Fleming College

LEARN | BELONG | BECOME

Self-Study

Environmental Technology Program
2012

Confidential

The information in this Self-Study is for the confidential use of ECO Canada, the Canadian Environmental Accreditation Commission and its authorized agents, and will not be disclosed without the express authorization of the program's corporate authority.

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1 About Fleming College

Community colleges in Ontario were created as a response to a particular need at a particular point in time. Community colleges, or Colleges of Applied Arts and Technology as they are called in Ontario, and CEGEPs in Quebec, were devised to meet the needs of that part of the population for whom university was not accessible but who still needed and desired a post-secondary education. In other words, the history of community colleges cannot be categorized as an organic evolution but rather as reactionary construction. The first offices of Sir Sandford Fleming College opened in Peterborough in 1967.

Leslie Frost was one of the prime instigators for the opening of Sir Sandford Fleming College Forestry Technician School in Lindsay (Frost Campus) that same year. An agreement was made between the Department of Lands and Forests, the Board of Governors of the college and Father Carrol to share the use of St Mary's Convent. The Department of Lands and Forests transferred their Forest Ranger school program to the Russell Street Campus.

Fleming College Vision, Mission & Core Promise From Strategic Plan

Vision

Students succeeding through personalized learning. Innovation and achievement powered by people.

Mission

Fleming champions personal and career success through applied learning. We contribute to community success and sustainability through programs, service and applied research.

Core Promise to Students

At Fleming College, you become part of a learning community. We engage you in personalized learning and provide personalized support. Set in welcoming communities, our smaller campuses provide a friendly environment where people know your name. Close relationships, high expectations and a hands-on, minds-on learning experience help you develop the knowledge and skills, attitudes and values that lead to success at work and in life. From here, you can go anywhere as you begin or change your career. Or, through well-developed educational pathways, you can pursue further educational opportunities. You will experience first-hand our commitment to innovation in programs and practices and to building sustainable, healthy futures for our people, communities and environment.

For all of these reasons, 99% of Fleming Students agree they made the right choice coming to Fleming College.

Fleming's 2010—2015 Strategic Plan is available here.

Fleming's 'core promise', "Learn, Belong, Become", places continued emphasis on the provision of high quality learning opportunities for students in a supportive community that enables students to develop to their full potential. This 'core promise' serves as a key directional statement for the college's strategic plan in 2010 and beyond.

The Frost Campus

The Frost Campus serves approximately 1,800 full-time students and has prepared graduates for entry into careers in the environment and natural resources sector of Canada's economy for 45 years. The campus offers 27 programs in Environment, Natural Resource Sciences, and the success and reputation of Frost graduates in their careers is nationally recognized and respected. The high regard in which our graduates are held by employers constitutes our most significant success. The reputational value of our "product" is acknowledged as being second to none. Fleming College's Frost Campus features a 42,000 square foot Environmental Technology Wing that demonstrates various "green" technologies encompassing renewable energy sources, environmentally sensitive building design and materials, and specialized features including a Green Roof and a Living Wall.

The Centre for Alternative Wastewater Treatment (CAWT) is also at the heart of the school's Environmental Technology Wing. The CAWT is focused on achieving a scope of constructed wetland research that does not presently exist in Canada. It is a hub for constructed wetland and alternative wastewater treatment expertise, applied research, education, resources and demonstration projects. The CAWT fosters collaborative research partnerships with universities, government agencies, non-governmental organizations, and the private sector. In addition, it fosters and engages in opportunities to enhance student learning through the integration of applied research activities in student curricula.

Fast Facts: By the Numbers

- 20,000 alumni
- 1,800 full-time students
- 27 programs
- approximately $500,000 in contract training and continuing education activity per year
- $2.3 million in federal research funding for Centre for Alternative Wastewater Treatment in 2010
- 150 acres (60.7 hectares) campus property
  = 45 Years of success – more graduates working in the environmental and natural resources sectors than any other college in Canada

Frost Campus Vision 2011-2015

The Environmental Technology program is offered at Fleming College's Frost Campus in Lindsay, Ontario, home to the School of Environmental and Natural Resource Sciences (SENRS).

OUR VISION FOR FROST CAMPUS IS GROUNDED IN THESE STRATEGIC PRIORITIES:

1. Thematic Focus on Water

Within the context of environmental and natural resource sciences education and training, water is a common theme that flows through all programs at the campus, providing an interdisciplinary approach to education, research and innovation.

A new brand for the campus, integrated with the college brand, recognizes and celebrates the distinctive learning environment, culture, history and location of this campus – while expressing its vision for the future.

2. Enrich the Quality of the Student Experience

Every student participates in a unique, hands-on, minds-on learning experience, through a workplace experience, a community-based learning experience or an applied research opportunity. A field camp is embedded in every program.
More students, faculty and staff have international opportunities and more international students choose to study at our campus, experiencing and enriching the campus culture.

3. Business Growth and Viability

The School, Contract Training/Continuing Education and the Centre for Alternative Wastewater Treatment are integrated, aligned and leveraged to achieve strategic and competitive advantage. This focus benefits our full-time students, continuing education students, community members, and industry on a local and a global scale, while capitalizing on our unique expertise.

A metric is established to determine the ideal full-time post-secondary population and other revenue-generating opportunities, resulting in achieving a campus financial break-even point and in generating a revenue stream to the college.

Non-traditional modes of delivery are developed where viable and strategically aligned, such as compressed, blended and off-site delivery. These modes provide outreach training to Aboriginal communities in fields where there is a current and future demand.

Certification and training opportunities are developed for university graduates, current students, industry and the local community, leading to growth in these markets.

New university partnerships and joint delivery efforts with universities are established through the creation of three to four new joint programs or partnerships over the five year period.

Increased student recruitment targeted towards the Greater Toronto Area, Southern Ontario, large Canadian urban centres, and internationally (including the United States), results in continued growth from these areas.

4. Maximize our Campus Infrastructure and Facilities

The Frost Campus Master Plan is developed, with recommendations for future space and land use. Through the enhancement of college facilities and the restoration of college lands, the campus becomes a true “learning lab” and model environmental sustainability demonstration site.
Land use plans for the Frost Campus including the Smith Farm and Dahl properties are developed with a view towards potential use as sites for field trips, field and project work and camp activities.

5. Human Resources and Organizational Design

Succession planning in all departments at the Frost Campus has become a priority in order to address the known increase in impending staff retirements over the next 5 years. A review of the Frost Leaders

Team (FLT) mandate and membership is also recommended. Considering alternative staffing models in program delivery that includes the expanded use of technologists and technicians in support of learning and teaching is also a priority.

6. Partnerships

Partnership priorities include, but are not limited to:

- Collaboration with community partners in the support of the Community Links Centre for Community-Based Projects and Social Mapping (C-Links). C-Links is a community-based research and education centre that will become the clearing house for community-based student project work, data warehousing and community-based research.
- Expand activities in our Industry Innovation Office
- Continue to set and achieve goals that are established annually within the context of the City of Kawartha Lakes and Fleming College Sustainability Agreement

2 About Fleming's Environmental Technology Program

The Environmental Technology program was created in the early 1980's from a need to fill a sector within the community college system that was void of pure environmental training. Originally, this program was splintered from the Geology Program at Fleming under the name of Terrain Geology. This name was further modified in 1988 to the Terrain and Water Resources Program to better reflect the environmental nature of the curriculum and to make it distinct and identifiable from the Geology Program. Subsequently, in 2004, the name was changed (Appendix 1) to the Environmental Technician and Environmental Technology Programs (collectively referred to as the "Environmental Technology Program" to represent all program streams) with the acronym ETN to represent students in the two-year Environmental Technician stream, ETY to represent students in the three-year stream and ETD to represent students in the Advanced Standing Environmental Technician stream; all of which stand to the present.

Environmental Technology Program – Mission Statement

The Mission of the Environmental Technology program is to provide students with exceptional training, knowledge and skills at the advanced level in the sciences comprising the environmental discipline. Students are provided with sound education and core competencies in current theories, principles and practices unique to the environmental discipline with a strong emphasis on practical hands-on training. The aim is to position our students at an advanced level in order to set them apart from other institutions. Competent instructors ensure that students possess confidence, capability and skills that prepare them to be directly employable as environmental practitioners upon graduation.
The mission statement for the ETY program aligns very well with the mission statement for Fleming College, which is "Fleming champions personal and career success through applied learning. We contribute to community success and environmental sustainability through programs, services and applied research."

Fleming College's strategic priorities include, but are not limited to, achieving excellence in student learning, leading in sustainability, and building community success. The ETY program supports these

strategic priorities through the delivery of quality learning experiences, the provision of industry-recognized hands-on training to students, and the opportunities to partner with the local community and outside agencies through applied research projects and student placement opportunities.

This statement has served as a guide in all aspects of the ETY program direction from guiding the recruitment of full-time faculty as well as part-time faculty from semester to semester, to adoption of procedures and protocols, to the acquisition and implementation of instrumentation and techniques in the field. In addition, the mission statement has set the bar to ensure that the Program remains competitive and current through ensuring currency and competence in faculty, acquisition of capital equipment and supplies, and maintaining/upgrading of infrastructure (teaching resources, classrooms, laboratories, field camps and equipment).

3 Environmental Program Credentials

Students in the Environmental Technology Program graduate with the Environmental Technician diploma in addition to the Environmental Technology (ETY) diploma. The ETY program is an Ontario College Advanced Diploma as defined by the MTCU, credentials validation framework.

Students who successfully complete the required courses in the three-year Program graduate with the Environmental Technology Diploma (ETY).

In order for a student to acquire the three-year ETY Diploma, they must have first successfully completed the ETN program (or equivalent).

It is important to note that the two-year Environmental Technician Program (ETN) was documented and accredited by ECO Canada in June 2010; consequently, the intention of this application and review is to document the key elements of the ***advanced*** third year component in order to secure a separate stand-alone accreditation for ETY. Therefore, in effect, reference to ETY implies that the student already possesses all skills and knowledge obtained from ETN and, therefore, is considered one program for the purposes of accreditation.

4 Environmental Program Contact

Provide contact information for the person responsible for this self-study:

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5 General Requirements

5.1 Institutional Requirements

Institutions Legal Authority

The Ontario Ministry of Training, Colleges and Universities is the Legal Authority for the creation and maintenance of colleges in the Province of Ontario.

Role of the Ministry: The *Constitution Act* gives exclusive authority to each province in Canada to make laws in relation to education. In Ontario, the Minister of Education and the Minister of Training, Colleges and Universities are responsible for the administration of laws relating to education and skills training.

Postsecondary Education

In the area of postsecondary education, the Ministry of Training, Colleges and Universities is responsible for:

- developing policy directions for universities and colleges of applied arts and technology
- planning and administering policies related to basic and applied research in this sector
- authorizing universities to grant degrees
- distributing funds allocated by the provincial legislature to colleges and universities
- providing financial-assistance programs for postsecondary school students
- registering private career colleges

Environmental Technology Program Approval

Fleming College is a legal entity created under the auspices of the Ontario Ministry of Training, Colleges and Universities. The Environmental Technology program received approval from the MTCU in 1985 to offer the program entitled Terrain and Water Resources Technology. Approval for the name change to Environmental Technology was granted and effective September 2001.

A second credential of note is the Environmental Technician and Environmental Technology Standard sanctioned by the Ontario Ministry of College and Universities. Fleming staff at Fleming(including ET Program faculty) were involved in the creation of the original standards in the 1990's and was again involved in the Environmental Standards update currently in Draft form as of February, 2012.

Board of Governors

The College is governed by a formal, Board of Governors, comprised of twelve external governors (appointed), four internal governors (elected by constituent group), the College President, and one (non-voting) student observer (elected).

The Board responsibilities include evaluating and monitoring Fleming College's quality and integrity; review and approval of strategic financial plans, and the annual budget plans and fiscal audits. For details of the authority and responsibilities of the governing board, review Board of Governors "By-Law" Policy No. 1-102 available here.

Institutions Financial Statements

The Fleming College Financial Report for 2012 can be found here and includes the auditors' opinion as to the fiscal integrity.

Institutions Program's Policies and Practices for Occupational Health and Safety Standards

Fleming is committed to the protection of its employees against work-related injuries and illnesses. In fulfilling this commitment, Fleming will provide and maintain a safe and healthy work environment. For details and evidence of policies and practices consistent with the Canadian Occupational Health and Safety Standards please refer to the links below:

Board Approved Policies & Procedures – Policy No. 4-412

Security & Safety at Fleming College

Human Rights and Immigration Policies

Fleming is committed to fostering a diverse and inclusive working and learning environment that is free from any form of harassment, discrimination and bullying. In fulfilling this commitment, Fleming will provide and maintain a safe and healthy work environment. For evidence of human rights and immigrations policies review at the links below:

Board Approved Policies & Procedures – Policy No. 3-311

Diversity & Accessibility

Diversity, Equity & Inclusion

Admissions Policy and Selection Criteria

Admissions – High School Students and Graduates
Admissions – Mature Students

- 5-501 Admission Policy

- 5-502 Issuance of Diplomas and Certificates
- 5-503 Maintenance of and Access to Student Records
- 5-504 Recognition of Academic Excellence
- 5-505 Review of an Admissions Decision
- 5-506 Student Rights & Responsibilities

Academic Regulations
The College presents a set of Academic Regulations to the Board for approval. These regulations, including such items as determination of Academic Standing, Grade Determination and Academic Integrity, among others, will provide guidance and support to the students and staff through the learning process. Details regarding Academic Affairs and the Policy No. 2-201 "Academic Regulations" here.

5.2 Program Requirements

Organization Charts
The Environmental Technology Program is a 3-year, 6-semester program, one of three technology programs offered at the Frost Campus. The Organizational Charts on Fleming's Human Resources webpage provide context as to how the ETY program fits within the institutional organization. Please reference the charts entitled:

- Overall College Structure
- Academic Structure
- School of Environmental and Natural Resource Sciences

These charts depict the overall academic reporting structure. The Academic Chair reports to the Dean, the Dean reports to the V-P Academic and the V-P Academic reports directly to the President of the College.

All programs are operated on the basis of a Program Coordinator model, whereby a full-time faculty member with expertise in the program discipline is provided time release to perform these leadership duties. Please refer here (Appendix 2) for a description of the duties of a Program Coordinator. The term of appointment for a coordinator is three years in duration. The current Program Coordinator, Stephen Thompson, is a full-time faculty member with 25+ years of teaching experience at the College, and over 12 years (collectively) of experience in the role of Program Coordinator for the ETY program. His role will be terminating in September 2012 at which time another ET Program faculty member (Melanie Logan) takes over for a term. Other individuals are given the opportunity to assume this leadership role in the program during the summer term when the incumbent is off on official vacation time.

The ETY Program consists of 5 full-time faculty and 1 full-time Program Technologist. Currently, the program is short one of these faculty as a result of a recent retirement. The replacement complement is anticipated to be filled by December 2012.

6 Environmental Program Development and Maintenance

6.1 Program Goals and Outcomes

6.1.1. Goal & Outcome Relevance

The ETY Mission as stated in section 2 above "About Fleming's Environmental Technology Program" serves as the starting point for all of the program's activities, services and policies. This statement has served as a guide in all aspects of the ET Program direction from directing the recruitment of full-time and part-time faculty from semester to semester, and from the technician to the technologist diploma specializations, to adoption of procedures and protocols and the acquisition and implementation of instrumentation and techniques in the field. In addition, the mission statement has provided a set of internal standards to ensure that the ETY Program remains competitive and current through ensuring currency and competence in faculty, acquisition of capital equipment and supplies, and maintaining/upgrading of infrastructure (teaching resources, classrooms, laboratories, field camps and equipment).

The Ontario Ministry of Training, Colleges and Universities (MTCU) publishes college program standards that apply to all similar programs of instruction offered by college institutions across the province. Each program standard for a post secondary instructional program include a vocational standard that identifies vocationally specific learning outcomes that apply to the program, essential employability skills that will apply to all instructional programs regardless of the instructional program vocation and general education requirements which are required for all postsecondary programs in the province. The Environmental Technology Program Standard (February 2012) may be accessed here.

The vocational outcomes that are based on those identified in the program standards are presented as learning outcomes on the course outline (as presented in Section 6.2.1). These vocational learning outcomes are similar in intent to the environmental competency outcomes that are mapped by ECO Canada during the accreditation process. The ECO Canada environmental competency outcomes are presented in Section 7.1 of this document.

The essential employability skills as identified by MTCU may be accessed here.

The MTCU policy is that all graduates within an Ontario College Advanced Diploma program must be able to demonstrate a reliable competency related to the essential employability skills. The essential employability skills are similar in intent to the Transferable Competency Outcomes that are mapped by ECO Canada during the accreditation process. The ECO Canada environmental competency outcomes are presented in Section 7.2 of this document.

In addition to the governmental program standard outcomes, program goals and outcomes for the ETY diploma are designed to reflect the current state of the environmental workplace, industrial standards of practice, and the expectations employers have for the breadth and depth of training and competency

of ETY graduates. Individual course goals and outcomes, a subset of ETY program standards, support environmentally appropriate and current learning, technologies and practical experience.

6.1.2 Development and Maintenance

The MTCU Environmental Technology Program Standards were updated in consultation with the program coordinators and/or their designate in February 2012. The updated standards provide an update to the required vocational standards for college programs issuing an Ontario College Advanced Diploma in Environmental Technology. As required by MTCU, the ETY program has committed to ensuring the program curriculum reflects the February 2012 updated vocational outcomes and essential employability skills as required by MTCU for students entering the program in September 2013. This process will be completed through curriculum review processes documented in Section 6.2.3 of this document.

In addition to the MTCU Program Standard program goal and outcome standard development and maintenance processes, the ETY program conducts program goal and outcome development and maintenance through a number of formal and informal processes. Internal reviews, meetings and planning sessions are held amongst full and part-time faculty and staff on a regular basis, included efforts targeted towards specific program outcomes and goals. Goal and outcome maintenance and development is also achieved through regular meetings and interaction with the ET program advisory committee.

Program faculty maintain current environmental sector standards for the ETY program through participation in ongoing training courses and certifications, conferences and workshops. In addition, ongoing relationships and projects with partners in the environmental sector (e.g. Kawartha Region Conservation), interactions with numerous agencies (e.g. Ontario Ministry of the Environment), public sector companies via the ETY Industrial Placement course and direct connections to industry and research (e.g. the Centre for Alternative Wastewater Treatment) all contribute positively to the development and maintenance of program outcomes and goals.

6.2 Curriculum Development

6.2.1 Curriculum Documentation

Course syllabi (course outlines) for the most recent offering of the Environmental Technology program course offerings are included for review in Appendix 3:

Semester 1:
MATH 63 Applied Mathematics in Natural Resource Sciences
COMM 44 College Communications for Environmental Science
ENVR 20 Ecology and Environment
ECOS 13 Ecosystem Skills
GEOM 36 Geospatial Techniques
NATR 8 Leadership in the Environment

Semester 2:
COMM 34 Technical Reporting
COMP 345 Introductory Computing
ENVR 11 Environmental Techniques
FSTY 50 Trees and Shrubs of Ontario
SCIE 62 Introductory Chemistry
COMP 461 Data Management for Environmental and Natural Resource Sciences

Semester 3:
ENVR 8 Environmental Measurement
ENVR 15 Land Reclamation Principles
ENVR 19 Watershed Management
SCIE 6 Aquatic Biology
SURV 18 Geomatics in Surveying

Semester 4:
ENVR 13 Erosion Control
ENVR 18 Water Treatment and Pollution Control
ENVR 21 Environmental Legislation
MATH 25 Statistics
SURV 19 Geomatics for Environmental Engineering
APST 27 Field School
ENVR 1 Air Pollution and Abatement

Semester 5:
APST 28 Fall Field School
ECOS 1 Applied Ecology
ECOS 4 Constructed Wetlands
ENVR 5 Environmental Applications
ENVR 6 Environmental Site Assessment and Audit
ENVR 12 Environmental Technology
ENVR 17 Waste Management Approaches

Semester 6:
APST 88 Winter Field School
ENVR 3 Behaviour of Contaminants
ENVR 7 Environmental Laboratory Techniques
ENVR 9 Environmental Planning and Assessment
ENVR 16 Spill Response and Case Studies
FLPL 71 Industrial Placement
GEOL 21 Environmental Hydrogeology
SCIE 16 Environmental Sampling and Analysis

The program course outlines are considered to be formal college publications that provide a snapshot of the individual course content by providing a general summary of the course scope, activities and expectations. Fleming College provides a standardized template for the preparation of course outlines. The course outline is a written agreement between the learner and the course facilitator with mutual responsibilities designated between student and faculty member for summarizing course content and participating in the learning process. The Fleming College guidelines for course outline development and review can be accessed here.

The Fleming College Centre for Learning and Teaching provides resources for faculty with regards to course outline development. Links to documents that provide an overview of the development and writing of course outlines and developing and assessing learning outcomes are as follows:
Guidelines for Writing Course Outlines
The Learning Outcome Approach

Curriculum as documented through each course outline is verified by the Program Coordinator for each semester of the program approximately one year in advance. Curriculum changes identified for the following year are identified and approved by the Academic Chair. Course outlines are approved each semester by the Dean.

6.2.2 Instructional Methodology

Students in the ETY program have successfully completed the Environmental Technician Diploma, which is an ECO Canada accredited program. Due to the progressive nature of the program curriculum, the ETY program has been developed to provide a successive learning component, with the two-year technician program providing a basis for introducing, developing and assessing environmental competencies with the third year technology program providing additional learning outcomes to support and enhance the student's environmental competencies.

As detailed in Sections 6.1.1 and 6.1.2, the program goals and outcomes are based on the vocational outcomes and essential employability skills as required by MTCU. As such, ETY program course outlines and course curriculum have been developed to reflect the required vocational outcomes and essential employability skills through the culminating demonstration of learning and achievement.

Program course outlines are formatted to provide students with the core competencies and essential employability skills that will be reliably demonstrated through the successful completion of the course, a summary of the specific learning outcomes, a summary of the learning sequence and an assessment plan that identifies the assessment of demonstrated learning outcomes. Where necessary, the course outline will identify recommended and required learning resources.

6.2.3 Program Review and Curriculum Renewal

Annually, the Environmental Technology program engages in the curriculum renewal process which includes an assessment of curriculum content, design and delivery to ensure program currency and vitality. An outcome of the process results in the development of inputs to guide program activity for

the subsequent year. The program team (Academic Chair, Program Coordinator, Program faculty and Program support staff) examine program curriculum, affirms the strengths of its design and delivery and identifies areas for improvement in response to their findings. These discussions occur during program faculty meetings, Program Advisory Committee meetings and/or through special focus groups.

Every five years, the program undergoes Program Review which is characterized as a review for depth and breadth of program content. Student involvement is incorporated into this Program Review process. Program data is collated, reviewed and assessed against given criteria thereby measuring both the vitality and viability of the program. This analysis is used to develop long-term program plans to guide continuous curriculum improvement and building on cumulative outcomes of the annual curriculum renewal process.

Mandated reviews for program accreditation (for example; ECO Canada) follow each agency's developed process rather than relying on the Fleming College Program Review process. The results of these external body program reviews are utilized to supplement the annual curriculum review and implementation for subsequent activity within the program.

The curriculum review and program review process is outlined in Fleming College's Program Quality Assurance Process Curriculum Renewal and Program Review document (revised May 14, 2012). The document identifies the review committee members and their terms of reference and defines the key criteria for review and associated standards. The Curriculum Renewal and Program Review document can be accessed here.

In addition to the above noted internal and external program review processes, the program conducts Program Advisory Committee meetings on a regular basis. The Program Advisory Committee provides a valuable link to program related industries and sector. The committee recommendations and advice concerning program relevance related to the local and regional sector are recorded and implemented where necessary during the curriculum and program review processes for inclusion to the program.

The Fleming College Program Advisory Committee Policy may be accessed in Appendix 4.

7 Environmental Program Curriculum

The environmental program shall support the preparation of graduates for employment or further studies within industry, government, or academia; and establish and maintain processes to monitor their success.

7.1 Environmental Competency Outcomes

The National Standard for Environmental Programs provides specific requirement for environmental program curriculum. This is demonstrated via a Competency Outcome Map that addresses the following environmental disciplines:

a) Environmental Impact Assessment

b) Site Assessment (Remediation, Restoration, and Reclamation)
c) Regulatory and Enforcement
d) Pollution Prevention, Abatement, and Control
e) Climate Change
f) Waste Management
g) Water Quality Management
h) Environmental Sampling and Analytical Work
i) Policy Development and Planning
j) Planning, Monitoring, and Reporting for Sustainability
k) Corporate Environmental Program Planning and Implementation
l) Environmental Health and Safety
m) Natural Resources Planning and Management
n) Environmental Education and Training
o) Environmental Research
p) Environmental Business, Technology, and Product Development
q) Environmental Communications and Public Awareness.

Compliance with the above is presented in the Environmental Competency Outcome Maps for both the ETY and ETN programs outlined in Appendix 5.

7.2 Transferable Competency Outcomes

The environmental program curriculum shall provide opportunities to develop transferable competency outcomes including:

a) Professional Ethics and Work Style
b) Learning and Creativity
c) Communicating Effectively
d) Collaboration
e) Critical Thinking/Judgement
f) Planning and Organizing Work and Projects
g) Leading/Influencing
h) Business Acumen.

Compliance with the above is presented in the Transferable Competency Outcome Map in Appendix 5.

8 Faculty Complement

During the last year, the School of Environmental & Natural Resource Sciences has taken a proactive, strategic approach to HR planning to ensure current and ongoing adequacy of staffing needs in all programs. In particular, there has been a focus on providing the appropriate ratio of full-time to part-time faculty members as well as hiring faculty who have the qualifications, experience and skill set to meet the various program needs.

Several factors were considered during the strategic HR planning process, including the following:

- College and campus strategic priorities were reviewed to ensure program alignment with the overall strategic direction.

- Student enrolment data was analyzed to identify areas of program growth and potential decline.
- New program needs were discussed and analyzed with an emphasis on identifying faculty qualifications, experience and competencies.
- Recent faculty retirement/resignation statistics and projected future retirement data were examined to identify current and potential future gaps.
- Data identifying full-time faculty course alignment was analyzed.
- Data identifying contract faculty teaching hours by course was carefully examined in order to identify opportunities to convert from contract to full-time faculty.

Various meetings and discussions were held during the HR planning process including a meeting with the Dean, Chair, HR, Program Coordinators and Technologists in order to fully discuss and prioritize staffing requirements. As a result of this HR planning process, a commitment has been made to hire several new full-time professors, including one additional full-time professor for the Environmental Technology program in December 2012.

In the Fall 2011 and Winter 2012 semesters, the ratio of full-time faculty to contract faculty teaching contact hours (TCH) in the School of Environmental & Natural Resource Sciences and the Environmental Technology Program was significantly higher than the overall College ratio as depicted in the table below:

	Ratio of Full-Time : Contract Faculty Teaching Contact Hours (TCH)	
	Full-Time Faculty	**Contract Faculty**
Fleming College	40 %	60 %
School of Environmental & Natural Resource Sciences	56 %	44 %
Environmental Technology (all years)	53 %	47 %
Environmental Technology (3rd Year Only)	73 %	27 %

Once the new Environmental Technology Professor is hired in December 2012, there is expected to be further improvements in these ratios as there will then be 7 full-time professors devoted to the program and 3 contract faculty.

The School of Environmental & Natural Resource Sciences will continue to implement this strategic approach to HR planning as part of their ongoing commitment to ensuring appropriate staffing for their programs.

8.1 General

The environmental program faculty is central to the program's ability to produce graduates that are capable of integrating environmental principles, philosophy, and theory into environmental practice. The environmental program shall employ or have access to a sufficient number of personnel (including faculty, administrative, and technical support) to provide:

a) adequate faculty-student ratios and interaction,

b) appropriate balance of full-time and non-full-time faculty members,

The College implemented The Guidelines for Professional Practice for faculty and students. These guidelines recognize the importance of positive student-faculty interaction. The fulltime workload includes a minimum of 6 hours per week for out of class assistance time for faculty to meet with students. The ET program is delivered by a complement of full and part-time faculty and a full-time program technologist. Please refer to the chart below which provides a summary of the current cadre of faculty in the program.

Every program in the School experiences the challenges of delivering an integrated, holistic curriculum with a mix of both full- and part-time faculty. The program relies on individuals with expertise in specific areas of hydrogeology, environmental assessment, land reclamation, environmental analysis and others. This expertise is sometimes met by contract faculty who may change from one semester to the next, making the process of continuous curriculum development more of a challenge. An additional challenge that the School of Environmental and Natural Resource Sciences (SENRS) faces is the fact that a portion of the curriculum is managed and staffed by another School within the college, the School of General Arts and Sciences (GAS). These challenges may be met in part through the hiring of additional full-time faculty for core program courses, and revising the current model by which GAS courses are delivered within the School (these include General Education courses, mathematics and communications courses).

Faculty Name	Full-time	Part-time	Courses Delivered	Other Duties
Melanie Logan	X		Environmental Site Assessment Fall Field School Environmental Planning and Assessment Winter Field School	Program Coordinator (effective September 2012)
Anne Vanwarmerdam	X		Environmental Hydrogeology	
Mark Williamson	X		Applied Ecology Environmental Laboratory	

			Techniques Fall Field School Winter Field School	
Stephen Thompson	X		Constructed Wetlands Fall Field School Spill Response and Case Studies Winter Field School	
Bruce Pettit (retired in June 2012)	X		Environmental Technology	
Scott Miles	X		Industrial Placement	
Kelly Cordick		X	Waste Management Approaches Environmental Applications	
Mark Dzurko	X		Behaviour of Contaminants	
Bob Bialkowski		X	Environmental Sampling and Analysis	
Valerie Bowering		X	Spill Response and Case Studies	
James Adam (retired in January 2012, to be replaced December 2012)	X		Environmental Planning and Assessment	
Bob Bialkowski		X	Environmental Sampling and Analysis	
Scott Miles	X		Industrial Placement	

8.2 Competencies

For the teaching positions in the environmental program, faculty members shall have the appropriate:
a) education;
b) professional credentials;
c) work, field, and/or research experience; and
d) skills in teaching and learning methodologies (including assessment methodologies, communication skills, and technologically current knowledge).

The ET Program was established in the early 1980's from a need to fill a sector within the community college system that was void of environmental training. From the outset, Program developers set the bar by recruiting only faculty and staff that were previously employed outside the college from either the private or public sectors and coming from an environmental discipline. The intention was to ensure that these individuals could deliver relevant and practical training in all aspects of core materials being trained and delivered to students; specifically within an environmental context. This same strategy has been, and is currently being employed for all part-time, partial load or sessional faculty to ensure definitive curriculum delivery. As a result of this strategy, faculty and staff are well-equipped to meet the primary objectives of the program; specifically in the areas of environmental theory and practical hands-on application.

Please refer to Appendix 6 for a detailed summary of the credentials of program faculty and all corresponding Curricula Vitae (Kelly Cordick, Anne Van Warmerdam, Mark Williamson, Melanie Logan & Stephen Thompson).

8.3 Program Leadership and Support

The environmental program shall have a full-time (or joint full-time) faculty member with defined leadership responsibilities. Environmental programs should also develop leadership skills in others to ensure that the program's survival does not become dependent on one individual.

A reasonably stable core group of full-time or joint full-time faculty with a primary commitment to the program and/or institution should be maintained to provide for coherent academic planning, coordination of instruction, and curriculum development.

Fleming College operates all programs on the basis of a Program Coordinator model, whereby (most often) a full-time faculty member with expertise in the program discipline is provided time release to perform these leadership duties. Please refer to here for a job description of the duties of a Program Coordinator. The term of appointment for a coordinator is three years in duration. The current Program Coordinator, Mr. Stephen Thompson, is a full-time faculty member with 25 years of teaching experience at the College, and over 12 years (collectively) of experience in the role of Program Coordinator for the ET program. Other individuals are given the opportunity to assume this leadership role in the program during the summer term, when the incumbent is off on official vacation time.

In September, 2012, Melanie Logan will be taking on the responsibilities of Program Coordinator.

8.4 Faculty Engagement

Program faculty and staff are involved in the review and renewal of program curriculum on a regular basis. All programs at the College undertake an annual curriculum renewal process that examines the current performance of the program with respect to a series of indicators, including student and graduate satisfaction with the program. This renewal process also examines emerging trends in related industries and solicits input from the program advisory committee. Program faculty and staff collectively identify projects related to curriculum renewal that are undertaken during the spring-summer semester. Each program also undertakes a much more in-depth program review process every five years. This process examines trends in the program over the previous five years with respect to student enrolment,

student and graduate satisfaction, human and financial support resources, competitor programs, and industry trends. Program faculty, staff and advisory committee members are key players in this process.

The college provides many opportunities for faculty to be involved in committees and groups responsible for continuous improvement of college policies and procedures related to curriculum development, academic progression and probation, strategic plan development for the college, and others. Faculty can seek membership on the following committees:

Academic Planning and Development Committee (APDC)

1. This committee reviews and approves all new program proposals, program revisions (e.g. new program name, implementation of co-op, etc.), and academic policies (e.g. Prior Learning and Assessment) prior to their consideration by the Academic and Student Affairs Committee (ASA) and Board of Governors. More information is available here.

College Board of Governors (BOG)

2. Fleming College is governed by a formal, Board of Governors, as outlined in 5.1 c above. The Board is comprised of various governors and provides opportunities for four internal governors (elected by constituent group) some of which are program faculty.

Academic and Student Affairs Committee (ASA) sub-committee of BOG

3. The responsibilities of this committee include the review of both existing and proposed new programs of instruction at Fleming College, as well as the review of academic and student policies and practices. Details are available in Appendix 7.

General Education Committee

4. This committee is responsible for the review of general education courses across the college to ensure adherence to and consistency with respect to the general education policies set by the Ministry of Colleges, Training and Universities and the College.

President's Advisory Council

5. As stated in the Minister's Binding Policy Directive, the purpose of an advisory college council is to provide a means for students and staff of the college to provide advice to the President on matters of importance to students and staff. It is a corporate body in the sense that it will deal with issues that affect the entire college. It is a future oriented body involved with Strategic Planning. An underlying premise is that the Council will be a forum for communication between the President and College faculty, staff, and students regarding issues which are focused on, or affect, the academic activities of the College. More information can be found in the President's Advisory Council Handbook in Appendix 8.

In addition, there are ad hoc college-wide steering committees and teams formed to address current projects and tasks. Two recent examples include the following;

Course/Program Redesign Team

- This team worked to develop and implement alternate delivery methods in specific program areas (e.g. Weekend College, modular delivery, etc.)

Review of Academic Year Task Force (RAYT)

- This team examined the feasibility of several alternative designs to the existing academic year design at the college. This process is currently on hold, pending the acquisition of more information regarding the potential implications to students.

Developmental positions are also available to faculty including temporary assignments in other academic schools, the Centre for Learning and Teaching and so on.

Chair

6. This individual is responsible for the continuous review of programs and their associated curriculum to ensure program viability and vitality. The Chair also manages workload and contract development for all faculty members within a given School.

Consistent with College policy and practices, the Environmental Technology program faculty team has a commitment to sound academic planning, coordination and instruction and curriculum development. The ETY Program developed a Skills Matrix (Appendix 9) which documents program principles and practices as well as key legislative content. In addition, related certifications and competencies are documented. All of these categories are further ranked as to the level of competency achieved at the completion of the Program (Basic, Intermediate or Advanced). This Matrix serves as the guidance document providing consistency in curriculum content and is assessed annually to permit identification of gaps, changes in the market/discipline as well as recent additions/advancements to Program curriculum. All faculty members (either full-time or part-time), use the matrix as a guide to curriculum content which ensures consistency and achievement of both course and Program outcomes as well as a guide for curriculum development.

As a result of the compact size of the ETY team, there is the advantage of being able to discuss and react more quickly to identify needs for Program integrity, planning and development. Faculty members are intimately familiar with the course content (as they have most often created and “own” the course curriculum) and also test this on a regular basis by being the conduit for delivery and immediate feedback from the student body. In addition, curriculum is formally reviewed and discussed on an on-going basis through focus meetings (i.e. weekly meetings) by the faculty in the Program and when modifications to curriculum are deemed necessary. The Advisory Committee is apprised of these candidate modifications and they are discussed at the annual meeting within the context of the expertise of the committee and relevant job skills required by students. Once a decision is made for modification, the Advisory Committee passes a resolution to support implementation of the modifications and this is presented to Administration for implementation. Proposed program modifications are considered with the larger context of budget (available resources) and the academic planning cycle.

8.5 Performance Management

Fleming College supports the continuous development of its employees and encourages full participation in professional development activities. Individual 3 year PD plans are collaboratively determined and agreed to by the supervisor and staff member.

Our Core Promise

Learn - Develop your knowledge, skills and capacity to innovate.

Belong- contribute to a strong team through connection and collaboration.

Become - Grow as a person while achieving your goals.

Living our core promise at the College requires strong leadership, establishing the vision for the future and the strategy for getting there. Leaders model the way, motivating and inspiring others to head in right direction. It also involves a dual commitment from support staff at the College, to stay current with technology and administrative systems, and to continuously learn how to best support students and faculty in the delivery of our Core Promise.

Faculty Development:

Faculty development at Fleming is supported by Staff Development - Department of Human Resources, and the Centre for Learning & Teaching. The Faculty Development Facilitator is responsible for planning and enabling activities that enhance teaching and learning, in alignment with strategic goals and initiatives of the College. The School of Environmental and Natural Resource Sciences has a PD committee, with membership that includes faculty, support staff and administrators. The PD committee determines school-wide PD priorities and reviews PD applications to make decisions regarding the commitment of resources from an allocated budget.

9 Admissions

9.1 General

The College overall admissions policy is outlined in the Board Approved Policies and Procedures: Policy 5-501. The admissions policies and procedures for college programs are reviewed on a regular basis as part of the Program Review process. In addition, Policy No. 5-505 provides a vehicle for students to appeal an admissions decision made by the college. The program adheres to its published admission policies, which are consistent for all diploma programs within the School. Admissions policies are also reviewed as part of the program review process.

9.2 Publications and Finances

The following link provides the admission policy specific to the Environmental Technician program. In addition this link provides information regarding expected costs in addition to tuition fees such as books supplies and field schools: Program ancillary fees, together with links to fees dates and payment options

are also posted here. The following provides a link to the College's Financial Aid information including OSAP, student loans and bursary opportunities.

The College's Admissions and Financial Aid staff are also available to provide guidance and assistance to the students in completing the necessary documentation to apply. In addition, the Registrar's Office produces an annual "Welcome Package" which outlines these opportunities, together with the many services available for students.

Fleming College and the Fleming College Foundation, along with our generous donors and sponsors, have provided more than $6 million to students in financial need. Details of all available bursaries and information on how students can apply are provided here on the College website, together with information on how students can be selected to receive awards, available to new and/or returning students. Additionally, entrance bursaries are available for new, full-time students and returning full-time students, provided from a percentage of tuitions fees collected by Fleming College. To be considered for this bursary program, students are mailed a copy of the Financial Aid Profile with their program offer and asked to complete it for consideration. In recent years, 80% of students who applied were eligible and received this bursary.

9.3 Selection

It is the responsibility of the Registrar or his/her designee to determine, using the records at his/her disposal, whether or not individual students meet those requirements and in conjunction with the Academic Leaders Team to establish procedures for **selecting students for admission. Each program has specific criteria as outlined in the Environmental Technology program page.**

10 Student Services

10.1 General

Fleming offers a multitude of services to support student success including Aboriginal, Accessibility, Counseling, Health Services and many more as listed in the Fleming website under "Services/Services for Students". Additionally, all students enrolled in semester one of a program of study at the college are assigned a student advisor, who could be a faculty or support staff member. These student advisors meet the students within the first two days of the semester and communicate with students throughout the semester on a weekly basis, by email or drop-in visits to class, etc. Students beyond their first semester of studies are assigned their Program Coordinator as their advisor.

