Major Curriculum Changes 2008
For the 2009-2010 Academic Calendar

Supplemental Information

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University of Toronto Mississauga

Major Curriculum Changes 2008 – Supplemental Information
For the 2009-2010 Academic Calendar

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University of Toronto Mississauga
Major Curriculum Changes for Biology: 2009-2010 Calendar

New Program

Biology for Health Sciences - Major

Program Description and Rationale:

This 'streamed' major program was developed to fill a niche for students in Biology at the University of Toronto Mississauga who have an interest in human or health-related studies. This is a high demand area with many requests at the Ontario Universities Recruitment Fair and at the University of Toronto Mississauga's Open House Recruitment Day. The timing could not be better since over the last few years we have developed new courses that deal with areas related to gaining a fuller understanding of the biological foundation of health in humans, such as, "Human Anatomy and Physiology", "Human Development, and "Human Cell Biology". The timing is also appropriate with the partnership with the Faculty of Medicine and the Academy of Medicine and the University of Toronto Mississauga, and the building of a Health Sciences Complex.

Many of our students in Biology hope to enter some area within the health profession and we have not been able to give them any program that helps them direct their course choice. This program will help them determine courses in which they can get the biological grounding needed to understand health issues. This program builds on a background of Biology, Chemistry and Mathematics, and then leads students through human anatomy, physiology, cell and molecular biology, development, genetics, and statistics, and then streams them through 1 of 3 concentrated areas of biology; 1) Cell, Molecular and Biotechnology, 2) Neuroscience, or 3) Genes and Behaviour. This major program could be combined with a number of other major programs at UTM such as Psychology, Anthropology, Health Sciences Communication, Exceptionality in Human Learning, Forensic Science, and Chemistry, as well as other disciplines, such as the Major in Management. This major program could also be complemented by a Minor in Biomedical Communications (Science).

This will be a popular program and we expect a few hundred students through this program. The entrance requirements are quite high (CGPA of 2.5) and this will limit the number of students in this program. We believe that this program will increase the number of highly qualified students within Biology and we believe that students exiting this program will be better prepared to enter many of the professional programs or industry.

The Department of Biology is a large group and these courses are already being taught by our faculty. As a second year foundation course, we have increased BIO210H5 (Human Anatomy and Physiology) to a full year course. We believe this is important so that we can give a thorough grounding to all students within this program on form and function of the human body. We have asked for money for a 0.5 stipend to be able to relieve other teaching for an increase in this course. As an aside, this course is very popular and is the Life Science course chosen by most students at the University of Toronto Mississauga to fulfill their requirement for professional schools, and having it a full year option will make this even more suitable for students.

This new "streamed" major program is rigorous and fits with our academic mission and plans. In the future we hope to partner with other departments to develop a new specialist program related to health that can include courses from Anthropology, Psychology, Forensic Science, and possibly the Environment.

The following groups have been consulted of this new "streamed" major and we have not received any concerns: Chairs of Ecology and Evolutionary Biology, Cell and Systems Biology, Anthropology, University of Toronto Mississauga's Director of Forensics and the Director of the Human Biology Program, St. George.

***Learning Objectives*:**

- To provide a foundation for students with an academic interest in human or health-related sciences.
- To provide students with an understanding of the biological foundations of health in humans.
- To provide students with the tools necessary to understand, and critically-examine health-related human issues in the broader context of the biological sciences
- To provide a competitive advantage amongst our students when applying to professional programs or for positions in health-related industries.

Program Requirements

ERMAJ#### Biology for Health Sciences – Major

This program focuses on areas of biological science that relate to the health of humans and will provide a biological foundation for the health sciences.

Limited enrolment Enrolment in the Major Program is limited to students who have completed 4.0 credits (including BIO152H5 and BIO153H5) and who have achieved a CGPA of at least 2.5

8.0 credits are required including at least 2.0 at the 300/400 level.

1. BIO152H5, 153H5; CHM140Y5; MAT132Y5/134Y5*/135Y5/137Y5

2. BIO206H5, 207H5, 210Y5, 310H5, 380H5, (BIO360H5/STA220H5/PSY201H5)

3. 1.5 credits from one of the following lists:

   Cell, Molecular, and Biotechnology Stream:
   BIO200H5, 215H5, 314H5, 315H5, 370Y5, 372H5, 374H5, 477H5; JBC472H5

   Neuroscience Stream:
   BIO215H5, 304H5, 315H5, 403H5, 409H5, 411H5, 434H5

   Genes and Behaviour Stream:
   BIO215H5, 315H5, 318Y5, 341H5, 361H5, 407H5, 434H5, 442H5, 443H5

*MAT134Y5 - Calculus for Life Sciences is highly recommended.

NOTE: As part of your degree requirement the 'Biology for Health Sciences' Major would be academically complemented by a Major in Psychology, Anthropology, Health Sciences Communication, Exceptionality in Human Learning, Forensic Science, and Chemistry, as well as other disciplines such as the Major in Management. This major program would also be complemented by a Minor in Biomedical Communications (Science).

