---|
| *Conway, Tenley* | *Geography* | *Associate* | *Full* | *MScPl* | *CI; TS* |
| *Gough, Bill* | *Physical and Environmental Science* | *Associate* | *Full* | *GGR; MEnvSci* | *CI; TS* |
| *Harvey, Danny* | *Geography* | *Full* | *Full* | *CfE* | *CI* |
| *Hoffman, Matthew* | *Political Science* | *Associate* | *Full* | | *CI; TS* |
| *Kant, Shashi* | *Forestry* | *Full* | *Full* | | *CI; TS* |
| *Li, Yue* | *Management* | *Associate* | *Full* | *MBA* | *CI;TS* |
| *Schimmack, Ulrich* | *Psychology* | *Associate* | *Full* | *PSY* | *TS* |
| *Smith, Sandy* | *Forestry* | *Full* | *Full* | *EEB* | *TS* |
| *Smith, Tat* | *Forestry* | *Full* | *Full* | | *CI;TS* |
| | | | | | |
| **Tenure-Stream** | | | | | |
| *Krisgstin, Sally* | *Forestry* | *Assistant* | *Full* | | *CI;TS* |
| *TBA* | *Geography/Env.* | *Assistant* | *Full* | | *CI;TS* |
| *TBA* | *Management* | *Assistant or Associate* | *Full* | | *CI;TS* |
| *TBA* | *Geography/ Management* | *Assistant* | *Full* | | *CI;TS* |
| **Teaching Stream** | | | | | |
| *Armstrong, Ann* | *Management* | *Lecturer* | *Associate* | *MBA* | *CI* |
| *Havelka, Monica* | *Geography* | *Senior Lecturer* | *Associate* | | *CI* |
| *Murck, Barbara* | *Geography* | *Senior Lecturer* | *Associate* | | *TS* |
| **Sessional lecturers** | | | | | |
| *Maly, Kenneth* | *Environment* | *Lecturer* | *Associate* | *CfE* | *CI; TS* |
| *Savan, Beth* | *Sustainability Office* | *Director* | *Associate* | *CfE ; Env.St* | *TS* |
| *Farahani, Ellie* | *Physics* | *Research Fellow* | *Associate* | *CfE ; PHY* | *CI; TS* |
| **Others (please specify)** | | | | | |
| *Shear, Harvey (part-time instructor)* | *Economics/ Geography* | | *Full* | | *CI; TS* |

** CI: course instructors; TS: thesis supervisor; C/PS: clinical or practice supervisor.*

**b. Learning Resources**

Please refer to Appendix C for: 1) a statement issued by Student Affairs and Services demonstrating support for the MScSM program; and 2) the University of Toronto Libraries Report for the MScSM program.

**c. Financial support for students**

UTM is committed to attracting and supporting the most academically qualified students in Canada to this program. Many of the number of the qualified undergraduate students we spoke to indicated that it is appropriate to provide need-based financial aid to students in both years of the program. Our proposed budget currently devotes approximately 10% of tuition to funding student financial aid, although this is subject to change if the financial situation of the University worsens. Students in the MScSM program will also be qualified to serve as graduate Teaching Assistants in the Geography and Environment program. There is a chronic shortage of qualified graduate students to serve as TAs at UTM in these areas of instruction. We anticipate that between 10 and 15 MScSM students a year will be hired to TA in Geography at UTM. TAships typically provide between $2,300 and $4,600 a year. Furthermore, we anticipate that many of the summer internship positions that students acquire will be paid internships. As noted earlier, students will be

greatly assisted by a dedicated placement officer to secure internships, and some of these opportunities are with companies or organizations that typically offer paid internships to students. Furthermore, students registered in the MScSM will qualify for both OGS and SSHRC scholarships as those funding sources are open to terminal-degree professional program graduate students. In addition, the Vice Dean, Graduate, UTM, among others, is planning to work with the UTM Advancement Office to try and create endowed scholarships for students registered in the program.

**d. Space/Technology**

Space within the renovated Davis Building on the UTM campus will be provided to accommodate the Program. The administration and the offices for sessional instructors will be located in and around the Geography/Environment Department. There is currently space in the renovated Davis Building that is sufficient to accommodate the director, administrative staff and sessional instructors. In addition, MScSM students will have access to the graduate student office space located in the Geography Department. Individual office space for the new faculty will be provided by the departments to which they report. These departments include Geography/Environment and Management. These two departments have indicated that they will provide offices to the new faculty once they are hired. In addition, the new UTM instructional centre will be used to provide classroom space. The CAO of UTM has agreed to provide space sufficient to mount the program and house the administration/faculty associated with the Program should the MScSM program be approved.

# 11. Quality and other indicators

UTM and its faculty have a long-standing reputation concerning the creation and delivery of innovative graduate programs such as the Master of Management of Innovation (this is a Faculty of Medicine, Department of Health, Policy, Management and Evaluation program, but housed and supported at UTM); the Master of Biotechnology and the Master of Management and Professional Accounting program. In addition, UTM has outstanding undergraduate programs in both environment and management. The professors who are interested in participating in teaching and supervising students in the MScSM are extremely well qualified to be part of an interdisciplinary program that combines science, economics and financial knowledge. Furthermore, the tradition and commitment to excellence in teaching and research, as well as the interest and inclusion of important partners (from the business and sustainability spheres such as Hewlett Packard, Auriel Capital and others) in the design of the program bodes well for its successful implementation.

## 12. Governance Process:

| ***Levels of Approval Required*** |
|---|
| Provostial Sign Off |
| Faculty/Divisional Council |
| Submission to Provost's Office |
| AP&P |
| Academic Board (summary) |
| Executive Committee of Governing Council |
| Ontario Quality Council |
| Submitted to MTCU (in case of new degrees, new graduate degrees and programs, new diplomas) |

***Developed: January 4, 2011***

**Table 1. Programs in Environment and Business in Canadian Universities**

| | Program | Duration | Method of teaching/ Structure of Program | Focus of Program | Tuition Fees (for domestic students) | Other Characteristics |
|---|---|---|---|---|---|---|
| | | | | | | |
| York University | MBA with Specialization in Business and Sustainability | Average of 20 months | 12 credits in sustainability and business topics | Sustainable Business | $50,000 for the program ($60,000 for international students) | Ranked #1 internationally as best 'sustainable MBA'. The specialization in Business and Sustainability does not appear on degree. |
| | Business and Sustainability Diploma | Three terms | 12 credits in sustainability and business topics | Business or Environment (if choose to add the diploma to a MA in Env. Studies. ) | $37,500 (for MBA) or $5,400 (for MA) for each program | Added to an MBA or a MA in Environmental Studies |
| | | | | | | |
| University of Waterloo | MA in Environment and Business | 3 years (only part time available) | ONLINE | 8 courses plus an 'experiential project' worth two courses | $29,000 for the program | No science, mostly business oriented |
| | MA in Environment and Resources Studies (PhD also available) | 2 years | One core course, two elective courses, one team research project and a thesis (with thesis development course) | Focus on environment and public administration | $10,000 for the program | Focus on theoretical perspectives |
| | | | | | | |
| Ryerson University | MA in Environmental Applied Science and Management (PhD also available) | 2 years | Three core course. Thesis (3 electives) or project (7 electives) option. | Focus on hard science and management skills (no business) | $10,000 for the program | Many courses in environmental science |
| | | | | | | |
| McGill University | MBA with Concentration in 'Global Strategy and Leadership' | 2 years | Regular MBA with internship | Globalization and Business | $29,500 for the program | One course related to sustainability is offered as an elective ("Strategies for Sustainable Development") |
| | | | | | | |
| Concordia University | MBA | 2 years | Regular MBA | Business | $15,000 ($8,500 for Quebec residents $42,000 for int'l) for the program | One course related to sustainability is offered as an elective ("Sustainable Business Strategy"). Students can also |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | take courses from other departments such as environmental law, environmental economics, etc. |
| | | | | | | |
| Dalhousie University | Master of Resource and Environmental Management | 16 months | 13 half credits (8 core+5 electives) includes internship placement | Environment Management | $13,000 for the program | Does not focus on economic management |
| | | | | | | |
| University of British Columbia | Master of Business Administration – Sustainability and Business Specialization | 16 months | 20 modules (9 core, 11 electives) | Sustainability and Business | $41,500 for the program ($47,500 for int'l) | Courses on CSR, Environmental Marketing, Sustainable Entrepreneurship, and Sustainable Transportation |
| University of Western Ontario | Master's in Environment and Sustainability | 12 months | 6.5 course credits plus workshops and seminars | Environment and Sustainability Consulting | $9,000 for the program | Minimal environmental science courses; consulting program consisting mainly of workshops and seminars |