The Environmental Technology Program also incorporates its own specific strategies for assisting students in finding work experiences and employment upon graduation. One primary method is for all faculty members to maintain ongoing contact with existing employers, past graduates, agencies, and institutions. This results in advanced and direct notice of job postings to program students. All students are directly informed of each of these postings by the Program Coordinator via email as well as having these posted on the Campus job site maintained by a full-time support person. In addition, the ET Program holds sessions on proper preparation of resumes and cover letters as well as running mock interviews and interview preparation guidance sessions. Consultant lists are maintained, updated and supplied to the students annually to ensure a current list of contacts for resume deployment. Finally,

the Frost Campus holds a Job Fair whereby employers from a multitude of sectors and environmental disciplines are invited to the college to interact directly with students and to accept resumes on the spot.

Fleming is one of the few colleges that provide free tutoring for students who require it. There is a very active Learning Support Services (LSS) department that provides support to students on different levels, depending on individual student needs. At the beginning of each semester drop-in group tutorials are automatically set up for courses where there is known demand for tutoring support. Students who require further support can sign-up to meet with a peer tutor from within the Environmental Technology program. LSS also offers regular workshops which provide tips and strategies to help students develop better time management skills, note-taking techniques, study skills and test preparation techniques.

Accommodations for students with disabilities are available for students who self-identify and may include: weekly appointments with an educational assistant, one-on-one tutoring, note taking services, and testing accommodations such as alternative testing areas and additional time on tests. The college employs a full-time Learning Strategist as well as a full-time Assistive Technologist, both of whom are on campus at Frost one day a week to support students with disabilities.

Other Student Services on campus include access to a registered nurse on a daily basis, and access to a doctor one day per week. There are two full-time counsellors on campus who maintain full schedules of appointments throughout the academic year to provide personal, academic and disability counselling to students in need. The counseling department often partners with community agencies to organize on-campus workshops in areas such as stress management, healthy relationship or other topics that promote individual well being. An Aboriginal Counsellor and an Aboriginal Student Success Facilitator are available to support aboriginal students attending the college. The Career Services department offers personal resume, cover letter and interviewing services and maintains a very active job board. Career Services also organizes an on-campus job fair in February of each year that is attended by numerous agencies across Ontario and Canada. Student Services runs an Emerging Student Leaders Series to help students develop their leadership skills and prepares them to take on leadership roles such as peer tutoring, student government positions and volunteer opportunities. Mature Student Meet and Greet sessions offered early in the semester help to ease some of the challenges that may be associated with returning to school as an adult.

10.2 Student Engagement

Document, or reference appendices/external links, that demonstrate conformance with the requirements.

11 Institution Facilities and Learning Resources

11.1 General

Dedicated classrooms 132 and prep room 133 are used for the Environmental Technology program. Classroom 132 consists of 12 workstations, plus one additional dedicated classroom, a dedicated project

room and a small prep area. In addition, the College has recently modified an existing lab space for the Environmental Technology with a renovated 7,800 gross sq ft lab.

The School also contains a large learning space called the 'Biodiversity Lab', which enables students to study a wide range of organisms outside of regular scheduled class time. This lab is supported by knowledgeable staff and, similar to a library loan system, operates a circulation desk where additional equipment and specimens are available for students to sign out and use to complete projects or to practice skills.

11.2 Publications and Finances

Library Services and Information Resources

The Frost Campus houses a comprehensive library facility which contains a large collection of environmental books, publications and maps. This is augmented by an extensive collection of online resource databases including up to date, full text availability of leading peer-reviewed journals in the environmental field.

Library hours: Monday – Thursday: 7:45 am – 9pm
Friday: 7:45 am – 4:30pm
Saturday – Sunday: 1pm – 5pm

- Remote Access to online databases and library catalogue: 24/7
- All databases by all vendors, including the library catalogue, e-books and Google Scholar, can be searched individually or simultaneously using our integrated search tool
- Books can be renewed, or put on hold electronically (remotely)
- Support is provided by email, by phone and in person.
- In first semester communications, students are provided with library orientation classes where they are introduced to the physical and online library by way of a class scavenger hunt and a library assignment.

Resources:

Total Print Sources: Books: 54,029
Periodicals: 117 titles

Environmental technician/technologist Print Collection:

Book titles: 1263
Periodical Titles: 10
Biocommons Equipment & Specimens: 1774 items

College participates in borrowing agreements with the other 23 community colleges, Trent University and Kawartha Lakes Public Library. There is also an interlibrary loan service with libraries across Canada.

Electronic Resources: Total # Databases: approximately 90

Subject Specific databases: 6 (this number does NOT include general reference databases)

The library is participating in a consortium E-Book Pilot Project along with the other 23 community colleges. This will greatly increase our number of e-books and improve our access to these resources.

Visual Media Collection: Total # of titles: 2846
Environmental Program Titles: 71

Films on Demand Collection: A video streaming service that allows students/staff to view educational media on laptops/computers with internet access anywhere, anytime.
Total # of titles: 11,910
Environmental Program Titles: 332

Map Collection: 11,000 Ontario base maps and national topographic maps

Collection of Ontario Geological Survey Reports

The Frost Campus library provides the following resources:

- Wireless network available
- 13 networked computer workstations in the library
- 3 group work rooms with 8-10 seats per room , stocked with computers, data projectors, and white boards for team projects and discussion groups
- Absolute quiet study space with 12 seats
- Quiet study space for students with laptops with ability to seat 8 people
- 27 tables and individual study carrels with seating for approx 75 students
- Networked printing, both colour and black and white
- 2 black & white photocopiers and 1 colour photocopier
- Scanner

In 2012, the library upgraded its library server and catalogue hardware and software.

An evaluation of the library and related learning resources is conducted periodically and summarized in a report format. This includes collection analysis by program, activity reports for electronic databases and circulation statistics by call number area.

In 2012, the library surveyed users to discover our strengths and weaknesses in services and resources. Such surveys of students and staff are conducted periodically and KPI data is collected annually.

The staffing complement for library resources includes a Manager of Library Operations, three full time library technicians and one full time library technologist.

The library staff works in partnership with the academic program faculty and co-ordinators to build a robust, relevant and up-to-date collection of physical and electronic resources. Staff attend school meetings, review curriculum and course outlines, liaise with faculty and use collection development tools available from jobbers. Staff also participate in program reviews and curriculum renewal processes.

As well, professional library staff is actively involved in developing information literacy in students through library orientation, information sessions and research assignments. Additional information is available here.

Document, or reference appendices/external links, that demonstrate conformance with the requirements.

12 Program Financial Resources

12.1 Sufficiency of Resources

The college is a public sector organization, and as such, its primary funding sources are transfers from the Ministry of Colleges, Training and Universities (the "Ministry") and student tuition. Additional, one-time allocations of funds for capital, infrastructure and instructional equipment are also provided by the Ministry to all colleges. However, this funding is not guaranteed and is provided on an ad hoc basis. During the annual budgeting process, resources are allocated based on a costing model that takes into account the unique costing pressures of individual programs. At the school level, these cost pressures for individual programs are rationalized against an overall revenue and costing allocation through budget review meetings with representation from each program coordinator.

Funding pressures are an ongoing challenge for Community Colleges in Ontario and a concern for Ontario's Council of Presidents ("COP"), as well as the Association of Canadian Community Colleges. All have been strongly advocating for additional funding for community colleges. The current funding model provides additional funding only if specific growth targets are met and for targeted funding envelopes (e.g. aboriginal funding, first generation funding, etc.). Given the current demographics in most areas of the province, Ministry growth targets can be a particular challenge for small to medium sized colleges outside of the larger urban centers.

12.2 Financial Management

As a public sector institution, the college undergoes an external audit each year in accordance appropriate public sector accounting procedures. Revenue is received through tuition and Ministry of Colleges, Training and University funding, and resources are allocated based on a costing model that takes into account the unique costing pressures of individual programs. At the school level, these cost pressures for individual programs are rationalized against an overall revenue and costing allocation through budget review meetings with representation from each program coordinator. The Coordinator of the Environmental Technology program participates in these meetings.

The approval of program budgets is part of a larger budget approval process for the College that aggregates each school budget into an overall academic division budget. Each division of the college completes a budget that is rolled into a college budget which is submitted for approval to the Board of Governors. Each year, the Finance Division provides a guideline of its 'Critical Path' for development of the upcoming fiscal year budget as outlined in the Academic Division Schedule.

13 Scholarly Activity

13.1 General

Faculty members in the program have a long history in their commitment to advanced academic endeavours as evidenced by engaging in a multitude of projects and activities. Initially, the faculty took part in an international project involving the assistance of the Environment Ministry in Belize, Central America. This involved a number of visits to that country as well as an exchange among students. The primary focus was the review and revision of environmental legislation, policy and strategies for pollution abatement in that country. Also, the process of Environmental Assessment was reviewed and assistance provided in the re-writing of environmental legislation and implementation of an environmental assessment strategy.

A second initiative of the Environmental Technology faculty was in the discipline of wastewater treatment. Part of this strategy was to develop domestic expertise in the discipline of alternative wastewater treatment for domestic application and, subsequently, take this knowledge and technology to international locations.

The initial project that launched these endeavours was the securing of a footprint within the Greenhouse at the Frost Campus at Fleming College and the subsequent construction of an innovative and research-based Solar Ecology Wastewater Treatment system (SES). This facility was unique in its design and provided the students with the opportunity to enhance their academic experience by being provided with a facility to further develop knowledge in areas including advanced wastewater treatment, aquatic biology, hydraulics, environmental chemistry, sampling/monitoring and interpretation of water quality results.

The SES was so well received that it was recognized by Trent University and its international partners from Ecuador and Mexico within an existing federally funded CIDA (Canadian International Development Agency) project. This led to an invitation to the faculty and students for participation and installation of a similar facility at a selected location for an impoverished community in Mexico. This project resulted in an exchange of faculty and students between learning institutions both in Mexico and Canada as well as several visits, construction of a wastewater treatment system, the basis of a number of student Masters Theses, student internships in Mexico as well as a sabbatical for an ET faculty member. In addition, faculty and students were also involved in a number of domestic and international conferences and site tours (Stratford - England, Wales – England, Kentucky - U.S.A, Orlando – Florida, U.S.A, and Mexico City, Mexico) which enriched the learning environment and opportunities.

Faculty and staff of the program built further on this initiative by modifying course curriculum to include a stronger focus on alternative wastewater treatment (i.e. creation of the Constructed Wetland course in Semester 5 of the Program); construction of or assistance with the design and construction of a number of constructed wetland systems in Ontario (Haliburton Hatchery, Dartford Straw-bale home, Community Centre - Minden, Kinark Outdoor Educational Centre – Minden, Straw-bale home – Peterborough, etc). Concurrently, the faculty of the ET Program initiated the securing of $2 million in funding as well as concept, design and construction of the Centre for Alternative Wastewater Treatment

(CAWT) at the Frost Campus. This facility has since been split from the ET Program to operate as an autonomous research facility and has grown in notoriety as a leader in research and development of alternative water and wastewater treatment technologies, among other new initiatives and growth areas which are described below.

In summary, faculty, staff and students have benefited greatly from the groundwork and innovations in the discipline of wastewater treatment and particularly alternative technologies. This information, knowledge and skills have been embedded into curriculum and have greatly enriched the learning experience for students in both the Environmental Technology program but also for the College community in general.

Centre for Alternative Wastewater Treatment:
The Frost campus is the site of the Centre for Alternative Wastewater Treatment (CAWT). The CAWT is a nationally accredited lab and research facility that is currently conducting research in the area of alternative forms of water and wastewater treatment in the Canadian Arctic as well as internationally, including China, India, Kenya, Surinam and Costa Rica. Joint industry-college research at the CAWT provides students and faculty/staff with industry-related, applied, real-world experience. In the last two years alone, 10 faculty and 50 staff have participated in applied research projects totally 30,000 hours of paid research time. Additionally over 30 students have participated in paid research activities with industry partners in the CAWT. Faculty members in the Environmental Technology program utilize the expertise of CAWT staff for guest lectures, tours, and participation in student projects.
In 2012 the Canada Foundation for Innovation awarded the CAWT $1.8M in funding to expand and upgrade the CAWT infrastructure which will allow the college to offer industry partners state-of-the-art facilities for applied R&D projects while allowing students more opportunities in engage in challenging and current industry projects.

13.2 Scholarly Activity Support

The School and the College have recently demonstrated a stronger commitment towards the development of applied research projects that serve to enhance student learning. International activities which had been limited for a number of years are now also being encouraged, and several faculty members have recently been approved to conduct applied research as part of their sabbatical activities. The CAWT has numerous resources that can be shared with the ET program that would serve to enhance applied research activities for both faculty and students. These resources include, but are not limited to:

- Six outdoor sub-surface flow constructed wetland cells
- Greenhouse facility for bench scale and mesocosm research
- Environmental Chamber
- 2000 sq. foot plant propagation facilities
- Fully-equipped accredited analytical laboratory
- 20 Outdoor experimental ponds

The CAWT continues to enhance its resource base. For example, funding through the Colleges Ontario Network for Industry Innovation (CONII) has recently provided $90,000 per year for three years for staffing support, and $20,000 additional per year for project support. Two additional projects include the provision of $500,000 over five years through the RBC Blue Water Program for project work related to protecting sources of drinking water on indigenous communities in the Canadian North, and $240,000 from Environment Canada to conduct treatment wetland research throughout the Canadian North.

In 2010, the CAWT was awarded $2.3M in funding from NSERC over 5 years. This program provides resources to allow collaboration between faculty, staff, students, and private sector partners with the purpose of doing innovative applied research. Currently, this funding provides considerable paid faculty release time and student support to collaborate on research projects with industry. Student involvement from the ET program in several CAWT projects has been and will continue to become increasingly significant as the Centre evolves.

The college does not yet have a mentoring program in place, but it is anticipated that this or a similar process may be initiated as the School's level of involvement in applied research continues to expand.

As mentioned above, the quality of the program and student learning experiences have and are enhanced by:

a) international internship opportunities
b) student placement/exchanges
c) instructional materials (experiences, video, photographs, case studies, etc.) now incorporated into curriculum in a number of courses including Aquatic Biology, Environmental Measurement, Water Treatment and Pollution Control as well as upper level courses in the Environmental Technology Program
d) field trip locations

Operation Wallacea

It should be noted that faculty from the ET Program did receive release time in the summer 2010 semester to investigate international opportunities with Operation Wallacea.

Operation Wallacea is an organization that encourages and supports the involvement of students in research projects at locations around the globe. This provides students with opportunities to assist in on-going research projects focussed in the disciplines of biodiversity, biological and conservation management that operate in remote locations across the world. Survey teams, comprised of academics and students volunteers, are involved in practical assistance in the projects. It is the intention of the ET Program to establish an on-going relationship with OPWall to engage students, provide a pathway for international opportunities and also to establish a fund-raising strategy within the Campus to financially assist interested students.

Appendices

Appendix 1 - Name Change

Appendix 2 - Program Coordinator Duties

Appendix 3 - Course Outlines

- MATH 63 Applied Mathematics in Natural Resource Sciences
- COMM 44 College Communications for Environmental Science
- ENVR 20 Ecology and Environment
- ECOS 13 Ecosystem Skills
- GEOM 36 Geospatial Techniques
- NATR 8 Leadership in the Environment
- COMM 34 Technical Reporting
- COMP 345 Introductory Computing
- ENVR 11 Environmental Techniques
- FSTY 50 Trees and Shrubs of Ontario
- SCIE 62 Introductory Chemistry
- COMP 461 Data Management for Environmental and Natural Resource Sciences
- ENVR 8 Environmental Measurement
- ENVR 15 Land Reclamation Principles
- ENVR 19 Watershed Management
- SCIE 6 Aquatic Biology
- SURV 18 Geomatics in Surveying
- ENVR 13 Erosion Control
- ENVR 18 Water Treatment and Pollution Control
- ENVR 21 Environmental Legislation
- MATH 25 Statistics
- SURV 19 Geomatics for Environmental Engineering
- APST 27 Field School
- ENVR 1 Air Pollution and Abatement
- APST 28 Fall Field School
- ECOS 1 Applied Ecology
- ECOS 4 Constructed Wetlands
- ENVR 5 Environmental Applications
- ENVR 6 Environmental Site Assessment and Audit
- ENVR 12 Environmental Technology
- ENVR 17 Waste Management Approaches
- APST 88 Winter Field School
- ENVR 3 Behaviour of Contaminants
- ENVR 7 Environmental Laboratory Techniques
- ENVR 9 Environmental Planning and Assessment

ENVR 16 Spill Response and Case Studies
FLPL 71 Industrial Placement
GEOL 21 Environmental Hydrogeology
SCIE 16 Environmental Sampling and Analysis

Appendix 4 - Program Advisory Committee Policy Manual

Appendix 5 - Competency Outcome Map

Appendix 6 - Faculty Curricula Vitae

Appendix 7 - Academic & Student Affairs Committee Mandate

Appendix 8 - President's Advisory Council Handbook

Appendix 9 – Skills Matrix

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Appendix 1

Ministry of Training, Colleges and Universities
Postsecondary Education Division
Colleges Branch
Program Quality Unit
9th Floor, Mowat Block
900 Bay St
Toronto ON M7A 1L2
Tel (416) 325-2874
Fax (416) 327-1853

Ministère de la Formation et des Collèges et Universités
Division de l'éducation postsecondaire
Direction des collèges
Unité de la qualité des programmes
9e étage, édifice Mowat
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Ontario

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S. MacFarlane
Board Circulation

January 31, 2002

Dr. Brian L. Desbiens
President
Sir Sandford Fleming College of
Applied Arts and Technology
Sutherland Campus, Brealey Dr.
Peterborough, Ontario
K9J 7B1

RECEIVED
FEB 07 2002

Dear Dr. Desbiens:

RE: MODIFICATION

Program	-	Environmental Technician
MCU Code	-	52700
APS Number	-	01110
Duration	-	2 years, 4 semesters
Effective Date	-	September 1, 2001

PROGRAM CODE: ETN
ETY

Program	-	Environmental Technology
MCU Code	-	62700
APS Number	-	01111
Duration	-	3 years, 6 semesters
Effective Date	-	September 1, 2001

Following on recommendations on titles from the Environmental Technician and Environmental Technology standards released October 10, 2000, new titles were required for your college's Terrain and Water Resources Technician and Terrain and Water Resources Technology programs. Your letter dated January 14, 2002 confirms the new titles as shown above.

If you have any questions regarding the changes, please contact Michael Pimento (416) 314-3859.

Yours sincerely,

Jane Kirkwood

Jane Kirkwood
Manager
Program Quality Unit

cc: Mr. Paul Rochetta
Registrar

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Appendix 2

PROGRAM COORDINATOR

Base-line Duties

Program Coordinator Role Summary:

The Program Coordinator plays an important academic leadership role that is critical to program sustainability and student success. As the program champion, the Coordinator facilitates key academic and operational processes, working collaboratively with the Dean, Academic Lead, faculty and support areas.

COORDINATOR RESPONSIBILITY	DUTIES
SUPPORTING STUDENT SUCCESS:	
• Assist students in the development of an educational plan appropriate to their career aspirations & abilities • Provide students with opportunities to evaluate & re-evaluate progress toward their goals	• Provide advice & council to students in assessing individual academic support from point of entry to point of exit • 1st semester advising link
ACADEMIC RESPONSIBILITIES:	**These responsibilities are in concert with the Deans & ALs**
• Process program course exemptions • Evaluate and advise on direct entry applicants	• Program-specific approved by program coordinators; Gen Eds, IDS and Service School subjects approved by Subject coordinator
• Course outlines	• Approve course outlines
• Student Verification	• Confirms student enrolment during start-up with the Registrars Office class roster in consultation with course faculty • End-of-semester predictions
• Curriculum Verification	• Confirms program curriculum for both the academic year & post secondary calendar ensuring faculty (program & service) are involved
• Timetable Verification	• Review draft timetables, 3 times/year for errors/omissions • Reviews with program faculty & tech support
• Academic Progression	• Meet with students identified for academic progression & complete progression documentation • Develop contracts for students on probation • Monitor students on academic probation • Recommend to Dean for student to step out if not meeting contract
• Academic Appeals	• If no resolution between a student & faculty member (step 1 of appeal process) student can raise issue with Coordinator • Coordinator can resolve or provides appropriate documentation to Dean
• Academic Awards	• Develop new awards & criteria; consult with faculty to select recipients; submit marks for awards process • Attend Awards ceremony
• Convocation	• Process graduation eligibility exceptions in conjunction with Registrars Office • Attend Convocation (or designate)

SUPPORTING FACULTY SUCCESS:	
• Provide guidance and assistance to faculty with: ○ Peer support for colleagues ○ course outline approval or creation ○ marking / evaluation ○ faculty & student complaints & concerns ○ textbook ordering ○ academic policies, such as plagiarism	• Embeds & reinforces "Guidelines for Professional Practice" in the culture of Fleming • First point of contact for feedback for students & faculty • Problem solving with faculty &student issues • Course/Program Orientation for new hires(infrastructure orientation for office, email, phone via SOL) • Identifies resources to faculty and students to support their needs • Escalates to Dean performance issues & concerns
DEAN and ACADEMIC LEAD COLLABORATION:	
• Assist the Dean/AL in the development of faculty workload assignments	• As the program content expertise, provides input on workload assignments • Coordinates faculty team if required
• Assist the Dean in School-related activities such as strategic planning, budget & enrollment, • Retention & student success	• Provides input to Dean regarding academic strategies • Identifies trends from their field of expertise • Identifies enrolment growth opportunities to academic delivery • Contributes to solutions to resolve enrolment challenges
PROGRAM RESPONSIBILITIES:	
• Leads curriculum renewal	• Participates in yearly Curriculum renewal
• Develops & maintains a • network of program-related contacts	• Provides updates to Dean • Including attendance at local, regional or provincial meetings (e.g, Heads of….) • Act as a program advocate @ Fleming & external communities
• Coordinate & lead Program meetings	• Sets meeting times & develops agenda • Lead program meetings (can include tech support & service faculty)
• Coordinate & participate in Program advisory committee meetings	• Works in conjunction with SOL (who provides administrative support)
• Coordinate & participate in meetings with students	• Initiate program meetings with student representation for open dialogue on student needs & program requirements
• Program Budget	• Initiates purchases for program • Provides input to Dean on capital needs

Appendix 3

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APPLIED MATHEMATICS IN NATURAL RESOURCE SCIENCES

Course Outline
Course Number: MATH63
2011 Fall
Sir Sandford Fleming College

Program: Common First Semester
School of General Arts & Sciences

Course Format: In Person
Hours: 45

Faculty: Lloyd Barr Office:
Office Hours: As posted

Availability:
Email: llbarr@flemingc.on.ca

Faculty: Kimberly Bell Office: 155B
Office Hours: As posted

Availability:
Email: kimbbell@flemingc.on.ca

Faculty: Kaukab Kamran Office: 155B
Office Hours: As posted

Availability:
Email: kkamran@flemingc.on.ca

Faculty: TBA

Coordinator: Julia Godawa Office: 5911
Email: jgodawa@flemingc.on.ca

Dean: Ann Drennan Office: 5923
Email: adrennan@flemingc.on.ca

Additional Comments:

Students are urged to retain this course outline for inclusion in their career portfolio.

Dean Approved:2011/08/31
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio

development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course will enable students to apply specific mathematical concepts and acquire foundation skills important in the Natural Resource and Environmental Sciences. It is designed to complement and reinforce learning within other first semester courses and program areas.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Uses numerical data, mathematical concepts and reasoning to solve problems
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Manage oneself and one's resources to achieve goals

Aim:
To enable learners to perform mathematical procedures required in their specific areas of study in natural resource and environmental science programs.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Correctly perform mathematical calculations in order to demonstrate the appropriate use of these calculations within the field of environmental and natural resource sciences.

Additional Learning Outcomes Comments:

Weekly Learning Objectives:

Upon successful completion of the course, the learner will be able to:

a.use a scientific calculator to solve a variety of Natural Resource based mathematical problems.

b. use scientific notation, significant digits, units of measurement and apply mathematical terminology appropriately and correctly.

c. Correctly perform mathematical calculations in order to demonstrate the appropriate use of these calculations within the field of environmental and natural resource sciences.

d. convert units in and between the Metric and Imperial systems using the unit factor method.

e. use algebraic principles to solve for an unknown variable.

f. apply principles of ratio and direct and inverse proportion to calculate map scale, photo scale and solve a varity of resource related problems.

g. organize field data and use appropriate formulas as well as a scientific calculator to obtain common statistical parameters including mean, mode, median, range and standard deviation.

h. calculate compass, declination and azimuth.

i. use basic geometric principles in area, perimeter and volume to solve a variety of resource related problems.

j. use primary trigonometric functions and Pythagorean theorem to find the sides and missing angles of triangles.

k. calculate logarithms for given natural resource applications.

l. use a variety fo natural resource skills, such as pacing factor, dot grid measurement, map scale, photo scale and declination in applied mathematical calculations.

m. determine the equation of a straight line using points on the line and/or the slope and y-intercept.

n. use the equation of a straight line to make predictions in applied problems.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Course Introduction Course Outline Module 1 - Basic Math Skills Review and Scientific Notation	a,b	Lab: Module 1
Week 2	Class 1:Module 2 Algebra and Solving Equations Class 2: Module 2	a,e	Lab: Module 2
Week 3	Class 1:Module 3 - Significant Digits and Metric Conversions Class 2: Quiz #1	a,b,c,d	Lab: Module 3 Quiz #1(5%):Covers Weeks 1-2
Week 4	Class 1:Module 4 - Imperial and Metric	a,b,c,d	Lab: Module 4

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Conversions and Unit Factors Class 2:Module 4		
Week 5	Class 1: Module 5 - Map Scale and Pacing Factor Class 2:Quiz #2	a,b,c,d,e,f,l	Lab: Module 5 Quiz #2 (10%): Covers Weeks 1-4
Week 6	Class 1:Module 6 - Math Calculations of compassing, azimuth and declination Class 2:Module 6	a,b,c,d,e,h	Lab: Module 6
Week 7	Class 1: Module 7 - Math calculations in Photogrammetry, Parking Lot Exercise Class 2:Quiz #3	a,b,c,d,e,f,l	Lab: Module 7 Quiz #3 (15%): Covers Weeks 1-6
Week 8	Independent Study Activity	a,b,c,d,e,i,l	Independent Study Activity
Week 9	Class 1:Module 9 - Direct and Indirect Variation Class 2:Module 9	a,b,d,e.f	Lab: Module 9 Independent Study Activity Assignment Due (10%)
Week 10	Class 1:Module 10 - Volume of Geometric Solids, Rate of Flow and PPM, PPB, PPT Class 2:Module 10	a,b,c,d,e,i	Lab:Module 10
Week 11	Class 1: Module 11- Introduction to Trigonometry Class 2: Module 11	a,b,d,e,j	Lab: Module 11
Week 12	Class 1: Quiz #4 Class 2: Module 12 - Introduction to Statistics	a,b,f,g	Quiz #4 (20%): Covers Weeks 5-11 Lab: Week 12
Week 13	Class 1: Module 13 - Linear Equations Class 2: Module 13	a,b,d,e,f,m,n	Lab: Module 13
Week 14	Class 1:Module 14 - Logarithms Class 2:Review for Final Test	a,b,e,k	Lab: Module 14
Week 15	Final Test	a - n	Final Test(25%):Covers Weeks 1-14

Learning Sequence Additional Comments:

This course consists of one 2 hr. lab and one 1 hr. lab each week.

Learning Resources:

Required:
Applied Mathematics in Natural Resource Sciences (MATH063) Student Manual: Revised Fall 2011 Edition Sir Sandford Fleming College School of Environmental and Natural Resource Sciences

(photocopied)
Sharp Model EL-531X Advanced DAL Calculator in First Semester Kit
Metric Ratio Scale

Suggested:
Douglas Protractor

Assessment Plan:

Item/Date:	Percent:	Description:
Week 3	5	Quiz #1
Week 5	10	Quiz #2
Week 7	15	Quiz #3
Week 8	10	Independent Study Activity Assignment: Due in first class of Week 9
Week 12	20	Quiz #4
Week 15	25	Final Test
Weekly Labs:due at end of each assigned lab period	15	Each of the following is worth one percent: Weekly Labs 1-7 and 9-14 (either in lab or quiz format) Each of the following is worth half a percent: Quiz Review 1,2,3 and 4

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Direct PLAR related questions for the course to the OFFICE OF THE REGISTRAR

Exemptions contact for this course:
There are two options for this course:

1. Course Exemption Test
There is an exemption test for the course. Information regarding this test will be provided by the instructor during week 1. An exemption for the course is granted, if a minimum of 60% is achieved on this test.

2. Transfer Credit
Forms and information are available on the Fleming portal.

For further information on transfer credits, contact:
Cathy Stalkie (Frost Coordinator, School of General Arts and Sciences)
Office: 219 (Frost campus)
Email: cstalkie@flemingc.on.ca

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
1. Student Attendance: Attendance at all classes is strongly recommended, and will be recorded. Research shows that regular class attendance is a key factor in student success.

Students must attend lecture, labs and tests with their own section, to accommodate room timetabling and class size, unless prior arrangements have been made with the faculty member(s) involved.

Students are expected to bring calculators and course materials to each class. Students are solely responsible for catching up on course work when absent. Please contact the course faculty only if notes and assignments are unavailable from classmates.

2. Student Lateness: Students who are late for class are a disruption to their classmates and have a negative impact on the learning environment. Your instructor will share his/her late policies early in the semester. For reasons relating to classroom management late students may be refused entry. Lateness in general is unacceptable and will be dealt with on an individual basis.

3. Due Dates: It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the details. It should be noted that Academic Planning & Operations, Student Services, and Admissions & Records will not accept any assignments or projects.

Only those students who contact the professor PRIOR to missing a class activity WITH A VALID REASON will be given an opportunity to make up the marks allocated for that week. Documentation verifying the reason for absence may be requested at the discretion of the professor.

Assignments must be handed in on the due date indicated. Late assignments will not be accepted and a mark of zero will be given.

Missed tests/quizzes may be written at another date only if a VALID, DOCUMENTED REASON is submitted within an appropriate time frame to your professor.

4. Final Grades: Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

5. Student Attire for Field Work and Field Trips:
Appropriate attire, as determined by the course professor, is mandatory for field trips and for field

exercises.

Scheduled field exercises are usually conducted regardless of weather conditions.

For more specific information on requirements, please see the course outline or the professor responsible.

6. Scheduling: Rescheduling of course topics and evaluations may be necessary when unforeseen circumstances arise. Changes will be discussed and mutually agreed to in class.

7. Missed Field Trips and Field Exercises:

Students must consult with the course professor about any possible alternate arrangements for field trips and exercises missed. However, there is no guarantee that alternative arrangements can be made. Advance notice of absence may result in greater accommodation.

8. Format for Assignments: Use the Lab Rubric as a template for completing labs for submission and credit. Professors may grant some personal exemptions.

Labs should be neatly hand written on lined paper and submitted.

9. Evaluation Criteria: All assignments will be graded on the basis of content, style, structure, and mechanics.

10. Final grades: In this course, final grades are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. Faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

11. Academic Behaviour and Academic Integrity: You, as a Fleming student, will conduct yourself in a courteous, responsible fashion.

You are expected to work individually on assignments unless otherwise directed. Breaches of academic integrity such as plagiarism will result in a mark of zero (0) for the evaluated activity and will be reported in writing to the Registrar. You have the responsibility to support academic integrity. Please refer to your student handbook, Frost Facts, for the specific college regulations governing academic behaviour and academic integrity.

12. Other: Cell phones and MP3 players are not be used in the classroom; cell phones and MP3 players must be turned off as they are a distraction to the class.

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COLLEGE COMMUNICATIONS FOR ENVIRONMENTAL SCIENCE

Course Outline
Course Number: COMM44

2011 Fall
Sir Sandford Fleming College

Program: Environmental and Natural Resource Science
School of General Arts & Sciences

Course Format: In Person
Hours: 37.5

Faculty: Carolyn MacGillivray Office:

Office Hours: As posted

Availability:
Email: cmacgill@flemingc.on.ca

Faculty: Shirley Norman Office: 181
Office Hours: As posted

Availability:
Email: snorman@flemingc.on.ca

Faculty: Jacqueline Riley Gutierrez Office: 120
Office Hours: As posted

Availability:
Email: jgutierr@flemingc.on.ca

Faculty: Catherine Stalkie Office: 219
Office Hours: As posted

Availability:
Email: cstalkie@flemingc.on.ca

Faculty: Lawrence Gulston Office: 220
Office Hours: As posted

Availability:
Email: lgulston@flemingc.on.ca

Coordinator: Wendy Morgan Office: 5910

Email: wemorgan@flemingc.on.ca

Dean: Ann Drennan Office: 5923
Email: adrennan@flemingc.on.ca

Additional Comments:

Dean Approved:2011/09/05
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This first semester course will introduce students to the essential communication skills required to be successful in their chosen post-secondary program. These skills include reading, writing, speaking, listening and critical thinking. Students, individually and in teams, will improve their overall communication skills through a series of written assignments, in-class discussions based on readings, and lab activities. Emphasis will also be place on developing research skills, with assignments integrated closely with other common first semester courses.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.

6. Manage oneself and one's resources to achieve goals
7. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
To improve the stduent's potetntial for academic and professional success by further developing essential communication skills.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Use clear, concise and correct communication to convey ideas and information.
2. Read to comprehend, analyze, evaluate, and respond to diverse source material.
3. Use the critical thinking skills of analysis, synthesis and evaluation to systematically seek out answers, generate opinions, and craft messages—written and oral.
4. Seek out, evaluate, integrate, and document evidence to support and add credibility to ideas.

Additional Learning Outcomes Comments:

Students will achieve the above outcomes by engaging in some, or all, of the following elements of a performance
1) Engage in a series of writing assignments of varying lengths with the goal of producing text that clearly expresses ideas and information through the use of appropriate language, structure and mechanics.
2) Improve foundational language skills (grammar and mechanics) through a combination of self-directed learning, and seminar activities.
3) Complete regular reading assignments and develop strategies for analyzing and responding to a wide variety of source material.
4) Develop an introductory awareness of how audience and purpose influence communication.
5) Identify author, source type, audience, purpose, and author’s intent in selected source material.
6) Conduct research and evaluate the quality of supporting evidence for use in arguments and writing assignments.
7) Apply basic principles of quotation and paraphrase integration and accurately document source material according to a recognized citation style (APA).
8) Effectively summarize an author’s main ideas and intent.
9) Develop and use strategies to revise writing.
10) Effectively present ideas and information.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Seminar:Welcome & Orientation, Introduction to Course Outline Introduction to Writing Skills & Expectations	1-4	
Week 2	Seminar:Library Research Overview & Library Orientation	1-4	Writing Assignment #1 (10%)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Evaluating research material Comp Lab: Writing Assignment #1 - Library Research		(Due in lab)
Week 3	Seminar: Intro to documentation (electronic referencing) Writing a Reaction to Readings	1-4	
Week 4	Seminar:Taking Good Field Notes Field Notes Activity Comp Lab: Writing Assignment #2 - Writing a Reaction	1-4	Writing Assignmemt #2 (10%) (Due in lab) Writing Assignment #3: Field Notes 10%
Week 5	Seminar: Summary Writing Skills & Practice Computer Lab: Language Skills 1(Self Directed Learning)	1-4	Language Skills Quiz #1 (4%)
Week 6	Seminar: Internet Research Assignment, Electronic Referencing & Memo Writing Computer Lab: Writing Assignment #4: Summary Evaulation	1-4	Writing Assignment #4 (10%) (Due in Lab)
Week 7	Seminar: Internet Research Assignment Computer Lab:Language Skills 2 (Self Directed Learning)	1-4	Language Skills Quiz 2(4%) Internet Research Assignment (10%)
Week 8	Reading Week Program oriented, self-directed studies/field activities Team Development of materials for presentation weeks 13-15		
Week 9	Seminar: Preparing A Case Study Computer Lab: Plagiarism tutorial	1-4	Plagiarism tutorial quiz 5%
Week 10	Seminar: Conventions of Using Graphics Computer Lab:Language Skills 3 (Self Directed Study)	1-4	Language Skills Quiz #3 (4%)
Week 11	Seminar: Editing & Revision (of Case Study) Computer Lab: Editing & Revising	1-4	
Week 12	Seminar: Preparing & Delivering Oral Presentations Computer Lab:Language Skills 4 (Self Directed Study)	1-4	Language Skills Quiz #4 (4%) Case Study Report (10%)
Week 13	Seminar:Team Presentations as scheduled. Computer Lab: Accuplacer Exit Test	1-4	Team presentation (10%) as per schedule Accuplacer Exit Test

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
			(5%)
Week 14	Team Presentations as scheduled. Computer Lab:Language Skills #5	1-4	Language Skills Quiz #5 (4%) Team presentations (15%) as per schedule
Week 15	Team Presentations as scheduled.	1-4	Team presentations (10%) as per schedule

IMPORTANT SCHEDULING NOTE: Writing labs are offered in alternate weeks. The above schedule refers to students attending odd numbered sections; students in even numbered sections will have their lab schedules and due dates reversed. Please refer to section schedule provided by course professor for specific class and assignment dates.

Learning Resources:

1. *A Writer's Resource*, 2nd Canadian Edition by Maimon, Peritz and Rubens. McGraw-Hill Ryerson, 2009.

2. Readings will be provided to students either in class or on the course webpage. Students may be required to print resources and/or assignments in this course. Print credit cards are available for purchase, along with required textbooks, at the Fleming Station Bookstore.

Assessment Plan:

Item/Date:	Percent:	Description:
Weeks 2,4,4,6	40	Writing assignments (4 X 10%) 1. Library Research & Evaluating a Source (Short Answer Critical Thinking) 2. Written Reaction with Documentation (Comprehensive Critical Thinking) 3. Recording Field Notes 4. Responding to a Reading: Summary
Weeks 5,7,10,12,14,	20	Language Skills Quizzes: 1. Sentence fragments and run-ons (4%)

Item/Date:	Percent:	Description:
		2. Commas, colons, semicolons, and apostrophes (4%) 3. Cliches/slang, modifiers, wordiness, word choice,capitalization and homonyms.(4%) 4. Subject-verb agreement and spelling (4%) 5. Pronoun reference and agreement (4%)
Weeks 7, 12, 14	30	Internet Research Report – Case Study 1. Research Assignment 10% 2. Case Study Report 10% 3. Team Presentation 10%
Week 9	5	Plagiarism Quiz
Week 14	5	Final Test: Accuplacer Reading Comprehension

Additional Assessment Comments:

IMPORTANT SCHEDULING NOTE: Writing labs are offered in alternate weeks. The above schedule refers to students attending odd numbered sections; students in even numbere sections will have their lab schedules and due dates reversed. Please refer to section schedule provided by course professor for specific class and assignment dates.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Please contact the Registrar's Office for more information.

Exemptions contact for this course:
External credits are not accepted for this course. Exemptions for this course are only available to those students who hold internal Fleming credits that are considered equivalents, or to students who test out of the course based on post-admission assessment testing. Course equivalents include COMM44, 78, 79 and 80.

If you hold a first semester communications credit from Fleming College that is not listed above, and

would like to confirm equivalency, please contact the Coordinator, Cathy Stalkie at cstalkie@flemingc.on.ca / 705-324-9144 ext. 3241.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.

Class Attendance and Assignments
• Attendance at all classes is strongly recommended. Regular class attendance is a key factor in students' success.
• Students must attend the course section(s) that appears on their timetables.

Modifications to the Learning Sequence
• Rescheduling of course topics and evaluations may be necessary to accommodate scheduling challenges or other unforeseen circumstances.
• Significant changes will be discussed and mutually agreed to in class.

Missed Classes
• It is the student's responsibility to get caught up from missed classes. Please speak to fellow classmates about notes and handouts, and assignments and check the course webpage.

Missed Tests and Assessments
• Only in extreme circumstances will a student be permitted to write/submit a missed test or assessment. It is the student's responsibility to contact the professor as soon as possible after a missed test or assessment.
• If a student is going to miss a test or assessment for a legitimate reason, they should discuss the issue with their professor as soon as possible. It is the professor's right to determine whether to accommodate a student's request.