Program by course listings

First Year: BIO152H5, BIO153H5 – Introduction to Evolution and Evolutionary Genetics; Diversity of Organisms
CHM140Y5 – The study of Matter and its Transformations
MAT132Y5/134Y5*/135Y5/137Y5 – Mathematics
Total - 3.0 FCE

Second Year and Third Year:
BIO206H5 – Introductory Cell and Molecular Biology
BIO207H5 – Introductory Genetics
BIO210Y5 – Fundamentals of Human Anatomy and Physiology
BIO360H5 / STA220H5 / PSY201H5 – Statistics

BIO310H5 – Integrative Animal Physiology
BIO380H5 – Human Development
Total – 3.5 FCE, cumulative FCE = 6.5

1.5 Full credits from **one** of the following lists:

Cell, Molecular, and Biotechnology Stream:

BIO200H5 – Introduction to Pharmacology: Pharmacokinetic Principles
BIO215H5 – Laboratory in Molecular Biology and Genetics
BIO314H5 – Laboratory in Cell and Molecular Biology
BIO315H5 – Human Cell Biology
BIO370Y5 – Microbiology or BIO371H – Lectures in Microbiology
BIO372H5 – Molecular Biology
BIO374H5 – Biotechnology and Society
BIO477H5 – Molecular Biology of Gene Expression and Cancer
JBC472H5 – Seminars in Biotechnology

Neuroscience Stream:

BIO215H5 – Laboratory in Molecular Biology and Genetics
BIO304H5 – Physiology of Neural Systems
BIO315H5 – Human Cell Biology
BIO403H5 – Developmental Neurobiology
BIO409H5 – Laboratory in Physiology
BIO411H5 – Topics in Molecular and Cellular Physiology
BIO434H5 – Sensory Biology

Genes and Behaviour Stream:

BIO215H5 – Laboratory in Molecular Biology and Genetics
BIO315H5 – Human Cell Biology
BIO318Y5 – Animal Behaviour / BIO328H– Lectures in Animal Behaviour
BIO341H5 – Advanced Genetics
BIO361H5 – Biometrics II
BIO407H5 – Behavior Genetics
BIO434H5 – Sensory Biology
BIO442H5 – Mechanisms of Evolution
BIO443H5 – Phylogenetic Principles

* MAT134Y5 – Calculus for Life Sciences is highly recommended.

University of Toronto Mississauga
Proposed Major Curriculum Changes: 2009-2010 Calendar

1. New Program:

Primary/Junior Concurrent Teacher Education Program Option

Program Description and Rationale

It is proposed that the University of Toronto Mississauga offer a Primary/Junior (P/J) Concurrent Teacher Education Program (CTEP) option beginning in the Fall of 2010. The literature and recruitment materials for this program will be available for the fall recruitment campaign in September 2009. In addition the various CTEP websites and literature will reflect these changes. The addition of this program option will not affect staffing in the Department of Psychology since all required and recommended courses are already offered and this group of students will be part of the overall numbers for this department. The change will require the addition of teaching assistants for two of the CTEP courses but that need already exists and will be required for 2009-2010.

Focus

The proposed program option will follow the exact guidelines for the current U of T Mississauga CTEP option except that the focus of this option will be on developing teachers in the primary/junior panels. This option will provide students with a strong background in child development, abnormal behaviour, and exceptionality. This will provide excellent preparation for students who intend to pursue a career in special education. It will also provide Primary/Junior teachers with the necessary academic preparation to include students with disabilities in general education classrooms. In the Province of Ontario there is a growing need for teachers of students with exceptionality. This proposed option addresses this need and offers a unique opportunity for teacher candidates. Most of the consecutive programs in Ontario universities do not offer this degree of emphasis on human exceptionality in learning. This program option will be anchored in the Psychology Department and will follow the same format as current CTE programs at U of T Mississauga.

Program requirements

The new program option will be offered to students who are enrolled in the Psychology Major or Specialist or the Exceptionality in Human Learning (EHL) Major or Specialist Programs. The current requirements for these programs will not change and each student will be required to meet the expectations set out by both the Psychology Department and CTEP including the entrance and stay-in GPA for the Concurrent Teacher Education Program. As this new program option is focused on preparing elementary school teachers, there is no requirement for specialized teaching subjects. Students may elect any

other Minor, Major, or Specialist program offered at U of T Mississauga as long they meet the admission requirements and the program combination satisfies the requirement for the Honours Degree and the Concurrent Teacher Education Program.

Year 1 and Year 2 Entry

It is anticipated that applications for this P/J CTEP option will be accepted from secondary school students wishing to enter directly into the program or from first year university students interested in beginning the P/J CTEP option in Year 2. All applicants must choose one of the Major programs listed in the previous section. After second year P/J CTEP students will be eligible to upgrade their PSY or EHL Major to a Specialist if they meet the admission requirements.