**Table 2. Programs in Environment and Business at U.S Institutions**

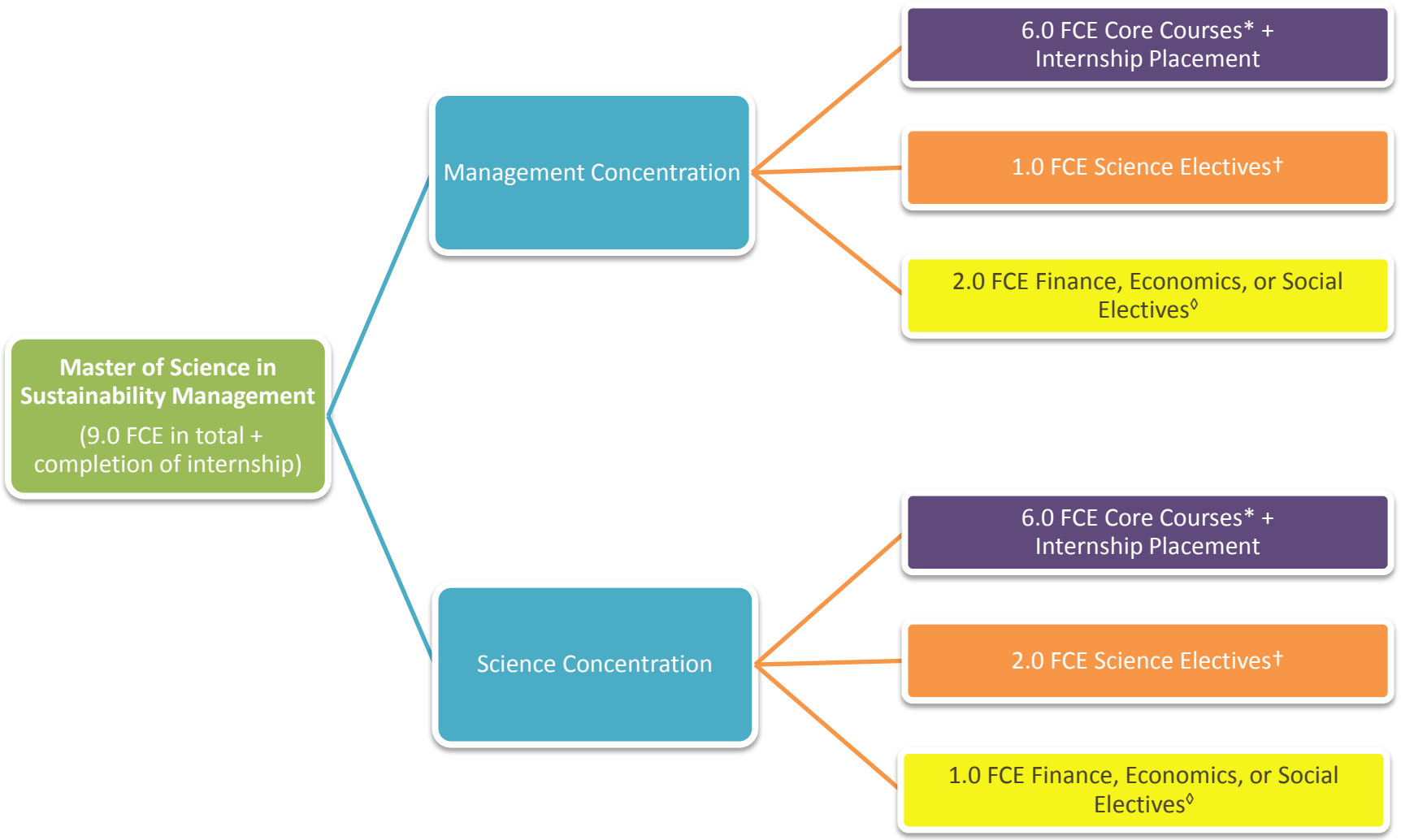
| | Program | Duration | Method of teaching/ Structure of Program | Focus of Program | Tuition Fee (for domestic students) | Other Characteristics |
|---|---|---|---|---|---|---|
| Marlboro College Graduate School | MBA in Managing for Sustainability | 2 years | In person and online; 60 credits (equivalent to 20 courses) including a capstone project and group trip focused on business-based sustainability | Business-based Sustainability | $42,000 USD for the program | Sustainability does not appear on MBA degree |
| | | | | | | |
| Bainbridge Graduate Institute | MBA in Sustainable Business | 2 or 3 year Hybrid programs | In person and online options; require a minimum of 60 credits (equivalent to approx. 20 courses) + independent study | Traditional MBA + Business & Sustainability + Management & Leadership + Entrepreneurship | $52,000 USD for the 2-year program or $53,500 USD for the 3-year program | Included courses: Foundations of Sustainable Business, Accounting and Triple Bottom Line, Sustainable Operations, and Responsible Capitalism, less of a focus on sciences |
| | Certificate in Sustainable Business | 3 quarters | 3 in-class courses over 3 terms | Sustainable Business | $6,800 USD for the certification | Flexible class delivery options (weekly or monthly) |
| | | | | | | |
| Presidio Graduate School | MBA in Sustainable Management | 2 years for full-time, or 4 years for part-time | 16 courses (including a capstone project course) | Sustainable Management | $50,280 USD for full time and part-time programs | Emphasizes on transformative thinking and practical tools (Project and service Learning) |
| | MPA in Sustainable Management | 2 years for full-time, or 4 years for part-time(including a capstone project course) | 16 required courses | Sustainable Management | $50,280 USD for full time and part-time programs | Emphasizes on transformative thinking and practical tools (Project and service Learning) |
| | Executive Education Certification | 5 months | In class and online; | Sustainable Management | $16,500 USD for the certification | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dominican University of California | GreenMBA® | 2 year full-time or 3 year part-time | 48-unit program (16 courses including a capstone project course) | Sustainable Enterprise | $40,000 USD for the program | GreenMBA® is a registration mark, the degree is Master in Sustainable Enterprise |
| | Sustainable Practice Certification Program | 1.5 years | 2 core courses + 2 electives + Practicum Internship | Sustainable Enterprise | $3000 USD for the certification | Business-orientated |
| | | | | | | |
| University of California, Santa Barbara | Master of Environmental Science & Management | 2 year | 80 units (44 core units + 36 elective units) including group project | Professional science degree in environmental science and management | $20,500 USD ($35,500 for non-residents, $50,500 for international) for the program | Internship offered as elective, core courses are mainly science-based but include a "Business and Environment" course |
| | | | | | | |
| Duke University | Master of Environmental Management | 2 year | 48 units (including a Master project) | Professional program with 7 separate concentration in environmental management | $29,000 USD for the program | Core courses vary based on concentration selection; strong focus on sciences |

| | | | | | | |
|---|---|---|---|---|---|---|
| Harvard Extension School | Master of Liberal Arts, Sustainability and Environmental Management | 2 year (have up to 5 years to complete) | Thesis track (40 credits – 9 courses and a master's thesis) or Capstone track (48 credits – 11 courses and a capstone course) | Two concentrations are offered: 1) Ecological Management; or 2) Sustainable Development | $21,000 – 23,000USD for the program | Offers a combination of online and on-campus classes; degree cannot be entirely completed online |

| | | | | | | |
|---|---|---|---|---|---|---|
| Columbia University | Master of Science in Sustainability Management | 3 years on a full-time or part-time basis | 36 points program including 5 areas of study:<br>1) sustainability management<br>2) economics and quantitative analysis<br>3) physical sciences<br>4) public policy<br>5) financial management | Sustainability management | $51,480USD for the program | No internship opportunity offered |

**Chart 1: Outline of Academic Structure**

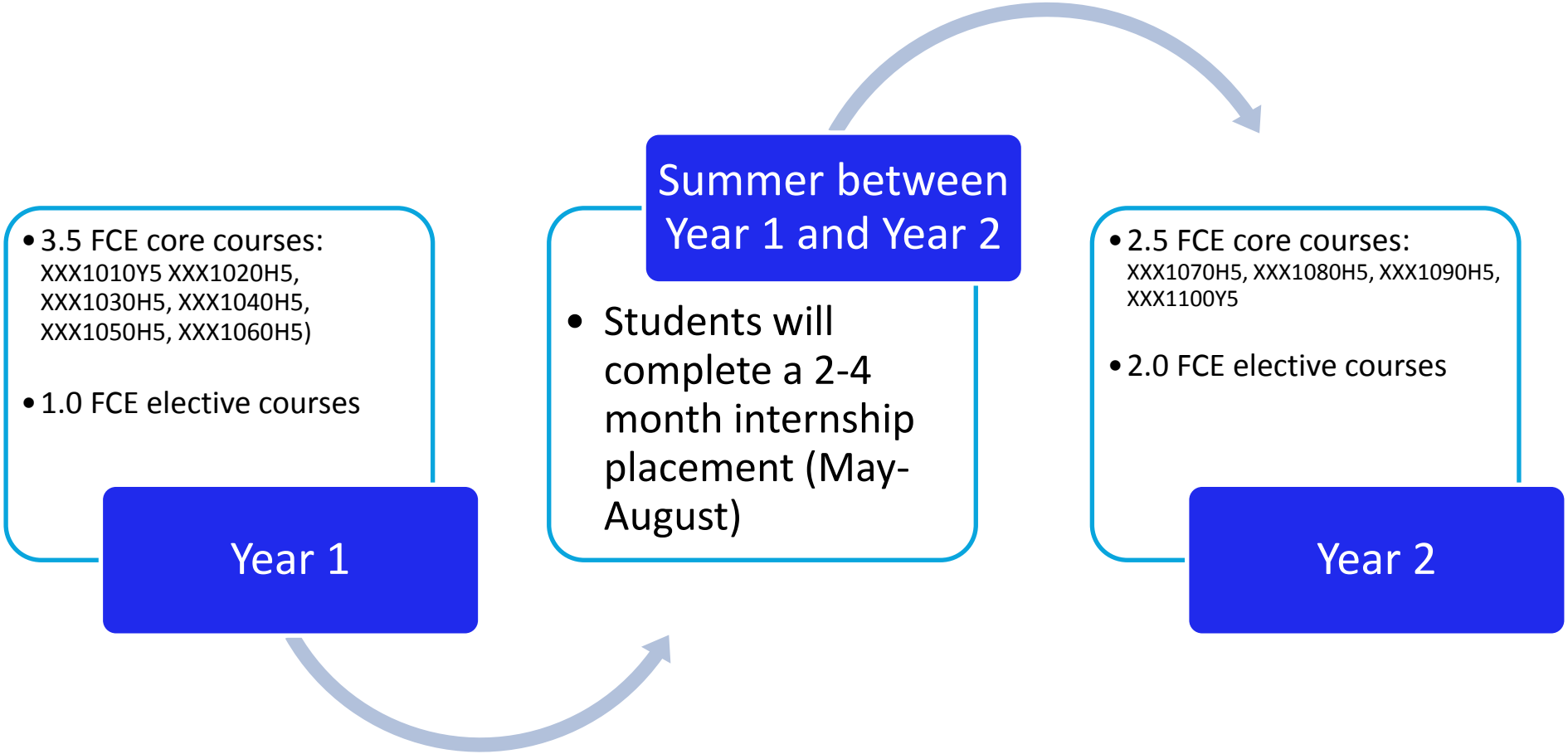


* XXX 1010Y5 Principles of Sustainability Management, XXX 1020H5 Decision Making for Sustainability Management, XXX 1030H5 Environmental Science, XXX 1040H5 Managerial Economics for Sustainability Management, XXX 1050H5 Ecosystem Science, XXX 1060H5 Managing Sustainable Organizations, XXX 1070H5 Environmental Law and Policy, XXX 1080H5 Strategies for Sustainability Management, XXX 1090H5 Capstone Course – The Sustainable Enterprise, and XXX 1100Y5 Research Paper

† EES1107H3 Remediation Methods, EES1125H3 Contaminated Site Remediation, EES1117H3 Climate Change and Impact Assessment, ENV1002H1 Environmental Policy, ENV1704H1 Environmental Risk Analysis and Management, JPG1407H1 Efficient Use of Energy, JPG1408H1 Carbon Free Energy

◊ XXX 2010H5 Marketing in Sustainability Management, XXX 2020H5 Environmental Ethics, EES1124H3 Environmental Project Management, Entrepreneurship with a Social Mission (course has not been assigned a course code), MGT 2918H1 Multidisciplinary Special Topics, RSM 2216H1 Special Topics in Accounting, ENV1707H1 Environmental Finance and Sustainable Investing, ECO 2908H1 Environmental and Resource Economics