Late Assignments
• You must submit/present all written/oral assignments on their assigned dates unless you make specific arrangements in writing/voice mail/E-mail with your professor at least 24 hours prior to the due date in question.
• In the case of an emergency, make arrangements (in writing, if necessary) immediately upon your return.
• Your professor will make special arrangements for valid reasons only. Extenuating circumstances will be discussed on an individual basis. It is the professor's right to determine whether to accommodate a student's request.
• A penalty of 10% per day will be applied to an assignment not submitted by the original or extended due date. An assignment more than three days late will receive a grade of zero ("0"). No assignment will be accepted after the last day of classes without prior arrangement with your professor.

Classroom Behaviour
• Students are not permitted to use cellphones, iPods, or other electronic devices for the purposes of sending/receiving calls, text messaging, or web surfing during lectures or seminars.
• Students wishing to record the class material must receive permission from the professor.
• Laptops will be permitted provided that they are being used for an academic purpose related to the activities occurring in the class.

Evaluation Criteria
• All written assignments will be graded according to the Department-approved writing assessment tool—available on students' course page.

Grades

• Grades for assignments will be entered into the WebCT gradebook within two weeks of an evaluation.
• Students have two weeks after the grade appears to report any concerns or problems to their professors.

Final grades

• Final grades are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline.
• Faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Records

• Students are encouraged to keep a copy of this outline, copies of all submitted assignments, and to retain graded material until the end of the semester.

Academic Integrity

The College views very seriously any form of academic dishonesty, such as plagiarism, submission of work for which credit has already been received; cheating, impersonation; falsification or fabrication of data; the acquisition of confidential materials, e.g., examination papers; misrepresentation of facts; altering transcripts or other official documents.

Plagiarism

In essence, plagiarism is the submission for credit of work taken without adequate documentation from an existing source. One form of plagiarism involves direct incorporation, without proper credit, of phrases, passages of text, images, or data of any kind from an existing source. A second form involves using data or information without proper credit (even though the incorporated information is paraphrased or otherwise not in direct form).

• Students are taught about issues of plagiarism in their first semester communication courses. Specifically, they are taught how to identify and avoid plagiarism. Because of the seriousness of a breach of Academic Integrity, students are strongly encouraged to seek clarification from their Communications instructors prior to the submission of written work.
• A plagiarized assignment will receive a grade of zero.
• Students should refer to their first semester handbook, A Writer's Resource, or the excellent site by Diana Hacker at http://www.dianahacker.com/resdoc/ to review the mechanics of citing sources.
• Students should also be familiar with the course and college rules about plagiarism: Section 6.6.0 of Fleming's Academic Regulations.

Missed Field Trips and Field Exercises (FROST SPECIFIC)

• Students must consult with the course professor about any possible alternate arrangements for field trips and exercises missed.
• Advance notice of absence may result in greater accommodation as there is no guarantee that alternative arrangements can be made.

Student Attire for Field Work and Field Trips (FROST SPECIFIC)

• Appropriate attire, as determined by the course professor, is mandatory for field trips and for field exercises. Scheduled field exercises are usually conducted regardless of weather conditions. For more specific information on requirements, please see the course outline or the professor responsible.

ECOLOGY AND ENVIRONMENT

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Course Outline
Course Number: ENVR20

2011 Fall
Sir Sandford Fleming College

Program:Common First Semester
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 60 hours

Faculty: Cyndy Broughton Office: 181
Office Hours: As posted

Availability: By posted office hours
Email: cbrought@flemingc.on.ca

Faculty: Anurani Persaud Office:
Office Hours: As posted

Availability: By email
Email: anpersau@flemingc.on.ca

Faculty: Grant Bashford Office: 115A
Office Hours: As posted

Availability: By posted office hours
Email: gbashfor@flemingc.on.ca

Faculty: Barbara Elliot Office: 256
Office Hours: As posted

Availability: By posted office hours
Email: belliot@flemingc.on.ca

Faculty: David Wright Office:
Office Hours: As posted

Availability: By email
Email: davidw@flemingc.on.ca

Faculty: Neil Steffler Office: 258
Office Hours: As posted

Availability: By posted office hours
Email: nsteffle@flemingc.on.ca

Faculty: Mark Williamson Office: 183
Office Hours: As posted

Availability: By posted office hours
Email: marwilli@flemingc.on.ca

Coordinator: Barbara Elliot Office: 256
Email: belliot@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Course format: TWO 1-hour lectures, one 2-hour lab and one 1-hour our guided learning hour (GLH) EVERY WEEK

Course Leader: Cyndy Broughton, Room #181, email: cbrought@flemingc.on.ca

GLH Lab technologists: Jim Deitch, email: jdeitch@flemingc.on.ca, Derrick Laplante, email: delaplan@flemingc.on.ca, Mark Newell, email: mnewell@flemingc.on.ca

Please make a copy of this outline for your career portfolio.

Dean Approved: 2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

Learn how nature works by studying the key components of the ecosystems in the Kawartha Lakes Region. Through field and lab exploration of wild life, landforms, forests, lakes, rivers and wetlands, students will see the connections between themselves, the environment and ecosystems that surround them.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
2. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
This course will enable learners to use a variety of methods to investigate patterns in nature and the impacts of human behaviour on the natural world.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Apply basic knowledge of ecological principles, worldviews and the nature of science in the development of a personal perspective on humans and the environment.
2. Identify landscape features and geological landforms characteristic of a given region at a basic level, under field conditions.
3. Use introductory knowledge of earth-forming processes and geology in the identification of physiographic regions and ecosystems.
4. Apply basic knowledge of the hydrologic cycle and ecosystem processes in assessing the general impact of human activity within a given watershed.
5. Use introductory knowledge of abiotic, biotic and cultural characteristics to evaluate the ecological significance of a particular landscape.
6. Assess, at a basic level, the impact of a development issue using knowledge of ecosystem functions and interdependencies.
7. Examine the significance of energy conservation strategies in a given environment.
8. Examine the ways in which declining atmospheric quality could have a possible impact on human health, the environment and quality of life.
9. Given continued human population growth, assess the possible impacts of this trend on ecosystem health and culture.
10. Use topographic map skills to draw and interpret contour lines and topographic profiles that represent landscape features and landforms.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1: Sept. 6 Classes begin Module 1: Ecological Principles	Lecture 1 :course outline/ structure (learning teams), resources Lecture 2: ecology, environment and sustainability LAB: NO LABS THIS WEEK	1	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	GLH: NO GLH'S THIS WEEK		
Week 2: Sept. 12 Module 1: Ecological Principles	Lecture 3: world views Lecture 4: principles of scientific inquiry LAB: Geology of the Kawartha Lakes (field trip) GLH: field trip NOTE: Students meet faculty in parking lot B to board the bus for the field trip	1, 2, 3	
Week 3: Sept. 19 Module 2: Earth Sciences	Lecture 5: earth sciences Lecture 6: earth sciences LAB: Succession Lab GLH: complete fieldwork from lab	1, 3, 4, 5, 6	Lab/GLH 5% Succession Lab
Week 4: Sept. 26 Module 2: Earth Sciences	Lecture 7: earth sciences Lecture 8: earth sciences Presentation on Test Study Skills by LSS staff LAB: Landforms of the Kawartha Lakes(field trip) GLH: field trip NOTE: Students meet faculty in parking lot B to board the bus for the field trip	1,2, 3	
Week 5: Oct. 4 Module 3: Terrestrial Ecosystems	Lecture 9: Terrestrial Ecosystems Lecture 10: Terrestrial Ecosystems LAB: Case Study/Campus Walkabout GLH: Case Study/learning Teams	1, 3, 4, 5, 6	Lecture Test 1: 8%
Week 6: Oct. 10 Module 3: Terrestrial Ecosystems	Lecture 11: Terrestrial Ecosystems Lecture 12: Terrestrial Ecosystems LAB: Soil Analysis I NOTE: Thanksgiving Monday labs will cover soils content in Week 7	1, 4, 5, 6	Quiz - 10% on Field Trips - webct
Week 7: Oct. 17 Module 4: Aquatic Ecosystems	Lecture 13: Aquatic Ecosystems Lecture 14: Aquatic Ecosystems Lab: Soil Analysis II GLH: Monday Labs ONLY will complete the soils lab in the GLH to make-up for Thanksgiving Monday Assign Wetlands Internet assignment in the lab; to be submitted in the lab week 9	1, 4, 5, 6	Lab/GLH: 2.5% Soil ID
Week 8: Oct. 24 LEARNING WEEK	Preparation for lecture test #2 Completion of Wetlands Internet assignment Due week 9		
Week 9: Oct. 31 Module 4: Aquatic Ecosystems	Lecture 15: Aquatic Ecosystems Lecture 16: Aquatic Ecosystems Lab: Topography Lab I	1, 4, 5, 6,10	Wetlands Internet Assignment Due 2.5%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	NOTE: Students are asked to bring topographic map Lindsay 31 D/7 to the lab next week. Submit Wetlands Internet assignment		
Week 10: Nov. 7 Module 5: Humans and the Environment	Lecture 17: Human Population Lecture 18: Human Population Lab: Topography Lab II NOTE: Students require Topographic map Lindsay 31 D/7 to complete the lab. Assign Human Population Lab	1, 4, 5, 6, 9,10	LECTURE TEST 2: 14% Lab: 5% Topographic Profile
Week 11: Nov. 14 Module 5: Humans and the Environment	Lecture 19: Energy and Electricity Lecture 20: Agriculture Lab: Water Quality Submit Human Population Lab Assignment GLH: Case Study work	1, 4, 5, 6, 7	Lab: 2.5% Water Quality Human Population Due 4%
Week 12: Nov. 21 Module 5: Humans and the Environment	Lecture 21: Permaculture Lecture 22: Atmosphere and Climate Lab: Constructed Wetlands NOTE: Hand in Case Study Report at the end of the lab period. GLH: Quiz Webct based (content:soils/water quality/wetlands)	1, 4, 5, 6, 7, 8	Lab: 5% Constructed Wetlands GLH:Quiz 7.5% Case Study Report Due 5%
Week 13: Nov. 28 Module 5: Humans and the Environment	Lecture 23: Atmosphere and Climate Lecture 24: Environmental Health Lab: Alternate Energy Introduction to Week 14 Lab NOTE: students must be present in class during this Week 13 lab in order to receive the GHG assignment due in Week 14	1, 4, 5, 6, 7, 8, 9	Lab: 4% Alternate Energy
Week 14: Dec. 5 Module 5: Humans and the Environment	Lecture 25: First Peoples Lecture 26: Future Challenges Lab: GHG Food Consumption Film: "End of Suburbia"	1, 4, 5, 6, 7, 8, 9	Lab:5% GHG Food Consumption
Week 15: Dec. 12	Lecture 27 and 28: NO LECTURES FINAL TEST WebCT Lab: NO LAB GLH: NO GLH	1, 4, 5, 6, 7, 8, 9	FINAL TEST: 20%

Learning Sequence Additional Comments:

It is suggested that students retain the following items for inclusion in their career portfolio:
* hard copy of course outline
* digital and hard copy of case study presentation

Learning Resources:

Learning Resources:
Required:
Cunningham, W. P., Cunningham, M. A., Saigo, B. W., Bailey, R., and Shrubsole, D. (2005). Environmental Science: A Global Concern. Toronto, ON: McGraw-Hill Ryerson.
WebCT Ecology and Environment Course Page
Fleming College. (2011). Ecology and Environment Course Manual (CFS Kit).

Recommended:
http://www.ourenvironment4e.nelson.com/student/
http://www.enn.com/ - Environmental News Network
http://www.ishmael.org/welcome.cfm - The Ishmael Community

Adams, P. & Taylor, C. (1992). Peterborough and the Kawarthas. 2nd edition. Peterborough, ON: Heritage Publications.

Eyles, N. (2002). Ontario Rocks: three billion years of environmental change. Markham, ON: Fitzhenry & Whiteside.

Additional resources, including lecture/lab materials and other supporting materials, will be distributed during the term.

Assessment Plan:

Item/Date:	Percent:	Description:
Lab: Succession	5	Week 3: due by END of GLH
Lecture Test 1	8	Week 5: in Testing Centre (Room 335)
Quiz on Field trips	10	Week 6: during scheduled posted times in the Testing Centre
Lab: Soil Analysis	2.5	Week 7: due by END of the Lab (Due by the end of the GLH for Monday classes)
Lab: Wetlands	2.5	Week 9: due by START of Lab
Lecture Test 2	14	Week 10 in the Testing Centre (Room 335)
Lab: Topographic Profile	5	Week 10: due by END of Lab
Lab: Water Quality	2.5	Week 11: due by END of Lab
Lab: Human Population	4	Week 11: due by START of Lab
Lab: Constructed Wetlands	5	Week 12: due at END of Lab
GLH: Quiz	7.5	Week 12: in the GLH
Lab: Case Study	5	Week 12: due by the END of the Lab

Item/Date:	Percent:	Description:
Report		
LAB: Alternate Energy	4	Week 14: due at START of Lab
Lab: GHG Food Consumption	5	Week 14: due at END of Lab
Final Lecture Test	20	Week 15: date and time TBA Testing Centre (room 335)

Additional Assessment Comments:

It is suggested that students retain the following items for inclusion in their career portfolio:
* digital and hard copy of case study presentation
* Ecology and Environment course outline

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Student Access and Referral Services, Learning Resources Centre (LRC), Brealey Campus, ext. 1358

Exemptions contact for this course:
Cyndy Broughton, Ecology & Environment Course Leader, Room 181, Frost Campus

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
1. Student Attire for Field Work and Field Trips:
Appropriate attire, as determined by the course professor, is mandatory for field trips and for field exercises. Hard hats and closed-toe footwear are mandatory in order to allow students to exit the buses on fieldtrips.

Scheduled field exercises are usually conducted regardless of weather conditions. Students are expected to bring weather-appropriate clothing to class.

For more specific information on requirements, please see the course outline or the professor responsible.

2. Class Attendance and Assignments:

Attendance at all classes is strongly recommended. Research shows that regular class attendance is a key factor in student success.

Students must attend lecture, labs and tests with their own group, to accommodate room timetabling and class size, unless prior arrangements have been made with a completed and signed Student Request Form.

2.1 Scheduling

Rescheduling of course topics and evaluations may be necessary when unforeseen circumstances arise. Changes will be discussed and mutually agreed to in class.

2.2 Missed Field Trips and Field Exercises:

Students must consult with the course professor about any possible alternate arrangements for field trips and exercises missed. However, there is no guarantee that alternative arrangements can be made.

Advance notice of absence may result in greater accommodation.

2.3 Missed Classes:

It is the student's responsibility to get caught up from missed classes. Please contact the course faculty only if notes and assignments are unavailable from other sources (e.g. student portal, classmates).

2.4 Missed Tests and Assessments, including Oral Presentations

If a student misses a test or other assessment due to unavoidable circumstances, it is the student's responsibility to contact the professor within 24 hours of their return to school.

A student may be allowed to write the missed test or assignment if proper documentation explaining the reason for the absence is presented to the faculty. Considerations for accommodations include a medical certificate or legal document. However, the professor has the right not to allow the student to write the test or assessment missed.

Advance notice of absence may result in greater accommodation.

Students must attempt each of the three lecture tests (Lecture Test #1, Lecture Test #2, Final Test) in order to be considered for a passing grade in this course.

2.5 Late Assignments:

Students are responsible for submitting assignments and projects on the due date and time. The SENRS School Office, Student Services, and Admissions and Records will not accept any assignments or projects.

If the assignment is not submitted on the due date and time, a grade of zero will be assigned. However, an individual extension of the due date may be granted at the discretion of the professor. It is the student's responsibility to notify the professor of the problem within 24 hours of the assigned due date.

Considerations for extensions include a medical certificate or legal document.

Late assignments identical to the original will not be accepted under any circumstances after the original assignments or tests have been graded and distributed to the class.

For further information, please see the course outline and the professor responsible.

2.6 Format for Assignments

All assignments must be word processed. Professors may grant some personal exemptions, in which case assignments will be typed.

2.7 Evaluation Criteria

All assignments will be graded on the basis of content, style, structure, and mechanics.

3. Final grades

In this course, final grades are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. Faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

ACADEMIC BEHAVIOUR AND ACADEMIC INTEGRITY

You, as a Fleming student, will conduct yourself in a courteous, responsible fashion.

You are expected to work individually on assignments unless otherwise directed. Breaches of academic integrity such as plagiarism will result in a mark of zero (0) for the evaluated activity and will be reported in writing to the Registrar. You have the responsibility to support academic integrity. Please refer to your student handbook, Frost Facts, for the specific college regulations governing academic behaviour and academic integrity.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

Return to document

ECOSYSTEM SKILLS

Course Outline
Course Number: ECOS13

2011 Fall
Sir Sandford Fleming College

Program: Common First Semester
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 60

Faculty: Barbara Merchant Office: 155B
Office Hours: As posted

Availability:
Email: bmerchan@flemingc.on.ca

Faculty: Robert Bialkowski Office: 155B
Office Hours: As posted

Availability:
Email: rbialkow@flemingc.on.ca

Faculty: Andrew McDonough Office:
Office Hours: As posted

Availability:
Email: amcdonou@flemingc.on.ca

Faculty: Christina Soliman Office: 155B
Office Hours: As posted

Availability:
Email: csoliman@flemingc.on.ca

Faculty: Donald McLeod Office: 221
Office Hours: As posted

Availability:
Email: dmcleod@flemingc.on.ca

Faculty: Kelly Cordick Office: 183
Office Hours: As posted

Availability:

Email: kcordick@flemingc.on.ca

Faculty: James Martin Office: 258
Office Hours: As posted

Availability:
Email: jimartin@flemingc.on.ca

Faculty: Josh Feltham Office: 213
Office Hours: As posted

Availability:
Email: jfeltham@flemingc.on.ca

Faculty: Michael Fraser Office: 281
Office Hours: As posted

Availability:
Email: mfraser@flemingc.on.ca

Faculty: Thomas Luloff Office:
Office Hours: As posted

Availability:
Email: tluloff@flemingc.on.ca

Faculty: Kristine McBride Office:
Office Hours: As posted

Availability:
Email: krmcbrid@flemingc.on.ca

Coordinator: Barbara Elliot Office: 256
Email: belliot@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Course Leader: Josh Feltham
Course Format: one 1 hr. lecture, one 3 hr. lab and one 1 hr. guided learning hour per week.
Please copy this document for your Career Portfolio.

Dean Approved: 2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio

development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course will focus on three areas of study: identification, field and lab skills. Students will identify and classify the living and non-living components of the specific ecosystems described in the Ecology and Environment (ENVR 20) course. Field skills to be developed include the ability to navigate through the natural environment and use a variety of ecosystem inventory techniques. Special emphasis will be placed on safe work habits in lab and field.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals

Aim:
To enable learners to develop a range of key observational and functional skills required to work in a range of positions across the environmental sector.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. follow the prescribed lab and field health and safety guidelines in order to create a safe work environment for course activities.

2. record data and observations using a standardized protocol (SCAN: Specific, Complete, Accurate, Neat).
3. operate specific instruments or equipment in order to perform given tasks.
4. identify specific examples from the following categories:
   - fish
   - rocks and minerals
   - trees
   - birds
   - mammals
   - herptiles

   in order to survey or monitor populations and habitat.
5. use a compass and Global Positioning Systems (GPS) under field conditions.
6. identify specific drilling equipment and methods that can be used to address resources drilling needs in a variety of ecosystems.
7. use aerial photography to identify objects and calculate scale, distance and area and to determine azimuths.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Classes Begin	Course Orientation, Lab/ Field Safety & Techniques No LAB or GLH during Orientation week	1,2	
Week 2	LEC: Geology (Rocks & Minerals) LAB: Rocks & Mineral ID, Rock Lab GLH: Rock & Mineral Study	1,2,3,4	Rock Lab 5%
Week 3	LEC: Drilling & Blasting 1 LAB: Geotechnical, Diamond Core, Waterwell GLH: Rock & Mineral Test	1,2,3,4,5,6	Mineral Test 10%
Week 4	LEC: Drilling & Blasting 2 LAB: Blast Hole, Directional SDL: Drilling Pre-Test/Practise	1,2,3,4,5,6	
Week 5	LEC: Compassing/Orienteering LAB: Working with Maps & Compass Pacing/Compassing GLH: Drilling & Safety Test (WebCT)	1,2,3,5,7	Drilling & Safey Test 15% (WebCT)
Week 6	LEC: Photogrammetry LAB: Compassing Field Trip GLH: Compassing Field Trip	1,2,3,5,7	Compassing Field Trip or Photogrammetry 10%
Week 7	LEC: Power Point & Digital Images LAB: Photogrammetry Assignment GLH: Photo Assignment	1,2,3,5,7	Compassing Field Trip or Photogrammetry 10%
Week 8	Program Oriented, self-directed	4	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	studies/field activities Read Week 9 Lecture & Lab Notes Work on Power Point Presentations for Weeks 10 & 11		
Week 9	LEC: Dendrology LAB: Summer & Winter Tree ID GLH: Study Period for Tree ID	2,4	
Week 10	LEC: Bird ID LAB: Bird ID; Bird Presentations (5%) GLH: Study Period for Tree ID	2,3	Bird Presentation 5%
Week 11	LEC: Mammal ID LAB: Mammal ID; Mammal Presentations (5%) GLH: Tree ID Test	2,4	Mammal Presentation 5% Tree Test 10%
Week 12	LEC: Fish ID & Anatomy LAB: Fish ID Exercise GLH: Birds & Mammals Test (WebCT)	2,4	Birds & Mammals Test 10% (WebCT)
Week 13	LEC: Biological Measurement LAB: Biological Measurement SDL: Fish ID Website	1,2,3,4	
Week 14	LEC: Herptiles LAB: Herptiles GLH: Fish Test (WebCT)(Unless otherwise specified)	1,2,3,4	Fish Test 10% (WebCT)
Week 15	LEC: No Lecture LAB: Review Herptiles ID Website GLH: Herptiles Test (WebCT) (Unless otherwise specified)	1,2,3,4	Herptiles Test 10% (WebCT)

Learning Sequence Additional Comments:

All lectures will occur before labs beginning with Week 1.

Learning Resources:

Required:
Ecosystem Skills Manual. (Photocopy)
Hilts, S. (1997). Ontario Trees & Some Woodland Plants. Guelph, ON. University of Guelph; Centre for Land and Water Stewardship
Fleming College. (2011). Components of Common First Semester resource kit.

Assessment Plan:

Item/Date:	Percent:	Description:
Rock Lab	5	Week 2 Lab
Rock & Mineral Test	10	Week 3 GLH
Drilling Test	15	Week 5 GLH (WebCT)
CompassingField Trip	10	Week 6 or 7 Field Trip
Photogrammetry Lab	10	Week 6 or 7 Lab
Tree Test	10	Week 11 GLH
Bird Presentation	5	Week 10 Lab (Powerpoint)
Mammal Presentation	5	Week 11 Lab (Powerpoint)
Birds & Mammals Test	10	Week 12 GLH (WebCT)unless otherwise indicated
Fish Test	10	Week 14 GLH (WebCT)unless otherwise indicated
Herptiles	10	Week 15 GLH (WebCT)unless otherwise indicated

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Student Access and Referral Services, LRC, Brealey Campus, ext. 1358

Exemptions contact for this course:
Josh Feltham, Course Leader, Room 213

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
1. Student Attire for Field Work and Field Trips:

Appropriate attire, as determined by the course professor, is mandatory for field trips and field exercises.
Scheduled field exercises are usually conducted regardless of weather conditions.

For more specific information on requirements, please see the course outline or the professor responsible.

2. Class Attendance and Assignments:

Attendance at all classes is strongly recommended. Research shows that regular class attendance is a key factor in students' success.

Students must attend lecture, labs, and tests with their own group, to accommodate room timetabling and class size, unless prior arrangements have been made with a completed and signed Student Request Form.

2.1 Scheduling

Rescheduling of course topics and evaluations may be necessary when unforeseen circumstances arise. Changes will be discussed and mutually agreed to in class.

2.2 Missed Field Trips and Field Exercises:

Students must consult with the course professor about any possible alternate arrangements for field trips and exercises missed. However, there is no guarantee that alternative arrangements can be made.

Advance notice of absence may result in greater accommodation.

2.3 Missed Classes:

It is the student's responsibility to get caught up from missed classes. Please contact the course faculty only if notes and assignments are unavailable from classmates.

2.4 Missed Tests and Assessments, including Oral Presentations

If a student misses a test or other assessment due to unavoidable circumstances, it is the student's responsibility to contact the professor within twenty-four hours of their return to school.

A student may be allowed to write the missed test or assignment if proper documentation explaining the reason for the absence is presented to the faculty. However, the professor has the right not to allow the student to write the test or assessment missed.

Advance notice of absence may result in greater accommodation.

2.5 Late Assignments:

Students are responsible for submitting assignments and projects on the due date and time. The SENRS School Office, Student Services, and Admissions and Records will not accept any assignments or projects.

If the assignment is not submitted on the due date and time, a grade of zero will be assigned. However, an individual extension of the due date may be granted at the discretion of the professor. It is the

student's responsibility to notify the professor of the problem within twenty-four hours of assigned due date.

Considerations for extensions include a medical certificate or legal document.

Late assignments identical to the original will not be accepted under any circumstances after the original assignments or tests have been graded and distributed to the class.

For further information, please see the course outline and the professor responsible.

2.6 Format for Assignments

All assignments must be word processed where applicable. Professors may grant some personal exemptions, in which case assignments will be typed.

2.7 Evaluation Criteria

All assignments will be graded on the basis of content, style, structure, and mechanics.

3. Final grades

In this course, final grades are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. Faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

ACADEMIC BEHAVIOUR AND ACADEMIC INTEGRITY

You, as a Fleming student, will conduct yourself in a courteous, responsible fashion.

You are expected to work individually on assignments unless otherwise directed. Breaches of academic integrity such as plagiarism will result in a mark of zero (0) for the evaluated activity and will be reported in writing to the Registrar. You have the responsibility to support academic integrity. Please refer to your student handbook, Frost Facts, for the specific college regulations governing academic behaviour and academic integrity.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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GEOSPATIAL TECHNIQUES

Course Outline
Course Number: GEOM36

2011 Fall
Sir Sandford Fleming College

Program:Common First Semester
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Cecilia Rulli Office: 168
Office Hours: As posted

Availability:
Email: crulli@flemingc.on.ca

Faculty: Beatrize Vitorino Office: 215
Office Hours: As posted

Availability:
Email: bvitorin@flemingc.on.ca

Faculty: Lawrie Keillor-Faulkner Office: 213
Office Hours: As posted

Availability:
Email: lkeillor@flemingc.on.ca

Faculty: Paige Wearing Office: 119
Office Hours: As posted

Availability:
Email: pwearing@flemingc.on.ca

Faculty: Markus Wieland Office:
Office Hours: As posted

Availability:
Email: mwieland@flemingc.on.ca

Faculty: Karen Whillans-Browning Office: 173
Office Hours: As posted

Availability:

Email: kwhillan@flemingc.on.ca

Faculty: Hal Ward Office:
Office Hours: As posted

Availability:
Email: hward@flemingc.on.ca

Coordinator: Barbara Elliot Office: 256
Email: belliot@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

One 1-hour lecture, one 2-hour lab, one 1-hour Guided Learning Hour (GLH) lab per week.

Guided Learning Hour (GLH) Labs:
Sue Mantle, Geomatics Help Desk, email: smantle@flemingc.on.ca
Kevin Rabjohn, Geomatics Help Desk, email: krabjohn@flemingc.on.ca
Tim Wykes, Geomatics Help Desk, email: twykes@flemingc.on.ca

Please make a copy of this document for your Career Portfolio.

Dean Approved: 2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course is designed around the four pillars of Geomatics: Remote Sensing, Cartography, Surveying and GIS. Students will develop entry-level skills in data capture, surveying, (computer) drafting, principles of remote sensing, air photo interpretation, and in usage of representative Geomatics-related software.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Manage oneself and one's resources to achieve goals

Aim:
Using recognized geomatics principles, the student will be able to create, edit and represent new and existing spatial data accurately and effectively using a variety of industry-standard geomatics software.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Design and produce an effective cartographic product (including maps, charts, figures and tables).
2. Apply basic design principles such as hierarchies, type placement and proper layout, accurately and consistently.
3. Apply basic math skills in making accurate scale measurements and calculations, and in calculating UTM plane co-ordinates.
4. Produce accurate survey plots using GPS and digital plotting techniques.
5. Use GPS to record environmental features and integrate these features in geomatics software.
6. Understand the use of Electronic Distance Measurement (EDM) to produce environmental topographic features.
7. Use geomatics-related software for standard functions such as plotting and digital map creation.
8. Use basic GIS analysis to produce new geographic and statistical information.
9. Assess the application of remote sensing (i.e. satellite imagery, aerial photography) methods in acquiring accurate positional data and extracting ecological and environmental data.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Classes Begin	Lec: Course Orientation Intro to Geomatics Lab: Intro to computer lab Intro to Illustrator Part A	1,7	
Week 2	Lec: Map Design: content, layout,	1, 2, 7	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	conventions, visual hierarchies Lab: Intro to Illustrator Part B Start Assignment 1: Part A		
Week 3	Lec: Map Scale: representations, calculations, Metric Ratio Scale (MRS) Lab: Illustrator: Assignment 1: Part B	1, 2, 3, 7	
Week 4	Lec: Geo-Referencing: latitude and longitude, Universal Transverse Mercator (UTM) Lab: Scale & Illustrator work period Assignment 1 submitted end of lab	1, 2, 3, 7	Assignment 1 (15%)
Week 5	Lec: Introduction to Global Positioning System (GPS) Lab: OBM/NTS Map Reading, Scale and UTM Work lab in map room	1, 2, 3, 5, 7	
Week 6 Monday Oct 10, Thanksgiving, College closed	Lec: Intro to GPS (cont'd) Lab: Scale and UTM test (map room) Lab: Intro to e-Trex GPS units	1, 2, 4, 5, 7	Scale and UTM Test (15%)
Week 7	Lec: Mid-Term (WebCT) Lab: Intro to AutoCAD, tutorial (computer room) GPS field work exercise	1, 2, 3, 4, 5, 7	Mid-Term (WebCT)(15%)
Week 8 Independent Learning Week	Program oriented, self-directed studies/field activities		
Week 9	Lec: Surveying Techniques and Traverses Lab: Review AutoCAD and GPS field work: Start Assignment 2: Part A	4, 5, 7, 9	Assignment 2 Part A (5%)
Week 10	Lec: Topographic and Feature Mapping Lab: AutoCAD Assignment 2: Part B: Map Feature Creation and Map Design	1, 2, 3, 4, 5, 6,7	
Week 11	Lec: Introduction to Geographic Information Systems (GIS): The World in a Box (Video 2462) Lab: AutoCAD Assignment 2: Part C Traverse Test, Assignment 2 submitted end of lab	1, 2, 3, 4, 5, 7	Assignment 2: Parts B & C (15%)
Week 12	Lec: Intro to GIS (cont'd) Lab: Intro to ArcGIS/ArcMap Tutorial	1, 7, 8	
Week 13	Lec: Photogrammetry and Air Photo Interpretation Lab: Start ArcGIS/ArcMap: Assignment 3:	1, 2, 3, 7, 8, 9	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Part A		
Week 14	Lec: Remote Sensing Lab: Assignment 3: Part B Assignment 3 submitted end of lab	1, 2, 3, 7, 8, 9	Assignment 3 (20%)
Week 15	Final Exam (WebCT) No Lab this week	All	Final Exam (WebCT)(15%)

Learning Resources:

Common First Semester Kit:
in particular, 1:10,000 Ontario Base Map (OBM) and 1;50,000 National Topographic Series (NTS) maps of Lindsay, metric ratio scale (MRS), technical pencil, calculator

Assessment Plan:

Item/Date:	Percent:	Description:
Assignment 1 (Illustrator)	15	Week 4 lab
Scale & UTM test	15	Week 6 lab
Mid-Term exam	15	Week 7 WebCT
Assignment 2: Part A: GPS	5	Week 9 lab
Assignment 2 (AutoCAD) submitted	15	Week 11 lab
Assignment 3 (ArcMap)	20	Week 14 lab
Final Exam	15	Week 15 WebCT

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
It is suggested that initial contact takes place with your lab professor or the course leader, who may then refer the student to the Program coordinator or Admissions and Records Office

Exemptions contact for this course:
Your lab professor or Course leader.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
1. Student Attire for Field Work and Field Trips:
Appropriate attire, as determined by the course professor, is mandatory for field trips and for field exercises.

Scheduled field exercises are usually conducted regardless of weather conditions.

For more specific information on requirements, please see the course outline or the professor responsible.

2. Class Attendance and Assignments:

Attendance at all classes is strongly recommended. Research shows that regular class attendance is a key factor in student success.

Students must attend lecture, labs and tests with their own group, to accommodate room timetabling and class size, unless prior arrangements have been made with a completed and signed Student Request Form.

2.1 Scheduling

Rescheduling of course topics and evaluations may be necessary when unforeseen circumstances arise. Changes will be discussed and mutually agreed to in class.

2.2 Missed Field Trips and Field Exercises:

Students must consult with the lab professor about any possible alternate arrangements for field trips and exercises missed. However, there is no guarantee that alternative arrangements can be made.

Advance notice of absence may result in greater accommodation.

2.3 Missed Classes:

It is the student's responsibility to get caught up from missed classes. Please contact the course faculty only if notes and assignments are unavailable from other sources (e.g. student portal, course website). Students wishing to change labs (on a one-time use only) must use the student request form.

2.4 Missed Tests and Assessments, including Oral Presentations

If a student misses a test or other assessment due to unavoidable circumstances, it is the student's responsibility to contact the professor within 24 hours of their return to school.

A student may be allowed to write the missed test or assignment if proper documentation explaining the reason for the absence is presented to the faculty. Considerations for accommodations include a medical certificate or legal document. However, the professor has the right not to allow the student to write the test or assessment missed.

Advance notice of absence may result in greater accommodation.

2.5 Late Assignments:

Students are responsible for submitting assignments and projects on the due date and time. The SENRS School Office, Student Services, Admissions and Records, and the Information Centre will not accept any assignments or projects.

If the assignment is not submitted on the due date and time, a grade of zero will be assigned. However, an individual extension of the due date may be granted at the discretion of the lab professor. It is the student's responsibility to notify the lab professor of the problem within 24 hours of the assigned due date.

Considerations for extensions include a medical certificate or legal document.

Late assignments identical to the original will not be accepted under any circumstances after the original assignments or tests have been graded and distributed to the class.

For further information, please see the course outline and the professor responsible.

2.6 Format for Assignments

All assignments must be computer processed, with the exception of hand written tests.

2.7 Evaluation Criteria

All assignments will be graded on the basis of content, style, structure, originality and mechanics.

3. Final grades

In this course, final grades are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. Faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

ACADEMIC BEHAVIOUR AND ACADEMIC INTEGRITY

You, as a Fleming student, will conduct yourself in a courteous, responsible fashion.

You are expected to work individually on assignments unless otherwise directed. Breaches of academic integrity such as plagiarism will result in a mark of zero (0) for the evaluated activity and will be reported in writing to the Registrar. In addition, students must hand in original work from the current semester.

Any work that is deemed not original, or not from the current semester, will be given a mark of zero (0).

You have the responsibility to support academic integrity. Please refer to your student handbook, Frost Facts, for the specific college regulations governing academic behaviour and academic integrity.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class. Similarly, sound/mp3 players (e.g. iPod) must be turned off during class time. In addition, electronic media and communication programs such as Facebook, Twitter, YouTube, etc., and/or email programs are not permitted while lab instruction is occurring.

Return to document

LEADERSHIP IN THE ENVIRONMENT

Course Outline
Course Number: NATR8

2011 Fall
Sir Sandford Fleming College

Program:Common First Semester
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Peter Hughes Office: 173
Office Hours: As posted

Availability:
Email: pehughes@flemingc.on.ca

Faculty: Val Bishop Office: 281
Office Hours: As posted

Availability:
Email: vbishop@flemingc.on.ca

Faculty: Barbara Merchant Office: 155B
Office Hours: As posted

Availability:
Email: bmerchan@flemingc.on.ca

Faculty: Derrick Laplante Office: 304
Office Hours: As posted

Availability:
Email: delaplan@flemingc.on.ca

Faculty: Christina Soliman Office: 155B
Office Hours: As posted

Availability:
Email: csoliman@flemingc.on.ca

Faculty: Kevin Callan Office: 155B
Office Hours: As posted

Availability:

Email: kcallan@flemingc.on.ca

Faculty: Kristine McBride Office:
Office Hours: As posted

Availability:
Email: krmcbrid@flemingc.on.ca

Coordinator: Barbara Elliot Office: 256
Email: belliot@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Course Format: One 1-hour lecture; one 2-hour lab EVERY WEEK

NOTE TO STUDENTS:
Please make a copy of this outline for your career portfolio.
You will require hard copies of each of your course outlines from Semester 1 for inclusion in your portfolio.
We also urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course will enable students to develop a personal position and direct their career path within the context of the environmental and natural resource industry. An integrated, community based learning approach will be used to identify and apply a personal understanding of leadership, sustainability and community in the context of natural resource sciences.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
3. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
4. Manage oneself and one's resources to achieve goals
5. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

General Education Themes:

Civic Life: Courses in this area should provide students with an understanding of the meaning of freedoms, rights, and participation in community and public life, in addition to a working knowledge of the structure and function of various levels of government (municipal, provincial, national) in Canada and/or in an international context.

Personal Understanding: Courses in this area will focus on understanding the individual: his or her evolution; situation; relationship with others; place in the environment and universe; achievements and problems; and his or her meaning and purpose, allowing students the opportunity to study institutionalized human social behaviour in a systematic way.

Aim:
To provide learners with knowledge and awareness with respect to leadership, sustainability and community. To introduce skill requirements in the natural resources/environmental industries and to provide the opportunity for development of individual perspectives, leadership and advocacy skills.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. acquire and apply, at an introductory level, skills and knowledge in the environment/natural resources field related to sustainability, community and leadership.
2. make the link, and apply current understanding of environment, economic and social sustainability to the community.
3. develop a personal understanding of leadership and the qualities that contribute to leadership in the environmental and natural resources field.
4. develop a professional portfolio.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Sept 6-9 Classes begin	Lecture: Course Introduction & Critical Thinking Lab: No lab	3	
Week 2 Sept 12-16	Lecture: Transferable Skills Lab 1: Skill Inventory & Job Search Lab 10: The Links Project	1,2,3,4	
Week 3 Sept 19-23	Lecture: Leadership and Service Learning in Natural Resource Sciences Lab 2: Right Here, Right Now Lab 3: Annotated Bibliography Lab 9: Introduce Portfolio	1,2,3,4	Lab 1 due 5%
Week 4 Sept 26-30	Lecture: Introduction to Sustainability Lab 2: Right Here, Right Now Lab 3: Annotated Bibliography Lab 9: Introduce Portfolio	1,2,3,4	
Week 5 Oct 3-7	Lecture: Environmental Advocacy Lab 4: Case Study: Sheila Watt-Cloutier	1,2,3	Lab 2 due 5% Lab 4 due 5%
Week 6 Oct 10-14 Thanksgiving Monday	Lecture: Leading to Change Lab 5: Natural Resources Law	1,2,3	Lab 5 due 5%
Week 7 Oct 17-21	Lecture: Resource Consumption Lab 6: Water; Commodity or Basic Human Right?	1,2,3	Lab 6 due 5% Lab 3 due 5% Midterm 15%
Week 8 Oct 24-28 Independent Learning Week	Students should use time during independent learning week to collect items for their portfolio	1-4	
Week 9 Oct 31-Nov 4	Lecture: Professional Associations, Ethics and Certifications Lab 7: Case Study; Human Conflict and Natural Resources	1,2	Lab 7 due 5%
Week 10 Nov 7-11	Lecture: Reclamation and Remediation Lab 8: Case Study: Pearson International	1,2,4	Lab 9 due 10%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Airport Expansion		
Week 11 Nov 14-18	Lecture: Environmental Leadership and Technology: Guest Lecturer Lab 10: The Links Project Presentations	1,2,3	Lab 8 due 5% Lab 10 due 10%
Week 12 Nov 21-25	Lecture: Environmental Leadership and Social Responsibility Lab 10: The Links Project Presentations	1,2,3	Lab 10 due 10%
Week 13 Nov 28-Dec 2	Lecture: Environmental Leadership and Economics Lab 10: The Links Project Presentations Semi-finals	1,2,3	
Week 14 Nov 5-9	Lecture: Closure & Exam Review Lab 10: The Links Project Finals	1,2,3	
Week 15 Nov 12-16	Final Exam	1,2,3	Final Exam 25%

Learning Sequence Additional Comments:

Attendance at, and direct participation in your scheduled lectures is highly recommended and required for successful completion of course components.