Recruitment of secondary students will begin in September 2009. Students who are enrolled in first year as of winter 2010 can be recruited via PSY100Y5 and can apply with the same deadline as those applying to Chemistry, Math or French. The estimated enrollment in this program is 30 students. First year Psychology enrolls approximately 1300 students so it is projected that the target enrolment will not be difficult to achieve. Additionally there has been a tremendous interest in a primary/junior program at U of T Mississauga at the many recruitment fairs over the past two years.

Suggested prerequisite courses for applicants from secondary school

Applicants from Secondary School must have completed the following courses:

- ✓ 4U Math (Data Management Recommended)
- ✓ 4U English
- ✓ 4U Biology recommended (students will have to take a course on the biological basis of behaviour)

P/J CTEP Required Courses

Students enrolled in the P/J CTEP option must complete the following courses over their 4 or 5 years in the program:

- ✓ All CTE courses at U of T Mississauga
- ✓ All B.Ed. courses
- ✓ PSY100Y5 Introduction to Psychology
- ✓ PSY210H5 Introduction to Developmental Psychology
- ✓ PSY345H5 Exceptionality: Disability and Giftedness
- ✓ PSY442Y5 Practicum in Exceptionality (only students in the Specialist Program in Exceptionality in Human Learning; optional for the rest who qualify for admission). Students may take this course in fourth year, in which case CTEP and PSY will coordinate their placement to satisfy both program requirements. Alternatively, they may take it in their fifth year due to the professional term requirements for the second term in fourth year of the education part of CTEP. In

this case they would be required to complete a full 78 hour placement associated with this course.

Recommended Courses for P/J CTEP option students

The following courses are **strongly** recommended for P/J CTEP option students:

- ✓ PSY311H5 Social Development
- ✓ PSY312H5 Cognitive Development
- ✓ PSY315H5 Language Acquisition
- ✓ PSY321H5 Cross Cultural Psychology
- ✓ PSY341H5 Disorders of Children and Adolescents

Upon completion of their degree requirements each candidate will progress towards taking Additional Qualification Courses in Special Education. The combination of a H.B.Sc. in Human Exceptionality in Learning and the Additional Qualifications in Special Education will make these graduates very marketable.

The following information provides an overview of the existing CTEP options across the University of Toronto and the various course options that are currently in place.

Current CTEP Website Information

The Concurrent Teacher Education Program values and is committed to the development of strong university, school, community partnerships. Over the course of the program, Concurrent Education Students will have a variety of field-based education-related experiences and the opportunity to connect these experiences to content taught in their courses at the University of Toronto. Initially, students observe in school communities and gradually become involved in tutoring, student teaching, and research-based inquiry experiences. In addition to the field experiences, students will have two supervised practicum placements, as well as an internship experience.

What Teaching Levels and Areas of Study does CTEP Offer?
If you want to become an elementary school teacher - preparation is at the Primary/Junior **(P/J)** level which spans Kindergarten to Grade 6. You will be a generalist teacher as you will be responsible for teaching many subjects including Math, Music, Drama, Science etc.

- **P/J students at U of T Scarborough** must apply to study in one of the following areas: Mathematics, Chemistry, Physics or French.
- Students interested in applying to the **Victoria College P/J Program** in **Year 2** are encouraged to enroll in the Ryerson stream of the Vic One Program in Year 1 of their H.B.A. or H.B.Sc. degree.

If you want to become a secondary teacher - preparation is at the Intermediate/Senior **(I/S)** level, which spans Grades 7 to 12.

Every Concurrent Education Student intending to teach in secondary school must select one **anchor subject**, which becomes their main area of study in the undergraduate program, as well as one of their **two** teaching subjects. Each CTEP Unit offers different **Anchor Subjects** in high demand subject areas where there is an identified need for teachers:

University of Toronto Mississauga: **Chemistry, French, Math**
University of Toronto Scarborough: **Chemistry, French, Math, Physics**
Faculty of Physical Education and Health: **Health and Physical Education**
Faculty of Music: **Music Instrumental, Music Vocal**
St. Michael's College: **Religious Education**

Other Teaching Subjects

In addition to having an anchor subject, each concurrent education student intending to teach in secondary schools must select another teaching subject from the approved CTEP list:

Business Studies -- Accounting
Business Studies -- Information and Communication Technology
Business Studies -- General
Computer Studies
Dramatic Arts
Economics
English
Family Studies
French as a Second Language
Geography
Health and Physical Education
History
Social Sciences - General
International Languages German
International Languages Italian
International Languages Spanish
International Languages Other
Mathematics
Music: Instrumental
Music: Vocal
Politics
Religious Education
Science: Biology
Science: Chemistry
Science: General
Science: Physics
Visual Arts

Note: The choice of second teaching subjects depends on the courses available at a particular campus, faculty or college and the student's schedule.

Intermediate/Senior candidates must focus in depth on their teaching subjects and they must complete 4 or 5 full credits in their chosen subject area. By the end of Year 1 of the

program, I/S candidates must decide on their second teaching subject so that they can start working towards accumulating the 4 or 5 credits required. Students who enter the program in Year 2 are required to declare their second teaching subject when accepting their position in the program.