**Chart 2: Timing of Program Requirements**



## Chart 3. Potential Internship Partners for MScSM Students

| Business Organization Partner | Brief Description |
|---|---|
| **Hewlett-Packard Canada** | HP Canada is a leading technology solutions provider to consumers, businesses and institutions globally. In 2010, HP Canada was named one of Canada's Greenest Employers; they have been recycling billions of pounds of used computer equipment and ink cartridges since 1987. HP Canada's top three environmental priorities are: climate and energy, product reuse and recycling, and supply chain responsibility. |
| **Green Enterprise Ontario** | Green Enterprise Ontario is a leading business association which aims to build a more sustainable economy in Ontario. This is achieved through providing Ontario companies with educational programs and tools to develop sustainable business practices; educating consumers to purchase sustainable goods and services; and introducing governmental policies and programs that foster a sustainable business environment. |
| **Centre for Social Innovation** | The Centre for Social Innovation is a social enterprise whose mission is to catalyze social innovation at the local and international level. The Centre serves as a large innovation hub that currently houses nearly 100 social mission groups in sectors ranging from arts to the environment. Tenants at the Centre for Social Innovation can share ideas, strategies and experiences to solve existing social, economic and environmental challenges. |
| **MaRS Discovery District** | MaRS Discovery District is a non-profit innovation centre that provides science, technology, and social entrepreneurs with the business skills, networks, and capital they need to take their idea to the marketplace. Within MaRS, there is a Cleantech sector that focuses on renewable energy, energy efficiencies, sustainable solution technologies, low carbon energy infrastructure, and clean water. |
| **Jantzi-Sustainalytics** | Sustainalytics is a consulting company that provides environmental, social and governance (ESG) research and analysis, sustainability benchmarks, and responsible investment services to investors around the world. |

# Appendix A

## CORE COURSES

| Course | Course Title | Course Description | Department |
|---|---|---|---|
| *XXX 1010Y5<br><br>**NEW**<br><br>**(Year 1 Fall)** | Principles of Sustainability Management | This course examines the core principles of sustainability (including the three pillars of social, environmental and economic sustainability), the functions of management, and fundamental business concepts. The apparent conflicts between traditional management practices and sustainability will be discussed and new management tools and techniques that integrate sustainability will be explored. Students will also analyze companies engaged in transformative, as well as superficial, sustainability management strategies such as using alternative energies or, conversely, greenwashing. The second part of this course asks students to challenge the status quo and allows for alternative visions of possible business models to emerge. Students will explore the meaning of leadership as it has changed over time and the new roles required to facilitate organizational and social transformation toward sustainability. Case studies will be used extensively to give students a sense of the real challenges faced by actual businesses. This course will meet twice a week as it is worth a full credit (1.0 FCE). | UTM – PGPC |
| *XXX 1020H5<br><br>**NEW**<br><br>**(Year 1 Fall)** | Decision Making for Sustainability Management | This course is designed to provide students with an understanding of a variety of decision making tools that will allow them to be better equipped in their management and control functions for sustainability management. These tools include activity-based costing, full cost accounting, total cost accounting, resource consumption accounting, throughput accounting, environmental risk assessment (i.e. biophysical decision-making frameworks such as material life cycle analysis, greenhouse gases inventories, and techniques developed from industrial ecology), environmental compliance audits, environmental management systems audits, and the Global Reporting Initiative Sustainability Framework. | UTM – PGPC |

| | | | |
|---|---|---|---|
| *XXX 1030H5<br><br>**NEW**<br><br>**(Year 1 Fall)** | Environmental Science | This course offers the knowledge necessary to build a more solid understanding of environmental problems and processes. Students will learn about biochemistry, biology, ecology and hydrology as they relate to environmental sustainability. A portion of their expertise will be developed through lab experiments. | UTM – PGPC |
| *XXX 1040H5<br><br>**NEW**<br><br>**(Year 1 Winter)** | Managerial Economics for Sustainability Management | The course exposes students to the application of economic principles and methodologies to sustainability management decisions by profit and non-profit organizations. Students learn a variety of economic techniques to analyze values, markets, and trade of environmental goods and services, and explore how changes in economic institutions and policies impact sustainability management. These techniques are applied to analyze environmental issues such as deforestation, biodiversity loss, climate change, and carbon trading.<br>Concepts of socially responsible investment, green entrepreneurship, and green innovations are also discussed. | UTM – PGPC |
| *XXX 1050H5<br><br>**NEW**<br><br>**(Year 1 Winter)** | Ecosystem Science | This course provides an in-depth understanding of ecosystem science including topics such as hydrology, carbon cycle, soil science, etc. The course also focuses on socio-environmental processes such as propagation of pollutants in air, water and soil and effective methods of remediation. | UTM – PGPC |
| *XXX 1060H5<br><br>**NEW**<br><br>**(Year 1 Winter)** | Managing Sustainable Organizations | In this course, students will further investigate the management principles underlying human behaviour in organizations. Topics which will be studied include motivation, personality, communication, negotiation, teamwork and ethics, the impact and determinants (environment, technology, competitiveness, size, life-cycle, communication needs) of an organization's form as well as the difficulties of re-framing organizations. The benefits and constraints of being a sustainable organization will be realized. Students will strengthen their ability to communicate environmental issues effectively in writing and speaking. They will improve their | UTM – PGPC |

| | | | |
|---|---|---|---|
| | | presentation skills and develop strategies to bridge stakeholders of various positions within an enterprise. | |
| *XXX 1070H5<br><br>**NEW**<br><br>**(Year 2 Fall)** | Environmental Law and Policy | The purpose of this course is to study Canadian and international environmental law, international treaties related to environmental practice and sustainability, theories of social justice and equity, transparency, and case studies from Canada and abroad that provide examples of positive and negative legal practices related to the environment and business. | UTM – PGPC |
| *XXX 1080H5<br><br>**NEW**<br><br>**(Year 2 Fall)** | Strategies for Sustainability Management | This course will present new theories designed to address sustainability as a corporate strategic principle. Starting from a foundation which involves exploring the fundamentals of strategic management, learning how to analyze industries, and the strategies that firms adopt and why they succeed or fail, students will be able to recognize the threats and opportunities posed by the demands for sustainability and will be able to develop business strategies to remain competitive in existing and new markets. With a series of case studies and presentations by guest speakers from companies involved in sustainable businesses, students will gain a unique perspective on current sustainability issues (i.e. energy production, supply chain management, etc…). | UTM – PGPC |
| *XXX 1090H5<br><br>**NEW**<br><br>**(Year 2 Winter)** | Capstone Course – The Sustainable Enterprise | This course synthesizes the material of the program into a practical and creative research project based on a real-world problem. It involves group work based on developing a sustainable enterprise. Emphasis will be on honing team building and group problem solving skills. | UTM – PGPC |
| *XXX 1100Y5<br><br>**NEW** | Research Paper | Required research paper, most likely based on internship placement experience. The course will be managed jointly by a professional writer and environmental consultant to ensure that it meets both | UTM – PGPC |

| | | | |
|---|---|---|---|
| **(Year 2 Fall and Winter)** | | professional and sustainability standards of excellence. The research paper must demonstrate scholarly competence, an understanding of the literature in the research area related to sustainability and current practice in the industry. This is a year-long course worth 1.0 FCE. | |

Courses marked with * are new courses

## SCIENCE ELECTIVE COURSES

| Course | Course Title | Course Description | Department |
|---|---|---|---|
| JPG 1407H1 | Efficient Use of Energy | The course examines the options available for dramatically reducing our use of primary energy with no reduction in meaningful energy services, through more efficient use of energy at the scale of energy-using devices and of entire energy systems. Topics covered include generation of electricity from fossil fuels and energy use in buildings, transportation, industry, and agriculture. Each topic will cover (i) the underlying physical principles that determine the potential of and the limits to energy efficiency improvements, (ii) the difference in potential savings when focusing on individual energy using devices rather than entire energy-using systems, (iii) examples of efficiency improvements that have been achieved in practice in various countries around the world, and (iv) the cost and financing of energy efficiency improvements. As well, the role of the so-called rebound effect in eroding the energy-saving benefit of efficiency improvements will be discussed. | Centre for Environment |
| JPG 1408H1 | Carbon Free Energy | The course examines the options available for providing energy from carbon-free energy sources: solar, wind, biomass, hydro, oceanic, and geothermal energy, as well as through sequestration of carbon from fossil fuel sources. The hydrogen economy is also discussed. For each carbon-free energy source, the physical principles, physical or biophysical limits, efficiencies, and other constraining factors are discussed, as well as examples of current applications, current and projected future costs, and possible future scenarios. The course | Centre for Environment |

| | | | |
|---|---|---|---|
| | | concludes by combining the main conclusions from JPG 1407F concerning the prospects for reducing energy demand through improved energy efficiency, with the conclusions drawn in this course concerning the feasibility of large-scale carbon-free energy, to generate scenarios of future greenhouse gas emissions, showing the range of possible consequences for global mean temperature, sea level rise, and ocean acidification. | |
| EES 1107H3 | Remediation Methods | This course will examine the principal methods currently in use for remediating contaminated soils and waters. Emphasis will be placed on reviewing the advantages and limitations and site-specific applicability of remediation techniques and technologies. | UTSC – Master of Environmental Science |
| EES 1117H3 | Climate Change and Impact Assessment | The study and consideration of climate change is of increasing significance to society. This course will review the evidence for climate change over the past 150 years using both direct measurements and proxy data. Projection of future climate change will also be considered by modeling. Students will complete a major case study and research paper. | UTSC – Master of Environmental Science |
| EES 1125H3 | Contaminated Site Remediation | This course builds on the basics of Remediation Methods covered in EES1107 by elaborating on the practical implementation of the common remediation processes including Soil Vapour Extraction, Groundwater Pump and Treat (including treatment train design), Monitored Natural Attenuation, Bioremediation and novel innovative methods. Each method considered will be evaluated in the context of the applicability & treatment analyses, and pilot studies that must be completed before project implementation; full scale design & construction; start-up & optimization; reporting requirements; off-gas/residue treatment methods; decommissioning & closure. | UTSC – Master of Environmental Science |
| ENV 1002H1 | Environmental Policy | The subject of the course is action taken or not taken by governments at all four jurisdictional levels to achieve environmental policy goals. | Centre for Environment |

| | | | |
|---|---|---|---|
| | | The focus is upon Canada, but other jurisdictions are also discussed. The two specific issues of solid waste and climate change are used to illustrate course themes. | |
| ENV 1704H1 | Environmental Risk Analysis and Management | General concepts of risk analysis and management will be introduced in a framework that will include risk identification, estimation, evaluation, management, and emergency planning. These are illustrated by applications to natural hazards, climate change, medical risks, occupational health, contaminated industrial lands, banking and insurance. | Centre for Environment |