Learning Resources:

Additional resources, including lecture/lab materials and other supporting materials, will be distributed during the term.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 3	5	Lab 1: Skill Inventory and Job Search
Week 5	5	Lab 2: Right Here, Right Now
Week 5	5	Lab 4: Case Study Sheila Watt-Cloutier
Week 6	5	Lab 5: Natural Resources Law Lab
Week 7	5	Lab 6: Water; Commodity or Basic Human Right
Week 7	5	Lab 3: Annotated Bibliography
Week 7	15	Mid term exam
Week 9	5	Lab 7: From Conflict to Peacebuilding
Week 10	10	Lab 9: Portfolio

Item/Date:	Percent:	Description:
Week 11	5	Lab 8: Pearson International Airport Expansion
Weeks 11/12	10	Lab 10: The Links Project Presentations
Week 15	25	Final Exam

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
It is suggested that initial contact takes place with your lab professor or the course leader, who may then refer the student to the Program Co-ordinator or Student Access & Referral Services, LRC, Brealey Campus, ext. 1358.

Exemptions contact for this course:
Val Bishop vbishop@flemingc.on.ca : 705-324-9144 ext. 6754 : Office 281 Frost Campus

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
Academic Responsibilities:

1. Student Attire for Field Work and Field Trips:
Appropriate attire, as determined by the course professor, is mandatory for field trips and for field exercises.

Scheduled field exercises are usually conducted regardless of weather conditions.

For more specific information on requirements, please see the course outline or the professor responsible.

2. Class Attendance and Assignments:

Attendance at all classes is strongly recommended. Research shows that regular class attendance is a key factor in students' success.

Students must attend lecture, labs and tests with their own group, to accommodate room timetabling and class size, unless prior arrangements have been made with the faculty member(s) involved.

2.1 Scheduling
Rescheduling of course topics and evaluations may be necessary when unforeseen circumstances arise. Changes will be discussed and mutually agreed to in class.

2.2 Missed Field Trips and Field Exercises:

Students must consult with the course professor about any possible alternate arrangements for field trips and exercises missed. However, there is no guarantee that alternative arrangements can be made.

Advance notice of absence may result in greater accommodation.

2.3 Missed Classes:

It is the student's responsibility to get caught up from missed classes. Please contact the course faculty only if notes and assignments are unavailable from other sources (e.g. student portal, classmates).

2.4 Missed Tests and Assessments, including Oral Presentations

If a student misses a test or other assessment due to unavoidable circumstances, it is the student's responsibility to contact the professor within 24 hours of their return to school.

A student may be allowed to write the missed test or assignment if proper documentation explaining the reason for the absence is presented to the faculty. However, the professor has the right not to allow the student to write the test or assessment missed.

Advance notice of absence may result in greater accommodation.

2.5 Late Assignments:

Students are responsible for submitting assignments and projects on the due date and time. The School of Environmental and Natural Resource Sciences Office, Student Services, Admissions and Records, and the Information Centre will not accept any assignments or projects.

If the assignment is not submitted on the due date and time, a grade of zero will be assigned. However, an individual extension of the due date may be granted at the discretion of the professor. It is the student's responsibility to notify the professor of the problem within 24 hours of the assigned due date.

Considerations for extensions include a medical certificate or legal document.

Late assignments identical to the original will not be accepted under any circumstances after the original assignments or tests have been graded and distributed to the class.

For further information, please see the course outline and the professor responsible.

2.6 Format for Assignments

All assignments must be word processed. Professors may grant some personal exemptions, in which case assignments will be typed.

2.7 Evaluation Criteria

All assignments will be graded on the basis of content, style, structure, and mechanics.

3. Final grades

In this course, final grades are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. Faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

ACADEMIC BEHAVIOUR AND ACADEMIC INTEGRITY

You, as a Fleming student, will conduct yourself in a courteous, responsible fashion.

You are expected to work individually on assignments unless otherwise directed. Breaches of academic integrity such as plagiarism will result in a mark of zero (0) for the evaluated activity and will be reported in writing to the Registrar. You have the responsibility to support academic integrity. Please refer to your student handbook, Frost Facts, for the specific college regulations governing academic behaviour and academic integrity.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

Return to document

TECHNICAL REPORTING

Course Outline
Course Number: COMM34H

2012 Winter
Sir Sandford Fleming College

Program:School of Environmental and Natural Resource Sciences
School of General Arts & Sciences

Course Format: Hybrid
Hours: 45

Faculty: Jacqueline Riley Gutierrez Office: 120
Office Hours: As posted

Availability: By appointment
Email: jgutierr@flemingc.on.ca

Faculty: Shirley Norman Office: 181
Office Hours: As posted

Availability: By appointment
Email: snorman@flemingc.on.ca

Faculty: Catherine Stalkie Office: 219
Office Hours: As posted

Availability: By appointment
Email: cstalkie@flemingc.on.ca

Faculty: Charlotte Smith Office:
Office Hours: As posted

Availability: By appointment
Email: charsmit@flemingc.on.ca

Faculty: Indira Wijesinghe Office: 204B
Office Hours: As posted

Availability: By appointment
Email: iwijesin@flemingc.on.ca

Coordinator: Wendy Morgan Office: 5910
Email: wemorgan@flemingc.on.ca

Dean: Ann Drennan Office: 5923
Email: adrennan@flemingc.on.ca

Dean Approved:2012/01/09
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

Successful communicators use knowledge, skills and strategies to create effective messages for a range of audiences and contexts. This course emphasizes critical thinking and problem-solving to meet communication challenges in today¿s workplace. Students will refine technical writing, communication skills and presentation techniques through a variety of assignments, assessments and hands-on practice.

Prerequisites:
College Communications for Environmental Science (COMM44)
College Communication Skills for Environmental Science (COMM157)

Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
4. Manage oneself and one's resources to achieve goals

Aim:
The aim of this course is to develop versatility and skill in creating technical messages that achieve results.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Identify and analyze technical communication, audiences and contexts.
2. Create professional documents in standard formats that demonstrate mastery of purpose, audience, context and technical writing conventions.
3. Identify, analyze and manage the verbal and non-verbal elements of messages for specific audiences.
4. Use interpersonal skills to communicate effectively in meetings and collaborate on projects.
5. Use technology and new media to create and enhance technical communications.
6. Conduct research and analyze information to create effective reports and presentations.
7. Use documentation to acknowledge sources and establish credibility.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Lecture: Resumes Seminar: Course Outline, Employment Assignments Computer: Memo & Letter Format Review	1,2,5,6	Lecture Quiz 2.5%
Week 2	Lecture: Employment Letters Seminar & Computer Lab: Resumes & Employment Letters & Career Services Visits	1,2, 5,6,	Lecture Quiz 2.5%
Week 3	Lecture: Job Interviews Seminar: Interview Team Practice Computer: Preparation of Interview Questions	1,2,3,4,6,	Lecture Quiz 2.5% Employment Writing 10%
Week 4	Lecture: Writing Processes & Products Seminar & Computer Lab: Interviews	1,2,3,4,6,	Lecture Quiz 2.5% Team Interviews as scheduled 15%
Week 5	Lecture: Field Trips & Short Reports Seminar & Computer Lab: Interviews	1,2,3,4,6,	Lecture Quiz 2.5% Team Interviews as scheduled 15%
Week 6	Lecture: Short Reports: Progress Reports Seminar: Report Assignments Computer: Progress Report Practice Lab	1,2,5,7	Lecture Quiz 2.5%
Week 7	Lecture: Short Reports: Proposals Seminar & Computer Lab: Interviews	1,2,3,4,6,	Lecture Quiz 2.5% Team Interviews as scheduled 15%
Week 8 Independent Learning			
Week 9	Lecture: Formal Report Elements Seminar: Team Building & Minutes Computer: Team Topic Search & Planning	4,6,7	Lecture Quiz 2.5% Short Report 10%
Week 10	Lecture: Organizing Your Report	1,2,4,6,7	Lecture Quiz 2.5%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Seminar: Review of Report Elements & CSE review Computer: Outlining		
Week 11	Lecture: Documentation Seminar: Intros, Conclusions & Graphics Computer: Technical Conventions	1,2,3,4,6,7	Lecture Quiz 2.5%
Week 12	Lecture: Editing & Revising Seminar: Revising & Editing Reports Computer: Peer Editing of Reports	1,2,3,4,5,6,7	Lecture Quiz 2.5% Technical Reports 25%
Week 13	Lecture: Instructions & Manuals Seminar & Computer Lab: Oral Presentations	1,2,3,4,5,6,7	Lecture Quiz 2.5% Oral Presentations as scheduled 10%
Week 14	Lecture: Oral Presentations Seminar & Computer Lab: Oral Presentations	1,2,3,4,5,6,7	Oral Presentations as scheduled 10%
Week 15	Lecture: Oral PresentationsSeminar & Computer Lab: Oral Presentations	1,2,3,4,5,6,7	Oral Presentations as scheduled 10%

Learning Resources:

Gulston,L. 2008. The Nelson Guide To Report Writing, 2nd ed. Toronto: Thomson Nelson

Assessment Plan:

Item/Date:	Percent:	Description:
Wks 1,2,3,4,5,6,7,9,10,11,12,13	30	Lecture quizzes - 12 x 2.5%
Week 3	10	Employment Writing
Week 4, 5 & 7 (as scheduled)	15	Employment Interviews
Week 9	10	Short Progress Report
Week 12	25	Technical Report
Week 13, 14 & 15 (as scheduled)	10	Oral Presentations

Additional Assessment Comments:

Class time is scheduled as one seminar period and one computer period. Lectures are online in this hybrid course; students are expected to access the lecture materials weekly to prepare for classroom instruction. Report assignments are due in the seminar class periods. Additional time outside of class is required for reading and completing report, employment and presentation assignments.

Faculty reserve the right to place students on a team or to restructure non-functioning teams.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Please contact the Registrar's Office

Exemptions contact for this course:
Please contact Cathy Stalkie (Office 219, Extension 3241) for information about exemptions from Communications courses.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
Class Attendance and Assignments

• Attendance at all classes is strongly recommended. Regular class attendance is a key factor in students' success.
• Students must attend the course section(s) that appears on their timetables.

Modifications to the Learning Sequence

• Rescheduling of course topics and evaluations may be necessary to accommodate scheduling challenges or other unforeseen circumstances.
• Significant changes will be discussed and mutually agreed to in class.

Missed Classes

• It is the student's responsibility to get caught up from missed classes. Please speak to fellow classmates about notes and handouts, and assignments and check the course webpage.

Missed Tests and Assessments

• Only in extreme circumstances will a student be permitted to write/submit a missed test or assessment. It is the student's responsibility to contact the professor as soon as possible after a missed test or assessment.
• If a student is going to miss a test or assessment for a legitimate reason, they should discuss the issue with their professor as soon as possible. It is the professor's right to determine whether to accommodate a student's request.

Late Assignments

• You must submit/present all written/oral assignments on their assigned dates unless you make specific arrangements in writing/voice mail/E-mail with your professor at least 24 hours prior to the due date in question.
• In the case of an emergency, make arrangements (in writing, if necessary) immediately upon your return.
• Your professor will make special arrangements for valid reasons only. Extenuating circumstances will be discussed on an individual basis. It is the professor's right to determine whether to accommodate a student's request.
• A penalty of 10% per day will be applied to an assignment not submitted by the original or extended due date. An assignment more than three days late will receive a grade of zero ("0"). No assignment will be accepted after the last day of classes without prior arrangement with your professor.

Classroom Behaviour

• Students are not permitted to use cellphones, iPods, or other electronic devices for the purposes of sending/receiving calls, text messaging, or web surfing during lectures or seminars.
• Students wishing to record the class material must receive permission from the professor.
• Laptops will be permitted provided that they are being used for an academic purpose related to the activities occurring in the class.

Evaluation Criteria

• All written assignments will be graded according to the Department-approved writing assessment tool on the basis of style, structure and mechanics.

Grades

• Grades for assignments will be entered into the WebCT gradebook within two weeks of an evaluation.
• Students have two weeks after the grade appears to report any concerns or problems to their professors.

Final grades

• Final grades are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline.
• Faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Records

• Students are encouraged to keep a copy of this outline, copies of all submitted assignments, and to retain graded material until the end of the semester.

Academic Integrity

The College views very seriously any form of academic dishonesty, such as plagiarism, submission of work for which credit has already been received; cheating, impersonation; falsification or fabrication of data; the acquisition of confidential materials, e.g., examination papers; misrepresentation of facts; altering transcripts or other official documents.

Plagiarism

In essence, plagiarism is the submission for credit of work taken without adequate documentation from an existing source. One form of plagiarism involves direct incorporation, without proper credit, of phrases, passages of text, images, or data of any kind from an existing source. A second form involves using data or information without proper credit (even though the incorporated information is paraphrased or otherwise not in direct form).

• Students are taught about issues of plagiarism in their first semester communication courses. Specifically, they are taught how to identify and avoid plagiarism. Because of the seriousness of a breach of Academic Integrity, students are strongly encouraged to seek clarification from their Communications instructors prior to the submission of written work.
• A plagiarized assignment will receive a grade of zero.
• Students should refer to their first semester handbook, A Writer's Resource, or the excellent site by Diana Hacker at http://www.dianahacker.com/resdoc/ to review the mechanics of citing sources.
• Students should also be familiar with the course and college rules about plagiarism: Section 6.6.0 of Fleming's Academic Regulations.

Missed Field Trips and Field Exercises (FROST SPECIFIC)

• Students must consult with the course professor about any possible alternate arrangements for field trips and exercises missed.
• Advance notice of absence may result in greater accommodation as there is no guarantee that alternative arrangements can be made.

Student Attire for Field Work and Field Trips (FROST SPECIFIC)

• Appropriate attire, as determined by the course professor, is mandatory for field trips and for field exercises. Scheduled field exercises are usually conducted regardless of weather conditions. For more specific information on requirements, please see the course outline or the professor responsible.

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INTRODUCTORY COMPUTING

Course Outline
Course Number: COMP345

2012 Winter
Sir Sandford Fleming College

Program:General Arts & Science (GAS)
School of General Arts & Sciences

Course Format: In Person
Hours: 45

Faculty: Robert Clark Office: 3600
Office Hours: As posted

Availability: By email
Email: boclark@flemingc.on.ca

Faculty: Gordon Bowley Office: 202
Office Hours: As posted

Availability: By email
Email: gbowley@flemingc.on.ca

Faculty: Keith Quade Office: 5910
Office Hours: As posted

Availability: By email
Email: kquade@flemingc.on.ca

Faculty: Kerri Tojcic Office:
Office Hours: As posted

Availability: By email
Email: ktojcic@flemingc.on.ca

Faculty: TBA

Coordinator: Keith Quade Office: 5910
Email: kquade@flemingc.on.ca

Dean: Ann Drennan Office: 5923
Email: adrennan@flemingc.on.ca

Dean: Silvana Macdonald Office: 5906
Email: simacdon@flemingc.on.ca

Additional Comments:

The weekly course hours are as follows:
• ONE Hour: Scheduled lab every week led by the course professor.
• TWO Hours: Unscheduled Self-Directed Learning every week assigned by the professor in the scheduled lab classes.

Students are encouraged to complete course work in the College Learning Commons within the week it was assigned. Assistance is available from the technologists in the College Learning Commons.

Dean Approved:2012/01/06
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

Working in the Windows XP environment, this computer course introduces the student to computer basics (computer terminology, e-mail, file management) and the application and use of word processing, spreadsheet, and presentation software using Microsoft Office 2007. Through the extensive use of hands-on activities, students will gain sufficient knowledge and experience to make productive use of computers as a tool in both college and workplace environments. Students will have the opportunity to attain the International Computer Driving Licence (ICDL) Start Certification if they attain 75% or more on each of the four ICDL Start Certification tests.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Uses numerical data, mathematical concepts and reasoning to solve problems
2. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
3. Manage oneself and one's resources to achieve goals

Aim:
Students will develop basic skills in the use of computer applications to develop and present information in an appropriate and comprehensible manner.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Navigate through the essential parts of the Windows XP Operating System, efficiently use Microsoft Office 2007 Word, PowerPoint and Excel at a basic student level at Fleming College, efficiently manage digital files, retrieve information from an LMS (WebCT) and send email with attachments.
2. List the basic components of the computer, their functionality and terminology.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 (Jan 9-13)	Course Introduction Course Outline		
Week 2 (Jan 16-20)	Introduction to Fleming Network: Email, WebCT, Evolve Portal & COMP345 Student Handbook	1	CL W2 (1): In-Class Lab. A basic run through on how to make electronic submissions for marking (1%)
Week 3 (Jan 23-27)	Computer Concepts & ICDL Registration	1,2	
Week 4 (Jan 30-Feb 3)	Introduction to Windows XP: Getting Started; Managing Files; Print Management; Running Applications; Using Compress; Virus Control; Control Panel. ICDL Syllabus 5.0 Module 2 – Using the Computer & Managing Files to complete tasks independently.	1,2	CL W4 (1): XP In-Class Lab (1%) Quiz W4 (3): Computer Concepts Test (3%)
Week 5 (Feb 6-10)	Introduction to Windows XP: Getting Started; Managing Files; Print Management; Running Applications; Using Compress; Virus Control; Control Panel. ICDL Syllabus 5.0 Module 2 – Using the Computer & Managing Files to complete remaining tasks independently.	1	SD W5 (2): Self-Directed Submission using ICDL Module-2 (2%)
Week 6 (Feb 13-17)	Introduction to Word 2007: Getting Started: Documents; Editing text; Printing; Formatting text; Tools; Formatting	1	Assign W6 (5): Windows XP and File-Management

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	paragraphs; Multiple documents; Tables; Document manipulation; Mail merge; Objects. ICDL Syllabus 5.0 Module 3: World Processing to complete tasks independently.		Practical Assign (5%) SD W6 (2): Self-Directed Submission using ICDL Module#3 (2%)
Week 7 (Feb 20-24) Monday is "Family Day"	Introduction to Word 2007: Getting Started: Documents; Editing text; Printing; Formatting text; Tools; Formatting paragraphs; Multiple documents; Tables; Document manipulation; Mail merge; Objects. ICDL Syllabus 5.0 Module 3: World Processing to complete remaining tasks independently.	1	ICDL W7(16): ICDL File Manage-Cert (16%) CL W7 (1): Word In-Class Lab (1%)
Week 8 (Feb 27-Mar 2)	Independent Learning Week	1	
Week 9 (Mar 5-9)	Introduction to PowerPoint 2007: Getting Started; Slides & presentations; Formatting; PowerPoint objects; Slide shows. ICDL Syllabus 5.0 Module 6 – Presentation to complete tasks independently.	1	Quiz W9 (5): Word Practical Test (5%) SD W9 (2): Self-Directed Submission using ICDL Module#6 (2%)
Week 10 (Mar 12-16)	Introduction to PowerPoint 2007: Getting Started; Slides & presentations; Formatting; PowerPoint objects; Slide shows. ICDL Syllabus 5.0 Module 6 – Presentation to complete remaining tasks independently.	1	CL W10 (1): PowerPoint In-Class Lab (1%) ICDL W10 (16): ICDL Word-Cert Test (16%)
Week 11 (Mar 19-23)	Introduction to Excel 2007: Getting started; Open and close workbooks; Creating and saving workbooks; Formulas. ICDL Syllabus 5.0 Module 4 – Spreadsheets to complete assigned tasks independently.	1	Quiz W11 (5): PowerPoint Practical Test (5%)
Week 12 (Mar 26-30)	Introduction to Excel 2007: Getting started; Open and close workbooks; Creating and saving workbooks; Formulas. ICDL Syllabus 5.0 Module 4 – Spreadsheets to complete assigned tasks independently.	1	ICDL W12 (16): ICDL PowerPoint-Cert Test (16%) SD W12 (2): Self-Directed

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
			Submission using ICDL Module#4 (2%)
Week 13 (Apr 2-6) "Good Friday"	Introduction to Excel 2007: Workbooks; Editing; Printing; Formatting; Functions & Addressing; Charts. ICDL Syllabus 5.0 Module 4 – Spreadsheets to complete assigned tasks independently.	1	
Week 14 (Apr 9-13)	Introduction to Excel 2007: Workbooks; Editing; Printing; Formatting; Functions & Addressing; Charts ICDL Syllabus 5.0 Module 4 – Spreadsheets to complete assigned tasks independently.	1	CL W14 (1): Excel In-Class Lab (1%) Quiz W14 (5): Excel Practical Test (5%)
Week 15 (Apr 16-20)	Open-source software and online resources that will help students in their academic studies.	1	ICDL W15 (16): ICDL Excel-Cert Test (16%)

Learning Sequence Additional Comments:

The learning sequence may be subject to change by the course professor or subject coordinator due to unforeseen circumstances that affect normal college or course operations. Students are expected to attend the one-hour scheduled lab every week. Attendance is recorded by the professor. Weekly lab activities must be completed in the lab class to attain marks.

Students are expected to complete the weekly Self-Directed Learning Plans (SDLP) during the TWO HOURS of self-directed learning each week. Students are to do their own individual work. Computers are available for students in the Learning Commons and various computer labs (when unoccupied by a class) during operational hours. Students may also use their home computers to complete the SDLP if they have Windows XP and MS Office 2007 with the understanding that neither Fleming College nor ICDL are responsible for technical support.

********** ICDL CERTIFICATION **********
The International Computer Driving License (ICDL) Start Certification is an additional component of the COMP345 course.

1) All four ICDL Certification tests(Windows XP, Word 2007, PowerPoint 2007 and Excel 2007), must be completed in the Testing Centre at their respective campus.

2) The four ICDL Certification tests make up 64% of the COMP345 grade.

3) Students must attain a passing grade of 75% in each of the 4 Certification Tests in order to attain the ICDL Start Certification.

4) It is NOT a requirement to achieve ICDL certification in order to successfully pass the COMP 345 course.

5) Passing COMP345 simply requires 50% overall. (49% is not a pass)

6) ICDL Certification tests that are written late will NOT count toward a student's COMP345 mark but may be used towards their ICDL Certificates.

********** ICDL PACKAGE & REGISTRATION **********
1) You must purchase your ICDL package as soon as possible and self-register online with ICDL.

2) If you are not registered you will not be able to write your ICDL tests and therefore you will have to re-take the entire course.

3) The registration site is www.icdl.ca/COMP345registration

4) If an error is made in ICDL registration it is the student's responsibility to contact ICDL at (testregistration@icdl.ca), and advise them of the corrections required.

5) If you are a repeat student to COMP345 it is your responsibility to contact ICDL, (testregistration@icdl.ca), by week#3, and advise them of your new section number for this term. Failure to do so will prevent your professor from being able to your marks.

6) Improperly done or incomplete registrations are not valid reasons for test extensions.

7) Apply for OSAP early! (They will often provide emergency cash advances if you are approved). Late OSAP approval is not grounds for test extensions.

********** ICDL TESTING **********
1) All ICDL testing is done through icdlca.enlight.net
2) The four ICDL Certification tests must be completed in the Testing Centre at your particular campus. Please check your WebCT\COMP345 main page on Fleming's Portal for Dates and times.
3) It is the student's responsibility to register, remember their ICDL username and password, and to log into the testing site "weeks" before the day of testing to verify accessibility.
4) If you have registered with ICDL through a previous term with Fleming, (within the last two years), you are not required to register again but you are required to attain more testing credits through the Cashier's Office, inside the Registrar Office. Testing Credits are approximately $12+HST for Certification Tests and $6+HST for Diagnostic tests. Receipts are then submitted to your Testing Centre and test credit adjustments are then granted.

PLEASE READ... "Frequently Asked Questions for Repeat COMP345 Students" found on WebCT-COMP345.

Learning Resources:

COMP345 Course Package (contains the following)
• COMP345 Student Handbook

• ICDL Start Package:
-- Module 2: Using the Computer and Managing Files;
-- Module 3: Word Processing;
-- Module 4: Spreadsheets;
-- Module 6: Presentation;
-- ICDL Start Certification Self-Registration

Assessment Plan:

Item/Date:	Percent:	Description:
ICDL "Certification" Tests 4 @ 16%	64	ICDL Certification tests cover Windows XP, Word 2007, PowerPoint 2007, and Excel 2007. Certification tests are administered in the Testing Centre using the ICDL testing environment. Texts and any reference materials/learning resources are not allowed. Students must attain 75% on each of the four tests in order to receive the ICDL Start Certification. 1) ICDL Test: Using the Computer and Managing Files (16%) 2) ICDL Test: Word Processing (16%) 3) ICDL Test: Presentation (16%) 4) ICDL Test: Spreadsheets (16%)
Practical Tests 3 @ 5%	15	Three Practical Tests are worth 5% each. These tests cover Word 2007, PowerPoint 2007 and Excel 2007. These are NOT ICDL tests, yet still must be done in the Testing Centres.
File Management Assignment 1 @ 5%	5	The File Management Assignment provides students with an opportunity to demonstrate competency in correct file management in Windows XP. The assignment will also demonstrate proper file management and will be submitted electronically using the WebCT Assignment "Dropbox".
Self-Directed Submissions 4 @ 2%	8	Self-Directed Submissions are designed to help students learn on their own and to reward them marks for completing these Self Directed exercises. These exercises will be found in the students' ICDL books. These submissions will have a due date and must be submitted electronically.
In-Class labs 5 @ 1%	5	These will be an "In-Class" Labs where students will be given instructions on how to submit an assignment into WebCT for marking.

Item/Date:	Percent:	Description:
		This procedure will be used not only in COMP345 but in many other courses throughout students' education at Fleming.
Computer Concepts WebCT Test 1 @ 3%	3	A computer-based multiple-choice test that evaluates the student's knowledge of the concepts and principles associated with the computing environment and the software taught in this course (the Fleming Network, email, WebCT and Evolve Portal). This test is administered in the Testing Centre using WebCT. Texts and any reference materials/learning resources are not allowed
4 ICDL "Diagnostic" Tests 4 @ 0%	0	These are not tests for grade marks. They are a very important preparation tool for your ICDL Certification Tests. These four ICDL-Diag tests can be done on any Fleming computer. These can be accessed online at http://icdlca.enlight.net
Note:	0	1) 50% is required to pass COMP345. 2) 49% is not a pass. 3) There are no extra assignments to bump up marks.

Additional Assessment Comments:

Marks will be released in the WebCT Gradebook within two weeks after the FINAL date of submission for assessments.

COMP345:EXEMPTION TEST
****
Students are required to do a MANDATORY Computer Skills Exemption Test. These tests are done in the main Testing Centre and must be done on your own time.

These tests must be completed within the first 10 school days of the term to move forward with the course. The deadline is January 20 2012.

You will be notified by email if your results qualify you for an exemption. You will be given a limited window of time to respond to that email should you decide to take the exemption. Actual marks from these tests will not be made available to students or individual faculty.

Do NOT register your ICDL package until after Exemption Test notification. If your book package has been opened and you have already registered with ICDL you will not be eligible for a refund should you be offered an exemption.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Brealey Contact: Terri Geerinck, PLAR Facilitator tgeerinc@flemingc.on.ca

Frost Contact: Contact: Cathy Stalkie, PLAR Facilitator cstalkie@flemingc.on.ca

1) IMPORTANT: Applications for PLARs MUST be submitted within the FIRST TEN school days.

2) Once a student has applied for a PLAR they are immediately taken off the class roster for COMP345 and have given up their seat.

3) Should the student fail the PLAR test they must take the course in the following term.

4) A student may not complete a PLAR for a course that the student has failed within the last year.

Exemptions contact for this course:
Keith Quade, kquade@flemingc.on.ca

NOTE:
1) High school courses are not acceptable for consideration in this process.
2) Previous course must have been taken within the past three years.
3) Previous course must contain hours and outcomes deemed equivalent to COMP345 by the Coordinator.
4) It is the student's responsibility to supply a full Course Outline of past course they wish to be considered.
5) The student must continue to attend class until the exemption process is completed. The student is responsible for all learning and evaluations that are assigned during the exemption process.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
1. Students are advised to preserve all evaluated work produced or received during the course to verify the official final mark as recorded by Records and Admissions.
2. Students must correspond with faculty through their Fleming College email accounts, not their personal email accounts. Students are required to check their College email frequently (several times a week)
3. Students must exercise proper care and backup procedures for electronic files. Corrupted or lost files are not a valid excuses.
4. Failure to complete assessments within the prescribed date(s) and time(s) results in a zero grade
5. Testing days are assigned to each class section. Information regarding specific testing days is made available on WebCT\COMP345. It is the student's responsibility to note the testing days as they are announced as well as check signage outside the Testing Centre.
6. It is the responsibility of any “Repeat” students to acquire extra testing credits and submit them to

the Testing Centre "weeks" before their testing dates. (See Page 4 for details)
7. It is the responsibility of any “Repeat” students to contact ICDL by week#3 to notify them of your new section number. Failure to do so will result in marks not being available for grading.
8. It is the student’s responsibility to register with ICDL, remember their ICDL Username and Password and to log on to ICDL "weeks" in advance to make sure their login is successful.
9. Assignments, Tests and assessments from previous courses are not acceptable for submission in the current course. Lab activities for marks are conducted during the 1-hour professor-led lab. Student absence, arriving late or leaving early, will result in a mark of zero for the lab activity.
10. In order to preserve the integrity of Testing Centre test material, it will not be returned to students. However, ICDL test results will be available immediately following the tests.
11. Assessments are to be completed by each individual student. Material in which the course professor detects that all or parts of the work were the result of file sharing will be deemed to be an act of plagiarism. All acts of plagiarism will be handled in accordance with the College Academic Regulations. In addition, the names of the students involved will be reported to their Program Coordinators who may apply additional program-related policies regarding plagiarism.

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ENVIRONMENTAL TECHNIQUES

Course Outline
Course Number: ENVR11

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 6

Faculty: Julia Scarlett Office: 220
Office Hours: As posted

Availability: By posted office hours
Email: jscarlet@flemingc.on.ca

Faculty: Melanie Logan Office: 257
Office Hours: As posted

Availability: By posted office hours
Email: melogan@flemingc.on.ca

Faculty: Cyndy Broughton Office: 181
Office Hours: As posted

Availability: By posted office hours
Email: cbrought@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2012/01/09
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This is a lab course that provides the fundamentals and skills required for working in the environmental field. Laboratory work will include hands-on measurement and identification of soil and rock using standard testing procedures. Plant relationships with earth materials will be examined and evaluated. Basic properties of water, introductory hydrogeology and groundwater sampling/monitoring techniques will also be introduced.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals

Aim:
The aim of this course is to provide an introduction to concepts and processes used in soil and water studies. This course will serve as a foundation for subsequent studies within the Environmental Technology Program.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Accurately convert metric and imperial units in scientific calculations
2. Identify various soil textures and describe their properties
3. Execute Atterberg Limits, Proctor density, Particle Size Analysis and Hydrometer tests on soils

4. Design and execute a snow sampling program which will relate conductivity values to de-icing compounds used on winter roads.
5. Relate the uses of industrial minerals to environmental concerns
6. Explain the significance of common sampling parameters used to determine water quality
7. Execute the collection of groundwater samples from a piezometer following correct procedures
8. Explain and practice correct techniques used in collecting surface water samples
9. Identify and describe the components of the Solar Ecology water treatment system (SES)
10. Convey technical information in a written report
11. Construct and interpret a soil test pit log
12. Design and execute a water quality sampling programme
13. Recognize septic system installation requirements
14. Demonstrate proper lab procedures
15. Recognize introductory techniques to site investigations
16. Describe the components of site restoration
17. Construct and install piezometers

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan 9 - 13 Classes start	Lab A: Course Introduction & Lab Orientation Lab B: Dimensional Analysis Lab C: Dimensional Analysis con't,, Road Salt Experiment introduction	1,4,14	
Week 2 Jan. 16 - 20	Lab A: Introduction to Constructed Wetland Systems - CAWT Tour and Video Lab B: CAWT Assignment (4%) Lab C: Dimensional Analysis Quiz (8%)	1,9,10,	4% CAWT Assignment 8% Dimensional Analysis Quiz
Week 3 Jan. 23 - 27	Lab A: Introduction to Soils & Soil Properties, Soil Classification Lab B: Field Description of Soils Lab C: Practice Field Description of Soils and Practical Exercise (4%)	2,10,14	4% Field Description of Soils Practical Exercise
Week 4 Jan. 30- Feb. 3	Lab A: Particle Size Analysis Demonstration, Porosity and Permeability Lab B: Particle Size Analysis (4%) Lab C: Clay Properties and Hydrometer Procedure Demonstration	2,3,10,14	4% Particle Size Analysis
Week 5 Feb. 6 - 10	Lab A: Hydrometer Procedure (4%) Lab B: Complete Hydrometer Procedure, Atterberg Limits Demonstration Lab C: Atterberg Limits Procedure (4%)	3,10,14	4% Hydrometer Procedure
Week 6 Feb. 13 - 17	Lab A: Complete Atterberg Limits, Soil Compaction/Proctor Density Demonstration	3,10,14	4% Atterberg Limits 4% Proctor

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Lab B: Proctor Density Procedure (4%) Lab C: Complete Proctor Density Midterm Test Study Guide		Density
Week 7 Feb. 20 - 24 Provincial Holiday Monday Feb 20	Lab A: Provincial Holiday - No Classes Lab B: Midterm Test (15%) Lab C: Road Salt Experiment - sample analysis	2,3,4,9,14	15% Midterm Test
Week 8 Independent Learning Week Feb. 27-Mar 2	Program oriented, self-directed studies/field activities		
Week 9 Mar. 5 - 9	Lab A: Introduction to Site Investigations Lab B: Site Investigations con't., Constructing Piezometers Lab C: Site Investigations - Soil Logging	2,11,15,17	7% Road Salt Assignment Due in Lab C
Week 10 Mar. 12 - 16	Lab A: Environmental and Economic Impact of Industrial Minerals Lab B: Septic Systems Assignment (4%) Lab C: Soil Test Pit Assignment Introduction	5,13,14,15	
Week 11 Mar. 19 - 23	Lab A: Soil Test Pit Lab B: Soil Test Pit Lab C: Soil Test Pit	2,3,10,11,14,15,	4% Septic Systems Assignment Due
Week 12 Mar. 26 - 30	Lab A: Properties of Water & Sampling Techniques Lab B: Surface Water Monitoring (4%) Lab C: Introduction to Site Restoration	6,8,10,12,14,15,16	Surface Water Monitoring 4%
Week 13 Apr. 2 - 6 Good Friday April 6 College Closed	Lab A: Site Restoration Field Work Lab B: Site Restoration con't.,(5%) Introduction to Hydrogeology Lab C: Good Friday College Closed	2,6,10,14,15,16	Site Restoration 5%
Week 14 Apr. 9 - 13	Lab A: Hydrogeology and Groundwater Monitoring Lab B: Piezometer Installation, Groundwater Sampling (6%) Lab C: Completion of Groundwater Sampling Assignment Test Review	1,2,6,7,10,11,14,15,17	12% Soil Test Pit Report due Groundwater Sampling 6%
Week 15 Apr. 16 - 20	Lab A: Test Review Lab B: End of Term Test (15%) Lab C: no lab	5,6,8,13,15,16	End of Term Test 15%

Learning Resources:

Suggested Learning Resource:
Denholm, K. & Schut, L. 2009. Field Manual for Describing Soils in Ontario (4th edition). Land Resource Science, University of Guelph.

Assessment Plan:

Item/Date:	Percent:	Description:
1. Week 2	8	Conversions Quiz
2. Week 2	4	CAWT Assignment
3. Week 3	4	Field Description of Soils
4. Week 4	4	Particle Size Analysis
5. Week 5	4	Hydrometer Procedure
6. Week 6	4	Atterberg Limits
7. Week 6	4	Proctor Density
8. Week 7	15	Midterm Test
9. Week 9	7	Road Salt Experiment
10. Week 11	4	Septic Systems Assignment
11. Week 12	4	Surface Water Monitoring
12. Week 13	5	Site Restoration
13. Week 14	12	Soil Test Pit Report
14. Week 14	6	Groundwater Monitoring
15. Week 15	15	End of Term Test

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
It is suggested that initial contact takes place with the course professor who may then refer the student to the Program co-ordinator or Admissions and Records

Exemptions contact for this course:
Contacts: Admissions and Records Office for exemption forms and verification by Steve Thompson

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty

member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions & Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for submitting assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

Missed Tests
It is the student's responsibility to be present for all tests and evaluations. Missed tests will be given a mark of zero. Only under extenuating circumstances will a make-up test be allowed.

Due Dates
All assignments are due on their announced date and time. Unless specified otherwise, assignments are due by the end of the lab period on the prescribed date.
There will be no exceptions to due dates except that: an individual extension may be granted for a documented situation of a serious nature that is beyond the student's control. The student is responsible for notifying the instructor as early as possible and for providing documentation.

A general extension may be granted when a serious problem arises due to unforeseen circumstances, in which case an adjustment will be applied to all submissions, whether late or on time.

Submissions
Assignments that are submitted below a minimum level of competence as determined by the Professor will be returned as incomplete and on resubmission will be given a grade subject to the late assignment penalty. All submissions must be neat and legible. Any illegible assignments will be returned to the student unmarked. A neat version may be re-submitted, but will be subject to the late penalties.

Late Assignments
Late assignments will be penalized 10% of the project value per school day to a maximum of 50%. After five school days, the assignment will not be accepted; a grade of zero will be given.

Academic Integrity
All students are expected to work individually on assignments unless otherwise specified. While much of the work in the course involves group work, students are expected to submit a copy of their own work for evaluation unless specified otherwise. Each student has the responsibility to support academic integrity. Breaches of academic integrity (such as cheating and plagiarism) will normally result in a grade of zero for the evaluation involved. Any subsequent offense may result in the student being required to withdraw from the College. All breaches of academic integrity will be reported.

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TREES AND SHRUBS OF ONTARIO

Course Outline
Course Number: FSTY50

2012 Winter
Sir Sandford Fleming College

Program:Common Second Semester
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 1 hour lecture, 3 hour lab per week

Faculty: Neil Steffler Office: 258
Office Hours: As posted

Availability:
Email: nsteffle@flemingc.on.ca

Faculty: Barbara Merchant Office: 155B
Office Hours: As posted

Availability:
Email: bmerchan@flemingc.on.ca

Faculty: Brenda Lucas Office:
Office Hours: As posted

Availability:
Email: blucas@flemingc.on.ca

Faculty: Ernie Silhanek Office: 259
Office Hours: As posted

Availability:
Email: esilhane@flemingc.on.ca

Faculty: Helene Savard Office: 174
Office Hours: As posted

Availability:
Email: hsavard@flemingc.on.ca

Faculty: Michael Fraser Office: 281
Office Hours: As posted

Availability:

Email: mfraser@flemingc.on.ca

Coordinator: Barbara Elliot Office: 256
Email: belliot@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

NOTE: Students whose classes are affected by statuatory holidays may find that the course outline Learning Sequence (pp.2-4)will have to be adjusted accordingly. Students will be notified of scheduling changes, but it is the student's responsibility to be aware of these changes and to attend class.
Please retain a copy of this course outline for your career portfolio.