What Courses Can I Take as Part of CTEP?

This chart illustrates how the Concurrent Teacher Education Program courses and hands-on opportunities are distributed across the years of the program:

Undergraduate Degree	H.B.A., B.Mus., B.P.H.E., and H.B.Sc. Courses	Professional Education Degree	B.Ed. Courses
This column focuses on the undergraduate degree and provides information on the credit value and sequence of courses (by year)	This column focuses on the undergraduate degree course titles and components	This column focuses on the Bachelor of Education degree and provides information on the credit value and sequence of courses (by year)	This column focuses on the Bachelor of Education degree course titles and components

Legend – The shading & patterns used on the charts below indicate the following:

	Early Foundations Courses		Advanced Foundations Courses
	Subject Studies Courses		Methodology Courses
	Unit-Specific Internship		Practicum Experience (Evaluated Student-Teaching Experience
	Unit-Specific Education Related Electives		
	Joint Program Features		

Undergraduate Degree	H.B.A., H.B.Sc., B.Mus., B.P.H.E., and Courses	Professional Education Degree	B.Ed. Courses
0.5 **Years 1 or 2**	Child and Adolescent Development in Education with 20-hour field experience focused on the learner	**0.5** **Year 4**	Psychological Foundations of Learning (B.Ed.)
0.5 **Years 2 or 3**	Equity and Diversity in Education with 20-hour field experience focused on the community and schools	**0.5** **Year 4**	Social Foundations of Teaching and Schooling (B.Ed.)

0.5 **Years 2 or 3**	Communication and Conflict Resolution (Menu of Courses)	**0.5** **Year 3**	Principles of Teaching: Legal, Ethical and Professional (B.Ed.) School Law (B.Ed.) = *On-line component that is part of the Principles of Teaching course*
1.0 (2 x 0.5 A minimum of credits each SS&T) **Years 1, 2, 3 and Fall Session Year 4**	2 Subject Studies for Teachers Courses (Menu of existing courses and possibility of new courses in unit's such as Math for Teachers)	**0.5** **Year 3**	Inclusive Education: ESL and Exceptional Learners (B.Ed.) with 20-hour field experience focused on observation/tutoring
		0.5 **Years 4 and 5**	Mentored Inquiry and Teaching With up to 30 days in schools (10-15 MIT days per 0.25 Course)
0.5 or no credit (credit value determined by unit) **Years 3, 4 or 5**	CTEP Internship	**2.0** **Years 4 and 5**	Curriculum, Instruction and Assessment Primary/Junior and Intermediate/Senior
Range of Courses Years 1, 2, 3, 4 or 5	Education-related Electives - a list of courses offered by each unit.0.25, 0.33, 0.67, 0.5 and 1.0 courses At U of T Mississauga, these courses could help candidates build a Minor in Education.	**0.5 (2 x 0.25 Prac)** **Years 4 and 5**	Practicum *Year 4 - Professional Session 35-40 days* *Year 5 - End of April- May 20-25 days*
CTEP e-Portfolio from Years 1 to 5: Student to Professional			
CTEP Community (includes CTEP On-line Community Organization within Blackboard)			
3.0 Credits Undergraduate Degree		**5.0 Credits Education Degree**	

The course content of the program includes theory, method and foundation courses and there is a strong emphasis on linking theory with practice. Candidates must successfully complete 14 core components in order to be recommended for the program degrees (H.B.A., H.B.Sc., B.P.H.E, or B.Mus. and the B.Ed.) and to be recommended for the Ontario Teachers' Certificate of Qualification. The core components in the concurrent program include:

The Early Foundations Courses

Child and Adolescent Development: Focuses on research on child and adolescent development. Candidates explore how best to facilitate growth and learning in the area of education. This course includes a 20-hour field experience and entails observation of development across the various age groups.

Equity and Diversity in Education: Focuses on raising awareness and sensitivity to equity and diversity issues facing teachers and students in diverse schools and cultural communities. It includes a 20-hour field experience that entails observation of, and participation in, equity and diversity efforts in a community organization.

Communication and Conflict Resolution: The course focuses on principles and practices of conflict management and resolution, emphasizing interpersonal communication, including cross-cultural perspectives and communicating across different identities and worldviews, with emphasis on the relevance of these skills, principles, and processes to teaching and schooling.

Principles of Teaching: Legal, Ethical and Professional: Builds understanding of teaching as a professional practice. The course will primarily focus on the research base underlying policies and documents such as the Foundations of Professional Practice. This course is linked to an online module on School Law.
Subject Studies Courses: Provide a foundation in subject areas for I/S teachers in the Ontario School System. These courses develop an understanding of the basic concepts required to implement the K-12 curriculum. Primary/Junior candidates are expected to increase their knowledge in a broad range of subject areas, while Intermediate/Senior candidates focus in more depth on their teaching subjects.