Courses marked with * are new courses

## ECONOMIC/FINANCIAL/SOCIAL ELECTIVE COURSES

| Course | Course Title | Course Description | Department |
|---|---|---|---|
| *XXX 2010H5<br><br>**NEW** | Marketing in Sustainability Management | This course explores the concepts of sustainable marketing (with a focus on green marketing) and the objectives of fostering sustainable consumption. Students will analyze sustainable practices in relation to the marketing mix – product, pricing, promotion, supply and distribution channels. At the end of the course, students will be capable of developing, communicating and evaluating go-to-market strategies in sustainable businesses. | UTM – PGPC |
| *XXX 2020H5<br><br>**NEW** | Environmental Ethics | This course investigates the ethical dimensions of climate change and environmental pollution. Students will gain a critical understanding of the underlying ethical principles in sustainability management. These include duties to future generations, international justice, deep ecology, and sustainable development. Throughout the course, students will participate in group discussions where they will learn to justify ethical decisions on a wide range of environmental issues. | UTM - PGPC |
| ENV 1707H1 | Environmental Finance and Sustainable Investing | Environmental finance and responsible investing are fast-emerging fields. They involve the application of new and established financial market instruments and practices to the management of environmental issues, and the incorporation of environmental, social and governance | Centre for Environment |

| | | | |
|---|---|---|---|
| | | (ESG) factors into asset management. Banks, insurance companies, pension funds, venture capitalists, financial services companies and governments are becoming increasingly engaged on the topic in order to manage risks and capitalize on new opportunities. This course explores the growing materiality of ESG factors on the bottom line financials, using real case examples of how various firms and investors are driving and responding to this relatively new strategic area. | |
| EES 1124H3 | Environmental Project Management | Environmental projects must be completed in a timely manner, for a preset cost and must satisfy many levels of regulation. This course will cover the best practices in project planning, cost estimation, contracting and coordination of the numerous individuals and companies engaged to accomplish the project. | UTSC – Master of Environmental Science |
| ECO 2908H1 | Environmental and Resource Economics | This course introduces students to a set of core topics in environmental economics and natural resource economics. The course will cover environmental topics such as benefit-cost analysis, cost estimation, contingent valuation, cost minimization, dispersion modelling, marketable permits; natural resource topics may include optimal extraction of non-renewable resources, renewable resources, common-property resources, the economics of recycling, and sustainable development. | Department of Economics |
| Course has not been assigned a course code | Entrepreneurship with a Social Mission | The main objective of Entrepreneurship with a Social Mission is to expose students to the conceptual foundations for, and practices of, social enterprises. Social enterprises are designed to do well and to do good. There are a number of well-established social enterprises in the United States, the U.K., India and parts of Africa. Social enterprises are starting to develop in Canada and are generating considerable interest and excitement in the social and economic sectors. The course will examine the range of social enterprises, both local and global. It will encourage students to develop their entrepreneurial skills. | Michael Lee-Chin Family Institute for Corporate Citizenship |
| MGT 2918H1 | Multidisciplinary | This course will look at corporate strategies that can drive both social | Michael Lee-Chin |

| | | | |
|---|---|---|---|
| | Special Topics | and financial performance. Students will explore and market and non-market strategies through a thorough grounding in corporate responsibility theories, models and decision-making tools, a variety of cases, and with the participation of speakers from corporations, consultancies and NGOs. The course requires a team-based strategic analysis of a single company and a major written project on a related topic of each student's choice. By the end of the course, students will be able to determine which amongst a wide variety of CSR initiatives will be most strategically advantageous, the most effective and the most responsible. | Family Institute for Corporate Citizenship |
| RSM 2216H1 | Special Topics in Accounting | Our goal is to develop student's understanding of the strategic implications of managing corporate environmental risk. In so doing the course aims to provide students with the opportunity to develop their ability to critically analyse corporate environmental performance and to evaluate future environmental liabilities within the industry context. Emphasis will also be placed on developing the skills of collecting, organising and interpreting corporate environmental performance information. | Michael Lee-Chin Family Institute for Corporate Citizenship |

| Tentative New Course Delivery Table for MScSM Program | | | | | |
|---|---|---|---|---|---|
| **Course Session** | **New Course Title** | **2012 – 2013** | **2013 – 2014** | **2014 – 2015** | **2015 – 2016** |
| **Year 1 – Fall (Sept-Dec)** | **XXX 1010Y5 Principles of Sustainability Management** (Year 1 requirement) | Director | Director | Director | Director |
| | **XXX 1020H5 Decision Making for Sustainability Management** (Year 1 requirement) | Yue Li** | Yue Li**/ Sessional Instructor | Tenure-stream faculty #1 | Tenure-stream faculty #1 or Li** |
| | **XXX 1030H5 Environmental Science** (Year 1 requirement) | Barb Murck**/Monica Havelka** | Monica Havelka** | Monica Havelka** | Tenure-stream faculty #2 or Havelka** |
| | **XXX 2010H5 Marketing in Sustainability Management** (Year 1 elective) | Sessional Instructor | Sessional Instructor | Sessional Instructor | Sessional Instructor |
| **Year 1 – Spring (Jan-Apr)** | **XXX 1040H5 Managerial Economics for Sustainability Management** (Year 1 requirement) | Tenure-stream faculty #1 | Tenure-stream faculty #1 | Tenure-stream faculty #1 | Tenure-stream faculty #1 |
| | **XXX 1050H5 Ecosystem Science** (Year 1 requirement) | Harvey Shear** | Tenure-stream faculty #2 | Tenure-stream faculty #2 | Tenure-stream faculty #2 |
| | **XXX 1060H5 Managing Sustainable Organizations** (Year 1 requirement) | Ann Armstrong | Ann Armstrong | Sessional Instructor | Sessional Instructor |
| **Year 2 – Fall (Sept-Dec)** | **XXX 1070H5 Environmental Law and Policy** (Year 2 requirement) | Not Offered | Matthew Hoffman** / Bill Gough | Matthew Hoffman** | Matthew Hoffman** |
| | **XXX 1080H5 Strategies for Sustainability Management** (Year 2 requirement) | Not Offered | Tenure-stream faculty #1 | Tenure-stream faculty #3 | Tenure-stream faculty #3 |
| | **XXX 1100Y5 Research Paper** (Year 2 Requirement) | Not Offered | Examples of Academic Supervisors: Tenley Conway; Sally Krigstin; Sandy Smith; Tat Smith; Ulrich Schimmack. Tenure-stream faculty #2 must supervise. | Examples of Academic Supervisors: Tenley Conway; Sally Krigstin; Sandy Smith; Tat Smith; Ulrich Schimmack. Tenure-stream faculty #3 must supervise. | Examples of Academic Supervisors: Tenley Conway; Sally Krigstin; Sandy Smith; Tat Smith; Ulrich Schimmack. New tenure-stream faculty # 1, 2, and 3 must supervise. |
| | **XXX 2020H5 Environmental Ethics** (Year 2 elective) | Not Offered | Kenneth Maly** / Len Brooks | Kenneth Maly** | Kenneth Maly** |
| **Year 2 – Spring (Jan-Apr)** | **XXX 1090H5 Capstone Course (**Year 2 requirement) | Not Offered | Director | Tenure-stream faculty #2 | Tenure-stream faculty #3 |
| | **XXX 1100Y5 Research Paper (Cont.)** (Year 2 Requirement) | Not Offered | (XXX 1100Y5 Cont. – see above) | (XXX 1100Y5 Cont. – see above) | (XXX 1100Y5 Cont. – see above) |

**This professor will be involved in teaching this course on an alternating and continuing basis.

Tenure-stream faculty #1 **(hired for 2012)** – specializes in management with a focus on environmental economics and finance
Tenure-stream faculty #2 **(hired for 2013)** – specializes in environmental science and geography
Tenure-stream faculty #3 **(hired for 2014)** – specializes in environmental science and sustainability management

**Professional Graduate Programs Centre (Mississauga)**

**Graduate Unit:** Professional Graduate Program Centre (UTMississauga)

**Degree Program Offered:** Sustainability Management – MScSM

**Overview:**
The Master of Science in Sustainability Management (MScSM) is a full-time, professional program designed to educate students about managing businesses and organizations in a way that balances environmental, economic and social needs. The MScSM. is a course-based program for students who want a thorough understanding of the economics and science behind environmental policies. Upon graduation, MScSM students will be able to communicate clear and ambitious environmental objectives as well as demonstrate management and accounting skills to put those strategies into operation.

**Contact and Address:**
Website: www.utm.utoronto.ca/pgpc1.0.html
Email: anna.reale@utoronto.ca
Telephone: (905) 569-4432
Fax: (905) 828-3979

Professional Graduate Program Centre
University of Toronto at Mississauga
Room 3200, South Building
3359 Mississauga Road North
Mississauga, Ontario L5L 1C6
Canada

**Minimum Admission Requirements:**
Applicants are accepted under the general regulations of the School of Graduate Studies. In addition, applicants must meet the following requirements:

- An appropriate bachelor's degree from a recognized university in environmental sciences, management/commerce, or a related field, with a standing equivalent to at least a mid-B in the final year of the program.
- Successful completion of 0.5 full-course equivalent (FCE) in undergraduate statistics or mathematics course(s).

**Program Requirements:**

- Successful completion of 9.0 core FCEs consisting of:
    - 1.0 FCE research paper (XXX1100Y)
    - 0.5 FCE capstone group project (XXX1090H)
    - 4.5 FCE from other core courses. All the cores course are offered at UTM and include XXX 1010Y, XXX 1020H, XXX 1030H, XXX 1040H, XXX 1050H, XXX 1060H, XXX 1070H, XXX 1080H

- 3.0 FCE electives chosen from the appropriate course lists based on the student's concentration (see below). Students must choose either the science concentration or the management concentration:
    - **Concentration –Science:** For their elective courses, students must complete 2.0 FCE from the list of science elective courses and 1.0 FCE from the list of management elective courses
    - **Concentration –Management:** For their elective courses, students must complete 2.0 FCE from the list of management elective courses and 1.0 FCE from the list of science elective courses
- All students must complete a summer internship between the first and second year of the MScSM program

Normal Program Length: 5 sessions (full-time)
Time Limit: 3 years (full-time)

## Course List:

***Core Courses***
XXX 1010Y Principles of Sustainability Management
XXX 1020H Decision Making for Sustainability Management
XXX 1030H Environmental Science
XXX 1040H Managerial Economics for Sustainability Management
XXX 1050H Ecosystem Science
XXX 1060H Managing Sustainable Organizations
XXX 1070H Environmental Law and Policy
XXX 1080H Strategies for Sustainability Management
XXX 1090H Capstone Course – The Sustainable Enterprise
XXX 1100Y Research Paper

***Sciences Elective Courses***
EES 1107H Remediation Methods
EES 1117H Climate Change and Impact Assessment
EES 1125H Contaminated Site Remediation
ENV 1002H Environmental Policy
ENV 1704H Environmental Risk Analysis and Management
JPG 1407H Efficient Use of Energy
JPG 1408H Carbon Free Energy

***Management Elective Courses***

XXX 2010H Marketing in Sustainability Management
XXX 2020H Environmental Ethics
EES 1124H Environmental Project Management
ENV 1707H Environmental Finance and Sustainable Investing
MGT XXXX Entrepreneurship with a Social Mission

MGT 2918H Multidisciplinary Special Topics
RSM 2216H Special Topics in Accounting
ECO 2908H Environmental and Resource Economics

# Appendix B

**Assessing the Employability of MScSM Graduates**

The potential employability of MScSM graduates has been critically analyzed through numerous business, government, and research reports as well as in-depth consultations with academic and industrial stakeholders. These results are further used to guide the design of the MScSM program, in effort to equip graduates with the knowledge and skills demanded by employers such that they can remain competitive in the labour market.