Dean Approved:2012/01/02
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course deals with the identification of approximately 100 species of trees and shrubs of importance to those managing the forests resources of Ontario. Throughout the semester identification features for common trees and shrubs in both summer and winter condition are introduced and applied. A number of field trips are utilized to assist students with their identification skills. In the weekly lecture series topics such as tree growth, reproduction, photosynthesis, respiration, forest ecology and uses of trees will be introduced. At the completion of the course students will have a sound working knowledge of dendrology. The skills introduced in this semester may then be used in following semesters when working with Forest Ecosystem Classification, Restoration Ecology, Conservation Planning and other habitat management situations.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
2. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
3. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
4. Manage oneself and one's resources to achieve goals

Aim:
Knowledge and skills developed in this course will provide graduates with a strong background in Dendrology. This will assist graduates in later semesters for subsequent studies in the fields of forest management, ecology, silviculture and restoration. In addition techniques introduced will allow graduates to effectively teach others the skills in a variety of situations.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. identify approximately 100 species of trees and shrubs found in Ontario.
2. construct and use keys to identify an unknown specimen.
3. understand and apply the use of the binomial system of scientific nomenclature.
4. explain the processes and factors that influence the growth and reproduction of woody plants.
5. appreciate the complexity of forest ecosystems, species interactions and biodiversity at a variety of scales.
6. discuss a variety of uses and applications of trees, wood and wood products.
7. obtain an appreciation of the cultural importance of trees.

Additional Learning Outcomes Comments:

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan. 9--13	Lecture: Introduction to the course Principles of identification and preservation of collected samples Lab: Identification features of Type A leaves and twigs.	1, 2	
Week 2 Jan. 16-20	Lecture: Classification and naming of trees and shrubs. Lab: Off-campus field trip to Emily Tract to examine features of Type "A" native species.	1,2, 3	
Week 3 Jan. 23-27	Lecture: Tree Anatomy & Physiology Lab: Type A leaf test (first hour) Introduction to Type B conifers	4,5,6	Type A leaf test - Value 10%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 4 Jan. 30--Feb. 3	Lecture: Tree Anatomy & Physiology (cont.) Lab: Type A twig test (first hour) Introduction to Type B identification (leaf and twig features)	1,4	Type A twig test - Value 10%
Week 5 Feb. 6--10	Lecture: Sexual reproduction of woody plants Lab: Completion of Type B species leaf and twig features. Retests available for type A leaf and twig tests.	1,2,5,6	Retests available for Type A leaf and twig tests.
Week 6 Feb. 13--17	Lecture: Asexual reproduction of woody plants. Lab: Field trip to Indian Point in preparation for the Outdoor Identification test.	1, 2,3,4,5,6	
Week 7 Feb. 20-24 Feb. 20 COLLEGE CLOSED (Family Day)	Lecture: NO LECTURE (Family Day Feb. 20 COLLEGE CLOSED) Mid-term test (WebCT based: in Testing Centre. Schedule to be announced). Lab: Principles of wood identification Type B samples available for review	1, 2,4,6	Lecture: Mid-term Test - Value 10% Lab: Construct key to separate samples to wood category (5%)
Week 8 Feb. 27--Mar. 2	Independent Learning Week - Program oriented, self-directed studies/field activities. Samples available in the Biocommons in preparation for Type B leaf & twig test.	1	
Week 9 Mar. 5--10	Lecture: Introduction to Tree Growth Lab: Type B leaf and twig test	1, 4,5,6	Type B leaf and twig test - Value - 20%
Week 10 Mar. 12--16	Lecture: Introduction to Tree Growth (cont.) Lab - Field trip off campus	1,5,7	
Week 11 Mar. 19--23	Lecture: Introduction to Forest Ecology Lab: Type B leaf and twig test (Second opportunity)	1,5,7	Retest for type B leaf and twig. Value - 20%
Week 12 Mar. 26--Apr. 30	Lecture: Forest Health Issues Lab: Field trip off-campus (Outdoor ID test)	1, 5,6,7	Outdoor Identification test - First opportunity - Value - 25%
Week 13 Apr. 2--6	Lecture: Forest Biomes of Canada Lab: Field trip off-campus (Outdoor ID test:	1,2,3,4,5,6,7	Outdoor Identification test -

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Apr. 6 Good Friday COLLEGE CLOSED	2nd attempt) NOTE: Please consult your lecturer or lab instructor for the testing schedule for this week.		Second opportunity - Value - 25%
Week 14 April 9--13	Lecture: Review in preparation for the final exam (Summary Test available on WebCT in the testing center: times to be announced). Lab: Field trip for sections who may have had a field trip cancelled due to weather conditions.	1,2,3,4,5,6,7	Summary Test - Value - 20% Note: For labs that are a week behind due to statuatory holidays, the second opportunity for the Outdoor ID test will occur in week 14.
Week 15 April 16--20	Lecture: WebCT exam continues--student/instructor consultations as requested. Lab: Student/instructor consultations as requested	1,2,3,4,5,6,7	

Learning Sequence Additional Comments:

Note: Students are expected to attend classes with their assigned section. Other arrangements MUST be made with the faculty members involved at least five days prior to the lab or trip.
Several field trips are scheduled throughout the semester; you are responsible for having suitable clothing and equipment for the weather conditions. HARDHATS are required for all field trips. Footwear must be appropriate for the conditions. All trips leave from parking lot #2 according to the scheduled time.
The Mid-Term Test and Final Exam are based upon the lecture material covered in class. Lectures posted on the course Web page do NOT necessarily reflect all material covered in the lectures.

Learning Resources:

Farrar, John Laird. 2000. Trees in Canada. Markham, Ontario. Fitzhenry and Whiteside/Canadian Forest Service. 502 pp.

Throughout the course numerous texts, articles and web-sites will be sourced. Students are encouraged to follow these leads as well as conducting their own research for additional information.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 3	10	Type A foliage test - (90% accuracy level)--Retest available
Week 4	10	Type A twig test - (90% accuracy level)--Retest available
Week 7	15	Lecture: WebCT test (10%)

Item/Date:	Percent:	Description:
		Lab: Construct and use a key to separate wood categories (5%)
Week 9	20	Identification test for Type B foliage and twigs -(80% accuracy level)--Retest available
Week 12	25	Outdoor Identification test - (90% accuracy level) Retest available
Week 14 & 15	20	Summary Test - Available in the Testing Centre on WebCT. The test will be available from Wednesday, April 14 to Tuesday, April 20 during testing centre hours. Note: Field trip for sections which missed classes due to statuatory holidays. A second opportunity for the Outdoor identification test is provided during lab time in week 14.

Additional Assessment Comments:

A pass (12.5/25) or more on the Outdoor Identification test is a mandatory component of this course. Students must achieve at least a passing grade in the Outdoor Identification test to pass this course. Students who have an accumulated passing grade in all other elements of the course, but who have failed their Outdoor Identification test, are eligible to receive a deferred grade. Successful completion of the Outdoor Identification component within the regulation time will result in a pass in all cases of deferred grades. Students should note, however, that it is their responsibility to contact instructors to set up times for re-testing of deferred grades.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
It is suggested that initial contact takes place with the course professor who may then refer the student to the Program coordinator or the Admissions and Records Office

Exemptions contact for this course:
Students who have taken a similar course, either at Fleming College or another educational institution,

should contact their faculty member for this course. An exemption form should be picked up from Admissions before contacting the faculty member. Documentation necessary when applying for an exemption may include (but is not restricted to): a transcript, outline of study material for the completed course, and a calendar description.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions & Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for submitting assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed at any time in any classroom; cell phones MUST be turned off as they are a distraction to the class.

Each student has the responsibility to support academic integrity. Students are expected to work individually on assignments; no student should have direct input into another student's solution. If group work is permitted, each student is expected to contribute in an equitable manner.

Each student has the responsibility to support academic integrity. Breaches of academic integrity (such as plagiarism) will be dealt with according to the academic regulations of the College.

The student has the responsibility, whenever possible, to inform the faculty in advance of any missed evaluations and due dates for exercises.

Make-up arrangements for tests and assignments are normally not allowed; however, make-up provisions may be provided in the event of documented illness/accident, or personal circumstances which in the judgment of the instructor prohibit the student from completing his/her work.

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INTRODUCTORY CHEMISTRY

Course Outline
Course Number: SCIE62

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technician and Technology; Fish and Wildlife Technician and Technology; Earth Resources Technician
School of General Arts & Sciences

Course Format: In Person
Hours: 45

Faculty: Heather Gibson Office: 202
Office Hours: As posted

Availability: By appointment
Email: hegibson@flemingc.on.ca

Faculty: Steven Baughman Office:
Office Hours: As posted

Availability: By appointment
Email: sbaughma@flemingc.on.ca

Coordinator: Ann Drennan Office: 5923
Email: adrennan@flemingc.on.ca

Dean: Ann Drennan Office: 5923
Email: adrennan@flemingc.on.ca

Dean Approved:2012/01/05
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course is designed to provide a knowledge and understanding of the principles of chemistry. The following topics: matter and energy, atomic structure, properties and nomenclature of compounds, chemical bonding, chemical reactions, solutions, acids and bases, and a brief study of organic chemistry will be presented

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
5. Manage oneself and one's resources to achieve goals

Aim:
To enable learners to become familiar with the knowledge and understanding of chemical concepts, principles, reactions, and its applications to industrial, environmental and earth science- related problems.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Apply safe laboratory practices in the planning, execution, and completion of experiments, including the use of appropriate equipment and glassware for collecting observations and data.
2. Select and use appropriate numeric, symbolic, graphical and linguistic modes of representation to communicate scientific ideas, plans and experimental results.
3. Express the result of any mathematical conversion or calculation with appropriate SI units and the correct number of significant figures.
4. Describe matter and reactivity in terms of energy changes; physical and chemical properties/change; relationship between periodic tendencies; types of chemical bonding; properties of compounds and molecules; types of chemical reactions.
5. Name and write chemical formulas for covalent molecules and various ionic compounds; use formulas in the balancing and representation of chemical reactions.
6. Apply the mole concept and periodic table information to determine empirical formulae, molecular formulae, molar masses, percentage composition or mass data.
7. Perform stoichiometric calculations involving the quantitative relationships of reactants and products, expressed in quantities of moles, atoms, molecules, mass, or molarity of the substances in a balanced chemical equation.
8. Describe the formation of a solution and its components; calculate and prepare solution concentrations in units of molarity, normality, ppm or percent concentration.

9. Apply the fundamental concepts of acid-base chemistry in a laboratory setting and theoretical context (e.g. word problems, calculations).
10. Name and represent organic compounds containing various functional groups using IUPAC convention and condensed structural formulas, respectively.
11. Understand the limitations of instrumentations.

Additional Learning Outcomes Comments:

Specific learning objectives by topic will be introduced during weekly lectures.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan. 9-13	Topics: Introduction to Course, Measurements, and Calculations involving Measured data (Chapter 2) LAB PERIOD: Lab Safety and Lab Notebook Criteria	1,2,3	
Week 2 Jan. 16-20	Topics: Density (Chapter 2) Classification of Matter, Energy (Chapter 3) DEMO LAB: Density & Specific Gravity	1,2,3,4,11	WebCT quiz 1 on Chapter 2 (1.5%) Lab Safety Quiz (1%)- due on-line Friday, May 13/11 by 5pm
Week 3 Jan. 23-27	Topics; Atoms, Elements, and The Periodic Table (Chapter 4) LAB #1: Spectrophotometric lab	1,2,3,4,11	Lab #1 (2.5%) WebCT quiz 2 on Chapter 3 (1.5%)
Week 4 Jan. 30- Feb. 3	Topics: Ionic and Covalent Bonding, Formulas and Naming of Ionic and Covalent Compounds (Chapter 6) LAB #2: Conductivity Measurements	1,2,3,4,5,11	Lab #2 (2.5%) WebCT quiz 3 on Chapter 4 (1.5%)
Week 5 Feb. 6-10	Topic: Review for Test #1, Formulas and Naming of Ionic and Covalent Compounds Continued (Chapter 6) LAB: TEST #1 (Chapters 2-4,6)	2,3,4,5	TEST #1 (15%) NO WebCT QUIZ
Week 6 Feb. 13-17	Topics: The Mole Concept, Molar Mass, Empirical and Molecular Formulas (Chapter 7) LAB #3: Percent Composition	1,2,3,4,5,6,11	Lab #3 (5%) WebCT quiz 4 on Chapter 6 (1.5%)
Week 7	Topics: Balancing Chemical Equations and	1,2,3,4,5,6,11	Lab #4 (2.5%)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Feb. 20-24	Chemical Reactions (Chapter 8) LAB #4: Dissolved Oxygen Lab NOTE: Week 8 Independent Learning Assignment Posted on WebCT this week.		WebCT quiz 5 on Chapter 7 (1.5%)
Week 8 Feb.27-March 2 (Independent Learning Week)	Week 8 Independent Study Assignment (Due: Friday, March 9th, by 5 pm)	2,3,4,5,6	NO WebCT QUIZ
Week 9 March 5-9	Topics: Mole Ratios, Chemical Quantities(involving mole ratios) (Chapter 9) LAB #5: Types of Chemical Reactions	2,3,4,5,6,7,11	Week 8 Assignment (5%) Lab #5 (2.5%) WebCT Quiz 6 on Chapter 8 (1.5%)
Week 10 March 12-16	Topics: Review for Test #2, Chemical Quantities Continued and Percentage Yield (involving mass)(Chapter 9) LAB: TEST #2(Chapters 7-9)	2,3,4,5,6,7	TEST #2 (15%) NO WebCT QUIZ
Week 11 March 19-23	Topics: Solutions, Solubility, and Concentrations (Chapter 12) LAB #6: Chloride Content of Water Samples	1,2,3,4,5,6,7,8,11	Lab #6 (2.5%) WebCT quiz 7 on Chapter 9 (1.5%)
Week 12 March 26-30	Topics: Acids, Bases and Buffers (Chapter 14) Lab #7: Solution Preparation	1,2,3,4,5,6,7,8,9,11	Lab #7 (5%) WebCT quiz 8 on Ch. 12 (1.5%)
Week 13 April 2-6	Topic: Acids, Bases and Buffers Continued(Chapter 14),Introduction to Organic Chemistry (Chapter 17) LAB #8: Total Alkalinity	1,2,3,4,5,6,7,8,9,11	Lab #8 (2.5%) WebCT quiz 9 on Ch. 14 (1.5%)
Week 14 April 9-13	Topic: Organic Chemistry Continued (Chapter 17) LAB PERIOD: LAB SKILLS TEST	All outcomes	LAB SKILLS TEST (4%) WebCT quiz 10 on Ch. 17 (1.5%)
Week 15 April 16-20	Topic: Review for Test #3 LAB: TEST #3 (Chapters 9,12,14,17)	All outcomes	TEST #3 (20%)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
			NO WebCT QUIZ

Learning Resources:

1. Course Textbook: Timberlake and Timberlake. 2011. Basic Chemistry, 3nd edition. Pearson Education Inc. Upper Saddle River, NJ. 702011. 555 p. ISBN 10:0-321-66310-1

2. On-line Resources: http://www.aw-bc.com/chemplace/

3. Scientific Calculator

4. Lab Notebook - available at Frost Campus Book Store

Assessment Plan:

Item/Date:	Percent:	Description:
Ongoing	25	Weekly Labs (8 labs - 2 @5% each and 6 @2.5% each)
Ongoing	15	Weekly WebCT quizzes starting Week #2: 10 quizzes @ 1.5% each
Week 8-9	5	Week 8 Independent Study Assignment: Due: by 5pm, Friday, March 9th (Week 9)
Week 14	4	Lab Skills Test: Completed in Week 14 Lab Period
Weeks 5, 10, 15	50	Test #1 (15%), Test #2 (15%), Test #3 (20%): Written in Lab Periods
Safety Quiz	1	Week 2: due by 5pm Friday, Jan. 20th

Additional Assessment Comments:

INDIVIDUAL WORK:

Students are required to submit lab notebooks and WebCT quizzes that have been completed independently.

LABORATORY REPORTS:

Lab reports will be due in at the following weeks lab time. (Note: Lab #4 is due at the end of the lab)

WebCT QUIZZES:

Students are expected to use their textbook and other resources for independent learning of minor concepts that will not be covered in class but may be part of the WebCT quiz.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Terri Geerinck, PLAR Facilitator
e-mail: tgeerinc@flemingc.on.ca
Phone Extension: 1466

Exemptions contact for this course:
Tara Meldrum, School Operations Liaison (extension 1637)
Email: tmeldrum@flemingc.on.ca

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
1. DUE DATES: All assessments (assignments, quizzes, tests, presentations, labs, reports, etc.) are due on their stated due date and time unless the student has made specific arrangements with the professor PRIOR to the due date.

2. STUDENT LATENESS: Students who are late for class/lecture/lab are a disruption to their classmates and have a negative impact on the learning environment. Your instructor will share his/her late policies early in the semester. For reasons relating to classroom management and/or laboratory safety, late students may be refused entry.

Lateness in general is unacceptable and will be dealt with on an individual basis.

3. STUDENT ATTENDANCE: Students are solely responsible for catching up on course work when absent. This includes collecting course materials (handouts, assignments, etc.) and catching up on missed classroom work. Students must perform the labs in order to get credit for the lab mark. Individual instructors will provide more specific expectations for attendance early in the semester.

4. FINAL GRADES: Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. Faculty members will not offer additional assessments to individual students beyond those cited in this course outline.

5. WebCT QUIZZES: Technical difficulties will not be considered a valid reason for missing an on-line quiz. A mark of zero (0) will be recorded.

6. ACADEMIC INTEGRITY: Students have a responsibility to support academic integrity. Students are expected to work individually on work submitted for evaluation unless otherwise specified. Breaches of academic integrity, such as cheating and plagiarism, will normally result in a grade of zero for the assessment component involved. In addition, all breaches of academic integrity will be reported to the registrar.

ADDITIONAL NOTES:

The Academic Planning & Operations office, Student Services, and Admission and Records will not accept any assignments or projects.

Use of cell phones and MP3 players are not allowed in lab/lecture/seminar. Cell phones must be turned off to avoid distractions.

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DATA MANAGEMENT FOR ENVIRONMENTAL AND NATURAL RESOURCE SCIENCES

Course Outline
Course Number: COMP461

2012 Winter
Sir Sandford Fleming College

Program:
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Kristine McBride Office:
Office Hours: As posted

Availability: By appointment
Email: krmcbrid@flemingc.on.ca

Faculty: Anurani Persaud Office:
Office Hours: As posted

Availability: By appointment
Email: anpersau@flemingc.on.ca

Faculty: Markus Wieland Office:
Office Hours: As posted

Availability: By appointment
Email: mwieland@flemingc.on.ca

Faculty: Cecilia Rulli Office: 168
Office Hours: As posted

Availability: By appointment
Email: crulli@flemingc.on.ca

Faculty: Beatrize Vitorino Office: 215
Office Hours: As posted

Availability: By appointment
Email: bvitorin@flemingc.on.ca

Coordinator: Barbara Elliot Office: 256
Email: belliot@flemingc.on.ca

Dean: Linda Skilton Office: 289A

Email: lskilton@flemingc.on.ca

Dean Approved:2012/01/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

In this course, the student will use information technology tools to manipulate data from a variety of disciplines within the School of Environmental and Natural Resource Sciences. This course will include data collection methods and strategies to effectively manage environmental and natural resource science data.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals

Aim:
This course will provide a comprehensive foundation in data management in the environmental and natural resource field.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Use various information technology tools to effectively gather, interpret and convey environmental and natural resource data in accordance with accepted protocols and standards.
2. Suggest and employ strategies to effectively manage the collection, storage and retrieval of environmental and natural resource data.
3. Recognize and differentiate amongst a variety of data, and related data collection methods, to meet specific research objectives in environmental and natural resource sciences.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan 9-13 Classes begin	Introduction to course & overview of data management SDL: Assignment 1: Organizing data & backup protocol	2, 3	
Week 2 Jan 16-20	Recording & organizing field observations I SDL: Assignment 2B: Field notes	1, 2, 3	Assignment 1 Due: 10% Assignment 2A Due: 2%
Week 3 Jan 23-27	Recording & organizing field observations II SDL: Keyboard shortcuts	1, 2, 3	
Week 4 Jan 30-Feb 3	Creating a standardized soil evaluation form SDL: Creating a standardized form	1, 2, 3	Assignment 2B Due: 8%
Week 5 Feb 6-10	Sorting & organizing field observations Test 1: Keyboard shortcuts SDL: Preliminary evaluation of field data	1, 2, 3	Test 1: 10%
Week 6 Feb 13-17	Summarizing forestry and water quality data SDL: Summarizing Data- work on Assignment 3	1, 2, 3	
Week 7 Feb 20-24 Family Day: Mon, Feb. 20th NO CLASSES	Midterm SDL: - Work on Assignment 3	1, 2, 3	Midterm: 20%
Week 8 Feb 27-March 2 Independent Learning Week NO CLASSES	No classes - self directed learning Work on Assignment 3: Data entry form	1, 2, 3	
Week 9 Mar 5-9	Reporting forestry & water quality data SDL: Data Presentation/reporting	1, 2, 3	Assignment 3 Due: 10%
Week 10	Accessing & incorporating external sources	1, 2, 3	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Mar 12-16	of data I and II SDL: Assignment 4: Accessing & incorporating external sources of data I and II		
Week 11 Mar 19-23	Creating a complete data management package SDL: Assignment 5: Data entry form, analysis and summary	1, 2, 3	Assignment 4 Due: 10%
Week 12 Mar 26-30	Data Integration I: Incorporating data summary in reports SDL: Assignment 5 - Work on assignment	1, 2, 3	
Week 13 Apr 2-6 Good Friday: Apr. 6th NO CLASSES	Data Integration II: Introduction to creating and managing a database SDL: Database creation/management	1, 2, 3	Assignment 5 Due: 10%
Week 14 Apr 9-13	Review and practice exam exercise SDL: Prepare for final exam	1, 2, 3	
Week 15 Apr 16-20	Final Exam No SDL	1, 2, 3	Final Exam: 20%

Learning Sequence Additional Comments:

Due Dates: Assignments are submitted electronically. They are to be posted in the appropriate folder BEFORE the START of your lab NOT DURING OR AFTER your lab.

Learning Resources:

Recommended:

Etheridge, Denise. 2007. Microsoft Office Excel 2007: Top 100 Simplified Tips & Tricks. Wiley Publishing Inc. Hoboken, NJ Pp 243.

Microsoft Free Online Training for Excel:
http://office.microsoft.com/en-us/excel-help/CH010224830.aspx

Assessment Plan:

Item/Date:	Percent:	Description:
Week 2	10	Assignment 1 Due: Organizing data & backup protocol
Week 2	2	Assignment 2A Due: Collection of Field Notes - In class participation
Week 4	8	Assignment 2B Due: Field Notes
Week 5	10	Test 1: Keyboard shortcuts

Item/Date:	Percent:	Description:
Week 7	20	Midterm
Week 9	10	Assignment 3: Data Presentation
Week 11	10	Assignment 4: Data entry, analysis & summary
Week 13	10	Assignment 5: Database creation & management
Week 15	20	Final Exam

Additional Assessment Comments:

Assignments are submitted electronically. They are to be posted in the appropriate folder BEFORE the START of your lab NOT DURING OR AFTER your lab.

Assignment rubrics to be submitted to your professor at the start of the lab.

Any late assignments will be assigned a value of zero. If circumstances arise that prevent the submission of an assignment is is the student's responsibility to notify faculty as early as possible. Early notification may result in greater accommodation. See Academic Responsibilities below for more details.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Beatrize Vitorino
Office 215
Email: bvitorin@flemingc.on.ca

Exemptions contact for this course:
Beatrize Vitorino
Office 215
Email: bvitorin@flemingc.on.ca

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
Assignments & Plagiarism: For individual assignments, students are expected to work independently with no input from other students. For group assignments, each student in the group is expected to contribute an equitable amount of effort. In all assignments, plagiarism and academic dishonesty will not be tolerated and will be dealt with according to college academic regulations. Students are strongly

encouraged to review these regulations in their student handbook, Frost Facts.

Final Grades: Final grades in this course are assigned based on the level of academic achievement, which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Due Dates: Assignments are submitted electronically. They are to be posted in the appropriate folder BEFORE the START of your lab NOT DURING OR AFTER your lab.

Assignments are due as indicated in the Learning Sequence table in this outline, unless alternative arrangements are announced by faculty in lectures or labs; in which case it is the student's responsibility to note such revisions. Late assignments will receive a grade of zero. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, Admissions and Records, and Security staff do not accept any assignments or projects.

Absence: It is the student's responsibility to obtain information regarding assignments, lectures or labs that were missed due to absence and/or lateness for class. Regular attendance is strongly recommended.

Missed Assignments & Assessments: Decisions regarding missed evaluations, whatever the reason for missing them, will be left to the discretion of the faculty for this course. Advance notice of absence may result in greater accommodation and consideration will be given to students with a documented personal or family crisis. If a student misses a test or other assessment due to unavoidable circumstances, it is the student's responsibility to contact the professor within twenty-four hours of the missed test or assessment. However, the professor has the right not to allow the student to write the test or assessment missed.

Accommodations: Students who require accommodations are encouraged to meet with the course instructors to discuss response strategies.

Submitted Work – Standards: Most assignments are submitted electronically. If a hard copy is to be submitted, all assignments are to be submitted typed, double-spaced, properly formatted and on 8.5" x 11" paper, unless otherwise indicated by the professor.

Students must attempt all tests and assignments. ALL assessments worth a value of 10% or greater MUST be completed to receive a passing grade in this course.

Resolving Issues: Any issues with the course should be discussed directly with the faculty responsible for instructing your section. If the issue is not resolved, you may contact Beatrize Vitorino, the course leader. The next steps would be to contact Barbara Elliot, co-ordinator for common 2nd semester, and then the Dean, Linda Skilton. Do not attempt to circumvent this process as most issues can probably be quickly resolved through direct, honest and clear communication with the faculty instructing your section.

Cell Phones & Personal Technology: Cell phone use is not allowed in the classroom; cell phones and other personal technologies must be turned off as they are a distraction to the class. Use of personal technologies during tests will result in a grade of ZERO for the test.

Students may not access and use social media during lab time. Continued failure to adhere to this rule may result in your removal from the room.

Support: Please do not hesitate to ask for support and clarification in class. You are also encouraged to contact your professor(s), by email, to set up out of class appointments.

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ENVIRONMENTAL MEASUREMENT

Course Outline
Course Number: ENVR8

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology Program
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours:

Faculty: Stephen Thompson Office: 257
Office Hours: As posted

Availability:
Email: stevthom@flemingc.on.ca

Faculty: Melanie Logan Office: 257
Office Hours: As posted

Availability:
Email: melogan@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course is designed to develop student awareness and understanding of various aspects of the environment that are measurable and to relate the importance of these measurements in pollution studies. Students learn how to undertake surface and ground water quality sampling, flow measurement, field and laboratory analysis, data interpretation and reporting. These skills are applicable to lake, stream and ground water quality assessments, microbiological surveys, industrial/municipal inspections and monitoring, watershed studies and pollution prevention/abatement programs.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals

Aim:
The aim of this course is to provide an understanding of and hands-on training in the use of field sampling, monitoring and analytical equipment used in environmental measurement studies, interpretation skills and report compilation.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. demonstrate knowledge of water quality legislation, guidelines, policy and standards relating to pollution control in Ontario
2. operate field equipment used to sample, monitor and analyze water quality
3. collect, label, and preserve water samples using Ontario Ministry of the Environment and CCME protocols
4. interpret water chemical analytical results
5. operate a composite sampling device as used in industrial wastewater discharge locations
6. understand flow measurement equipment used in surface water, open channel and closed conduit surveys
7. collect sediment samples
8. collect groundwater samples
9. demonstrate knowledge of and perform laboratory equipment, methods and test procedures
10. perform microbiological culturing and testing

11. collect and preserve soil samples

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Sept 6-9	Lec: Course Introduction Lab: No Classes		
Week 2 Sept 12-16	Lec: Introduction to Water Measurement (Water Quality Assign) Lab: Field Instrument Operation and Maintenance	1,2,9	
Week 3 Sept 19-23	Lec: Water Chemistry Lab: Field Survey A (Nogies Creek -- Group A)	2,3,4	
Week 4 Sept 26-30	Lec: Water Chemistry Lab: Field Survey A (Nogies Creek -- Group B)	2,3,4,7	Water Quality Quiz WebCT(10%)
Week 5 Oct 3-7	Lec: Water Components and Sampling Strategies Lab: Field Survey B (Pigeon Creek -- Group A)	4,10	
WEEK 6 Oct 10-14 Thanksgiving Day College Closed	Lec: QA/QC in Sampling and Monitoring Lab: Field Survey B (Pigeon Creek -- Group B)	2,3,4,9	
Week 7 Oct 17-21	Lec: Surface Water Samplng Techniques Lab: Water Quality Analysis	10	Field Equipment Quiz WebCT(10%) Water Quality
Week 8 Independent Learning Week October 24-28	Program oriented, self-directed studies/field activities		
Week 9 Oct 31-Nov 4	Lec: Sediment Sampling Lab: Water Quality Analysis	2,8	Midterm Exam WebCT(20%)
Week 10 Nov 7-11	Lec: Basic Hydrogeology Lab: Groundwater Sampling Equipment	2,8	Water Quality Summary Sheets (5%)
Week 11 Nov 14-18	Lec: Legal Framework for Water Quality in Ontario Lab: Groundwater Sampling Equipment	1,2,3,8	Composite Sampling Assignment (5%)
Week 12 Nov 21-25	Lec: Groundwater Sampling Lab: Microbiology Sampling and Culture	4,8,9, 10	Equipment Competency Video (15%)
Week 13 Nov 28-Dec2	Lec: Water Quality Interpretation Lab: Microbiology Sampling and Culture	1,2,4, 10	Groundwater Quiz (10%)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 14 Dec 5-9	Lec: Water Quality Interpretation Lab: Soil Sampling	2,,6,11	Microbiology Quiz (10%)
Week 15 Dec 12-16	Lec: Flow Measurement Devices Lab: Scugog and Nogies Creek Field Survey Test	2,4,5,9,10	Field Survey Test (15%)

Learning Resources:

1. Ministry of the Environment and Energy. 1993. A Guide to the Collection and Submission of Samples for Laboratory Analysis. Toronto: Queens Printer for Ontario. 81 pp.

2. Thompson, S. 2007. Environmental Measurement Manual. Lindsay: Sir Sandford Fleming College.(photocopied). 352 pp.

3. Mitchell, Mark K. and William B. Stapp. 13th Edition. 2008. Field Manual for Water Quality Monitoring. Kendall/Hunt Publishing Company. Dubuque, Iowa. 145 pp.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 4	10	Water Quality WebCT Quiz
Week 7	10	Field Equipment WebCT Quiz
Week 9	20	Midterm Examination WebCT
Week 10	5	Water Quality Summary Sheets
Week 11	5	Composite Sampling Assignment
Week 12	15	Equipment Competency Video
Week 13	10	Groundwater Quiz
Week 14	10	Microbiology Quiz
Week 15	15	Field Survey Test

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Stephen Thompson or Melanie Logan

Exemptions contact for this course:
Stephen Thompson or Melanie Logan

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the SENRS School Office, Student Services, and Admissions & Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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LAND RECLAMATION PRINCIPLES

Course Outline
Course Number: ENVR15

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technician
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: James Adam Office: 177
Office Hours: As posted

Availability:
Email: jadam@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course seeks to familiarize students with the types of industrially stressed lands that exist. It will outline the problems associated with stressed lands from a land reclamation and rehabilitation standpoint and promote an understanding of what approaches can be taken to rehabilitate land.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Establish and maintain positive relationships in ways that contribute to the achievement of goals.

Aim:
Students will become familiar with the range and nature of stressed lands, characterize the different site conditions and propose effective techniques to address specific sites

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. establish, monitor and report on vegetation test plots
2. identify, describe the characteristics of vegetation, and select appropriate species for land reclamation/rehabilitation
3. explain the types of stresses that industrial activity can place on land
4. execute the appropriate testing practices as applied to stressed lands
5. identify and explain the techniques that are implemented to rehabilitate land

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
wk 1 Sept.5-9	Lec- Introduction to course - objectives of land reclamation Lab - no lab scheduled this week	1,3	
wk 2 Sept.12-16	Lec - Rationale for Test Plots Lab- Test Plot Project - Set up	1	
wk 3 Sept.19-23	Lec - Rehab Principles/ Considerations Lab- Acid Rock Drainage - Set up Part 1 Vegetation/Pit Assignment (due October 21st)	1,2	10%
wk 4 Sept.26- 30	Lec - Rehab Principles /Considerations Lab- allocated time to work on Veg/Pit Assignment	1,2,3	
wk 5 Oct. 3-7	Lec - Rehab Principles/Considerations Lab- Test Plot Monitoring (#1) - Seed Lab set up		
wk 6	Lec - Rehab Principles/ Considerations	2,3	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Oct. 10-14 10th is Thanksgiving	Lab - Vegetation/Pit Assign. (due Fri. Oct 21st)		
wk 7 Oct. 17-21	Lec - Herbaceous Cover Considerations Lab - Nitrogen Lab	1,2,3,4	5%
wk 8 Oct.24-28	Program oriented, self-directed studies/field activities		
wk 9 Oct.31-Nov.4	Lec - Quiz Lab - Phosphorous,Potassium	1,2,3,4	8% 5% 5%
wk 10 Nov.7-11	Lec - Aggregates in Ontario & Rehabilitation Lab- Tree Shrub/ Planting - Seed Lab Part 2	3,5	3%
wk 11 Nov.14-18	Lec - Aggregates in Ontario & Rehabilitation Lab - optional lab - may take place at an off site location, at an alternate time as the normally scheduled lab. - TBA	3,5	
wk 12 Nov.22-26	Lec - Acid Stressed Soils Lab- Case Study - Salts	3,4,5	5%
wk 13 Nov 21-Nov.25	Lec - Acid Stressed Soils Lab - Acid Rock Drainage- Part 11 I.D./Characteristic Test- Opportunity #1	3,4,5	7%
wk 14 Nov. 28-Dec.2	Final Test -(2hrs-time/room TBA) I.D./Characteristic Test- Opportunity #2 Test Plot Project - due in lecture	5	25% 12%
wk 15 Dec. 12-16	Lab- Opportunity #3 -Vegetation I.D/Characteristic Test(room/time- TBA)	1-5	15%

Learning Resources:

As assigned/supplied by instructor

Assessment Plan:

Item/Date:	Percent:	Description:
Wk 7	10	Vegetation/Pit Assignment
see lab schedule	30	Lab Exercises
see lab schedule	15	Vegetation I.D./Characteristic Quiz*
wk 14	12	Test Plot Project
wk 9	8	Quiz (offered in lecture time slot)
TBA Week 14	25	Final Test

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Jim Adam

Exemptions contact for this course:
Jim Adam

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the SENRS School Office, Student Services, and Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

* An 80% competency level is required for this component of the course. In the event this level is not achieved in one of the three scheduled opportunities, a failing grade (ie. the grade achieved) will be assigned to this component.It is important to note that successful completion of this part of the course is not required in order to receive a passing final grade in this course.

Some labs involve experiments with set-up, monitoring,analysis, and documentation. In order to be eligible for 100% of the marks associated with these activities, attendance and participation are required.

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WATERSHED MANAGEMENT

Course Outline
Course Number: ENVR19

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technician
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Anne Vanwarmerdam Office: 256
Office Hours: As posted

Availability: By appointment
Email: avanwarm@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

course website url: http://gaia.flemingc.on.ca/~avanwarm/WATERSHED/main.htm

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This lecture and lab course studies the various components of a watershed (limnology, hydrology, and hydrogeology) and their interactions. Various streamflow sampling techniques and their applications to predictions of flooding and sedimentation will be examined. Attention will be brought to the conflicting demands of use on the watershed and to various remedial options. Legislation under the Conservation Authorities Act and Drainage Act that influences watershed activities will also be presented.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals
8. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
The aim of this course is to develop in the students an understanding of the components which comprise a watershed. The dynamics of each component and their interactions are studied in order to determine the effects brought on by human activity. This course enables the student to understand why various measurements learned in Environmental Measurement are taken.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. delineate a watershed
2. identify watershed components
3. explain the basic components of stream flow, groundwater flow, and run-off
4. use the correct equipment in order to collect stream flow data
5. accurately calculate stream discharge values from collected stream flow data
6. interpret a hydrograph
7. correlate information from water well records to determine aquifer location and flow
8. identify impacts from human land use on a watershed
9. describe various methods of predicting major flooding events
10. explain Ontario's flood plain policy describe various methods of predicting major flooding events
11. describe stormwater best management practices (bmp’s)

12. identify watershed issues addressed in the Conservation Authorities Act and the Drainage Act.
13. Understand identification of drinking water protection zones under the Clean Water Act.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Introduction No labs		No labs
Week 2	Introduction to Stream Flow Measurement Equipment	3, 4, 5	intro to field trips 10%
Week 3	Stream morphology	3,5	Field Trip 1a Nogies Ck Tues.Sept.20/11 5%
Week 4	Stream morphology	3,4,5	Field Trip 1b: Nogies Ck Tues.Sept.27/11
Week 5	Stream flow	3,5	Field Trip:2a Pigeon River Tues Oct 4/11 5%
Week 6	Thanksgiving	1, 2	Field Trip:2b Pigeon River Tues Oct 11/11
Week 7	Hydrogeology		Pigeon River/Nogies ck 10%
Week 8 Independent Learning Week	Program oriented, self-directed studies/field activities		
Week 9	run-off	3,4,8,13	Watershed delineation 5% TSS
Week 10	hydrographs	3,7,8	Well records 10%
Week 11	Midterm (20%)	3,6	Midterm (lecture) 20% Flood prediction 8%
Week 12	flood forecasting	9,10	Rating curves 7%
Week 13	stormwater management	11,12	Conservation Authorities Act
Week 14	Source Water Protection (Clean Water Act)	11,12,13	Drainage Act 5%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 15	Final Exam	6,7,8,9,10,11,12,13	15%

Learning Sequence Additional Comments:

course website: http://gaia.flemingc.on.ca/~avanwarm/WATERSHED/main.htm

Learning Resources:

Recommended reading, but not required to buy:
Nathanson,Jerry A. Basic Environmental Technology, 5th ed.New Jersey: Pearson Prentice Hall, 2008.

Assessment Plan:

Item/Date:	Percent:	Description:
Sept 24 at beginning of lecture	10	stream velocity and discharge calculations
week 3 or 4, at end of Nogies Ck. trip	5	stream profile work
week 5 or 6, at end of Pigeon R. trip	5	stream profile work
Nov 14/11 at beginning of lecture	10	Pigeon River/Nogies Ck report
Week 9	5	Watershed Delineation
Week 11	10	well records
Week 11	20	midterm
Week 12	7	rating curves
week 13	8	flood predictions
Week 14, at end of lab	5	Drainage Act
Week 15	15	Final Exam

Additional Assessment Comments:

Unless stated otherwise, all assignments are due on the day of the regularly scheduled lab by 6:00 p.m.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Contacts: course professor or program co-ordinator

Exemptions contact for this course:
Contacts: Admissions and Records Office for exemption forms and course professor for approval

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
Mutually, professors and learners will support and adhere to College Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines will support the learning process:

It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the SENRS School Office, Student Services, and Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

Missed Tests
It is the student's responsibility to be present for all tests and evaluations. Missed tests will be given a mark of zero. Only under extenuating circumstances will a make-up test be allowed.

Due Dates

All assignments are due on their announced date and time. Unless specified otherwise, assignments are due by 4:30 p.m. of the prescribed date.
There will be no exceptions to due dates except that:
An individual extension may be granted for a documented situation of a serious nature that is beyond the student's control. The student is responsible for notifying the instructor as early as possible and for providing documentation.

A general extension may be granted when a serious problem arises due to unforeseen circumstances, in which case an adjustment will be applied to all submissions, whether late or on time.