The Advanced Foundations Courses

Inclusive Education: ESL and Exceptional Learners: Provides a foundation in inclusive curriculum and pedagogical practices for diverse exceptional learners (including behaviour, communication, intellectual, physical, and multiple exceptionalities) and students for whom English is a second language (ESL). This course includes a field experience involving observation of a variety of exceptional and English language learners.

Social Foundations of Teaching and Schooling: Focuses on how teachers can support diverse students' learning in classroom and school system settings. Requires developing understandings of classroom social and cultural dynamics in relation to teachers' curricular and pedagogical choices, working relationships among teachers and administrators in schools, and how educational policies shape diverse students' experiences of schooling. This component is linked to the Year 4 Professional Session Practicum.

Psychological Foundations of Learning: Focuses on key psychological theories and research relevant to student learning. Explores how psychological factors and a teacher's understanding of these issues influence student learning, student motivation and the learning environment. This component is linked to the Year 4 Professional Session practicum.

Methodology Courses

Curriculum, Instruction and Assessment: Emphasizes subject-specific methodology. Students are introduced to curriculum documents appropriate to their division(s), evidence-informed pedagogical practices, and assessment and evaluation methods.

Mentored Inquiry and Teaching: Draws upon foundational and curricular concepts introduced throughout the program. The goal is to help new teachers make sense of their teaching experiences as beginning practitioners through inquiry projects. This course includes 10 to15 Mentored Inquiry and Teaching days in schools over the course of the academic year. This component will be taken in conjunction with other B.Ed. courses including *Curriculum, Instruction, and Assessment* and practicum placements.

New Program Proposal for 2009-2010 Calendar

1. Program: Environmental Management Minor ERMIN1425 (Arts)

Within an Honours degree, 4.0 credits are required, of which at least 1.0 must be at the 300 level. Enrolment in this program is limited to students who have completed ENV100Y5 with a mark of 60% or higher.

First Year 1.0 credits	1. **Introduction/Foundation:** ENV100Y5 *Be sure to look ahead and plan to complete the prerequisites for any upper-level courses that are of interest to you.*
Second Year 1.5 credits	1. **Environmental Management Core:** ENV201H5 2. **Social Science/Humanities Perspectives:** 0.5 credits chosen from this list: ENG259H5; GGR202H5, 207H5, 208H5, 209H5, 288H5; PHL255H5, 273H5; POL250Y5; SOC226H5 3. **Scientific Perspectives:** 0.5 credits chosen from this list: BIO201H5, 205H5; ERS201H5; GGR214H5, 217H5, 227H5; PHY237H5
Upper Years 1.5 credits	1. **Experiential, Field & Research Perspectives:** 0.5 credits chosen from this list: ENV232H5, 299Y5; GGR379H5, 389H5; or another program-relevant Field, Experiential, or Research course, with permission of the Program Advisor 2. 1.0 additional credits chosen from this list: ANT368H5; ECO373Y5; ENV393H5; GGR329H5, 333H5, 345H5, 348H5, 349H5, 361H5, 365H5, 367H5, 369H5, 370H5, 378H5, 380H5; HIS318H5, 319H5; HPS328H1; MGT394H5; PHL373H1; POL343Y5; SCI398Y5; SOC319Y5, 339H5, 349H5, 355H5, 356H5; WRI375H5

*Note: This is intended to be an **interdisciplinary** program. At least four different disciplines must be represented among the courses that are counted as program requirements. For example, a course list selected from ENV + GGR + HIS + PHL is acceptable, but a course list selected only from ENV + GGR + HIS is not; a course list selected from ENV + HIS + ECO + POL is acceptable, but a course list selected only from ENV + HIS + POL is not. Please contact the Program Advisors or Academic Counsellor if you have any questions about the validity of your course selections.

2. Academic Rationale for creation of the program:

Ever since the major reorganization of Environment programs was undertaken at the University of Toronto Mississauga in 1995, students have expressed a strong interest in having the option of a Minor program in Environmental Management to complement

their discipline-based studies (in fact, students have often expressed dismay at the lack of such a program). The **interdisciplinarity** of the Environment Major programs makes them ideal in combination with discipline-based programs; the existence of a Minor in Environmental Management will give additional flexibility for students to add an applied focus on the environment to their discipline-based studies.

The Environmental Management (H.B.A.) programs (Specialist, Major, and now the Minor) **focus primarily on the social, economic, and policy aspects of the study of the environment**. The programs **draw from a variety of disciplines, mainly in the Humanities and Social Sciences**. Students specialize through the design of their individual pathway through Environmental Management, customizing the program to suit their interests and skills.

No matter which pathway is taken, students in the Environmental Management (H.B.A.) program streams – even though they are mainly Arts-based students – are expected to take some basic Science courses. The premise is that **those who will set environmental policy and guide society through our current environmental challenges should have some basic scientific understanding, in addition to having a firm grounding in social, policy, and/or economic aspects of environmental studies**.

The Environment programs at the University of Toronto Mississauga are truly interdisciplinary. Current environmental problems require interdisciplinary solutions and we have designed these programs to provide students with appropriate backgrounds to achieve this.