We predict there will be significant growth in employment opportunities for prospective graduates with sustainability management education; this is primarily driven by three factors: 1) an increase in the demand for sustainability skills by businesses; 2) Ontario's commitment to the Innovation Agenda; and 3) a shortage of sustainability skills among current business graduates. Despite evidence for a decline in corporate social responsibility jobs worldwide, examining Canadian labour market trends indicate a growing green economy with a prolific level of green jobs across many sectors.

***Sustainability skills are in demand***

As employers are recovering from the global economic crisis, they have shifted their concerns toward diminishing resources and sustainable development. The Boston Consulting Group in collaboration with MIT Sloan Management Review initiated a project called Sustainability Initiative, where they surveyed over 1,500 global corporate leaders (i.e. General Electric, Nike, Unilever, BP, Royal Dutch Shell, etc…) and more than 460 academics, government officials, and non-profit executives about their perspectives on integrating sustainability in their business strategy. Their report discovered greater than 90% of business leaders are addressing sustainability issues in some form and companies that act aggressively benefit from an early mover advantage in terms of reducing costs, generating new revenue streams and developing innovative business models.[4] The value of corporate sustainability investments is driven by tougher Canadian environmental legislation, and growing consumer awareness and employee interest in sustainability. The report also outlined a shortage of operational capabilities in the companies to successfully execute sustainability strategies. This indicates a need for new management personnel, who possess systems-thinking ability and skills related to the planning, measuring and reporting of sustainability performance to lead sustainability initiatives in a way that delivers measurable business results.

In addition, the Certified General Accountants Association of Canada published a research study in 2005 which examined the external reporting practices of companies on the Toronto Stock Exchange. The study confirmed the trend towards sustainability reporting in Canada; approximately 50% of the 3000 companies surveyed currently provide reports on social and environmental performance.[5] However, one of the major concerns for these companies is the level of credibility in the reporting as it was discovered that less than a quarter of all respondents were aware of the Global Reporting Initiative (GRI) Guidelines. CGA Canada believes the GRI Guidelines should become a mandatory requirement for sustainability reporting, and therefore managers who are knowledgeable of the GRI reporting framework would be in high demand.

[4] Berns et al. (2010) The Business of Sustainability. *The Boston Consulting Group*, retrieved from: http://www.bcg.com/documents/file29480.pdf

[5] The Certified General Accountants Association of Canada (CGA-Canada) is a self-regulating, professional association of certified general accountants. The report, *Measuring Up: A Study on Corporate Sustainability Reporting in Canada*, was conducted in partnership with the CGA-Canada Research Foundation.

Lastly, a survey of more than 1,300 business professionals conducted in 2009 by the National Environemntal and Education Foundation's (NEEF) Business & Environmental program found that 65% of respondants perceive knowledge in environment and sustainability as valuable particularly in new hires, while at least 75% believed such knowledge would become increasingly important over the next five years.[6] (To review specific examples of environmental and sustainability programs developed in the business community for their employees, please download "The Business Case for Environmental and Sustainability Employee Education" published by the NEEF).

Therefore, as sustainability issues continue to impact the business environment, we believe companies would have a growing interest in employing individuals (such as MScSM graduates) who are capable of recognizing a broader range of stakeholder interests and are trained to develop, implement, and measure sustainability initiatives.

***Ontario's commitment to the Innovation Agenda***

The 2008 Ontario Innovation Agenda[7] proposed by the Ministry of Research and Innovation outlined bio-economy[8] and clean technology[9] as a focus area for aggressive investments in the next eight years. This would be achieved through the execution of the GreenFIT Strategy[10] and the delivery of several programs[11] supported by the $1.15-billion Next Generation of Jobs Fund. In alignment with these initiatives, Ontario has proposed a new legislation called the Green Energy Act (GEA)[12] to build a stronger green economy where new investments would be attracted to the province and thus more green jobs would be created. Ontario expects to create 50,000 new jobs across all industry sectors within the first three years of passing the legislation.

The Ontario government has put forth a long term commitment towards fighting climate change and building a sustainable economy for future generations. However, this plan needs to be driven and sustained by a sufficient pool of highly-skilled 'green collar' professionals. The MScSM program aims to supply this niche market as the program is designed to stimulate student interest in green entrepreneurship and to train them to effectively manage green innovation.

***Skill shortage in sustainability management***

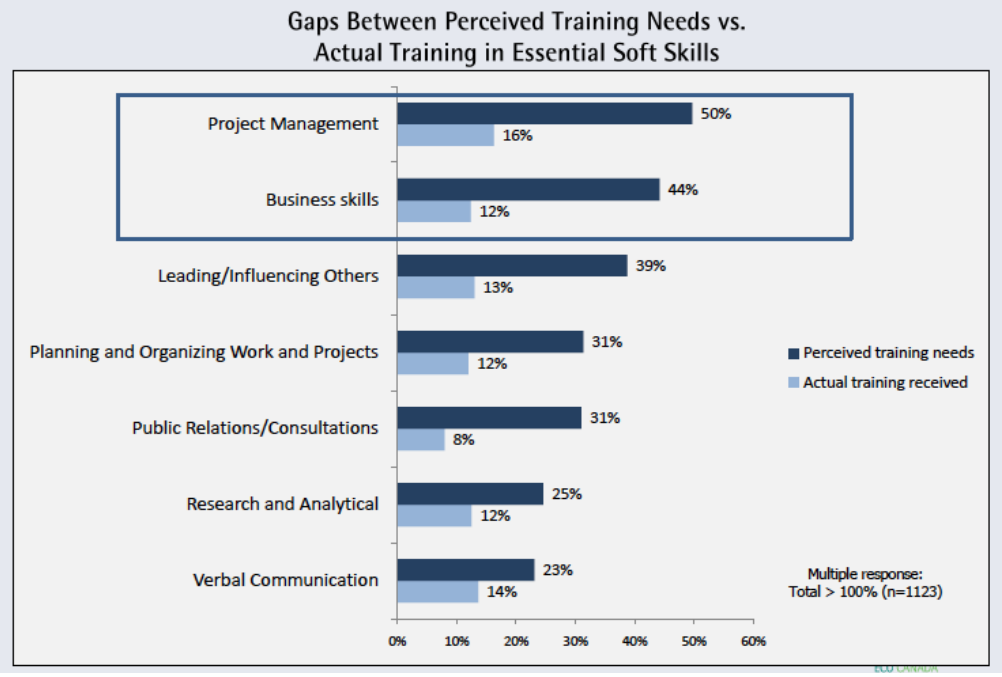
Based on in-depth interviews[13] with sustainability officers at major corporations, directors of sustainability consulting firms and non-profit agencies, university scholars in Canada and North America, and environmental practitioners, there is already a shortage of graduate students with key sustainability skills needed by businesses. Most of our interviewees believe that current graduates of business programs lack a real understanding of the three pillars of sustainability and are unprepared to implement

[6] National Environmental Education Foundation provides knowledge to trusted professionals to solve everyday environmental problems. The Business & Environment Program aims "to increase the ability of business leaders to engage and educate employees to develop and meet sustainability goals."
[7] Ontario Innovation Agenda: http://www.mri.gov.on.ca/english/programs/oia/documents/Ontario%20Innovation%20Agenda.pdf
[8] Bio-economy refers to the use of renewable and recyclable resources in forestry and agriculture
[9] Clean technology are emerging technologies that eliminate negative environmental impacts while offer competitive performance at lower prices
[10] The Green Focus on Innovation and Technology (GreenFIT) strategy enables Ontario companies to propose innovation and sustainable technologies and solutions as alternatives to the province's traditional purchasing
[11] There are two programs supported by the Five-Year Next Generation of Jobs Fund: 1) Jobs and Investment Program, which funds up to 15% of all eligible costs for a project that delivers economic and environmental benefit to Ontario; and 2) Strategic Opportunity Fund, which provides seed investment for bio-economy and clean technology innovations.
[12] *Green Energy and Green Economy Act*, S.O. 2009 C.12, online: http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2145
[13] Approximately 20 interviews were conducted, a list of interviewees could be provided except for those conducted under confidential agreements

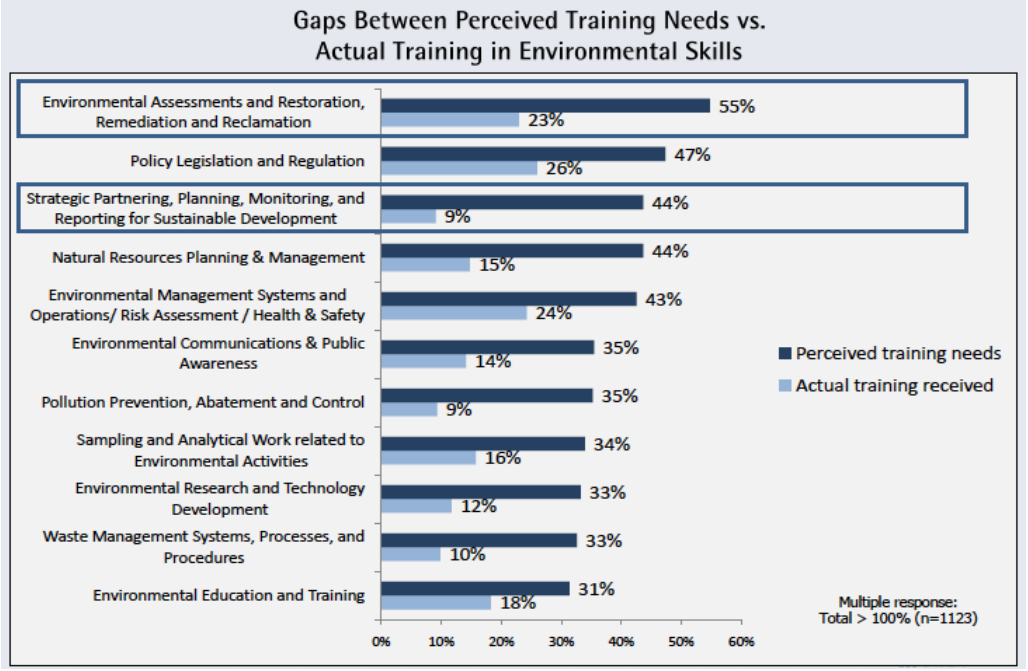
transformative approaches to strategic and operational plans. Although businesses have traditionally relied on external expertise for managing sustainability issues (such as GHG emission reporting and adherence to environmental regulations), some interviewees indicated a growing trend in the business environment towards internalizing these tasks.