Assignments that are submitted below a minimum level of competence as determined by the Professor will be returned as incomplete and on resubmission will be given a grade subject to the late assignment penalty.

Submissions

Unless otherwise stated, the assignments will be due one week following the day they were assigned. All submissions must be neat and legible. Any illegible assignments will be returned to the student unmarked. A neat version may be re-submitted, but will be subject to the late penalties.

Late Assignments

Late assignments will be penalized 10% of the project value per school day to a maximum of 50%. After five schooldays, the assignment will not be accepted; a grade of zero will be given.

Academic Integrity

All students are expected to work individually on assignments unless otherwise specified. Each student has the responsibility to support academic integrity. Breaches of academic integrity (such as cheating and plagiarism) will normally result in a grade of zero for the evaluation involved. Any subsequent offense may result in the student being required to withdraw from the College. All breaches of academic integrity will be reported.

AQUATIC BIOLOGY

Course Outline
Course Number: SCIE6

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Mark Williamson Office: 183
Office Hours: As posted

Availability:
Email: marwilli@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2011/09/08
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course provides an introduction to aquatic biology and limnology. Emphasis will be placed on the identification, sampling, and environmental significance of organisms, including aquatic plants, invertebrates, algae, bioindicators, and exotic species. Successful completion of this course requires that students undertake an aquatic plant field collection.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals
7. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
The student will become familiar with the basic concepts and fundamentals of aquatic biology and limnology, including biotic and abiotic components of aquatic ecosystems.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Identify the major families and species of aquatic plants in Ontario.
2. Identify the major families of freshwater invertebrates in Ontario
3. Use sampling devices such as Surber samplers, Schindler trap, plankton tow net, Ekman benthic sampler, D-frame net and Hester-Dendy plates to inventory aquatic populations.
4. Identify and recognize major algal groups, exotic species and key bioindicators in Ontario
5. Be familiar with the major environmental issues pertaining to aquatic environments in Ontario

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Classes Begin September 6	Lecture: Introduction to aquatic ecosystems No Lab	5	
Week 2	Lecture:Freshwater ecosystems Lab: Aquatic plants and habitats (Aquatic Plant test specimens)	1,2	
Week 3	Lecture: Field surveys and sampling Lab: Field Trip - Nogies Creek - Stream Assessment I	1,2,3	
Week 4	Lecture: Lake origins, types and life cycles.	1,3	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Lab: Field Trip - Nogies Creek - Stream Assessment I		
Week 5	Lecture: Light, heat and energy in aquatic systems Lab: Field Trip - Pigeon River - Stream Assessment II	2,3,4	
Week 6 Thanksgiving Monday Oct. 10	Lecture: Holiday Lab: Field Trip - Pigeon River - Stream Assessment II	2,3,4	
Week 7	Lecture: Nutrient cycling Lab: Wetland Plant I.D. Test (15%)	1,2,3,4	Wetland Plant I.D. Test (15%,)Field Survey Report (10%)
Week 8 Independent Learning Week	Program Oriented, self-directed studies/field activities		
Week 9	Lecture: Oxygen, temperature and pH relationships Lab: Aquatic invertebrates, Plant collection due (15%)	2,3	Aquatic Plant Collection (15%)
Week 10	Lecture: Lake types and life cycles Lab: Invertebrate diversity and water quality (5%)	1,2,5	SCI and Beak's Index (5%)
Week 11	Lecture: Algae Lab: Introduction to the algae (5%)	4,5	Algae I.D. (5%)
Week 12	Lecture: Food web dynamics/ Stream Systems Lab: Plankton Enumeration (5%)	2,3,5	Plankton Enumeration (5%)
Week 13	Lecture: Wetlands Lab: Invertebrate test (15%)	1,3	Invertebrate Test (15%)
Week 14	Lecture: Wetlands/Review Lab: Exotics and Bioindicators (5%)	1,3,5	Exotics and Bioindicators (5%)
Week 15	Final Test (25%)	1,2,3,4,5	Final Test (25%)

Learning Resources:

Newmaster, S.G., A.G. Harris and L.J. Kershaw. 1997. Wetland Plants of Ontario. Lone Pine Pub., Edmonton. 240 pp.

Reid, G.K. 1987. Pond Life. Golden Press, New York. 160 pp.

Assessment Plan:

Item/Date:	Percent:	Description:
1 - Week 7	10	Field Survey Report
2 - Week 7	15	Wetland Plant I.D. and Characteristics test
3 - Week 9	15	Plant Collection
4 -Week 10	5	SCI/Beak's Index
5 -Week 11	5	Algae I.D.
6 -Week 12	5	Plankton Enumeration
7 -Week 13	15	Invertebrate I.D. and Characteristics Test
8 -Week 14	5	Exotics & Bioindicators
9 Week 15	25	Final Test

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Refer to Student Access and Referral Services, LRC, Brealey Campus, ext. 1358

Exemptions contact for this course:
Students that have taken a similar course may apply for an exemption by contacting Admissions at Frost campus.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the details. It should be noted that the SENRS School Office, Student Services, Admissions and Records etc. will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member. All course assignments due at 4:00 PM on the date specified. Late assignments will incur a 10% penalty daily. Attendance at laboratory periods is mandatory in order to receive a mark for an assignment. Students are responsible for retaining

photocopied or electronic copies of all assignments where appropriate. Cell phone use is not allowed in the classroom, cell phones musr be turned off as they are a distraction to the class.

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GEOMATICS IN SURVEYING

Course Outline
Course Number: SURV18
2011 Fall
Sir Sandford Fleming College

Program:Forestry, Earth Resources, Environmental , and Geomatics Technician
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Bruce Pettit Office: 112
Office Hours: As posted

Availability:
Email: bpettit@flemingc.on.ca

Faculty: Robert Bialkowski Office: 155B
Office Hours: As posted

Availability:
Email: rbialkow@flemingc.on.ca

Faculty: Lawrie Keillor-Faulkner Office: 213
Office Hours: As posted

Availability:
Email: lkeillor@flemingc.on.ca

Faculty: Peter Head Office:
Office Hours: As posted

Availability:
Email: phead@flemingc.on.ca

Coordinator: Bruce Pettit Office: 112
Email: bpettit@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course places the emphasis on the fundamental principles of Geomatics as they apply to Surveying. Electronic instruments will be used with emphasis on data loggers to obtain field positions with features and attribute data. These field locations and attributes will be used to create GIS related survey plans. Coordinate Geometry will be used in the computation of boundaries areas and volumes. The GIS features will be implemented using practical field projects and the projects will be related to land information systems.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
4. Establish and maintain positive relationships in ways that contribute to the achievement of goals.

Aim:
The student will become competent with the concepts, equipment, and practices required for measuring distances, angles, elevations and areas in applied GIS projects.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Further develop the skills to measure angles and distances of spatial features, as introduced in the Geospatial Techniques course.
2. Identify the accuracy of measurement using mathematical closure or Error Ellipses in angles and distances using COGO
3. Compile accurate and electronic field notes using data loggers to communicate both the procedure and information obtained in fieldwork, so that the information can be used in a GIS.

4. Demonstrate co-operation and co-ordination skills within the field crew to optimise efficient and effective methods of fieldwork.
5. Produce boundary, topographic and geomatics plans that accurately demonstrate the surveyed area in the Autodesk Map.
6. Use total stations,levels and trigonometric levelling to determine the difference in elevation between topographic points and build a Digital Terrain Model.
7. Measure and relate GPS positions in UTM coordinates, to delineate point features and attributes in survey format for importing into AutoCAD from ArcPad
8. Overlay new field maps and plans onto OBM maps and orientate the background with existing features.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Introduction of field procedure and methods for surveying Review the concepts from geospatial techniques course. LAB: tape/chain measurement	1	
Week 2	Lecture on History and Types of Surveys also Distance Measurement and Field notes., Electronic Distance Measuring (EDM) Calculations for Slope reductions and trig calculations Lab: Introduction to measurements practices for Assignment #1 EDM measurement and level of theodolite/total station	1,2	
Week 3	Lecture:Angles, bearings/azimuths, angular closure, Angles to bearings LAB: Set up & measure horizontal angles with Total Station and theodolite. Con't on Assig#1; DUE: Field notes “A”	1,2,3	5%
Week 4	Radial ties to obtain Distances and Bearings. Types of total stations. LAB: calculations for closure and radial ties Con't on Assig#1	1,2,3,	
Week 5	Perimeter, Area, and Precision, Error of Closure Accuracy Ratio in the boundary limits LAB: EDM measurement Con't on Assig#1 DUE: Field Notes “B”	1,2,3,4	5%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 6	Test #1 (no lecture this week) LAB: Drafting of Plan of Survey in AutoCAD	1,2,3,4,5	10%
Week 7	Introduction to Levels and Elevations LAB: FinalDrafting of Plan of Survey DUE: Assignment #1	1,2,3,4,5	10%
Week 8	Program oriented, self-directed studies/field activities		
Week 9	Site Plans with levels and grid layout and related to boundary of study area LAB: Leveling Exercise Introduction of Assign#2, Site Plan	1,2,3,4,5,6	
Week 10	Topographic detail by Total Stations and data loggers with Trigonometric levels. LAB: Con't Assignment #2 Trigonometric Levelling and feature and attribute coding Drafting of site plan in Grids DUE: Field Notes "C"	1,2,3,4,5,6	5%
Week 11	Test #2 Lecture: GPS measurement with Trimble GPS LAB: Introduction to Assignment #3 DUE: Assignment #2	1,2,3,4,5,6	15% 10%
Week 12	Lecture: GPS – Measurement and attribute data with Global Positioning Systems/ LAB: Intro to Assign#3 GPS data	1,2,3,4,5,6	
Week 13	GIS Mapping with Survey Data Plotting UTM coordinates with GPS Download LAB: con't Assign#3 Site plan with added GPS points	1,2,3,4,5,6,7	
Week 14	Lecture: Review and calculations. EXAM	1,2,3,4,5,6,7,8	25%
Week 15	Assignment # 3 Due Wrap-up and completion of course material	All	15%

Learning Resources:

Required Texboook: McCormac, Jack: 2004. Surveying , Fifth Edition John Wiley & Sons, New Jersey, 357 pp. (with CD).

Assessment Plan:

Item/Date:	Percent:	Description:
Week 6	10	Test #1
Week 11	15	Test #2
Week 7	10	Assign #1
Week 11	10	Assign #2
Week 15	15	Assign #3
Week 14	25	Exam
Week 3	5	Field Note "A"
Week 5	5	Field Note "B"
Week 10	5	Field Note "C"

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Options: Individual portfolio of relevant documents and/or a challenge project involving skills covered in the course.

Exemptions contact for this course:
Contact Admissions and Records Office and course faculty.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
Mutually, professors and learners will support and adhere to College Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines will support the learning process:

It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the SENRS School Office, Student Services, Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to

illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

Assignments that are submitted below a minimum level of competence as determined by the professor will be returned as incomplete without a grade and on resubmission will be given a grade subject to a late penalty.

A late penalty of 50% may be applied by the Professor to the handing in of an assignment that has been deemed late due to negligent procrastination on the part of the student.

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EROSION CONTROL

Course Outline
Course Number: ENVR13
2012 Winter
Sir Sandford Fleming College

Program:Environmental Technician
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Adrian Philpot Office: 283
Office Hours: As posted

Availability:
Email: adphilpo@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2012/01/18
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

In this course, various methods of erosion control practices and appropriate approaches are introduced. Types of erosion, causes, and methods of erosion control will be examined. In this light, erosion control approaches that apply to urban, shoreline and agricultural sectors will be presented. Proper field inspection techniques and control measures, including engineering and biological approaches will be examined.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

Aim:
Students will acquire knowledge in erosional types and causes. Further, they will be able to undertake field inspections and assist in the implementation of control measures, including engineered and biological techniques.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Undertake field slope calculations and field documentation requirements
2. Calculate volumes of earth materials in a variety of circumstances
3. Determine rip rap requirements for streams
4. Undertake retention pond sizing calculations
5. Gain an introductory knowledge of wind erosion rate and factors affecting rates
6. Describe the types of erosion that occur, the factors that influence the rate of erosion, and the abatement measures that re available
7. Calculate rates of erosion on shoreline sites
8. Develop problem solving skills to address unique erosion control problems
9. Contrast how different sectors approach erosion
10. Plan mitigation procedures for riverine erosion

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
week 1	Lec: Introduction to Erosion Lab: Calculating slope and Volumes	1,2,8,9	
week 2	Lec: Water Erosion Lab: Mass movement, Universal Soil Loss Equation	2	Slope Lab assignment due 5%
week 3	Lec:Wind Erosion Lab:Soil Loss – Agricultural perspective	6,5	USLE Lab due 7.5%
week 4	Lec:Ice, Chemical, and Biological erosion Lab:Erosion Control Programs/ Regulations & Approvals	6,9	Wind Lab due 7.5%
week 5	Lec:Erosion impacts Lab:Estimating run-off/rational method	2	Legislation lab due 5%
week 6	Lec:Erosion Control Concepts Lab:Bioenginneering Techniques + Plantings (10% due week 11)	6	Rational Lab due 7.5%
Week 7	Lec:Site Survey and planning Lab:Mid Term quiz	10, 8	Mid Term exam 10%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
week 8	Self Directed Learning Reading week		
week 9	Lec:Novel erosion control methods Lab:Site assessment field trip (local - lab period only)	4, 10, 8	
week 10	Lec: Stream rehabilitation Lab: Channel erosion and control (Rip Rap)	3, 6, 7, 10	
week 11	Lec:Coastal Erosion Processes & Impacts Lab:Project sharing/brainstorming	8, 6	Rip rap lab due 7.5% Plantings marking 10%
week 12	Lec: Urbanization and growing erosion pressures Lab: Retention ponds/control structures	5,	Project due 20%
week 13	Lec:A local perspective - our watershed and Lake Simcoe Lab:Habitat enhancement opportunities	5, 9	
Week 14	Lec: Concepts Review Lab: Cave Formation		
week 15	Final Exam (webCT)		Exam (webCT)20%

Learning Resources:

N/A

Assessment Plan:

Item/Date:	Percent:	Description:
Lab 1/week 2	5	Slope calculations
Lab 2/week 3	7.5	Universal Soil Loss
Lab 3/week 4	7.5	Wind Erosion
Lab 4/week 5	5	Legislation
Lab 5/week 6	7.5	Rational Method
week 7	10	Midterm
Lab 6/week 11	10	Plantings lab
Lab 10/week 11	7.5	Rip Rap Sizing Lab
Week 12	20	Project
Final/ Week 15	20	Final Exam

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Contact the program coordinator

Exemptions contact for this course:
Contact the program coordinator

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed the learning process.
It is important to submit assignments and projects at specified time and location. The faculty member(s) for this course will provide the detail. It should be noted the Academic Planning & Operations Office, Student Services and Admissions and Records will not accept any assignments or projects.
Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment of components as cited in the course outline. It is important to note that faculty members will not offer additional evaluation activities beyond those cited in this course outline.
Cell use is not allowed in the classroom; cell phones must be turned off as they a distraction to the class.
Whatever the reason, missed evaluations and due dates for assignments, including those missed to illness, will be dealt with by your faculty member.

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WATER TREATMENT AND POLLUTION CONTROL

Course Outline
Course Number: ENVR18

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technician
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 4

Faculty: Subba Rao Yarra Office: 183
Office Hours: As posted

Availability:
Email: syarra@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Please check email regularly as this is how I will communicate with you! I always respond to email quickly, but if you need to meet in person, contact me to set up a time.

Dean Approved:2012/01/31
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course examines the step-by-step processes involved in conventional and alternative water and wastewater treatment processes, and also looks at methods of industrial wastewater and home drinking water treatment in Ontario. In addition, relevant legislation, guidelines, water/wastewater characteristics, and process control laboratory tests will be studied. This information will prepare students to take a number of Ministry of the Environment Certificate examinations that are offered at the completion of the course.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.

Aim:
The aim of this course is to provide an understanding of all of the processes involved in the treatment and distribution/ collection of water and wastewater from domestic, municipal and industrial activities. Students will be prepared for interactions associated with operation, operation troubleshooting, inspection responsibilities, complaint response and for the acquisition of five Certificates available from the MOE, namely; Water Treatment, Water Distribution, Wastewater Treatment, Wastewater Collection (the first four comprise the Operator in Training or OIT Certifications), and the Entry Level Drinking Water Operator Certificate.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Characterize the quality and quantity of sewage derived from municipal and industrial sources.
2. Characterize the quality and quantity requirements for drinking water delivered to municipal and industrial consumers.
3. Describe the individual process steps involved in the treatment of sewage, drinking water, industrial and private wastewater and domestic well water supplies.
4. Describe the microbiology involved in natural systems and their use in wastewater treatment processes.
5. Carry out routine inspections as per Ministry of the Environment protocols.
6. Sample and characterize effluents and water supplies from sewage, water, and industrial treatment plants.
7. Carry out routine laboratory tests used in wastewater and water treatment plant operation control (i.e. TSS, MLSS, MLVSS, F/M Ratio, Sludge Density, Jar Testing, etc.)

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan. 9-13	Double Intro lecture in lieu of labs (Tues 8-10 in Rm 280): 1. Introduction to instructor and course, OIT and ELC exams, 2. History of Drinking Water, Public Health (Video) Lectures 1. Water Characteristics 2. Basic Chemistry Principles	2, 3,	Ongoing; 4 x 2.5% attendance marks for 4 WTP/STP tours
Week 2 Jan. 16-20	Lab: Field Trip to York Region WTP Drinking Water Treatment Plant (DWTP) Lecture 1. Review of York Region DWTP Tour, Treatment Processes:Coagulation and Flocculation (video) 2. Jar Testing (video), intro Jar Test lab	2, 3, 5, 6, 7	
Week 3 Jan. 23-27	Lab: Jar Test Lab and Assignment Lectures 1 & 2 Regulations; Legislation/Guidelines affecting WTP's	2, 3, 6, 7	
Week 4 Jan 30- Feb 3	Lab: Math Lab; Lectures 2. Treatment Processes: Sedimentation and Filtration(Video) Regular lectures: 1. Sampling & Analysis 2. NO FRIDAY LECTURE	2, 3, 6, 7	
Week 5 Feb. 6-10	Lab: NO LABS WEEK 5 (Wk 4 double lecture instead) Lectures (both with Guest Lecturer Clive Berry) 1. Pumps and Valves 2. Other equipment and Electricity	3, 7	DWTP Quiz Wk 5 in Testing centre (day/times TBA): 10%
Week 6 Feb. 13-17	Field Trip To WTP TBA Lectures 1. & 2. Disinfection	2, 7	DWTP Lab Assignment Due Feb 22 in lecture; 10%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
			OIT APPLICATIONS DUE FRIDAY, Feb 18!!!
Week 7 Feb. 20-24	Lab Lindsay STP Tour (departure times TBA) Lectures 1. Well Operations (and Well Aware Video), STP tour recap 2. Distribution and Safety	2, 3, 6	Math for Operators Assignment Due Feb 24: 10%
Week 8 Feb 27-March 2	Independent Learning Week		
Week 9 Mar. 5-9	Lab: Catch-up/Clarification opportunity and ELC exam review Lecture: MOE Entry Level Drinking Water Operator Test (Midterm): 2hrs	ALL	ELC/Midterm review & exam(Day, time & Rm. all TBA) Value 15%
Week 10 Mar. 12-16	Lab STP Tour #2 (departure times TBA) Lectures 1. Bacteriology of Sewage, STP Legislation 2. Preliminary, Primary Treatment	1, 3, 4, 5,	
Week 11 Mar. 19-23	Lab Sewage Lab Tests and Assignment Lectures 1. STP tours Review 2.Secondary and Tertiary Treatment	4, 6, 7	STP Tour Quiz Wk 11 in testing centre, time/day TBA: 10%
Week 12 Mar. 26-30 (OIT exam day, time & Rm. all TBA)	Lab OIT Certificate Exam Review Lectures 1. STP Inspections 2. OIT EXAM: 2hrs	1, 3, 4	OIT cert review & exam(Day, time & Rm. all TBA) Value 15%
Week 13 April 2-6	Lab and Lecture periods: Alternative and/or Innovative Wastewater and Drinking Water Treatment Systems; Student Presentations	3, 4, 6	STP Lab Assignment due in labs; 10%
Week 14 Apr. 9-13	Lab and Lecture periods: Alternative and/or Innovative Wastewater and Drinking Water Treatment Systems; Student Presentations	1, 5, 6	Week 13 or 14; 10% presentations and attendance; Alternative/Innovative

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
			Water/Wastewater Treatment Methods
Week 15 Apr. 16-20	NO CLASSES: Course complete		

Learning Resources:

Course Handouts

Assessment Plan:

Item/Date:	Percent:	Description:
Wk 5	10	Drinking Water Treatment Plant Tours Quiz; in testing centre (days/times TBA)
Thurs, Feb 22 in lecture	10	Water Treatment Plant Lab Tests and Assignment
Fri, Feb 18 in lecture	0	OIT APPLICATIONS ARE DUE! TO WRITE THE EXAM AND COMPLETE THE COURSE REQUIREMENTS YOU MUST SUBMIT THIS!
Fri, Feb 25 in lecture	10	Math for Operators Assignment
Wk 9	15	ELC/Midterm exam: 2hr review & 2 hr exam; time/day TBA
Wk 11	10	Sewage Treatment Plant Tours Quiz: In testing centre,time/day TBA
Wk 12	15	OIT/Final Exam: 2hr review & 2 hr exam; time/day TBA
Due in labs, Wk 13	10	STP Lab Test Assignment
Week of April 4 or 11	10	Alternative/Innovative Methods of Drinking Water and Sewage Treatment; Student Presentations and attendance
Various dates	10	Field Trip Attendance: 2 Water Treatment Plant tours, 2 Sewage Treatment Plant Tours (2.5% each)

Additional Assessment Comments:

Both the OIT and ELC exams must be attempted as part of the successful completion of the course. Although the certificates will not be granted if a grade of under 70% is achieved, a passing grade in the course may still be obtained. A $30 application fee for the OIT exam applies, as well as the purchase of the Entry Level Drinking Water Course manual (approx $75).

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Program Co-ordinator or Admissions & Records Office

Exemptions contact for this course:
Steve Thompson, Program Coordinator

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions and Records will not accept any assignments or projects. The preferred time and location for assignment submission will be in class.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member. Missed tests that have not been previously negotiated with the professor will be given a grade of zero. Only a medical certificate or legal document received by the professor may allow for other considerations. All course assignments are due at 4:00 PM on the date specified. Late assignments will incur a 10% penalty daily. Attendance at laboratory periods is mandatory in order to receive a mark for an assignment. The professor reserves the right to deduct marks for poor spelling, grammar, or communication skills evident on any test or assignment. All course work should be prepared and presented in a professional manner. It is recommended that all assignments be typed. Students are responsible for retaining copies of all submitted and returned assignments in the event of lost or missing papers or in cases of dispute. For further clarification, refer to the Student Rights and Responsibilities document policy 3-326. Appeal of grades should follow process as outlined in Academic Regulations (article 6.2.3). Plagiarism and academic dishonesty will not be tolerated and will be dealt with according to college Academic Regulations (article 6.5.0).

Cell phone use is not allowed in the classroom: cell phones must be turned off as they are a distraction to the class.

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ENVIRONMENTAL LEGISLATION

Course Outline
Course Number: ENVR21

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technician
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Christine Brown Office:
Office Hours: As posted

Availability:
Email: christib@flemingc.on.ca

Faculty: Anne Vanwarmerdam Office: 256
Office Hours: As posted

Availability:
Email: avanwarm@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Students are welcome to email Anne questions or see me in person. It is best to email Christine.

Dean Approved:2012/01/05
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course provides emphasis on legislation in the environmental sector. Course content includes in-depth studies of pollution events in various settings with a focus on how and why the event occurred, related industrial and other processes involved and the environmental effect /impact created.

Legislative interpretation in various Acts including the Ontario Environmental Protection Act, Ontario Water Resources Act, Nutrient Management Act, Safe Drinking Water Act, Environmental Protection Act, Environmental Bill of Rights, Canadian Environmental Protection Act, and other environmental Regulations will be determined.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
4. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
5. Manage oneself and one's resources to achieve goals

Aim:
The aim of the course is to provide the student with information regarding the formation of laws in Ontario and Canada, and the subsequent legislation which governs the use and protection of land and water.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. describe how to successfully collect and present evidence in court
2. identify provincial and federal statutes and regulations which deal with the management and protection of the environment
3. determine which pertinent pieces of legislation apply to specific examples of pollution violations.
4. interpret legislation
5. identify and understand environmental abatement tools used in industry.
6. Identify the structure of a provincial ministry, as well as the roles conducted by the director, environmental officer, and minister.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Lecture: origins of Canadian Law Lab: due diligence	2,6	
Week 2	Lecture: jurisdictional differences Lab: Environmental Protection Act (EPA) EPA s14,15 , adverse effects	2,3,4,5	
Week 3	Lecture: the judicial system Lab: EPA s9, Reg 419,Reg.127	1,2,3,4,5,6	10% Assignment
Week 4	Lecture: Pulp and Paper process Lab:Abatement Tools (Orders, tickets, approvals)paper making	1,2,3,4,5,	10% Assignment - date to be determined
Week 5	Lecture: EPA Part V Lab: EPA Reg 347, Reg 362 and Varnicolor case study	2,3,4,5	5% Assignment
Week 6	Lecture : EPA Part X, Reg. 675 lab : mining extraction	1,2,3,4,5	10% assignment
Week 7 Ontario Family Day: February 21, 2011.	Lecture: Family Day Lab:Family Day		
Week 8 Independent Learning Week Feb.27 - Mar 3			
Week 9	Lecture - test Lab: EPA - Environmental Site Assessments	2,3,4,5,	15% test
Week 10	Lecture: OWRA Lab:electroplating demonstration and Case Study	2,3,4,5	10% Assignment (Lab)
Week 11	Lecture: Safe Drinking Water Act Lab: Safe Drinking Water Act	2,3,4,5	10%Assignment
Week 12	Lecture: Nutrient Management(Guest Lecture) Lab: Nutrient Management Act	2,3,4,5	
Week 13 Good Friday April 6	Lecture: Environmental Bill of Rights Lab: Envrionmental Bill of Rights	2,3,4,5,	10% Assignment
Week 14	Lecture:Environmental Assessment Act Lab: Canadian Environmental Protection Act (CEPA)	2,3,4,5	
Week 15	Final Exam 20%	1,2,3,4,5	Final exam 20%

Learning Sequence Additional Comments:

The instructor reserves the right to change the order of the lectures and to add additional course content in order to reflect the constantly changing landscape of Ontario's environmental legislation.

Learning Resources:

Environmental Protection Act
Ontario Water Resources Act
Ontario Safe Drinking Water Act
Nutrient Management Act
E-Laws at www.e-laws.gov.on.ca
Ontario Environmental Legislation, 2011-2012 Canada Law Book, 2011, Toronto, Ont.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 4	10	EPA - adverse effects and air pollution abatement assignment
TBA	10	paper making (due date to be determined)
Week 6	5	EPA - Varnicolor case study
Week 9	15	Test
Week 9	10	ore extraction assignment
Week 11	10	electroplating assignment
week 12	10	Safe Drinking Water Act
Week 14	10	Environmental Bill of Rights Assignment
Week 15	20	Final Test

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Admissions and Records Office and Anne Vanwarmerdam

Exemptions contact for this course:
Anne van Warmerdam

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the

learning process.
Unless specified otherwise, all assignments are to be completed individually by each student.

It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services and Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement, which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your Professor.

Missed Tests

It is the student's responsibility to be present for all tests and evaluations. Missed tests will be given a mark of zero. Only under extenuating circumstances will a make-up test be allowed.

Due Dates

All assignments are due on their announced date and time. Unless specified otherwise, assignments are due by 6:00 p.m. of the prescribed date.

There will be no exceptions to due dates except that:
An individual extension may be granted for a documented situation of a serious nature that is beyond the student's control. The student is responsible for notifying the instructor as early as possible and for providing documentation.

A general extension may be granted when a serious problem arises due to unforeseen circumstances, in which case an adjustment will be applied to all submissions, whether late or on time.

Assignments that are submitted below a minimum level of competence as determined by the Professor will be returned as incomplete and on resubmission will be given a grade subject to the late assignment penalty.

It should also be noted that the Academic Planning & Operations Office, Student Services, and Admissions and Records, will not accept any assignments or projects.

Submissions

All submissions must be neat and legible. Any illegible assignments will be returned to the student unmarked. A neat version may be re-submitted, but will be subject to the late penalties.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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STATISTICS

Course Outline
Course Number: MATH25

2012 Winter
Sir Sandford Fleming College

Program:Various Programs
School of General Arts & Sciences

Course Format: In Person
Hours: 45

Faculty: Kaukab Kamran Office: 155B
Office Hours: As posted

Availability:
Email: kkamran@flemingc.on.ca

Faculty: Victoria Maystruk Office:
Office Hours: As posted

Availability:
Email: vmaystru@flemingc.on.ca

Faculty: Kimberly Bell Office: 155B
Office Hours: As posted

Availability:
Email: kimbbell@flemingc.on.ca

Faculty: Adam Woodhouse Office:
Office Hours: As posted

Availability:
Email: awoodhou@flemingc.on.ca

Coordinator: Julia Godawa Office: 5906
Email: jgodawa@flemingc.on.ca

Dean: Ann Drennan Office: 5923
Email: adrennan@flemingc.on.ca

Dean Approved:2012/01/09
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio

development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course covers data organization, the basic statistical parameters, confidence intervals for means, the normal distribution, hypothesis testing (Chi-square, 'F', 't' and Anova), and regression analysis.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Uses numerical data, mathematical concepts and reasoning to solve problems
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Manage oneself and one's resources to achieve goals

Aim:
The student will be able to calculate basic statistical parameters, choose and apply some of the most commonly used methods of statistical analysis.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Accurately organize and describe a given set of data, perform appropriate statistical calculations and correctly interpret the results as required in the environmental sciences applications.

Additional Learning Outcomes Comments:

Weekly Learning Outcomes:

1. Construct a frequency distribution and summarize the distribution on a bar graph, histogram, frequency polygon and pie chart.
2. Calculate the following statistical parameters from grouped and raw data: mean, median, mode, standard deviation, variance and coefficient of variation.
3. Calculate and express the mean as a confidence interval.
4. Make estimates on population distributions using the standard normal curve.

5. Determine when, and know how, to use the following statistical analyses: Chi-square tests, "F" and "t" tests, ANOVA, and Regression Analysis
6. Perform a variety of statistical analysis using a computer spreadsheet.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Introduction to Statistics Frequency Distributions and Graphs	1, 2, 6	Assignment and Lab
Week 2	Measurements of Central Tendency	2, 6	Assignment and Lab
Week 3	Measurements of Dispersion	1, 2, 3, 6	Assignment, Quiz and Lab
Week 4	Confidence Intervals for Means	4, 6	Assignment, Quiz and Lab
Week 5	Population Distributions	3, 4, 5	Assignment, Quiz
Week 6	Test #1, the Normal Distribution	3, 4, 5, 6	Test #1, Assignment, Quiz and Lab
Week 7	Hypothesis Testing: the F-test	1, 2, 3, 4, 5	Assignment
Week 8	Independent Study Week		
Week 9	Mid-Term Test, Hypothesis Testing: t-test	5	Mid-Term Test, Assignment
Week 10	Hypothesis Testing: The Chi-square test	5, 6	Assignment, Quiz and Lab
Week 11	Hypothesis Testing: ANOVA	5, 6	Assignment, Quiz and Lab
Week 12	Regression Analysis	5, 6	Assignment, Quiz and Lab
Week 13	Test #2, review for Lab Test	5	Test #2
Week 14	Final Lab Test and review	1, 2, 3, 4, 5	Lab Test
Week 15	Final Exam	1, 2, 3, 4, 5	Final Exam

Learning Sequence Additional Comments:

In order to meet the needs of the student group, the instructor reserves the right to modify the course sequence. Also, due to any holidays and scheduling of lectures,labs and seminars, the Learning Sequence as listed may shift by a week.

Learning Resources:

All course material will be posted on WebCT before the start of the week. Students are responsible for printing the weekly material and bringing it to their lecture, lab and seminar.

Scientific calculator: Sharp EL-531W

Computer spreadsheets in the form of Excel will be available to students through Learning Common resources and during scheduled Lab times.

Assessment Plan:

Item/Date:	Percent:	Description:
Test #1	15	Weeks 1 - 4 material (Descriptive measures and confidence intervals)
Test #2	15	Weeks 9 - 12 material (The normal distribution and hypothesis testing; F, t, and chi-square tests)
Assignments	10	10 best of 11 weekly Assignments (each worth 1%)
Quizzes	10	7 Quizzes (four worth 1% each and three worth 2% each)
Labs	14	7 best Excel based Labs out of 8 labs (7 @ 2% each)
Final Lab Test	11	Final Excel Lab Test
Mid-Term Test	10	Covers first half of the semester material. Weeks 1 - 7
Final Exam	15	Covers second half of the semester material. Weeks 9 - 14

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Ann Drennan, adrennan@flemingc.on.ca

Exemptions contact for this course:
Ann Drennan, adrennan@flemingc.on.ca

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
• Student Attendance: Students are expected to attend all classes each week. Students are expected to bring calculators and textbooks to each class. Students are solely responsible for catching up on course work when absent. This includes collecting course materials (handouts, assignments, etc.) and catching up on missed classroom work. Individual instructors will provide more specific expectations for attendance early in the semester.

• Student Lateness: Students who are late for class are a disruption to their classmates and have a negative impact on the learning environment. Your instructor will share his/her late policies early in the semester. For reasons relating to classroom management late students may be refused entry. Lateness in general is unacceptable and will be dealt with on an individual basis.

• Due Dates: Only those students who contact the professor PRIOR to missing a class activity WITH A VALID REASON will be given an opportunity to make up the marks allocated for that week. Documentation verifying the reason for absence may be requested at the discretion of the professor.

Assignments must be handed in on the due date indicated. Late assignments will not be accepted and a mark of zero will be given.

Missed tests/quizzes may be written at another date only if a VALID, DOCUMENTED REASON is submitted within an appropriate time frame to your professor.

• Academic Integrity: The principle of academic honesty requires that all work submitted for evaluation and course credit be the original, unassisted work of the student. Cheating or plagiarism including borrowing, copying, purchasing or collaborating on work, except for group projects arranged and approved by the faculty member, or otherwise submitting work that is not the student's own violates this principle and will not be tolerated. Students have a responsibility to support academic integrity. Breaches of academic integrity, such as cheating and plagiarism, will normally result in a grade of zero for the assessment component involved. In addition, all breaches of academic integrity will be reported to the registrar.

• Final Grades: Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. Faculty members will not offer additional evaluation activities beyond those cited in this course outline.

• Use of cell phones and MP3 players are not allowed in lecture/seminar. Cell phones must be turned off to avoid distractions.

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GEOMATICS FOR ENVIRONMENTAL ENGINEERING

Course Outline
Course Number: SURV19

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technician
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours:

Faculty: Peter Head Office:
Office Hours: As posted

Availability:
Email: phead@flemingc.on.ca

Faculty: Bruce Pettit Office: 112
Office Hours: As posted

Availability:
Email: bpettit@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2012/01/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

In this course, geomatics principles are applied to Land Information Systems. Applied field projects are implemented in to existing geographic and parcel based land fabrics. Extensive use of coordinate geometry (cogo) is used to calculate and plot field projects in CAD based systems. Final plans are place into geographic information systems for manipulation and analysis of spatial data models.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Uses numerical data, mathematical concepts and reasoning to solve problems
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.

Aim:
to enable the student to gather, analyze and present geomatics field data incorporating environmental records, on maps and plans

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Identify and explain the techniques used to gather and transfer field data to coordinate files.
2. Use coordinate geometry (cogo) to place new and existing spatial data into a reference system
3. Produce maps and plans form new and existing land information systems.
4. Use and manipulate map projections and coordinate systems
5. Measure and relate GPS positions of points to features, lines and areas.
6. Acquire spatial data from digital air photos and remote sensing imagery and place in a reference system

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	AutoCAD review	1	
Week 2	Intro to Assign #1 - Reference Plan with shore ties	1,2	
Week 3	Create and insert blocks - con't Assign #1	1,2	
Week 4	Complete Assign #1 - Assign #1 Due	1,2	10%
Week 5	Test #1 Intro to Assign #2	1,2	10%
Week 6	Topographic Surveys with Elevations	1,2,3	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	- con't Assign #2		
Week 7	Elevation Models with AutoCAD - Assign #2 Due	1,2,3	15%
Week 8 - Independent Learning Week	Program Oriented, self-directed studies/filed activities		
Week 9	Elevation Models with AutoCAD Intro to Assign #3	1,2,3,	
Week 10	Geodesy: - UTM systems, grid factors - con't Assign #3	1,2,3,4	
Week 11	grid to ground distances convergence - Assign #3 Due	1,2,3,4	10%
Week 12	Test #2 Digitizing Air Photos - Intro to Assign #4 - Intro to Assign #4	1,2,3,4,5,6	15%
Week 13	Importing GIS data into AutoCAD - con't Assign #4	1,2,3,4,5,6	
Week 14	Exam - con't Assign #4	1,2,3,4,5,6	25%
Week 15	Complete Assign #4 - Assign #4 Due	1,2,3,4,5,6	15%

Learning Resources:

Geomatics Lab and printing facilities

Assessment Plan:

Item/Date:	Percent:	Description:
Test #1	10	Week 5
Test #2	15	Week 12
Assign #1	10	Week 4
Assign #2	15	Week 7
Assign #3	10	Week 11
Exam	25	Week 14
Assign #4	15	Week 15

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Options: Individual portfolio of relevant documents and/or a challenge project involving skills covered in the course. Contact Program Co-ordinator or Admissions and Records Office.

Exemptions contact for this course:
Contact: Admissions and Records Office and course faculty.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, & Admissions and Records, will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness will be dealt with by your Professor.

Late assignments are subject to a 50% penalty unless the student has submitted a special written request for an extension of the due date.

Late Assignments will not be accepted after the assignments have been graded and distributed during class time.

A makeup term test will only be provided to students who have made prior arrangements to write the test.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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FIELD SCHOOL

Course Outline
Course Number: APST27CS

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technician
School of Environmental& Natural Resource Sciences

Course Format: Camp/Study Trip
Hours:

Faculty: Stephen Thompson Office: 257
Office Hours: As posted

Availability: Other
Email: stevthom@flemingc.on.ca

Faculty: Gordon Balch Office: 288B
Office Hours: As posted

Availability: Other
Email: gbalch@flemingc.on.ca

Faculty: Mark Dzurko Office: 172
Office Hours: As posted

Availability: Other
Email: mdzurko@flemingc.on.ca

Faculty: Mark Williamson Office: 183
Office Hours: As posted

Availability: Other
Email: marwilli@flemingc.on.ca

Faculty: Anne Vanwarmerdam Office: 256
Office Hours: As posted

Availability: Other
Email: avanwarm@flemingc.on.ca

Faculty: Melanie Logan Office: 257
Office Hours: As posted

Availability: Other

Email: melogan@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2012/05/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

Field School provides the opportunity for students to integrate theory and practice in a field setting. It supports knowledge that has been gained during the first year. The field school activity also serves as an opportunity to introduce new field environmental techniques that are integrated into the curriculum over the course of the technician-level education and training.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Uses numerical data, mathematical concepts and reasoning to solve problems
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals
7. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
Students will increase their level of competence in field and lab activities.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Sample and properly document samples of surface water using a range of equipment
2. Calibrate and utilize field sampling instrumentation (field instruments, velocity meters, GPS, etc)
3. Complete analytical tests on samples collected in the field
4. Employ benthic sampling equipment and identify aquatic organisms
5. Employ water velocity techniques to determine discharge and contaminant loading
6. Interpret the results of analytical results in an aquatic setting
7. Gain practical experience on boat operation
8. Carry out a land-based groundwater well survey and monitoring activity
9. Understand structure and key elements of a bog
10. Present and interpret data

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 16	- use technical equipment to collect water samples - calibrate and utilize field equipment - conduct field kit analysis of water - conduct lab based analysis of water - assess the significance of the results of water quality testing - present data in the appropriate format - use technical equipment to collect aquatic invertebrates - identify aquatic invertebrates - recognize the significance of the presence/absence of invertebrates - use water velocity equipment to determine discharge and loading -carry out land-based groundwater well survey and monitoring -understand structure and key elements of a bog	1-10	Pass/Fail

Assessment Plan:

Item/Date:	Percent:	Description:
Week 16	P/F	Pass/Fail Successful completion of each component is a required element of

Item/Date:	Percent:	Description:
		Field School. Subsequent to verification that the student has successfully completed each element attempted, a Pass designation will be assigned.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Stephen Thompson, Office #257

Exemptions contact for this course:
Stephen Thompson, Office #257

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is essential to submit assignments and projects at a specified time and location. The faculty member for this course will provide the detail. It should be noted that the SENRS School Office, Student Services, and Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member. All course assignments due at 4:00 PM on the date specified unless otherwise specified. Late assignments will incur a 10% penalty daily. Attendance at laboratory periods is mandatory in order to receive a mark for an assignment. Students are responsible for retaining photocopied or electronic copies of all assignments in the event of lost or missing papers.