We have selected a core group of courses for this program that – while still maintaining interdisciplinarity – gives the new Minor a distinct identity, different from Minors offered by the contributing disciplines. We have made it mandatory that at least four different disciplines be represented among the program-related course selections. This Minor will allow students from the Humanities and Social Sciences to add an environmental focus to their discipline-based studies.

3. Learning Outcomes

All of the Environmental Management programs, including the new Minor, start from a Science core course (ENV100Y5 The Environment). In this course students acquire a **basic scientific understanding** of the functioning of the natural environment and human impacts on the natural system. They are taught to think like scientists and to approach environmental issues from a **critical analytical perspective**. Students emerge from this course with the essential Science background to continue in upper-level courses in a variety of disciplines, including Biology, Earth Science, and Geography; the fact that the course is accepted as a prerequisite for upper-level coursework in these (and other) departments is a testament to both the **depth and breadth of content knowledge** students gain through the course. An additional core course in the Minor is ENV201H5, Environmental and Resource Management (SSc). This course focuses on **integrating** the scientific background gained in ENV100Y5Y with **social, economic, and policy approaches** to environmental, resource, and land management.

The concept of **interdisciplinary literacy** has guided the Environment programs at U of T Mississauga from the beginning – all the way back to the early 1980s, when Ecology was a core required course in Environmental Management (variously listed as a B.A. or B.Sc. in the early years). It remains a valid philosophical grounding in today's world, where both social awareness on the part of scientists and scientific literacy on the part of policy makers are more important than ever.

One of our core philosophies with regard to the role of the Environment programs in combined degree programs is that the discipline-based course of study gives the student an academic core, while the interdisciplinary course of study gives the student a **practical, applied focus on environmental issues**. This philosophy has always worked well for our students.

We also have significant contact with employers in the Environment industry, through our experiential learning and community-based research opportunities, and they tell us that they, too, appreciate the value of a solid, discipline-based foundation combined with an applied focus on environmental issues. In addition to ENV100Y5 and ENV201H5, an integral aspect of all of the Environment programs, including the new Minor program, is the opportunity for students to pursue **fieldwork, independent research opportunities, and/or a service-learning or experiential learning opportunity**. This is consistent with the University's goals as expressed in Stepping Up.

Through coursework, experiential and service learning, research opportunities, and abundant extracurricular opportunities associated with this program, students will have the opportunity to gain a deep understanding of the **professions** within the interdisciplinary field of environmental science. We also have established close connections with the Environmental Careers Organization (ECO), the sector council for the environment industry in Canada, and intend to move towards a rationalization of the requirements of all University of Toronto Mississauga Environment Programs with the criteria for readiness for professional certification through CECAB, the Canadian Environmental Careers Assessment Board. We anticipate that all of the programs will fit easily into CECAB's certification structure.

4. Departmental/College Resource Implications:

General: The only resource implication that we can identify would be enhanced student interest in some courses, primarily those that are featured prominently in the new program, notably ENV100Y5 and ENV201H5. Plans had already been made to move to two sections in ENV100Y5 to accommodate student demand, so this it should not be a problem to accommodate the additional students. In fact, enrolments in the course may not increase at all as a result of the new program – the program enrolments may derive from students who are already taking ENV100Y5. ENV201H5 (formerly GGR234H5 Environmental and Resource Management) becomes a core course for the new Minor program, and there may be some enrolment pressure on this course as a result. Professor Conway is willing to expand the course to manage additional demand, provided TA assistance will be available to match the increase in student numbers. We have consulted with any other department/professor with courses that would be materially affected by

any of the changes proposed here. All of them are happy and excited to be associated with the new program. A list with the details of these consultations is appended.

Estimated Enrolment per Academic Year in the new program: We anticipate that the enrolment in this new program will start with approximately 5 students and will likely go to 30 students within the first few years of its existence. This is a conservative estimate, based on the healthy enrolments in the existing Environmental Management Major and Specialist programs.

New courses necessary to mount for this program: None

Additional Instructor(s) Requirements: None. We have purposely constructed the programs with a lot of flexibility around course choices, to accommodate courses that may not be taught every year. In addition, we have ensured that all of the "core" courses are courses that already taught every year and would not require any additional stipend or overload funding.

Teaching Assistant(s) Requirements: We do anticipate the potential for increased student interest and thus in enrolments in some core courses, notably ENV201H5, and this may eventually require additional TA support. All departments with courses that may experience growth have been consulted, as discussed above.

Laboratory Equipment Requirements: None anticipated

Computing Resources Requirements: None anticipated

New Program Proposal for 2009-2010 Calendar

1. Program: Environmental Science Minor ERMIN1061 (Science)

Within an Honours degree, 4.0 credits are required, of which at least 1.0 must be at the 300 level. At least four different disciplines* must be represented among the 4.0 credits that are counted as program requirements.
Enrolment in this program is limited to student who have completed ENV100Y5 with a mark of 60% or higher.