All interviewees are supportive of the MScSM program and most have expressed a strong interest in teaching workshops for the program in the future. The interviewees also identified a combination of skills/knowledge which are considered important, but inadequate in the employees of their organizations: business skills (in management, environmental accounting, economics, entrepreneurship, and project management); knowledge of environmental policies and regulations; scientific expertise in environmental issues; and communication skills. Furthermore, the 2010 Competency Survey Report[14] conducted by the International Society of Sustainability Professionals confirmed the importance of these skills and knowledge for success as a sustainability professional. Interestingly, ECO Canada discovered that even Canadian environmental practitioners believe they are inadequately trained in similar sets of skills (i.e. environmental assessment, monitoring and reporting for sustainable development, project management and business skills)[15]. This information greatly contributed to the planning and development of the MScSM curriculum, particularly in determining the set of core courses offered by the program.

**Professional Development Needs**
(Characteristics of Canadian Environmental Practitioners, ECO Canada)



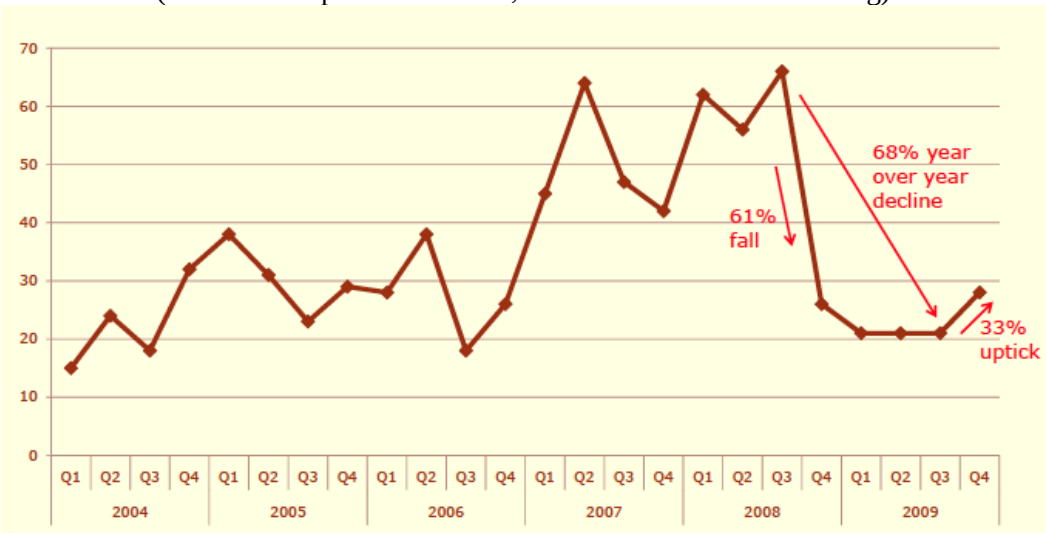

[14] The International Society of Sustainability Professionals (ISSP) is a non-profit, member-driven association for professionals that are committed to making sustainability standard practice; members share best practices and resources including special reports, salary reports and competency studies and best practices. The 2010 Competency Report was a 9-month study that surveyed over 400 professionals in sustainability on competencies identified as being most critical in driving successful sustainability performance. http://sustainabilityprofessionals.org/system/files/ISSP%20Special%20Report_3.10_final_0.pdf
[15]Environmental Careers Organization (ECO) Canada is a not-for-profit corporation that assists the Canadian environmental sector in investigates current environmental skills and labour trends within the environmental profession. http://www.eco.ca/pdf/Report2.pdf


Gaps Between Perceived Training Needs vs.
Actual Training in Environmental Skills
Environmental Assessments and Restoration, Remediation and Reclamation
55%
23%
Policy Legislation and Regulation
47%
26%
Strategic Partnering, Planning, Monitoring, and Reporting for Sustainable Development
44%
9%
Natural Resources Planning & Management
44%
15%
Environmental Management Systems and Operations/ Risk Assessment / Health & Safety
43%
24%
Environmental Communications & Public Awareness
35%
14%
Pollution Prevention, Abatement and Control
35%
9%
Sampling and Analytical Work related to Environmental Activities
34%
16%
Environmental Research and Technology Development
33%
12%
Waste Management Systems, Processes, and Procedures
33%
10%
Environmental Education and Training
31%
18%
0%
10%
20%
30%
40%
50%
60%
Perceived training needs
Actual training received
Multiple response:
Total > 100% (n=1123)

***Labour Market Trends***

To assess current employment opportunities for MScSM graduates, we reviewed the 2010 Corporate Social Citizenship (CSR) Job published by SUSTAINABILITYrecruiting[16], an executive-retained search firm that specializes in sustainability, CSR and corporate citizenship searches. The study discovered that CSR job postings have declined by 68% from 2008 to 2009 in the third quarter but have since increased by 33% into 2010.

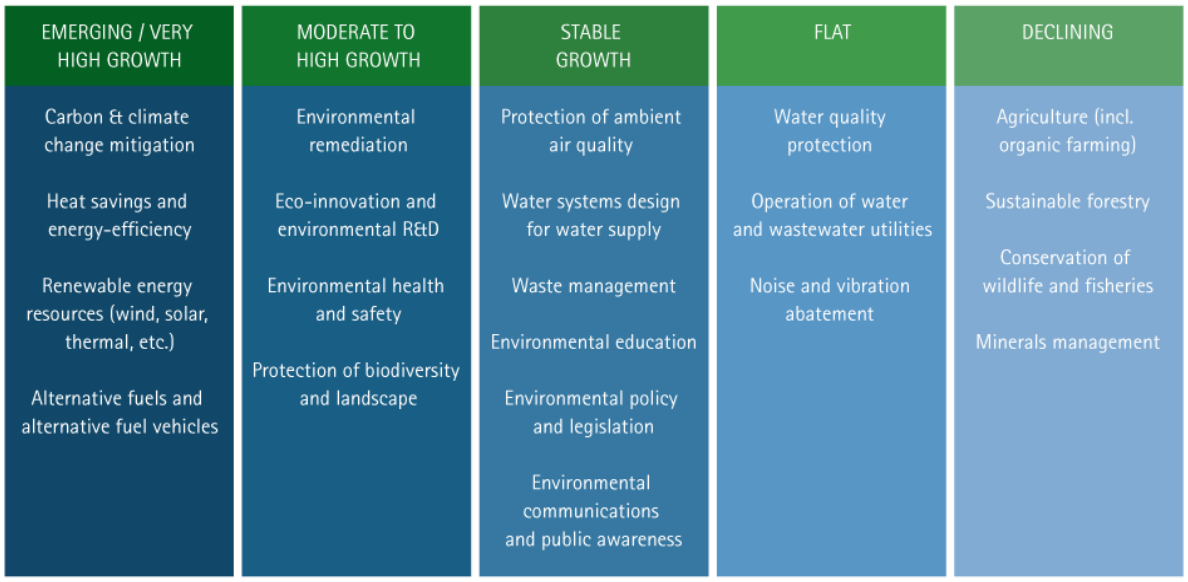
**CSR Job Posting by Quarter**
(CSR Jobs Report: 2004-2009, SUSTAINABILITYrecruiting)




However, the fluctuation in employment opportunities could potentially be attributable to the global economic recession rather than reflect a real decline in sustainability and CSR jobs. In addition, this report is not representative of the full scope of job opportunities available to MScSM students upon graduation. The MScSM program offers students with a high degree of flexibility in choosing either a concentration in science or management. While students studying in the management stream would be interested in CSR jobs, students in the science stream could express a higher interest in environmental science jobs. Therefore, we then investigated labour market trends on the Canadian environmental industry. In the Canadian Environmental Sector Trends 2010 Final Report[17], ECO Canada outlined the energy-related divisions (energy efficiency, renewable energy generation, alternative fuels, and alternative fuel vehicles) as having the greatest growth in employment. Some sectors within the energy related division have experienced double-digit growth over the past decade and they are expected to grow continuously. Future growth expectations for worker demand in each environmental sub-sector are summarized below:

[16] CSR Jobs Report, The State of the CSR Job Market: Key Findings and Trends. An analysis of 819 CSR Jobs: 2004-2009. http://www.ellenweinreb.com/docs/CSR_Jobs_Report_2009.pdf
[17] ECO Canada. (2010). Canadian Environmental Sector Trends 2010 Supplemental Report. http://www.eco.ca/pdf/Canadian-Environmental-Trends-Supplemental-Report-2010.pdf

**Future Growth Expectation for Worker Demand in each Environmental Sub-sector**
(Canadian Environmental Sector Trends Supplementary Report, ECO Canada 2010)




## An Assessment of Student Interest

In order to gather information about student demand for the MScSM program and obtain feedback on the program's structure and curriculum, two focus groups[18] were conducted with thirteen students at the University of Toronto Mississauga (UTM). Focus groups were an appropriate research tool to use because the MScSM is designed to be a niche program (where the first cohort is expected to have fifteen students). Therefore, in-depth interviews with a small sample of students who represent our population of interest was more effective at elucidating student demand than the use of large-scale quantitative research methods.

Focus group participants were recruited through 1) selective in-class invitations based on course relevancy to the study of environmental science and/or management; 2) announcements posted via Blackboard; and 3) emails to the members of the UTM Green Team[19]. Participants were third and fourth year UTM students (with the exception of two students who have completed their degrees) studying environmental science, management, economics, geography, biology or a related discipline.