Cell phone use is not allowed in the classroom: cell phones must be turned off as they are a distraction to the class.

AIR POLLUTION AND ABATEMENT

Course Outline
Course Number: ENVR1

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technology Program
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 1 hour lec, 2 hour lab

Faculty: Enzo Vizza Office:
Office Hours: As posted

Availability:
Email: evizza@flemingc.on.ca

Faculty: Stephen Thompson Office: 257
Office Hours: As posted

Availability:
Email: stevthom@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2012/01/11
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

This course is divided into two modules. The first module will deal with air pollution and abatement by exploring emission sources, meteorological effects, pollution control technology, monitoring, and relevant legislation. In the second module, students will gain an understanding of the role and function of the federal National Pollution Release Inventory.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
4. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
5. Manage oneself and one's resources to achieve goals

Aim:
The first module of the course is designed to provide the students with the ability to work in the discipline of air pollution and abatement within the environmental field. By providing the students with a knowledge base in the areas of air pollution monitoring, legislation and emission control technology, they will be equipped to be employed in either the public or private sectors.

The second module of the course is designed to provide students with the unique skills of data collection, interpretation and submission as required by legislation, via the National Pollution Release Inventory data submission package.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. state the various air pollution sources
2. describe legislation pertaining to air pollution
3. understand basic meteorological processes and the effect on air pollution
4. demonstrate knowledge of methods for air pollution monitoring
5. demonstrate knowledge of the methods by which air pollution can be eliminated or reduced
6. describe the immediate and long term effects of air pollutants
7. demonstrate knowledge of the application of proper air pollution control equipment
8. understand and complete a National Pollution Release Inventory database for submission to the federal government as required under the Canadian Environmental Protection Act

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan 9-13	Lec: Introduction Lab: 1. Video: "What's Up With The Weather" 2. State of the Environment (SOE) Assignment	1, 4, 6	SOE Assign (5%)
Week 2 Jan 16-20	Lec: Air Contaminanting Processes (Chapter 3) Lab: 1. Video (Climate) 2. Environment Canada Green House Gases/Emitter Website Exercise	1, 5, 6	
Week 3 Jan 23-27	Lec: Effects of air pollution (Chap 4) Lab: 1. Video: (Air Quality) 2. Assign Dustfall Exercise	1, 2, 4, 6, 7	Video Quiz (10%) WebCT
Week 4 Jan 30-Feb 3	Lec: Basic Meteorology (Chap 12) Lab: Dustfall Exercise Continued	3, 4	
Week 5 Feb 6-10	Lec: Measurement of Air Pollution (Chapter 6) Lab: Air Pollution Monitoring Equipment and (Powerpoint Pres)	3, 5	SOE Quiz(10%) WebCT
Week 6 Feb 13-17	Lec: Dispersion Modelling (Chap 11) Lab: Assign In-door Air Quality Exercise	2, 4	
Week 7 Feb 20-24	Lec: Key Air Quality Websites Lab: Dustfall Particulate Analysis	3, 4, 6	Chapters 3, 4, 6, 11 (10%) WebCT
Week 8 Feb 27-Mar 2	Independent Learning Week No Classes		
Week 9 Mar 5-9	Lec: Control Concepts & Devices (Chaper 8) Lab: Acid Rain Lab	2, 4	Dustfall Exercise Due (10%)
Week 10 Mar 12-16	Lec: Air Pollution Legislation (Chap 2) Lab: Nuclear Air Quality Issues (Japan Tsunami Case Study)	2, 4	In-door Air Quality Assessment Due(10%)
Week 11 Mar 19-23	Lec: MOE Abatement Officer Guest Lecture Lab:Field Trip Lindsay/Ops Landfill (Gas Management)	8	Module 1 Final Test Web CT (15%) Field Trip (5%)
Week 12 Mar 26-30	Lec: Introduction to the National Pollution Release Inventory (NPRI) Lab:National Pollution Release Inventory Training Session	8	
Week 13 Apr 2-6	Field Trip Section 1 St Mary's Cement Bowmanville or NPRI Continued	8	Field Trip (5%)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 14 Apr 9-13	Field Trip Section 2 St Mary's Cement Bowmanville or NPRI Continued	8	
Week 15 April 16-20	Lec/Lab:National Pollution Release Inventory Test	8	NPRI Test WebCT (20%)

Learning Resources:

Ministry of the Environment. 1992. Air Pollution Abatement Manual for Environmental Officers. Toronto: Queens Printer for Ontario 304 pp. (Includes State of the Environment Report)

Assessment Plan:

Item/Date:	Percent:	Description:
Week 1	5	SOE Assignment
Week 3	10	Video Quiz (WebCT)
Week 5	10	SOE Quiz (WebCT)
Week 7	10	Chap's 3,4,6 and 11 Test (WebCT)
Week 9	10	Dustfall Exercise
Week 10	10	Indoor Air Quality Assessment
Week 11	15	Module One Final Test (Web CT)
Week 11	5	Field Trip Lindsay/Ops Landfill
Week 13	5	Field Trip Bowmanville
Week 15	20	National Pollution Release Inventory Test (WebCT)

Additional Assessment Comments:

Course Faculty

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Steve Thompson

Exemptions contact for this course:
Steve Thompson

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions & Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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FALL FIELD SCHOOL

Course Outline
Course Number: APST28

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours:

Faculty: Stephen Thompson Office: 257
Office Hours: As posted

Availability:
Email: stevthom@flemingc.on.ca

Faculty: Mark Williamson Office: 183
Office Hours: As posted

Availability:
Email: marwilli@flemingc.on.ca

Faculty: Melanie Logan Office: 257
Office Hours: As posted

Availability:
Email: melogan@flemingc.on.ca

Faculty: Adrian Philpot Office: 283
Office Hours: As posted

Availability:
Email: adphilpo@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Dean Approved:2011/09/08
Note to Students:

We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

In this course, students take part in practical field exercises in the Fall Semester (Semester 5) that build on the skill set developed from the Technician Level program. These exercises and areas of specialized training for the fall setting may take place at off-campus locations. In some instances, elements are mandatory, and additional specialized training take place on an optional basis. The course is designed to promote a more comprehensive understanding of environmental activity.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals
8. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
Students will increase their level of competence in field and lab activities.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Conduct a mandatory Wetland Evaluation using Ontario Ministry of Natural Resources protocols
2. Demonstrate knowledge and experience from selected environmental disciplines taken in short courses and activities where available

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1-15	1) Carry out wetland evaluations and wetland site investigations 2) Participate in a combination of optional and mandatory activities including field trips to various locations.	1, 2	Pass/Fail

Assessment Plan:

Item/Date:	Percent:	Description:
Week 1	P/F	Pass/Fail Successful completion of each mandatory component is a required element of Field School. Subsequent to verification that the student has successfully completed each element attempted, a Pass designation will be assigned.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Stephen Thompson, Office #257

Exemptions contact for this course:
Stephen Thompson, Office #257

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.

It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the SENRS School Office,

Student Services, and Admissions & Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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APPLIED ECOLOGY

Course Outline
Course Number: ECOS1

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Adrian Philpot Office: 283
Office Hours: As posted

Availability:
Email: adphilpo@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

The purpose of this course is to provide students with an improved knowledge of the complexity and interactions present in natural ecosystems. Practical exercises will help to develop and refine field bioinventory, sampling and analytical skills. This course is also designed to promote knowledge and understanding of ecosystem stresses, management, conservation and rehabilitation.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
The student will become familiar with the basic and advanced concepts and fundamentals of field ecology.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Inventory bird and amphibian populations through census and call identification techniques
2. Carry out humane small mammal live trapping, perform a field mark-recapture population study
3. Demonstrate field bioinventory and site-mapping skills
4. Perform a forest inventory of woodlot compartments
5. Conduct wetland evaluations to Ontario MNR standards including the use of GIS for spatial and cartographic needs.
6. Identify minnows and small fish communities as a function of an Index of Biological integrity
7. Develop and implement an ecological restoration project.
8. Understand Species at Risk and current legislation
9. Identify Ontario Reptiles and conduct population surveys
10. Understand population estimation methods and the importance of consistent scientific protocol

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Lec: What is Ecology and Wetland Evaluation Course Lab: Wetland Evaluation Course	5	
Week 2	Lec: Wetland Evaluation Field Trip Lab: Wetland Evaluation Field Trip	3,5	
Week 3	Lec: Wetland evaluation Lab: Assessing small mammal populations	2,5	
Week 4	Lec: Wetland Evaluation Lab: Wetland Evaluation GIS mapping	3,5	
Week 5	Lec: Wetland Evaluation Field Trip Lab: Wetland Evaluation Field Trip	1,3,5	Small mammal lab due (10%)
Week 6	Lec: Wetland Evaluation test Lab: Minnow Identification and Index of Biological Integrity	5,6,	Wetland Evaluation test (10%)
Week 7	Lec: Ecological Restoration Lab: Assessing bird populations and bird calls	1, 7	Wetland evaluation summary due(15%)
Week 8 – Independent Learning Week October 25-29	Lec: Program-oriented, self-directed studies/field activities Lab: Program-oriented, self-directed studies/field activities	1,3,4,7	
Week 9	Lec: Birdsong & Amphibian call test Lab: Restoration project data collection	1,3,7,10	Birdsong/amphibian call test (10%)
Week 10	Lec: Ecology, populations, interactions, and threats Lab: Forest survey techniques	4,7,10	Minnow assignment due (10%)
Week 11	Lec: Ecological restoration implementation strategies Lab: Invasive species removal	4,7	Forest survey data analysis due (10%)
Week 12	Lec: Herp survey methods Lab: Herp survey lab	3,9,10	Restoration Data due(10%)
Week 13	Lec: Urban wildlife Issues Lab: Species at Risk legislation	8	SAR test (10%)
Week 14	Lec: Amphibian survey Lab: Amphibian population lab	1,3,10	Restoration plan due(10%), Amphibian lab (5%)
Week 15	Lec: What we have learned and careers in the field Lab: Wetland and birdsong makeup tests	10	

Assessment Plan:

Item/Date:	Percent:	Description:
Small Mammal Populations Report Week 5	10	Small Mammal Populations Report Due
Wetland Evaluation test Week 6	10	Passing the Wetland Evaluation written test is required to pass the course.
Wetland Evaluation Report Week 7	15	A complete Wetland Evaluation Report done individually must be handed in to complete this portion of the course. Obtaining the Wetland Evaluation Certificate is mandatory to pass this course.
Birdsong/Amphibian Call Test Week 9	10	Audio test on calls of 40 birds and amphibians.
Minnow ID report Week 10	10	Minnow report with IBI
Forest survey techniques Week 11	10	Forest survey techniques
Restoration field data Week 12	10	Restoration background data report
Species at Risk test Week 13	10	In-class test on SAR legislation
Implementation plan Week 14	10	Implementation plan for rehab project due
Amphibian lab Week 14	5	In lab assignment

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Course faculty

Exemptions contact for this course:
Students that have taken a similar course may apply for an exemption by contacting Steve Thompson, Program Coordinator

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the Academic Planning & Operations Office, Student Services, and Admissions and Records will not accept any assignments or projects. The preferred time and location for assignment submission will be in class.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member. Missed tests that have not been previously negotiated with the professor will be given a grade of zero. Only a medical certificate or legal document received by the professor may allow for other considerations. All course assignments are due at 4:00 PM on the date specified. Late assignments will incur a 10% penalty daily. Attendance at laboratory periods is mandatory in order to receive a mark for an assignment. The professor reserves the right to deduct marks for poor spelling, grammar, or communication skills evident on any test or assignment. All course work should be prepared and presented in a professional manner. It is recommended that all assignments be typed. Students are responsible for retaining copies of all submitted and returned assignments in the event of lost or missing papers or in cases of dispute. For further clarification, refer to the Student Rights and Responsibilities document policy 3-326. Appeal of grades should follow process as outlined in Academic Regulations (article 6.2.3). Plagiarism and academic dishonesty will not be tolerated and will be dealt with according to college Academic Regulations (article 6.5.0).

Cell phone use is not allowed in the classroom: cell phones must be turned off as they are a distraction to the class.

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CONSTRUCTED WETLANDS

Course Outline
Course Number: ECOS4
2011 Fall
Sir Sandford Fleming College

Program: Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Gordon Balch Office: 288B
Office Hours: As posted

Availability:
Email: gbalch@flemingc.on.ca

Faculty: Mark Williamson Office: 183
Office Hours: As posted

Availability:
Email: marwilli@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2011/09/08
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

Constructed wetlands are an innovative technology that makes use of natural processes to treat wastewater from a variety of sources including industrial and human waste and are becoming increasingly popular in North America. In this advanced course, students will develop practical skills by learning to design, construct and monitor artificial wetlands for a variety of applications as well as working with the Environmental Technology Program's Solar Ecology wastewater treatment system. Topics covered include wetland processes, biochemistry, wetland design, and sizing calculations, case studies, field trips to wetland projects and construction of functional scale models.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals

Aim:

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Understand the application of constructed wetlands for wastewater treatment
2. Understand the key natural processes operating within constructed wetlands
3. Design a constructed wetland system for specific applications
4. Monitor and analyse data acquired from wetland systems in order to measure system efficiency
5. Understand the legal and regulatory framework applicable to wetland construction and operation
6. Have a knowledge and appreciation of the historical development and global applications of constructed wetlands technology including case studies from both local and international settings

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Sept. 6 Classes Begin	Lec: Course Introduction/Project Design Lab: Field School		
Week 2	Lec: Introduction to Constructed Wetlands Lab: Research Project Development Designs/System Components and Monitoring	1,3	Project Design 5%
Week 3	Lec: Constructed Wetlands Design Lab: Sizing Calculations and Design Considerations	1,3,6	
Week 4	Lec: Wetland Chemical Processes I Lab: Solar Ecology Alternative Energy Project	1,4,6	Sizing Calculations 10%
Week 5	Lec: Wetland Chemical Processes II Lab: Project Design Development	1,3,4,6	
Week 6 Thanksgiving Oct. 10 (no class)	Lec: Thanksgiving Day - no classes	3	
Week 7	Lecture: Applied Wetlands Research (CAWT) Lab: Cold Climate Systems Performance	3	SES Alternative Energy Project 10%
Week 8 Independent Learning Week	Program-oriented, self-directed studies/field activities	3	
Week 9	Lec: Case Studies Lab: CAWT Data Analysis Exercise	2,4	Cold Climate Performance 5%
Week 10	Lec/Lab: Field Trip (Dartford Constructed Wetland, Shady Acres Constructed Wetland)		CAWT Data Analysis 5%, Field Trip Assignment 5%
Week 11	Lec: Legal and Regulatory Environment/Applications Lab: Case Study		Case Study 5%
Week 12	Lec/Lab: Research Project Development	1,3,5	
Week 13	Lec: Project Model Presentations Lab: Project Model Presentations		Design Project Model 20%
Week 14	Lec: Poster/Oral Presentations Lab: Poster/Oral Presentations	3	Poster Presentations 10% Oral Presentations 10%
Week 15	Final Examination		Final Exam 15%

Learning Resources:

There is no required textbook for this course. course materials will be provided by the instructor as required.

** In lieu of a textbook, a fee of $35.00 per student is required for laboratory and project supplies. These supplies will be retained by the student at the end of the course.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 2	5	Project Design
Week 3	10	Sizing Calculations Assignment
Week 7	10	SES Alternative Energy Project
Week 9	5	Cold Climate Performance
Week 10	5	Field Trip Assignment
Week 10	5	CAWT Data Analysis
Week 11	5	Case Study
Week 13	20	Design Project Model Presentation
Week 14	10	Design Project Poster Presentation
Week 14	10	Design Project Oral Presentation
Week 15	15	Final Examination

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Mark Williamson

Exemptions contact for this course:
Mark Williamson

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction in class.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty members will not offer additional evaluation activities beyond those cited in this course outline.

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ENVIRONMENTAL APPLICATIONS

Course Outline
Course Number: ENVR5

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 30

Faculty: Kelly Cordick Office: 183
Office Hours: As posted

Availability: By email
Email: kcordick@flemingc.on.ca

Faculty: Dan Reeves Office:
Office Hours: As posted

Availability: By email
Email: dareeves@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Kelly: Email is the quickest way to reach me, though I am happy to arrange to meet in person as well. I am on campus Tues, Thurs, Fri. Office 183.

Dan: Only on-site Thursdays, email communication otherwise is best.

Dean Approved:2011/09/08
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:

In this course, landscape character is examined, with an emphasis on the biophysical characteristics of the site. This field-based activity will be linked to new development initiatives and/or remediation efforts, as linked to the appropriate legislation and regulation.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals

Aim:
Students will increase their level of competence in field inventory/assessment applicability to regulation and industry based standard practice in field documentation and presentation standards.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Conduct a topographic survey implementing differential levelling.
2. Inventory and represent the landscape in terms of biophysical site conditions
3. Evaluate selected landscapes in terms of their sensitivity to and level of anthropogenic influences
4. Critically assess impacts on the terrestrial and aquatic environment from developments and associated infrastructure
5. Inspect and evaluate site conditions that are specific to particular land use activities and take appropriate actions to inventory and/or remediate the site

6. Understand industry standard techniques for assessing vegetation communities; Ecological Land Classification (ELC method)
7. Understand Natural Channel Design and stream rehabilitation techniques
8. Understand principles for use and sizing of stormwater management ponds and evaluate effectiveness
9. Learn to utilize industry standard sources for rare species status lists.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Sept. 6-10	a. Course Introduction b. Intro to Natural Channel Design/Stream Rehabilitation	2, 3, 6	
Week 2 Sept. 812-16	Introduction to bioengineering project: Burnt River	1, 2, 3, 4, 6	
Week 3 Sept. 19-23	Natural Channel Design, Part II: Stream Rehabilitation field trip (both groups combined; Tuesday approx 12-5)	2, 3, 4, 6	
Week 4 Sept. 26-30	Field trip to Burnt River -combined with Env. Technol. course(Sec.A 1-5, Sec.B 8-12)	1, 2, 3, 4, 6	Stream Rehab Assignment due; 5%
Week 5 Oct 3-7	Introduction to ELC Manual & ELC exercise (in class)	1, 2, 5	ELC Part 1. Due in class: 5%
Week 6 Oct. 10-14	ELC Part II: Field Trip (Ken Reid CA)	1, 2, 5	ELC Part 2 Due in class: 5%
Week 7 Oct. 17-21	Loggerhead shrike habitat mapping -combined trip to Carden Plain with Environmental Technology (Sec.A 1-5, Sec.B 8-12)	1, 2, 4, 5	Burnt River Assignment Due (all 3 parts); 35%
Week 8 Independent Learning Week Oct 24-28	self directed studies	n/a	
Week 9 Oct. 31-Nov. 1-4	Shrike data lab	2, 4, 5	Shrike data lab due; 5%
Week 10 Nov. 7-11	Introduction to Environmental Impact Study (EIS) Assignment	1, 2, 3, 4	
Week 11 Nov. 14-18	Culvert Design Considerations	1, 2, 3, 4	EIS Assignment due: 10%
Week 12 Nov. 21-25	Scugog River erosion control/ stormwater management: a.Introduction to assignment	1, 2, 3, 4, 7	Culvert Design Considerations Assignment due: 10%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	b.on campus field trip		
Week 13 Nov. 28-Dec. 2	Rare species sources; computer lab assignment.	8	Rare Species Lab: 5%
Week 14 Dec. 5-9	Guest Lecture; TBA		Stormwater Mgmt/Erosion Control (Scugog River) Asst. Due; 20%
Week 15 Dec. 12-16	no class; compensates for extra class time for field trips in Wks 3 & 5.		

Learning Resources:

As assigned/supplied by instructor
-ELC manual and vegetation field guides useful but not necessary

Assessment Plan:

Item/Date:	Percent:	Description:
Week 4	5	Stream Rehabilitation lab exercise. Due in lab.
week 5	5	ELC Part I. Due in lab.
Week 6	5	ELC Part II. Due in lab.
Week 7	35	Burnt River Assignment Due; Part 1 Report (15%), Part 2 rough field notes (10%), Part 3 Bioengineering Approach (10%). Due in lab.
Week 9	5	Shrike Data lab. Due in lab.
Week 11	10	EIS Assignment. Due in lab.
Week 12	10	Culvert Design Considerations Asst. Due in lab.
Week 13	5	Rare Species Computer lab assignment due. To be completed during class.
Week 14	20	Stormwater Mgmt/Erosion Control (Scugog River) Assignment. Due in lab.

Additional Assessment Comments:

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Steve Thompson

Exemptions contact for this course:
Steve Thompson

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at the specified time and location. The faculty member for this course will provide the detail. It should be noted that Academic Planning & Operations, Student Services, and Admission and Records, will not accept any assignments or projects.

Final grades in this course are assigned based on the level of acadmic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that the faculty member will not offer additional evaluation activities beyond those cited in this course outline.

Please note: for missed field trips a penalty of 15% will be applied to the assignment associated with that field trip. In the case of group assignments, this penalty will apply to the individual only, not to other group members who were present for the field trip. This penalty may be waived for absence due to illness or other documented reason to be evaluated on a case by case basis by the instructor.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are distraction to the class.

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ENVIRONMENTAL SITE ASSESSMENTS AND AUDIT

Course Outline
Course Number: ENVR6

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology Technologist
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Melanie Logan Office: 257
Office Hours: As posted

Availability: By posted office hours
Email: melogan@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
In this course, the application of audits and site assessments will be examined. The ability to conduct a phase 1, 2, and 3 environmental site assessment on a property that has been disturbed by human activity is provided. Decommissioning processes and guidelines will be covered. As well, standards used to establish criteria for conducting audits and assessments (including ISO 14000 requirements).

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals

Aim:
Differentiate between Audits and various types of Environmental Site Assessments. Understand the components of Phase 1, Phase 2, Phase 3 Environmental Site Assessments, Underground Storage Tank Removals and Designated Substance Surveys. Gain practice in gathering relevant background and field information and in writing Site Assessment Reports. Become familiar with Federal, Provincial, and Municipal requirements with respect to contaminated sites, redevelopment requirements and Records of Site Conditions.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Demonstrate an understanding of legislation, guidelines and standards pertaining to environmental audits and environmental site assessments.
2. Identify the types of audits and assessments that exist and the roles and responsibilities of involved parties and stakeholders.
3. Plan and undertake a Phase I Environmental Site Assessment.
4. Plan and undertake a Designated Substance Survey.
5. Plan and undertake a Phase II Environmental Site Assessment for a variety of physical site conditions and different contaminant types.
6. Work effectively in small groups of two to three, by sharing work equitably and staying focussed to producing quality work.
7. Assess site conditions and provide a detailed field assessment.
8. Demonstrate familiarity with the AESEC Environmental Screening Form.
9. Understand the reasoning and basic approach of Phase III Assessments.
10. Demonstrate an understanding of Ontario's Brownfields legislation and MOE’s Soil, Ground Water and Sediment Standards.
11. Differentiate between Environmental Site Assessments, Environmental Assessments and Environmental Audits as defined by Canadian Legislation.
12. Develop a basic working knowledge of Green Building Certification (LEED and BOMA BESt).
13. Plan and undertake an Underground Storage Tank Removal verification sampling program.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Sept. 6-9	Introduction to Environmental Site Assessments	1	
Week 2 Sept. 12-16	Lecture: Environmental Liabilities Lab: Environmental Liability Case Study: Sunrise Propane Explosion	1,2	Assignment #1 Liabilities 5%
Week 3 Sept. 19-23	Lecture: Audits and Assessments – What's the Difference? Review of Legislation pertaining to site assessments and audits. Lab: O.Reg 153/04 and Soil, Ground Water and Sediment Standards	1, 2, 11	Assignment#2 : Legislation and responsible parties 10%
Week 4 Sept. 26-30	Lecture: Phase 1 Environmental Site Assessment (ESA) Lab: Phase I ESA Record Search	1, 2, 3	Assignment #3:Phase 1 ESA 10%
Week 5 Oct. 3-7	Phase I ESA Site Visit in replacement of Lecture and Lab	2, 3, 6, 7	Assignment #4 site visit 10%
Week 6 Oct. 10-14	Lecture: Underground Storage Tank (UST)Removals Lab: Guest Speaker: Maxxam Analytics VOC/PHC F1 Soil Sampling Field Preservation Methods	1, 2, 13	
Week 7 Oct. 17-21	Lecture: Designated Substance Surveys (DSSs) Lab: Mock Asbestos/Lead Survey	1, 6, 7, 4	Assignment #5 Designated Substance Survey 10%
Week 8 Independent Learning Week	Program oriented, self-directed studies/field activities		
Week 9 Oct. 31-Nov. 4	Lecture: Phase 2 ESA Lab: Phase 2 ESA	5, 6, 7	Assignment #6: Phase II Report 20% (weeks 9, 10 and 11)
Week 10 Nov. 7-11	Lecture: Phase 2 ESA Lab: Self Directed Learning: Phase 2 ESA Assignment	3, 4, 5, 6, 7	Phase II report -soil vapour survey
Week 11 Nov. 14-18	Lecture: Risk Assessments Lab: Brownsfield Redevelopment Video	3, 5, 9	Phase II report
Week 12 Nov. 21-25	Lecture: To remediate or not to remediate? Phase III ESA's, Record of Site Condition, Env. Registry Lab: Brownsfield Redevelopment Case	10	Assignment #7 Phase III ESA's 10%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Studies		
Week 13 Nov. 28-Dec. 2	International Standards Organization (ISO) 14000 requirements	2, 11	Assignment #8: Record of Site Condition 5%
Week 14 Dec. 5-9	Lecture: Guest Lecture Lab: Green Building Certifications	3, 5, 6, 10, 11, 12	Guest Lecture 5%
Week 15 Dec. 12-16	Final Exam	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	15% Final Exam

Learning Resources:

The following is recommended as a required source of information:

Shineldecker, Chris L., 1992. Handbook of Environmental Contaminants: A Guide for Site Assessments.

The following are recommended as sources of information:

Canadian Standards Association, Z768-01 (R2006) Phase 1 Environmental Site Assessments, Environmental Technology, A CSA Information Product, CSA, Toronto, 2001.

Ibid, ISO 14015-02 Environmental Assessment of Sites and Organizations (EASO)(Adopted ISO 14015:2001, first edition, 2001-11-15)

Ibid, Z769-00 Phase II Environmental Site Assessment, Environmental Technology, CSA, Toronto, 2000.

Ibid, Z773-03 (R2008) Environmental Compliance Auditing, Environmental Management, CSA, Toronto, 2003.

Ibid, PLUS 1137 Audit Checklist for Environmental Management Systems , Environmental Management, CSA, Toronto.

Fuels Safety Division Technical Standards & Safety Authority: Environmental Management Protocol For Operating Fuel Handling Facilities In Ontario, GA1/99, October 2001

Environmental Protection Act, Ontario Regulation 153/04 Records of Site Condition - Part XV.1 of the Act (Available on-line)

Assessment Plan:

Item/Date:	Percent:	Description:
Due Week 3	5	Assignment #1 - Liabilities
Due Week 4	10	Assignment #2 - Legislation and responsible parties
Due Week 6	10	Assignment #3 - Phase 1 ESA

Item/Date:	Percent:	Description:
Due Week 7	10	Assignment #4 - Site Visit Inspection
Due Week 9	10	Assignment #5 - Designated Substance Surveys
Due Week 12	20	Assignment #6 - Phase 2 ESA Report (in class weeks 9,10 and 11)
Due Week 13	5	Assignment #7 - Phase III ESA
Due Week 14	10	Assignment #8 - Record of Site Condition
Week 14	5	Guest Lecture
Week 15	15	Final Exam

Additional Assessment Comments:

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
It is suggested that initial contact takes place with the course professor who may then refer the student to the Program Coordinator.

Exemptions contact for this course:
Admissions and Records Office for exemption forms and verification.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide details for each assignment and/or project. It should be noted that the SENRS School Office, Student Services and Admissions & Records Offices will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness will be dealt with by your faculty member(s). Missed tests that have not been previously negotiated with the professor will be given a grade of zero. Only a medical certificate or legal document received by the professor may allow for other considerations.

All course assignments are due on the date specified. Late assignments will incur a 10% penalty daily. Attendance at laboratory periods is mandatory to receive a mark for an assignment.

The professor reserves the right to deduct marks for poor spelling, grammar or communication skills evident on any test or assignment. All course work should be prepared and presented in a professional manner and as such should be typed.

All students are expected to work individually on assignments unless otherwise specified. Each student has the responsibility to support academic integrity. Breaches of academic integrity (such as cheating and plagiarism) will normally result in a grade of zero for the evaluation involved. Any subsequent offence may result in the student being required to withdraw from the College. All breaches of academic integrity will be reported to the Registrar.

Students are responsible for retaining coies of all submitted and returned assignments in the event of lost or missing papers or in case of dispute. For further clarification, refer to the Student Rights and Responsibilities document policy 3-326. Appeal of grades should follow process as outlined in Academic Regulations (article 6.2.3). Plagarism and academic dishonesty will not be tolerated and will be dealt with according to college Academic Regulations (article 6.5.0).

Cell phone use is not allowed in the classroom; cell phones must be turned off or placed on vibrate mode as they are a distraction to the class.

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ENVIRONMENTAL TECHNOLOGY

Course Outline
Course Number: ENVR12

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 30

Faculty: Bruce Pettit Office: 112
Office Hours: As posted

Availability:
Email: bpettit@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Dean Approved:2011/09/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This course examines the technological tools that are available in the environmental sector. Technological skill development, environmental application, and problem solving represent typical areas of study.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.

Aim:
The student will learn the techniques of creating reports that reflect the analysis of environmental investigations and field work samples. The reports will be integrated with mapping projects and have graphs and statistics to communicate the study area within the final written report.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. obtain reliable and relevant field data from total stations and GPS data loggers for use in a GIS
2. Analysis data bases and use the extracted data to prepare a map and report which demonstrates conclusive evidence for the field results.
3. Create digital terrain models from trianglation networks
4. Use presentation graphics to report on the outcomes of the field analysis and the conclusions of the testing
5. Prepare final reports that incorporate graphs and plans from field studies.
6. Query and analyse the field data using GIS mapping capabilities and produce final mapping reports

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Review AutoDesk Map	1	
Week 2	Plotting traverses Review of Total Station & Leveling	1	
Week 3	Centre Line Profiles & cross-sections & Data Loggers	1,2	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 4	Field Work for Assignment #1 Part "A"	1,2	
Week 5	Cogo calculations for centre line Profiles and cross-sections	1,2,3,	
Week 6	Test # 1 Assignment #1 Part "A", Final Reports with Charts, Graphs and maps DUE: Assignment #1, Part "A" Intro to Assignment #1, Part "B"	1,2,3,4	10% 15%
Week 7	Field Day for Assignment #2 Intro to Assign #2	1,2,3,4	
Week 8	Program Oriented, self-directed studies/field activities		
Week 9	DUE: Assignment #1, Part "B" Start Assign #2 Part "A"	1,2,3,4,5	10%
Week 10	Pathfinder Office GPS software and plotting in AutoCad Ploting Features and Attributes Cont'd Assitgn #2, Part "A"	1,2,3,4,5	
Week 11	Test #2 Cont'd Assitgn #2, Part "A" DUE: Assign #2, Part "A"	1,2,3,4,5	15% 15%
Week 12	ArcPad and on Nomad data logger and GPS Intro to Assign #2 Part "B"	1,2,3,4,5,6	
Week 13	AutoCAd Map and Reports Cont'd on Assign #2, Part "B"	1,2,3,4,5,6	
Week 14	EXAM: Cont'd on Assign #2, Part "B" DUE: Assign #2, Part "B"	1,2,3,4,5,6	20%
Week 15	Assign #2, Part "B" DUE Wrap-up and completion of course work.	All	15%

Assessment Plan:

Item/Date:	Percent:	Description:
Week 6	10	Test #1
Week 11	15	Test #2
Week 6	15	Assignment #1, Part "A"
Week 9	10	Assignment #1, Part "B"
Week 11	15	Assignment #2, Part "A"
Week 14	20	Exam
Week 15	15	Assignment #2, Part "B"

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
see your professor

Exemptions contact for this course:
see your professor

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the SENRS School Office, Student Services, and Admissions and Records, will not accept any assignments or projects.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness will be dealt with by your Professor.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline. Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class. A late penalty of 50% may be applied by the Professor to the handing in of an assignment that has been deemed late due to negligent procrastination on the part of the student.

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WASTE MANAGEMENT APPROACHES

Course Outline
Course Number: ENVR17

2011 Fall
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 60

Faculty: Melanie Logan Office: 257
Office Hours: As posted

Availability: By posted office hours
Email: melogan@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Dean Approved:2011/09/07
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This course is designed to provide an understanding of current waste management practices in Ontario, waste management problems and environmental effects, governing legislation, regulatory practices and enforcement, integrated waste management components, landfill site selection, development of waste management system applications, site closure, and post-operational uses.

Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals
8. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:

The aim of this course is to develop student knowledge and skills in the waste management discipline, specifically in the various components of integrated waste management in order to prepare students for employment in the waste management discipline.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Demonstrate knowledege of waste generation characteristics of municipalities and industries;
2. Demonstrate knowledge of all components of integrated waste management (ie: composting, 3 R's, wet/dry process, incineration;
3. Demonstrate knowledge of revelent legislation and policy related to waste management (ie: EAA, EPA(part V), Reg. 347, Waste Diversion Act);
4. Demonstrate knowledge of the approval process under the EAA and EPA for landfill site selection and landfill expansion applications;
5. Demonstrate knowledge of leachate and methane characteristics, control and treatment;
6. Design and undertake landfill site environmental monitoring programs;
7. Undertake a Personal Waste Audit
8. Conduct an institutional waste audit and prepare a waste audit report;
9. Present information pertaining to innovative waste management technologies;
10. Demonstrate knowledge of local and global issues (environmental, social and economic) related to waste generation and management

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	No Lecture Periods Lab: Rescheduled for Friday, September 9, 2011 9:00 am Rm 132 Introduce course content, review outline, Introduction to Lindsay Street North Landfill Monitoring Exercise and Reconnaissance Visit	6	
Week 2	Lectures 1. Video: Gone Tomorrow: The Hidden Life of Garbage, History of Waste, 2. Population Growth/Waste Generation, Terminology, Intro 1st Assignment Lab: Lindsay North Landfill Monitoring Exercise (self-directed with group)	1,2,7,10	
Week 3	Lectures 1. Introduction to traditional Waste Management Applications, Waste Characterization 2. Regulations and Responsible Authorities, Waste Management Legislation, Intro Leg Ass't. Lab Landfill Site Field Trip (Both Sections combined; Tuesday 8:45 to approx. 12:30 pm on Tuesday, Bus departs from Lot B)	1,2,3,10	2.5% Attendance Mark for field trip
Week 4	Lectures 1. EPA vs EAA 2. EPA/EPA Lab: Lindsay North Landfill Monitoring Exercise (self-directed with group)	3,4,6	Personal Waste Audit Assignment Value:10%
Week 5	Lectures 1. Reg. 347/Classification of Waste 2. Waste Diversion Act, Intro to Regulations Assignment Lab: Lindsay North Landfill Monitoring Exercise (self-directed with group)	3,6	
Week 6	Lectures 1. NO LECTURE; THANKSGIVING (STAT HOLIDAY) 2. Guest Lecture – Region of Durham Waste Management Technician Lab: Lindsay North Landfill Monitoring Exercise (self-directed with group)	2, 6	Regulations Assignment Value:10%
Week 7	Lectures	1,2,5	Old Lindsay North

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	1. Site Operations and Development Plans 2. Methane and Leachate Generation Lab: Leachate Movement Exercise: Advection, Diffusion, Dispersion, Retardation		Landfill Assignment Value:25%
Week 8	Independent Learning Week - Program oriented, self-directed studies/field activities		
Week 9	Lectures 1. Inspection and Enforcement 2. Waste Audits and Waste Reduction Work Plans Lab: Waste Audit Assignment Introduction	2,3,8,10	Leachate Movement Exercise Value: 5%
Week 10	Lectures 1. Ontario's Waste Management Challenge: To incinerate or not to incinerate? 2. Waste Mgmt in Ontario: Where are we at? Lab: Waste Audit Assignment	1,2,8,10	
Week 11	Lectures 1. National Packaging Protocol and Extended Producer Responsibility 2. The Great Pacific Garbage Patch Lab: Waste Audit Assignment	8,10	
Week 12	Lectures: 1: Video; Garbage: The Revolution Starts at Home 2: Waste Management in Canada: Provincial Comparisons Lab: Field Trip (TBA)	1,2,10	Waste Audit Assignment Value:15% Field Trip Attendance Value:2.5%
Week 13	Lectures: 1. Exam Review 2. FINAL EXAM NO LAB; makes up for double-length field trip in Week 12.	1,2,3,4,5,10	Final Exam: 15%
Week 14	Lectures and Labs: Innovative Technology Presentations *Group A attend Monday Lecture period, Group B attend Thursday Lecture	9	Innovative Technology Assignment Presentations Value: 12% (half of class will present week 14, half presents week 15). 3% attendance mark
Week 15	Lectures and Labs:	9	Innovative

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Innovative Technology Presentations *Group A attend Monday Lecture period, Group B attend Thursday Lecture		Technology Presentations Value: 12% (half of class will present week 14, half presents week 15). 3% attendance mark

Learning Resources:

E-Laws - www.e-laws.gov.on.ca/

Assessment Plan:

Item/Date:	Percent:	Description:
Week 3 Field Trip Attendance	2.5	Marks for attending mandatory field trip.
Personal Waste Audit Assignment DUE: SEPTEMBER 30th	10	Assess waste mgmt. approaches in your home community and compare to those of CKL OR Assess your personal waste generation.
Reg. 347 Assignment DUE: OCTOBER 7th	10	Work through Reg. 347 by answering a number of questions and case studies.
Old Lindsay North Landfill Assignment DUE: October 21	25	Complete a full monitoring program on an actual abandoned landfill.
Leachate Movement Exercise DUE: November 4	5	Advection/Diffusion/Dispersion/Retardation exercise
Waste Audit Assignment DUE: NOVEMBER 25th	15	Complete a waste audit at SSFC as annually required by legislation.
Week 12 Field Trip Attendance	2.5	Marks for attending mandatory field trip
Final Exam: Web CT Date(s) TBA	15	Cumulative Exam: Web CT
Week 14 or 15:	12	Chose an innovative technology and prepare a ten minute oral

Item/Date:	Percent:	Description:
Innovative Technologies Presentation		presentation. ORAL REPORT - Present in Week 14 or 15 as assigned; MARKS FOR PARTICIPATION
Week 14 or 15: Attendanceduring Innovative Technologies Presentations	3	Attendance marks given for attendance to provide audience for peers' Innovative Technology presentations (applies to week in which you DO NOT present yourself)

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
It is suggested that initial contact takes place with the course professor who may then refer the student to the Program Coordinator.