First Year 1.0 credits	1. **Introduction:** ENV100Y5 *Be sure to look ahead and plan to complete the prerequisites for any upper-level courses that are of interest to you.*
Second Year 2.0 credits	1. **Environmental Management Perspectives:** ENV201H5 2. **Biological & Ecological Perspectives:** 0.5 credits chosen from this list: BIO201H5, 204H5, 205H5, 206H5 3. **Geographical & Earth Science Perspectives:** 1.0 credits chosen from this list: GGR214H5, 217H5, 227H5; ERS201H5, 202H5, 203H5
Upper Years 1.0 credits	1. **Field, Experiential & Research Perspectives:** 0.5 credits chosen from this list: ANT318H5; BIO301H5, 302H5, 313H5, 316H5, 329H5; ERS325H5; ENV232H5, 299Y5, 399Y5; GGR317H5 (with field trip option), 379H5; SCI398H5; or another program-relevant Field, Experiential, or Research course, with permission of the Program Advisor 2. **Biogeochemical Perspectives:** 1.0 credit chosen from this list: BIO311H5, 330H5, 333H5, 373H5; CHM311H5, 333H5, 347H5, 361H5, 362H5, 391H5, 393H5; ERS315H5, 321H5; GGR305H5, 307H5, 309H5, 311H5, 315H5, 316H5, 317H5, 321H5, 337H5, 338H5, 372H5, 375H5, 377H5, 378H5; JBG312H5; PHY331H5, 332H5

*Note: This is intended to be an **interdisciplinary** program. At least four different disciplines must be represented among the courses that are counted as program requirements. For example, a course list selected from ENV + BIO + ERS + GGR is acceptable, but a course list selected only from ENV + BIO + GGR is not; a course list selected from ENV + BIO + ERS + CHM is acceptable, but a course list selected only from ENV + BIO + ERS is not. Please contact the Program Advisors or Academic Counsellor if you have any questions about the validity of your course selections.

2. Academic Rationale for creation of program:

Ever since the major reorganization of Environment programs was undertaken at the University of Toronto Mississauga in 1995, students have expressed a strong interest in having the option of a Minor program in Environmental Science to complement their discipline-based studies (in fact, students have often expressed dismay at the lack of such a program). The **interdisciplinarity** of the Environment Major programs makes them ideal to combine with discipline-based programs; the existence of a Minor in Environmental Science will give additional flexibility for students to add an applied focus on the environment to their discipline-based studies.

The Environmental Science (H.B.Sc.) programs (Specialist, Major, and now the Minor) **draw from a variety of disciplines, mainly in the Sciences**. The programs, including the new Minor, offer an opportunity to **acquire a broad foundation in the interdisciplinary sciences required to understand and find solutions for complex environmental problems.** Students can tailor the scientific focus of the programs to their specific interests.

No matter which pathway is followed through Environmental Science, some coursework on social and policy perspectives are a required part of the program. The premise is that **those who will develop our scientific knowledge and technological capacities, and whose scientific research will guide environmental policy must also have a basic understanding of the social, economic, and policy implications of their work.**

The Environment programs at University of Toronto Mississauga are truly interdisciplinary. Current environmental problems require interdisciplinary solutions and we have designed these programs to provide students with appropriate backgrounds to achieve this. We have selected a core group of courses for this program that – while still maintaining interdisciplinarity – gives the new Minor a distinct identity, different from Minors offered by the contributing disciplines. We have made it mandatory that at least four different disciplines be represented among the program-related course selections. This Minor will allow students from the Sciences to add an environmental focus to their discipline-based studies.

3. Learning Outcomes

All of the Environmental Science programs, including the new Minor, begin with ENV100Y5, a Science course. In this course students acquire a **basic scientific understanding** of the functioning of the natural environment and human impacts on the natural system. They are taught to think like scientists and to environmental issues from a **critical analytical perspective**. Students emerge from this course with the essential Science background to continue in upper-level courses in a variety of disciplines, including Biology, Earth Science, and Geography; the fact that the course is accepted as a prerequisite for upper-level coursework in these (and other) departments is a testament to both the **depth and breadth of content knowledge** students gain through the course. An additional core course in the Minor is ENV201H5, Environmental and Resource Management (SSc). This course focuses on **integrating** the scientific background gained in ENV100Y5 with **social, economic, and policy approaches** to environmental, resource, and land management.

The concept of **interdisciplinary literacy** has guided the Environment programs at the University of Toronto Mississauga from the beginning – all the way back to the early 1980s, when Ecology was a core required course in the early Environmental Management programs (which was variously listed as a B.A. or B.Sc. in the early years). It remains a valid philosophical grounding in today's world, where both social awareness on the part of scientists and scientific literacy on the part of policy makers are more important than ever.

One of our core philosophies with regard to the role of the Environment programs in combined degree programs is that the discipline-based course of study gives the student an academic core, while the interdisciplinary course of study gives the student a **practical, applied focus on environmental issues**. This philosophy has always worked well for our students.