The participants reacted positively to the MScSM program; the focus groups served to illuminate many important factors that contributed to their strong support for the program. Participants recognized a need for a program at the University of Toronto that addresses sustainability issues in a business environment. They were excited to have an interdisciplinary graduate program based at UTM that supplements undergraduate interest in environmental science and management. They believe the internship opportunity and the research component of the curriculum are key in enticing students to apply for the program. Students often feel inadequately prepared for entering the workforce upon graduation from a bachelor's

[18] Three focus groups were conducted on January 18, 2011 (5 students), January 27 2011 (8 students) and January 31 2011 (25 students). The sessions were one hour in duration and were moderated by Prof. Amrita Daniere, Vice-Dean of Graduate Studies at UTM.
[19] UTM Green Team is a collection of environmentally-minded students who volunteer or are employed by the Environmental Affairs Office. http://www.utm.utoronto.ca/5201.0.html

degree; the MScSM program (with internship and workshops built into the curriculum) could teach practical skills and communication skills needed to succeed in the workplace. As well, guaranteeing paid internships for the students provides them with some additional (and important) financial aid during their full-time studies.

The focus groups also highlighted areas where the MScSM program received feedback on how to better meet the needs of the students. Although participants were comfortable about offering elective courses in collaboration with other departments or programs at the St. George Campus, they were reluctant to travel to the Scarborough Campus regardless of their level of interest in a particular course. The participants identified their proximity to the university as an important factor in choosing a graduate program, however they would be interested in using video or teleconferencing technology at Mississauga to access courses delivered at Scarborough. Recurring commentary was made in relation to the tuition fee for the program. Some participants believe the program is too expensive especially when it is still in its infant stage while any reputation has yet to be built. These participants have proposed to reduce the tuition to $10,000 per year. However, another group of participants believe it is currently reasonably priced in between MBA and MSc programs. Despite the variation in the expectation for tuition fees, all students hoped the program would offer more financial aid on the basis of need and/or academic merit. As well, it is important for the program to use different promotional approaches to raise awareness among potential employers about the nature of the MScSM degree itself and the quality of the students that it will graduate.

As reported by the participants who shared their experiences, the MScSM program is attractive to students with a background in science or business. Students certainly see the value in the interdisciplinary approach of integrating sustainability and business education as well as incorporating research and internship opportunities into the program. The tuition fee may need to be reconsidered, or financial scholarships and assistance increased, in order to make the program accessible to a wide range of students.

**References**


Berns, M., Townend, A., Khayat, Z., Balagopal, B., Reeves, M., Hopkins, M. et al. (2010). The Business of Sustainability. *MIT Sloan Management Review*, retrieved from: http://www.mitsmr-ezine.com./busofsustainability/2009#pg8

Certified General Accountants Association of Canada. (2005). Measuring Up: A Study on Corporate Sustainability Reporting in Canada. Retrieved from: http://www.cga-canada.org/en-ca/ResearchReports/ca_rep_2005-06_sustainability.pdf

Environmental Careers Organization (ECO) Canada. (2009). Characteristics of Canadian Environmental Practitioners. Retrieved from: http://www.eco.ca/pdf/Report2.pdf

Environmental Careers Organization (ECO) Canada. (2010). Canadian Environmental Sector Trends 2010 Supplemental Report. Retrieved from: http://www.eco.ca/pdf/Canadian-Environmental-Trends-Supplemental-Report-2010.pdf

*Green Energy and Green Economy Act*, S.O. 2009 C.12, retrieved from: http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=2145

Ministry of Research and Innovation. (2008). Seizing Global Opportunities: Ontario's Innovation Agenda. Retrieved from: http://www.mri.gov.on.ca/english/programs/oia/documents/Ontario%20Innovation%20Agenda.pdf

National Environmental Education Foundation. (2009). The Business Case for Environmental and Sustainability Employee Education. Retrieved from: http://www.neefusa.org/BusinessEnv/white_paper_feb2010.pdf

Weinreb, E. (2009) CSR Jobs 2009 Report. SUSTAINABILITYrecruiting. Retrieved from: http://www.ellenweinreb.com/docs/CSR_Jobs_Report_2009.pdf

Willard, M., Wiedmeyer C., Warren Flint, R., Weedon, J., Woodward, R., Feldman, I. et al (2010). The Sustainability Professional: 2010 Competency Survey Report. *International Society of Sustainability Professionals.* Retrieved from: http://sustainabilityprofessionals.org/system/files/ISSP%20Special%20Report_3.10_final_0.pdf

**References**


The Aspen Institute, Center for Business Education, Beyond Grey Pinstripes 2009-2010, 2010, wwww.BeyondGreyPinstripes.org.

The Aspen Institute, Center for Business Education, The Sustainable MBA: The 2010-2011 Guide to Business Schools that are Making a Difference, 2010, www.aspeninstitute.org/publications/sustainable-mba-making-difference.

Bardaglio, Peter and Andrea Putnam, Boldly Sustainable: Hope and Opportunity for Higher Education in the Age of Climate Change, Washington, D.C.: National Association of College and University Business Officers, 2009.

Blewitt, John and Cedric Cullingford (eds.), The Sustainability Curriculum: The Challenge for Higher Education, London, UK: Earthscan, 2004.

Canadian Chamber of Commerce with Pollution Probe, A Guide to Climate Change for Small-to Medium-sized Enterprises: How to Plan for Climate Change, Reduce Operating Costs and Develop New Business Opportunities, 2006, www.chamber.ca.

CERES, The 21st Century Corporation: The CERES Roadmap for Sustainability, Boston, Mass, 2010.

Greenspoon, Julie Sara, Sustainability in Graduate Business Curriculum: Implications for Business Schools. University of Toronto Master's thesis, 2008.

Gosling, Jonathan and Henry Mintzberg, "Management Education as if Both Matter," *Management Learning* 37 (4), 2006: 419-428.

Huckle, John and Stephen Sterling (eds.), Education for Sustainability, London, UK: Earthscan, 1996.

Mintzberg, Henry, "Rebuilding Companies as Communities, *Harvard Business Review*, July-August 2009: 140-143.

Pollin, Robert and Jeannettee Wicks-Lim, "Job Opportunities for the Green Economy: A State-by-State Picture of Occupations that Gain from Green Investments," Political Economy Research Institute, University of Massachusetts Amherst, June 2008.

Raskin, Paul, Tariq Bunuri, Gilberto Gallopín, Pablo Gutman, Al Hammond, Robert Kates and Rob Swart, Great Transition: The Promise and Lure of the Times Ahead, A report of the Global Scenario Group, Stockholm Environment Institute, Boston, MA, 2002.

Toward 2030: Planning for U of T's Future (www.towards2030.utoronto.ca/).

Werbach, Adam. Strategy for Sustainability: A Business Manifesto, Boston, MA: Harvard Business School Publishing, 2009.

Willard, Bob, The Next Sustainability Wave: Building boardroom buy-in. Gabriola Island, BC, Canada: New Society Publishers, 2005.

World Wildlife Fund, Rethink Business: How Addressing Climate Change Can Improve the Bottom Line: Learnings from WWF Climate Savers Companies, 2010, www.wwf.ca/business.

**Interviews**

Vice President, Auriel Capital Management, London, UK

Employee, Mill Division, Catalyst Paper

Employee, Green Enterprise Ontario

Employee, Environmental Programs, Hewlett Packard Canada

Manager, Human Resource, Jantzi-Sustainalytics

Vice President, Price Waterhouse Coopers LLP

Employee, Schulich School of Business, York University.

Employee, Natural Resources Group, Stonyfield Farm

Employee, Sustainability Agency, Montréal, Quebec

Employee, Risk and Development, Corporate Branch of the Sustainability Team

Professor Edith Callaghan, Environment and Sustainability Studies, Acadia University, Nova Scotia.

Chelsea Dalton, Environmental Inventories Coordinator, University of Toronto Mississauga.

Rich Leimsider, Director, Center for Business Education, The Aspen Institute.

Director Ralph Meima, Marlboro College Graduate School, MBA in Managing for Sustainability.

Andrea Moffat and Natasha Scotnicki, authors of the "21st Century Corporation: the CERES Roadmap to Sustainability," CERES.

Professor Ron Nahser, Senior Wicklander Fellow at DePaul University's Institute for Business and Professional Ethics and also Provost Emeritus of Presidio School of Management, San Francisco (offering the first accredited MBA in Sustainable Management).

Tom Rand, Practice Lead, Cleantech and Physical Venture Group, MaRs Discovery District.

Dean Scott Schroeder, Bainbridge Graduate Institute, MBA in Sustainable Business.

Professor Monica Winn, Professor of Business Strategy and Sustainability, University of Victoria.

# Appendix C

1) Statement of Student Support, Student Affairs and Services

2) University of Toronto Libraries Report

**Student Service Information for Quality Assurance Framework – UTM**

Undergraduate and graduate students at the University of Toronto Mississauga have access to a range of services and co-curricular educational opportunities that complement the formal curriculum. Organized in Student Affairs & Services, the Registrar's Office, the Academic division and its departments, and the School of Graduate Studies, these services support the success of our students from the time they are admitted through degree completion and beyond.

**Academic advising** at UTM links students with content experts. The Registrar's Office helps new and graduating undergraduate students understand program and degree requirements, and provides specialized support to students at academic risk and those seeking special academic consideration due to unusual circumstances. Services are delivered one-on-one, through small group advising sessions, and in workshops. Individual academic departments at the undergraduate and graduate levels focus on individual academic advising with students in their particular areas of study.

**Career development** is primarily offered by the UTM Career Centre, with service areas including career counselling and work search support. Services are delivered in a variety of modes, including one-on-one advising and counselling, workshops, on-line tools and large-scale employment and service events. UTM also supports internships, externships, job shadowing, volunteer registries and recognition, and other career development opportunities through a broad range of academic departments and other services' offices.

**Disability-related accommodations** are facilitated by UTM's Access*Ability* Resource Centre, which works to match qualified students to appropriate sources for academic accommodation of physical, sensory, learning and mental health disabilities.

**Student housing** is available through 1,500 on-campus residence rooms under the Student Housing and Residence Life department. Housing options include traditional dormitories, suites/apartments, and townhouses, with distinct communities and programming for new undergraduates, upper-years undergraduates, graduate and professional students, and students with families. Support for off-campus housing is provided through partnerships with an external housing registry, the City of Mississauga, and the St. George campus Student Housing Office.

**Learning skills development** is a primary focus of the Robert Gillespie Academic Skills Centre, which offers workshops, seminars and individual consultations to help students identify and develop skills for success in their studies. The ASC also benefits students by educating instructors and teaching assistants on best practices in teaching and learning.

**International experience** is encouraged through the International Centre. The IC serves students from abroad who benefit from its immigration support, social opportunities and educational programming on transition issues. The centre also supports domestic/Canadian students seeking international experiences through travel and study abroad opportunities.

**Physical and mental health care**, including health promotion initiatives, are provided by the Health & Counselling Centre. This service utilizes a comprehensive range of health professionals,

including nurses, physicians, psychiatrists, personal counsellors and social workers, a nutritionist, and health educators. Services include physical exams, first aid, immunizations and allergy injections, pregnancy testing, sexually transmitted infection information and testing, birth control counselling and specialist referrals. A sports medicine clinic is also available on campus.

**Financial aid and awards** are supported through the Office of the Registrar, assisting students with OSAP, UTAPS, scholarships and other sources for financing their education, while assisting them in learning/strengthening budgeting skills.

**Student clubs and activities** are supported through the Student Affairs office for student governments and clubs, and the Office of the Dean and its academic departments for academic societies. Matching funds are offered by the Academic Dean for many activities that encourage individual and small-group interaction between instructors and students. A range of programming is offered by departments across campus, including new student orientation, leadership development, volunteer service, and educational programs, and diversity initiatives in gender, disability, ethnicity, faith, and sexual orientation supported both locally and through UT-wide equity officers.

**Physical well-being** is supported by the Department of Physical Education, Athletics & Recreation, offering individual and team-based recreational and sport activities from casual use through high-performance sport.

**Equity issues**, both broad and specific to sexual and gender diversity, ethnicity and culture, disability, family status, and other student identities facing barriers, are supported through a local network of UTM departments and referrals to UT-wide equity officers.

**School of Graduate Studies, Student Services**
[all campuses]

All graduate students at the University of Toronto have access to registrarial services and co-curricular programs at the School of Graduate Studies that assist students in meeting their academic goals.

Administrative staff at the School of Graduate Studies (SGS) provide **registrarial** services to graduate students including but not limited to recruitment, admission, orientation, registration, fees, program progress, awards/financial assistance and graduation.

The **Grad Room** is an accessible space on the St. George campus which provides University of Toronto graduate students with a lounge area and a multi-purpose space for academic, social and professional graduate student programming.

Grad Room is home to the **Graduate Professional Skills Program** (GPS). GPS is a non-academic program presented by SGS consisting of a variety of offerings that provide doctoral stream students a range of opportunities for professional skills development. The program focuses on skills beyond those conventionally learned within a disciplinary program, skills that may be

critical to success in the wide range of careers that graduates enter, both within and outside academe. GPS aims to help students communicate effectively, plan and manage their time, be entrepreneurial, understand and apply ethical practices, and work effectively in teams and as leaders.

The Office of **English Language and Writing Support** (ELWS) provides graduate students with advanced training in academic writing and speaking. By emphasizing professional development rather than remediation, ELWS helps students cultivate the ability to diagnose and address the weaknesses in their oral and written work. ELWS offers four types of instruction designed to target the needs of both native and non-native speakers of English: non-credit courses, single-session workshops, individual writing consultations, and website resources.

UNIVERSITY OF TORONTO
LIBRARIES

# University of Toronto Libraries Report for Master of Science in Sustainable Management, Professional Graduate Program Centre, University of Toronto Mississauga, January 2011

Context: The University of Toronto Library system as a whole is the largest academic library in Canada and is currently ranked fourth among academic research libraries in North America, behind Harvard, Yale, and Columbia[1]. The research and special collections, together with the collections of the undergraduate libraries, comprise almost 11.5 million print volumes, nearly 5.5 million microform volumes, more than 17,000 journal subscriptions in addition to a rich collection of manuscripts, films, and cartographic materials. The system also provides access to approximately 900,000 electronic resources in various forms including e-books, e-journals and journal collections, indices, and an increasing number of PDA or handheld materials[2] . There are numerous collection strengths in a wide range of disciplines reflecting the breadth of research and instructional programs at the University of Toronto. The strength of the collections, facilities and staff expertise attracts unique donations of books and manuscripts from around the world, which in turn draws scholars for research and graduate work.

| Major North American Research Libraries | | | | | |
|---|---|---|---|---|---|
| | **1998-1999** | **2005-06** | **2006-07** | **2007-08** | **2008-09** |
| **ARL RANK** | **UNIVERSITY** | **UNIVERSITY** | **UNIVERSITY** | **UNIVERSITY** | **UNIVERSITY** |
| 1 | Harvard | Harvard | Harvard | Harvard | Harvard |
| 2 | Yale | Yale | Yale | Yale | Yale |
| 3 | Stanford | Columbia | Columbia | **Toronto (3rd)** | Columbia |
| 4 | **Toronto (4th)** | **Toronto (4th)** | **Toronto (4th)** | Columbia | **Toronto (4th)** |
| 5 | California, Berkeley | California, Berkeley | California, Berkeley | California, Berkeley | Michigan |

| Top 5 Canadian Universities in the ARL Ranking of Major North American Research Libraries | | | | | |
|---|---|---|---|---|---|
| | **1998-1999** | **2005-06** | **2006-07** | **2007-08** | **2008-09** |
| | **RANK/ UNIVERSITY** | **RANK/ UNIVERSITY** | **RANK/ UNIVERSITY** | **RANK/ UNIVERSITY** | **RANK/ UNIVERSITY** |
| | **4/ Toronto** | **4/Toronto** | **4/Toronto** | **3/Toronto** | **4/Toronto** |
| | 30/Alberta | 27/Alberta | 19/Alberta | 12/Alberta | 16/Alberta |
| | 31/British Columbia | 29/British Columbia | 25/British Columbia | 25/British Columbia | 26/British Columbia |
| | 57/McGill | 34/Montreal | 33/Montreal | 26/McGill | 34/Montreal |
| | 76/York | 39/McGill | 36/McGill | 33/Montreal | 40/McGill |

[1] Chronicle of Higher Education, "Library Investment Index at University Research Libraries, 2007-2008." In the Almanac of Higher Education 2009.

[2] Figures as of September 2010 taken from UTL's "What's new in E-Resources page http://main.library.utoronto.ca/eir/EIRwhatsnew.cfm and UTL's annual statistics http://discover.library.utoronto.ca/general-information/about-the-library/annual-statistics

**Space and Access services:** The Library system provides a variety of individual, group undergraduate and graduate study spaces in the 10 central and 23 divisional libraries on the St. George, Mississauga, Scarborough and Downsview campuses. The University of Mississauga (UTM) Library study space and library computer facilities are available from 8:00 a.m. to midnight 7 days a week as well as extended hours during exam periods (twenty four hours, five days per week). Web-based services and electronic materials are accessible at all times from campus or remote locations, through the U of T based Scholars Portal and other leading edge digital services. Within the UTM Library, the AstraZeneca Canada Centre for Information and Technological Literacy features 11 high-performance workstations that provide access and support for powerful GIS applications such as ArcGIS, ArcView, and Google Earth Pro. The centre also provides high end digitizing and scanning equipment and expertise in the creation and management of digital datasets. Also housed in the UTM Library, the Li Koon Chun Finance Learning Centre (LKC FLC), features 32 state-of-the-art computers, and provides access to 4 Bloomberg terminals and 14 Thomson Reuters 3000 Xtra terminals.

**Instruction & Research Support:** The Library plays an important role in the linking of teaching and research in the University. To this end, information literacy instruction is offered to assist in meeting OCAV degree level expectations in the ability to gather, evaluate and interpret information. These services are aligned with the Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education.[3] Located in the UTM Library, the Robert Gillespie Academic Skills Centre (RGASC) and its faculty of specialists in academic support also provide learning support to undergraduate and graduate students.

**Program specific resources:** Instruction occurs at a variety of levels for all subject areas including Geography, Geographical Information Systems, Management, Biotechnology and Biology and is provided by the liaison librarians for various disciplines. The GIS/Data Librarian provides GIS instruction to graduate students from a variety of science related fields and teaches them to analyze and map their findings using applications available in the Library computer lab. The Science Liaison Librarian provides an orientation for new students in the Masters of Biotechnology program, and provides classroom instruction in several courses including BTC1710HS (Protein Chemistry Laboratory) and BTC1800HF (Biotechnology in Medicine). The LKC FLC currently supports several graduate and undergraduate courses in the Departments of Management and Economics, including ECO373 (The Environment: Perspectives from Economics and Ecology) and MMI1020H (Applied Econometrics for Managers). In addition, Librarians frequently collaborate to deliver workshops using resources that are relevant to sustainability research. These would include sessions on locating statistics, patents, and business resources.

Workshops on using databases, current awareness, scholarly communication, and assessing the impact of research are offered to graduate students in all disciplines and professional programs. The liaison librarians also customize feeds of library resources which appear prominently in Portal/Blackboard course pages and create library guides to help students with specific searching needs, including searching for patents and conference proceedings.

**Collections:**

---

[3] Association of College & Research Libraries. *Information Literacy Standards*. ACRL, 2006.

Collections are purchased in all formats to support the needs of particular disciplines and include new media formats where appropriate. The University of Toronto Library supports open access to scholarly communication through its institutional research repository T-Space, its open journal and open conference services, and subscriptions to open access publications. In addition to the resources at the UTM Library, research in Sustainable Management is supported by libraries on all three campuses including the Rotman Business Information Centre, the Robarts Library Map and Data Library, and the Gerstein Science Library.

**Journals**: The Library subscribes to all 5 of the top Environmental Studies and Environmental Sciences journals listed in Journal Citation Reports (JCR).[4] Each of these titles are available electronically to staff and students of the University. The Library also subscribes to the top online journals for Sustainable Management research. These include *Sustainability Science, Journal of Environmental Quality, Journal of Environmental Monitoring, Environmental Progress & Sustainable Energy, Resources, Conservation and Recycling, The Environmentalist, Environmental Management, Environmental Conservation, International Journal of Sustainable Development and World Ecology* and *Management of Environmental Quality.*

**Monographs:** The University of Toronto Mississauga Library maintains 31 book approval plans with Ingram Coutts. These plans ensure that the UTM Library receives books in management, environment, geography, biology and other science related disciplines including all books published by *Earthscan*, one of the leading English language publishers of books on environmental and sustainable development issues. The University of Toronto Library maintains comprehensive book approval plans with 53 book dealers and vendors world-wide. These plans ensure that the Library receives academic monographs from publishers worldwide in an efficient manner. In this way, the Library continues to acquire more than 120,000 print monograph volumes per year and an ever growing number of electronic books.

**Key Indexes and E Resources:**
The Library has active subscriptions to all key databases used in Sustainable Development research. These are the *Environmental Sciences & Pollution Management* database, *GreenFILE, Business Source Premier, ABI Inform, Web of Science, Scopus,* and the Gale *Environment and ePolicy Book* collection.

**Special Collection Highlight:**
The UTM Library provides access to the Land Information Ontario (LIO) database from the Ontario Ministry of Natural Resources. This resource includes hundreds of environmental and land management datasets for academic use.

Prepared by: Andrew Nicholson, Mindy Thuna, and Michael Meth, University of Toronto Mississauga Library, January 2011.
Submitted by: Carole Moore, Chief Librarian, University of Toronto Libraries, 2 March 2011

Carole Moore

[4] 2009 Journal Citation Reports® (Thomson Reuters, 2010)