We also have significant contact with employers in the Environment industry, through our experiential learning and community-based research opportunities, and they tell us that they, too, appreciate the value of a solid, discipline-based foundation combined with an applied focus on environmental issues. In addition to ENV100Y5 and ENV201H5, an integral aspect of all of the Environment programs, including the new Minor program, is the opportunity for students to pursue **fieldwork, independent research opportunities, and/or a service-learning or experiential learning opportunity**. This is consistent with the University's goals as expressed in Stepping Up.

Through coursework, experiential and service learning, research opportunities, and abundant extracurricular opportunities associated with this program, students will have the opportunity to gain a deep understanding of the **professions** within the interdisciplinary field of environmental science. We also have established close connections with the Environmental Careers Organization (ECO), the sector council for the environment industry in Canada, and intend to move towards a rationalization of the requirements of all University of Toronto Mississauga Environment Programs with the criteria for readiness for professional certification through CECAB, the Canadian Environmental Careers Assessment Board. We anticipate that all of the programs will fit easily into CECAB's certification structure.

4. Departmental/College Resource Implications:

General: The only resource implication that we can identify would be enhanced student interest in some courses, primarily those that are featured prominently in the new program, notably ENV100Y5 and ENV201H5. Plans had already been made to move to two sections in ENV100Y5 to accommodate student demand, so this it should not be a problem to accommodate the additional students. In fact, enrolments in the course may not increase at all as a result of the new program – the program enrolments may derive from students who are already taking ENV100Y5. ENV201H5 (formerly GGR234H5 Environmental and Resource Management) becomes a core course for the new Minor program, and there may be some enrolment pressure on this course as a result. Professor Conway is willing to expand the course to manage additional demand, provided TA assistance will be available to match the increase in student numbers. We have consulted

with any other department/professor with courses that would be materially affected by any of the changes proposed here. All of them are happy and excited to be associated with the new program. A list with the details of these consultations is appended.

Estimated Enrolment per Academic Year in the new program: We anticipate that the enrolment in this new program will start with approximately 5 students and will likely go to 30 students within the first few years of its existence. This is a conservative estimate, based on the healthy enrolments in the existing Environmental Science Major and Specialist programs.

New courses necessary to mount for this program: None

Additional Instructor(s) Requirements: None. We have purposely constructed the programs with a lot of flexibility around course choices, to accommodate courses that may not be taught every year. In addition, we have ensured that all of the "core" courses are courses that are already taught every year and would not require any additional stipend or overload funding.

Teaching Assistant(s) Requirements: We do anticipate the potential for increased student interest and thus in enrolments in some core courses, notably ENV201H5, and this may eventually require additional TA support. All departments with courses that may experience growth have been consulted, as discussed above.

Laboratory Equipment Requirements: None anticipated

Computing Resources Requirements: None anticipated

Proposed Deleted Programs – Curriculum 2008

Environmental Analysis and Monitoring (Science): Major & Specialist
Environment and Human Society (Arts): Major

It has been the consensus for a number of years among those involved in the interdisciplinary Environment and Human Society program and the Environmental Analysis and Monitoring programs to discontinue them, due to the historically low enrollments in each. These changes to the programs are a consolidation of four program streams into two; and the two programs that remain are a harmonization of the content and objectives of the original four.

The Environmental Analysis and Monitoring Major & Specialist will be combined with the better-subscribed Environmental Science Specialist Program (Science). Within the new Environmental Science Specialist it will still be feasible for students to follow a pathway that emphasizes the application of laboratory analytical sciences to environmental problems. The originator of these programs has been consulted and the discontinuation has been approved. The current enrollment in the Major program is 2 students while the Specialist has only 1 currently registered student; these students will be grandfathered.

Along with the Environmental Analysis Major & Specialist programs proposed for discontinuation, the Environment and Human Society Major program will be discontinued and its content and objectives merged into the Environmental Management Major Program (Arts). Within the new Environmental Management Major Program it will still be feasible for students to follow a pathway that emphasizes the application of concepts and knowledge from the Humanities (Philosophy, History, etc.) to the understanding of environmental problems. The originators of this program have been consulted and have approved the discontinuation of this program. At present there are 15 students registered in the Environment and Human Society Major; they will be grandfathered.

Health Sciences Communication (Science): Specialist

Although not a result of the recent review of the Institute of Communication and Culture, the discontinuation of the Health Sciences Communication Specialist program is in line with the direction the Institute is seeking to establish, and will no longer be offering the Specialist program in 2010-2011.

Since its inception in 2005, the Heath Sciences Communication Specialist program in CCIT has attracted only two students. To date, none have graduated. The reason for the low participation is that students in CCIT do not have the requisite science background for the HSC Specialist program, nor do they have the GPA.

It is recommended that interested students consider the Health Science Communication Major. In 2007, the Heath Sciences Communication Major program was designed to eventually replace the Specialist Program. The course selection is similar to the Specialist Program; however, the number of Biology courses and minimum GPA were lowered.