Exemptions contact for this course:
Steve Thompson, Coordinator

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide details for each assignment and/or project. It should be noted that the SENRS School Office, Student Services and Admissions & Records Offices will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness will be dealt with by your faculty member(s). Missed tests that have not been previously negotiated with the professor will be given a grade of zero. Only a medical certificate or legal document received by the professor may allow for other considerations.

All course assignments are due on the date specified. Late assignments will incur a 10% penalty daily. Attendance at laboratory periods is mandatory to receive a mark for an assignment.

The professor reserves the right to deduct marks for poor spelling, grammar or communication skills evident on any test or assignment. All course work should be prepared and presented in a professional manner and as such should be typed.

All students are expected to work individually on assignments unless otherwise specified. Each student has the responsibility to support academic integrity. Breaches of academic integrity (such as cheating and plagiarism) will normally result in a grade of zero for the evaluation involved. Any subsequent offence may result in the student being required to withdraw from the College. All breaches of academic integrity will be reported to the Registrar.

Students are responsible for retaining coies of all submitted and returned assignments in the event of lost or missing papers or in case of dispute. For further clarification, refer to the Student Rights and Responsibilities document policy 3-326. Appeal of grades should follow process as outlined in Academic Regulations (article 6.2.3). Plagarism and academic dishonesty will not be tolerated and will be dealt with according to college Academic Regulations (article 6.5.0).

Cell phone use is not allowed in the classroom; cell phones must be turned off or placed on vibrate mode as they are a distraction to the class.

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WINTER FIELD SCHOOL

Course Outline
Course Number: APST88CS

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: Camp/Study Trip
Hours: 20 hours

Faculty: Mark Williamson Office: 183
Office Hours: As posted
Availability:
Email: marwilli@flemingc.on.ca
Faculty: Stephen Thompson Office: 257
Office Hours: As posted

Availability:
Email: stevthom@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Dean Approved:2011/01/23
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
In this course, students take part in practical field exercises in the Winter (Semester 6) that build on the skill set developed from the Technician Level program. These exercises and areas of specialized training for the winter setting and may take place at off-campus locations. In some instances, elements are mandatory, and additional specialized training take place on an optional basis. The course is designed to promote a more comprehensive understanding of environmental activity.
Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills
The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals
7. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
Students will increase their level of competence in winter field as well as laboratory activities.

Learning Outcomes:
Upon successful completion of this course the learner will be able to:

1. carry out a lake water quality survey through the ice
2. carry out sediment sampling through the ice
3. utilize specialized water quality equipment through the ice
4. partcipate in winter ice safety training
5. participate in GPS navigation, snowshoeing/cross-country skiing to carry out a lake survey through the ice
6. carry out a snow pack density and chemistry survey

Additional Learning Outcomes Comments:

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
20 Hours	carry out lake water quality survey through the ice, sediment sampling through ice, use specialized water quality monitoring equipment through ice, participate in winter ice safety training, participate in GPS navigation, snowshoeing/cross-country skiing to carry out lake survey through ice, carry out snowpack density and chemistry survey	1, 2, 3, 4, 5, 6	Pass/Fail

Assessment Plan:

Item/Date:	Percent:	Description:
20 Hours	P/F	Pass/Fail Successful completion of each mandatory component is a required element of Winter Field School. Sebsequent to verification that the student has successfully completed each element attempted, a Pass designation will be assigned

Additional Assessment Comments:

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:

Exemptions contact for this course:

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.

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BEHAVIOUR OF CONTAMINANTS

Course Outline
Course Number: ENVR3

2012 Winter
Sir Sandford Fleming College

Program: Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 60

Faculty: Mark Dzurko Office: 172
Office Hours: As posted

Availability:
Email: mdzurko@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:

Dean Approved:2012/01/05
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
In this course, the unique nature and behaviour of some environmental contaminants are examined. Concepts introduced will include contaminant transport and fate, toxicity measurement, and hazard assessment. Case studies of current environmental problems will be used to illustrate the ecological complexity of some of these reactions.
Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills
The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
4. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
5. Manage oneself and one's resources to achieve goals
6. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
The aim of the course is to provide the student an understanding of contaminant chemistry, movement, and its effects on the environment.

Learning Outcomes:
Upon successful completion of this course the learner will be able to:

1. Effectively communicate understanding of a selected contaminant through written text and oral presentation
2. Provide chemical formulae for environmentally-significant chemical compounds
3. Predict a chemical's behaviour based on its structure and physical/chemical characteristics
4. Describe how chemicals are assessed in terms of their environmental effects and human toxicology
5. Conduct a Bioassay
6. Successfully prepare a stock solution in a chemistry lab setting
7. Describe various remedial technologies for specific contaminants
8. Determine an appropriate remedial technology in an industrial setting, knowing the contaminant types present

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	1. Introduction, writing and presentation skills 2. Chemistry Fundamentals Lab: No Lab	1, 2	
Week 2	1. Inorganic Chemistry 1 2. Inorganic Chemistry 2 Lab: Electron Configuration and Bonding	2	5% Assignment
Week 3	1. Inorganic Chemistry 3 2. Inorganic Chemistry 4 Lab: Inorganic Nomenclature - Polyatomics	2	5% Assignment
Week 4	1. Organic Chemistry 1 2. Organic Chemistry 2	2	5% Assignment

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Lab: Organic Nomenclature		
Week 5	1. Organic Chemistry 3 2. Chemical/Physical Properties 1 Lab: Organic Assignment II	2, 3	5% Assignment
Week 6	1. Chemical/Physical Properties 2 2. 3rd year field camp Lab: NO LAB - AT FIELD CAMP	1, 2, 3, 4	10% Assignment (wks 6 & 7)
Week 7	1. Origins of Contaminants 2. Midterm (15%) Lab: Decommissioning	1, 2, 3	15% Midterm
Week 8	Independent Learning Week		
Week 9	1. Toxicology 1 2. Toxicology 2 Lab: Daphnia Trial 1	1, 4, 5, 6	10% Lab (wks 9 - 10)
Week 10	1. Toxicology 3 2. Toxicology 4 Lab: Daphnia Trial 2	1, 3, 4, 5	15% Term Paper (wk 9)
Week 11	1. Environmental Remediation 1 2. Environmental Remediation 2 Lab: Contaminant Presentations	1, 3, 4, 7, 8	15% Presentation (wks 11 - 13)
Week 12	1. Environmental Remediation 3 2. Guest Lecture - MOE surface water specialist - PCB Sources in Great Lakes Lab: Contaminant Presentations	1, 3, 4, 7, 8	
Week 13	1. Environmental Remediation 4 2. Final Test (15%) Lab: NO LAB	3, 4, 7 ,8	15% Final Test
Week 14	Industrial Placement		
Week 15	Industrial Placement		

Learning Resources:
Additional Materials will be posted on WebCT

Assessment Plan:

Item/Date:	Percent:	Description:
Assignment 1 Due: wk 3	5	Inorganic Chemistry - Electron Configuration and Bonding
Assignment 2 Due wk 4	5	Inorganic Chemistry - Nomeclature and polyatomics
Assignment 3 Due: wk 5	5	Organic Chemistry - Nomeclature
Assignment 4	5	Organic Chemistry - Assignment II

Item/Date:	Percent:	Description:
Due: wk 6		
Midterm wk 7	15	Midterm Exam (Covering material up to and including Week 6)
Decommissioning Assignment Due: wk 9	10	Decommissioning Assignment
Term Paper Due: wk 10	15	Report on Contaminant of Choice
Daphnia Toxicology Lab Write-up Due: wk 11	10	Daphnia Toxicology lab write-up
Contaminant Presentation wks 11-13	15	Presentation on Contaminant chosen for Term Paper
Final Exam wk 13	15	Final Exam (Covering entire course content)

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.
PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Mark Dzurko

Exemptions contact for this course:
Mark Dzurko

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at the specified time and location. The faculty member for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions and Records will not accept any assignments or projects. The preferred time and location for assignment submission will be in class.

Plagiarism is an extremely serious academic offense and carries penalties varying from failure in an assignment to suspension from the college. Definitions, penalties and procedures for dealing with plagiarism are set out in Fleming Colleges "Academic Regulations; Section 6.0: Academic Integrity",

which is available online as policy No. 2-201.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member. Missed tests that have not been previously negotiated with the professor will be given a grade of zero. Only a medical certificate or legal document received by the professor may allow for other considerations.

All course assignments are due at 11:00 a.m. on the date specified. Late assignments will incur a 10% penalty daily. Attendance at laboratory periods is mandatory in order to receive a mark for the assignment. The professor reserves the right to deduct marks for poor spelling, grammar, or communication skills evident on any test or assignment. All course work should be prepared and presented in a professional manner. It is recommended that all assignments be typed. Students are responsible for retaining copies of all submitted and returned assignments in the event of lost or missing papers or in cases of dispute. For further clarification, refer to the Student Rights and Responsibilities document policy 3-326. Appeal of grades should follow process as outlined in Academic Regulation (article 8). Plagiarism and academic dishonesty will not be tolerated and will be dealt with according to college Academic Regulations.

Cell phone use is not allowed in the classroom: cell phones must be turned off as they are a distraction to the class.

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ENVIRONMENTAL LABORATORY TECHNIQUES

Course Outline
Course Number: ENVR7

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Faculty: Patrick Hogan Office: 195A
Office Hours: As posted

Availability:
Email: pahogan@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2012/01/03
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This course gives students experience in analytical laboratory techniques and instrumentation associated with the environmental workplace. Laboratory work will include hands-on experience in sample collection, preparation, and analysis for both organic and inorganic contaminants as well as exposure to standard laboratory procedures. The theory and practical applications of a variety of standard laboratory methods and instrumentation will also be examined.
Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills

The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Manage oneself and one's resources to achieve goals

Aim:

The aim of this course is to provide exposure and experience with the techniques and theory of environmental laboratory analysis.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Understand standard lab Q.A. / Q.C. practices
2. Undertake heavy metals analysis using Atomic Absorption Spectroscopy
3. Analyse water samples for Chlorophyll a content
4. Use immunoassay technology to test for organic toxins
5. Understand the theory and use of Semi-Permeable Membrane Devices (SPMDs)
6. Be familiar with the following instrumentation: Mass Spectrometer, Atomic Absorption Spectrophotometer, Inductively-coupled Plasma Mass Spectrometer, Gas and Liquid Chromatographs, Electron Microscope, Fluorometer

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Classes begin	Lecture: Course introduction. Lab procedures and current practices. Lab: Solutions, Dilutions and Standard Curves	1, 4, 5	
Week 2	Lecture: Analytical Techniques I Lab: Heavy Metals Analysis I	1, 2, 5	Lab Standards (10%)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 3	Lecture: Analytical Techniques II Lab: Heavy Metals Analysis II _ Atomic Absorption Analysis	6	Heavy metal Analysis 10%
Week 4	Lecture: Analytical Techniques III/ Chlorophyll Analysis Lab: ICP Techniques	1, 4	
Week 5	Lecture: Passive Environmental Samplers Lab: Semi permiable membrane devices (SPMD's)	1, 2	10% ICP Lab Report
Week 6	Lecture & Lab: Gray Lake Field Trip – Fluorimetric Chlorophyll a Analysis/Winter Lake Sampling	1, 6	
Week 7	Lecture: Tracer Techniques/Environmental Forensics Lab: Chloropyll Analysis	1, 3	Chlorophyll Analysis (7%)
Week 8 - Independent Learning Week Feb 27-Mar 2nd	Program Oriented, self-directed studies/field activities		
Week 9	Lecture: Immunoassays Lab: 2,4-D Immunoassay	1, 2	
Week 10	Lecture: Electron Microscopy and Analysis Lab: SPMD Analysis - Organic Contaminants Analysis	6	Immunoassays (5%)
Week 11	Lecture: Electron Microscopy Lab: Anion Chromatography	1, 2	SPMD Assignment 8% Lab Notebook (15%)
Week 12	Lecture: Lecture Test Lab: No Lab	1	Lecture Test (15%) Anion Chromatography (5%)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 13	Lecture: No Lecture Lab: Lab Test	1	Lab Test (20%)
Week 14	Industrial Placement		
Week 15	Industrial Placement		

Learning Resources:
Various readings, photocopied materials and/or reference materials as assigned by the instructor.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 2	10	Lab Standards
Week 4	10	Heavy Metals Analysis
Week 5	10	ICP Lab Report
Week 7	7	Chlorophyll Analysis
Week 10	5	Immunoassays
Week 11	10	Lab Notebook
Week 11	8	SPMD's
Week 12	5	Anion Chromatography
Week 12	15	Lecture Test
Week 13	20	Lab Test

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.
PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Pat Hogan

Exemptions contact for this course:
Pat Hogan

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty members will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class. .

Lab safety equipment (coats, glasses, gloves) will be provided and are required for all lab periods.

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ENVIRONMENTAL PLANNING AND ASSESSMENT

Course Outline
Course Number: ENVR9

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 60

Faculty: Melanie Logan Office: 257
Office Hours: As posted

Availability: By posted office hours
Email: melogan@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:
Dean Approved:2012/01/05
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This course studies two distinct disciplines: environmental planning and environmental assessment. The environmental planning component applies development related scenarios to provide knowledge in such areas as the Planning Act, zoning by-laws, official plans, Provincial Policy Statement, Oak Ridges Moraine Conservation Plan and ecosystem based planning approaches. The environmental assessment component deals with federal and provincial assessment processes including Class EA's, screening, public participation and implications for the environment.
Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills
The student has reliably demonstrated the ability to:

1. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
2. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
3. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
4. Manage oneself and one's resources to achieve goals
5. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
The first part of the course is designed to enable students to develop a basic understanding of the criteria for planning and resource development in Ontario. The second portion gives students a working knowledge of both federal and provincial E.A. processes and prepares them for employment with municipalities, industry, private consulting firms and government agencies.

Learning Outcomes:

Upon successful completion of this course the learner will be able to:

1. Identify and describe the basic mechanisms that determine land use
2. Describe how development is approached and controlled in Ontario
3. Explain the roles that regulatory groups play in the planning process in Ontario
4. Recognize and explain concepts associated with environmental assessment and associated legislation
5. Identify and describe the purpose, nature and process of environmental planning
6. Understand the provincial policies and legislation in Ontario to protect natural heritage systems

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan. 9-13	Lec. 1- Introduction - why plan? Lec. 2- Planning History in Ontario/Municipal Structure Lab- Ontario Land Use Activity	1,2,3	10%
Week 2 Jan. 16-20	Lec. 1- Official Plans Lec. 2- Zoning By-Laws Lab- Official Plan Assignment	1,2,3,5	15%
Week 3 Jan. 23-27	Lec. 1- Planning Act and policies Lec. 2- Provincial Policy Statement Lab- Official Plan Assignment	1,2,3,	

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 4 Jan.30 - Feb.3	Lec. 1- Severances, Right of Way, Easements Lec. 2- Minimum Distance Separation Lab- Lot Severance Exercise	1,2,3	5%
Week 5 Feb. 6-10	Lec. 1- Subdivision Development Lec. 2- Lakeshore Capacity Assessment Lab- Subdivision Evaluation Lab	1,2,3,5,6	10%
Week 6 Feb. 13-17	Lec. 1- Ecosystem based planning Lec. 2- Provincial Plans - Greenbelt, Oak Ridges Moraine, Niagara Escarpment Lab- No Lab - Field School	1,2,5	
Week 7 Feb. 20-24	Lec. 1- No Lecture Family Day Lec. 2- Ecosystem based planning Lab- Municipal Planning Exercise	1,2,3,6	5%
Week 8 Feb.27 - Mar.2 Independent Learning Week	Program Oriented, self-directed studies/field activities		
Week 9 Mar. 5-9	Lec. 1- Planning Test Review Lec. 2- Planning Test (TBA) Lab- No Lab (in lieu Planning test)	3,4	20%
Week 10 Mar. 12-16	Lec. 1- History and Overview EA Lec. 2- Class EA- Terms/ public notices Lab- Leg. Assignment	3,4	10%
Week 11 Mar. 19-23	Lec. 1- Class E.A. Terms /public notices Lec. 2 E.A. Process Lab- EA Case Study Lab	3,4	5%
Week 12 Mar. 26-30	Lec. 1- Federal EA's and CEAA Lec. 2- Environmental Impact Studies Lab- EA assignment	2,3,5,6	5%
Week 13 Apr. 2-6	Lec. 1- Final Test Lab- no lab this week	4,6	15%
Week 14 Apr. 9-13	Industrial Placement		
Week 15 Apr. 16-20	Industrial Placement		

Learning Sequence Additional Comments:

Item/Date:	Percent:	Description:
Week 1	10	Land Use Activity Summary - Due Week 2 beginning of Lecture 2.
Week 2	15	Official Plan Assignment - Due Week 4 at beginning of Lecture 2
Week 4	5	Lot Severance Exercise - Due Week 5 Beginning of Lecture 2
Week 5	10	Subdivision Evaluation Lab - Due at end of Lab
Week 7	5	Municipal Planning Exercise - Due Week 9 beginning of Lecture 1
Week 9	20	Planning Test
Week 10	10	EA Leg. Assignment - Due Week 12 at beginning of Lecture 2.
Week 11	5	Renewable Energy Approvals Lab - Due at end of Lab
Week 12	5	EA Lab Assignment - Due at end of Lab
Week 13	15	EA Test

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Program co-ordinator or course professor

Exemptions contact for this course:
Program co-ordinator or course professor

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty members will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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SPILL RESPONSE AND CASE STUDIES
Course Outline
Course Number: ENVR16
2012 Winter
Sir Sandford Fleming College

Program: Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 2-one hour lectures, 1-two hour lab

Faculty: Valerie Bowering Office:
Office Hours: As posted

Availability:
Email: vaboweri@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2012/01/11
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This advanced course focuses on current concerns related to commodity spills to the environment as well as techniques for environmental cleanup through containment, recovery, and disposal. Course topics will include legislation, oil/gas/chemical spills, leaking underground storage tanks, DNAPL's, operation of gas monitoring equipment, and confined space entry. A number of case studies and videos will be used to reinforce the key course components.
Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills
The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals

Aim:
The intent of this course is to provide the student with an understanding of various types of commodities that are being moved by various modes of transportation in Ontario and the appropriate legislation applying to these movements. Also, the course looks at various specific commodity spill events and contamination of sites which have occurred and focuses on the relevant legislation and response procedures utilized for dealing with investigations and cleanup of these spills. Finally, the topic of confined space entry is studied to provide necessary information to carry out safe procedures in the working environment.

Learning Outcomes:
Upon successful completion of this course the learner will be able to:

1. describe the legislation associated with commodity transportation and spills in Ontario and Canada
2. describe legislative responsibilities of various agencies but specifically the Ministry of the Environment (MOE)
3. understand the properties of hazardous materials, their environmental effects, and their behaviour in the environment
4. demonstrate knowledge with the unique properties involving spills of DNAPL and LNAPL chemicals
5. demonstrate knowledge in sampling and monitoring methods for all aspects of spill response
6. demonstrate knowledge and ability to perform spill containment, spill recovery and final disposal of commodity spills
7. demonstrate knowledge of behaviour of liquid pressurized gases (LPG's) in fire and spill situations
8. understand issues surrounding spills in Ontario
9. demonstrate knowledge of different industrial sectors in Ontario (MISA Facilities)
10. demonstrate knowledge of how to assess a spill before approaching a spills scene
11. understand the significance of contingency planning

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 Jan 11-15	Lecture 1: Introduction Lecture 2: Environmental Legislation Lab 1: Exxon Valdez Video	1, 2	
Week 2 Jan 18-22	Lecture 3: Role of SAC and Environmental Officers Lecture 4: Other Agencies Roles and Responsibilities Lab 2: Spill Legislation Assignment	1, 2	Spill Legislation Exercise 4%
Week 3 Jan 25-29	Lecture 5: BLEVE Video and Assignment Lecture 6: Weathering of Oils and Chemicals Lab 3: TDGA/ODGA Assignment	1, 3, 4, 7	BLEVE Assignment 3% TDGA/ODGA Assignment 8%
Week 4 Feb 1-5	Lecture 7: Test Lectures 1 to 5 Lecture 8: Properties of Hazardous Materials Lab 4: Spill Site Assignment	2, 3, 5	Lecture Test 12% Spill Site Assignment 8%
Week 5 Feb 8-12	Winter Camp	1, 2, 3, 6	
Week 6 Feb 15-19	Lecture 9: Behaviour of Oils and Chemicals Lecture 10: Spill Containment and Disposal Lab 5: Hazardous Materials Video DNAPL and LNAPL Assignment	3, 4, 6	DNAPL and LNAPL Assignment 4%
Week 7 Feb 22-26	Lecture 11: Gasland Video Lecture 12: Gasland Video and Natural Gas Extraction in Ontario Lab 6: Sectors in Ontario Assignment	8, 9	Sectors in Ontario Assignment 4%
Week 8 Mar 1-5	Independent Learning Week No Classes	n/a	
Week 9 Mar 8-12	Lecture 13: Test Lectures 6 to 10 Lecture 14: Above and Underground Furnace Oil Tanks Lab 7: Spills Response Video and Equipment Review Behaviour of Oils and Chemicals Through Soil	3, 4, 6	Lecture Test 12% Behaviour of Oil and Chemicals Through Soil 8%
Week 10 Mar 15-19	Lecture 15: Spill Scenarios and Approaching a Spills Scene Lecture 16: Contingency Planning Lab 8: Contingency Planning Video	10, 11	
Week 11 Mar 22-26	Lecture 17: Oil Spill Scenario Lecture 18: Test Lectures 11-17	3, 4, 10	Lecture Test 12% Air Spill Exercise 3%

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	Lab 9: Air Spills Exercise		
Week 12 Mar 29-Apr 2	Lecture 19: Mock Spill Exercise (1st lab group only) Lecture 20: Mock Spill Exercise (2nd lab group only) Lab 10: Mock Spill Exercise	1, 2, 3, 5, 10	Mock Spill 5%
Week 13 Apr 5-9	Lecture 21: Lab Test Review Lecture 22: Lab Test Lab 11: Spill Response Practical Exercise	6	Lab Test 12% Spill Response Practical Exercise 5%
Week 14 Apr 12-16	Industrial Placement		
Week 15 Apr 19-23	Industrial Placement		

Learning Resources:

1. 2004 Emergency Response Guidebook. Secretariat of Transport and Communications, 372 pp.
2. Dangerous Goods Transportation Act. R.S.O. 1990, c. D.1 (http://www.oshforeveryone.org/leg/documents/ont/onedgt/onadgte0.htm)
3. Transportation of Dangerous Goods Act. R.S.C. 1992, C-34.(http://www.tc.gc.ca/tdg/menu.htm)
4. Thompson, S. 2008. Spill Response Notes. Lindsay: Sir Sandford Fleming College, 210 pp.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 2	4	Spill Legislation Assignment
Week 3	11	BLEVE Assignment 3% TDGA/ODGA Assignment 8%
Week 4	20	Lecture Test 12% Spill Site Assignment 8%
Week 6	4	DNAPL and LNAPL Assignment
Week 7	4	Sectors in Ontario Assignment
Week 9	20	Lecture Test 12% Behaviour of Oils and Chemicals Through Soil 8%
Week 11	15	Lecture Test 12% Air Spill Exercise 3%
Week 12	5	Mock Spill
Week 13	17	Lab Test 12% Spill Response Practical Exercise 8%

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Admissions and Records Office

Exemptions contact for this course:
Steve Thompson

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions & Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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INDUSTRIAL PLACEMENT

Course Outline
Course Number: FLPL71

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technology Program
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 2 week student workplace placement

Faculty: Scott Miles Office: 133
Office Hours: As posted
Availability:
Email: smiles@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Dean Approved:2010/02/01
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This course is designed to allow students an opportunity to obtain program-related experience while working independently off campus in the public or private sectors of the workplace. It will also provide students with an opportunity to apply existing knowledge and gain new insights into the area of placement. This activity will occur after final examinations. Students will be required to seek a placement location of their choice and then apply to the course co-ordinator for approval.
Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills
The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
3. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
6. Manage oneself and one's resources to achieve goals

Aim:
The purpose of the course is two-fold. Firstly, it allows students the opportunity to obtain some program-related experience in the environmental workplace. Secondly, it provides an opportunity to apply existing knowledge and gain new insights in the area of the placement activity.

Learning Outcomes:
Upon successful completion of this course the learner will be able to:

1. Demonstrate knowledge of various work disciplines available
2. Demonstrate a skill set specific to the work placement discipline chosen
3. Make an informed decision regarding their personal career path

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 14 April 12-16	INDUSTRIAL PLACEMENT	1, 2, 3	PASS/FAIL
Week 15 April 19-23	INDUSTRIAL PLACEMENT	1. 2. 3	PASS/FAIL

Learning Sequence Additional Comments:
A minimum of 80 hours must be spent at the Industrial Placement.

Learning Resources:
None required

Assessment Plan:

Item/Date:	Percent:	Description:
Week 14 April 12-16	0	PASS/FAIL - SEE ADDITIONAL ASSESSMENT COMMENTS

Item/Date:	Percent:	Description:
Week 15 April 19-23	0	PASS/FAIL - SEE ADDITIONAL ASSESSMENT COMMENTS

Additional Assessment Comments:
Successful completion of this course requires that the student completes a documented two-week placement including a log of activities (typed) and an evaluation of the effort, competence and attitude of the student to be completed by the on-site placement supervisor.

Evaluations will be based on a submission from the placement supervisor as to effort, attitude, and competence displayed by the student during the placement period. Further, a report is required (typed) from each student which details daily activities and assessment of the placement.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.
PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.
PLAR options and contact for this course:
Coordinator: Steve Thompson Rm 257
Email: stevthom@flemingc.on.ca

Exemptions contact for this course:
Coordinator: Steve Thompson Rm 257
Email: stevthom@flemingc.on.ca

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the School of Environmental and Natural Resource Sciences Office, Student Services, and Admissions and Records, will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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ENVIRONMENTAL HYDROGEOLOGY

Course Outline
Course Number: GEOL63

2012 Winter
Sir Sandford Fleming College

Program:Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 60

Faculty: Anne Vanwarmerdam Office: 256
Office Hours: As posted

Availability:
Email: avanwarm@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:
Students are encouraged to contact professor by email should they have any questions or require further explanation

Dean Approved:2012/01/05
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This course introduces the fundamental theories and applications of groundwater studies. Lecture topics will include basic principles of groundwater, aquifer investigation, wells, groundwater management, and groundwater geotechniques. Lab efforts will be directed to hydraulic conductivity determinations, flow nets, pump tests, piezometric tests, and uses of test data.
Prerequisites: None.
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills
The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Create novel ideas/practices to enhance personal/professional success; adapt current ideas/practices in response to emerging needs.
5. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
6. Establish and maintain positive relationships in ways that contribute to the achievement of goals.
7. Manage oneself and one's resources to achieve goals
8. Articulate an understanding of the physical and social environment from the local to the global level; reflect on one's role and responsibility.

Aim:
The aim of this course is to familiarize the student with the basic principles of the science hydrogeology

Learning Outcomes:
Upon successful completion of this course the learner will be able to:

1. Explain hydrogeological terminology
2. Recognize hydrogeological properties
3. Apply hydrogeological techniques to site development projects
4. locate individual well records
5. interpret geological environments from well records
6. construct and interpret geological cross-sections
7. interpret local surficial geology and hydrogeological conditions
8. conduct and interpret pump tests
9. identify likely routes of contaminants in the hydrogeological environment
10. construct and interpret groundwater flow nets
11. identify groundwater protection measures exercised in Ontario

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1	Introduction to hydrogeology Basic Principles	1,2	Hydraulic conductivity 10%
Week 2	Basic Principles of groundwater flow	1,2,10	Flow Net construction 10%
Week 3	Geology of groundwater	1,2,6,7	Surficial geology interpretation

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
			10%
Week 4	Storage, Transmissivity, Specific Yield	1,2,3,4,5,6,7	Chandler's Corners - introduction 25%
Week 5	Winter Camp	4,5,6,7	Chandler's corners (cont'd)
Week 6	midterm (15%) Aquifer investigation techniques	1,2,3,4,5,6,7	Chandler's corners (cont'd) midterm 15%
Week 7	Family Day Aquifer investigation techniques	8	pump test methods
Week 8 Independent Learning Week	Program oriented, self-directed studies/field activities		
Week 9	Aquifer investigation techniques	8	pump test -Jacob method 10%
Week 10	Aquifer investigation techniques Geochemistry	8,9	pump test method - Theiss 10%
Week 11	Geochemistry	9	geochemical interpretation 10%
Week 12	Contaminant transport	9	Guest Lecture
Week 13	Groundwater Resource Management	11,7,9	Good Friday
Week 14	Industrial Placement		
Week 15	Industrial Placement		

Learning Resources:
Fetter,C.W. Applied Hydrogeology New Jersey:Prentice Hall,2001.

Assessment Plan:

Item/Date:	Percent:	Description:
Week 2	10	Hydraulic Conductivity
Week 3	10	Flow Nets
Week 4	10	Surficial Geology Interpretation
Week 6	15	mid term
Week 10	10	pump test - Jacob
Week 11	10	pump test - Theiss
week 11	25	Chandler's Corners

Item/Date:	Percent:	Description:
week 12	10	geochemical interpretation

Additional Assessment Comments:
Unless specified otherwise, assignments are to be completed on an individual basis.

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Contacts: course professor or program co-ordinator

Exemptions contact for this course:
Admissions and Records Office for exemption forms and professor for approval.

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.
It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the Academic Planning & Operations Office, Student Services, and Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

Missed Tests
It is the student's responsibility to be present for all tests and evaluations. Missed tests will be given a mark of zero. Only under extenuating circumstances will a make-up test be allowed.

Due Dates

All assignments are due on their announced date and time. Unless specified otherwise, assignments are due by 4:30 p.m. of the prescribed date.
There will be no exceptions to due dates except that:
An individual extension may be granted for a documented situation of a serious nature that is beyond the student's control. The student is responsible for notifying the instructor as early as possible and for providing documentation.

A general extension may be granted when a serious problem arises due to unforeseen circumstances, in which case an adjustment will be applied to all submissions, whether late or on time.

Assignments that are submitted below a minimum level of competence as determined by the Professor will be returned as incomplete and on resubmission will be given a grade subject to the late assignment penalty.

Submissions

Unless otherwise stated, the assignments will be due one week following the day they were assigned. All submissions must be neat and legible. Any illegible assignments will be returned to the student unmarked. A neat version may be re-submitted, but will be subject to the late penalties.

Late Assignments

Late assignments will be penalized 10% of the project value per school day to a maximum of 50%. After five schooldays, the assignment will not be accepted; a grade of zero will be given.

Academic Integrity

All students are expected to work individually on assignments unless otherwise specified. Each student has the responsibility to support academic integrity. Breaches of academic integrity (such as cheating and plagiarism) will normally result in a grade of zero for the evaluation involved. Any subsequent offense may result in the student being required to withdraw from the College. All breaches of academic integrity will be reported.

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ENVIRONMENTAL SAMPLING AND ANALYSIS

Course Outline
Course Number: SCIE16

2012 Winter
Sir Sandford Fleming College

Program:Fish and Wildlife Technology and Environmental Technology
School of Environmental& Natural Resource Sciences

Course Format: In Person
Hours: 45

Availability: By appointment
Email: tmiddel@flemingc.on.ca

Faculty: Robert Bialkowski Office: 155B
Office Hours: As posted

Availability: By posted office hours
Email: rbialkow@flemingc.on.ca

Coordinator: Stephen Thompson Office: 257
Email: stevthom@flemingc.on.ca

Dean: Linda Skilton Office: 289A
Email: lskilton@flemingc.on.ca

Additional Comments:
Co-ordinator: Environmental Technology - Stephen Thompson
Dean Approved:2012/01/04
Note to Students:
We urge you to retain this Course Outline for future reference. Course Outlines may assist with portfolio development, credit transfer, PLAR, advanced standing, and accreditation with professional associations.

Course Description:
This course involves the development and analysis of experimental design. Students will also be introduced to some of the methods of statistical analysis frequently used in the environmental field such as two-way ANOVA, cluster analysis, multiple regression, population estimation models.
Prerequisites:
Statistics (MATH25)
Corequisites: None.

This course contributes to the following learning outcomes or essential knowledge and skills required by learners as defined by Ministry of Training, Colleges and Universities program standards, employers, industry and professional organizations.

Vocational Outcomes

Core Competencies and Essential Employability Skills
The student has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience
2. Uses numerical data, mathematical concepts and reasoning to solve problems
3. Analyze, evaluate, and apply relevant information to solve problems and make effective decisions
4. Locate, select, organize, and document information using appropriate technology and information systems; use educational, presentation and information technologies to learn, collaborate, and communicate.
5. Manage oneself and one's resources to achieve goals

Aim:
The student will be able to develop and critically analyze experimental design.

Learning Outcomes:
Upon successful completion of this course the learner will be able to:

1. Design an appropriate experiment to test a hypothesis.
2. Critically analyze experimental designs presented in the literature.
3. Properly perform two - way ANOVA, regression and cluster analysis.
4. Estimate population sizes using several mathematical models.
5. Use the EXCEL spreadsheet for simple statistical analyses.

Learning Sequence:

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
Week 1 January 12 - 16	Course Introduction, statistics overview, graphing in EXCEL	5	5% Lab
Week 2	Experimental Design	1	5% Lab
Week 3	"Chi-square", "F" and "t" tests	3, 5	5% Lab
Week 4	One Way ANOVA	3, 5	5% Lab
Week 5	F&W: Winter Field Camp ET: Two Way ANOVA		5% Lab (ET) 10% quiz (ET)
Week 6	F&W: Two Way ANOVA ET: Winter Field Camp		5% Lab (F&W) 10% quiz (F&W)
Week 7	Regression in EXCEL	3, 5	5% Lab optional 10% assigment for F&W students
Week 8	Independent Learning Week		
Week 9	Multiple Regression	3, 5	5% Lab
Week 10	Population Estimation	3,4	5% lab
Week 11	F&W: Cluster Analysis	3	5% lab (F&W)

Wks/Hrs Units	Topics, Resources, Learning Activities	Learning Outcomes	Assessment
	ET: Independent Project Work		
Week 12	Hypothesis Testing in Scientific Literature	2,3,4,5	10% quiz 5% presentation 15% ET project
Week 13	Final Exam	1,2,3,4,5,	20%, (30% for F&W students not submitting optional assignment
Week 14	Students on placement		
Week 15	Students of placement		

Learning Sequence Additional Comments:
Missed labs and/or deadlines for labs will be assigned a mark of "0". Most of the labs are due at or before the end of the period in which they are assigned.

Learning Resources:
Banks, H. 1994. Environmental Design and Analysis Lab Manual. Lindsay. Sir Sandford Fleming College, 54 pp. (photocopied)

Assessment Plan:

Item/Date:	Percent:	Description:
Week 7	10	Quiz
Week 12	10	Quiz
Week 12	15	Independent project
Week 12	5	Presentation
Week 13	20	Final Exam
At the end of each lab	40	8 lab assignments worth 5% each

Additional Assessment Comments:
Labs are due at the end of the period for which they are assigned. Missed or late labs will be assigned a mark of "0".

Prior Learning Assessment and Recognition:
PLAR uses tools to help learners reflect on, identify, articulate and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms.

PLAR Assessment Options:
These include authentic assessment activities designed by faculty. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course.

PLAR options and contact for this course:
Steve Thompson

Exemptions contact for this course:
Steve Thompson

Academic Responsibilities:
Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.

Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the learning process.

It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the Academic Planning & Operations office, Student Services, Admissions and Records will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member. Laboratory assignments are due at the end of the period for which they are scheduled. An extension may be given, at the discretion of the instructor, until the beginning of the next lab period if the student attends the original lab and makes an honest attempt to complete the assignment during that period.

Cell phone use is not allowed in the classroom; cell phones must be turned off as they are a distraction to the class.

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Appendix 4

Program Advisory Committee Policy Number 2-202

Program Advisory Committee Mandate and Membership:

1. Terms of Reference (Role of Committee)

Although the Board of Governors and administration of Fleming College are ultimately responsible for all decisions, they depend to a large degree on quality advice from advisory committees. Each Advisory Committee reports through the College organizational structure to the Board of Governors. The advisory role of each committee encompasses a number of areas of responsibility which include such program-related activities as:

- Informing the scope, relevance and currency of program curriculum;
- Providing advice on the appropriateness of new programs in relation to employment demands and student needs;
- Defining the body of knowledge, competencies and skills required by graduates;
- Assisting with facility design and determination of equipment requirements for new programs;
- Suggesting opportunities for field placement locations;
- Providing leads on graduate placement opportunities;
- Assisting in equipment acquisition through industry donation or industry partnerships;
- Industry partnerships;
- Promoting the program to prospective students and employers;
- Acquiring industry sponsorship for student awards.
- Periodically meeting with current and prospective students to provide related career information.

2. MEMBERSHIP **(Procedures for student involvement in bold)**

Members are appointed by the President and the Board of Governors of the College, on the recommendation of the Academic Team Leader/Campus Principal.

Program Advisory Committees should have representation from:

- Major employer groups
- Government agencies and regulatory bodies, sectoral councils, e.g. Environmental Careers Organization (ECO Canada)
- Graduates of the program
- **Current students within the program**
- Other program areas, as appropriate (e.g. Interdisciplinary Studies)

- Membership to be enhanced, where appropriate (e.g. School Board representatives)

- Career & Employment Resources personnel to be invited to attend meetings, where possible, to enhance the relationship with Advisory Committee members.

Appropriate geographic representation is also recommended, where an industry is regionally specific (e.g. Collections' Conservation & Management). The committee to reflect the diversity of opinion within the industry.

The *minimum* number of representatives included on any Committee should be six (6). This does not include college employees/resource people

The Student Representative is a voting member of the Committee. The Co-ordinator and Academic Team Leader, Campus Principal, are non-voting resources to the committee; other faculty members are encouraged to attend as observers.

3. TERMS OF APPOINTMENT

The term of membership is a minimum of 3 years, once renewable. Key agencies/industries may have a standing representative on the committee. Committees are structured so that not every term expires at the same time.

Should a member miss two consecutive scheduled meetings without advising the Chair, that individual shall be deemed to have withdrawn from the committee.

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Environmental Competency Outcome Map – Appendix 5

Instructions: Mark an "x" in the appropriate cell to indicate whether the course referenced provides opportunities for development of the Environmental Competency Outcome

Course ID **Environmental Competency Outcomes**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Environmental Impact Assessment															
Ability to Conduct Environmental Impact Assessments											x				
Site Assessment (Remediation, Restoration, Reclamation)															
Ability to Conduct Environmental Site Assessments (e.g., ESA—Phase 1 and Phase 2)				x											
Ability to Develop/Implement Site Remediation (e.g., Phase 3) Plans				x											
Ability to Develop/Implement Site Restoration/Reclamation (e.g., Phase 3) Plans				x											
Regulator and Enforcement															
Ability to Interpret/Enforce/Comply with Environmental Regulations and Standards	x	x	x	x	x	x	x	x		x	x	x	x	x	x
Pollution Prevention, Abatement, and Control															
Ability to Implement Pollution Prevention, Abatement, and Control (PAC) Methods	x	x		x		x	x		x				x	x	x
Climate Change															
Ability to Identifying and Mitigating Climate Change Impacts	x	x						x	x			x			x
Waste Management															
Ability to Develop/Implement Waste Management Plans and Programs							x								
Ability to Monitor Waste Application/Disposal/Reduction Programs and Activities							x								
Water Quality Management															
Ability to Develop/Implement Water Supply and Water Efficiency Plans and Programs									x						

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Environmental Competency Outcome Map – Appendix 5

Instructions: Mark an "x" in the appropriate cell to indicate whether the course referenced provides opportunities for development of the Environmental Competency Outcome

Course ID **Environmental Competency Outcomes**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Sampling and Analytical Work Related to Environmental Activities															
Ability to Develop Environmental Sampling, Testing, and Monitoring Programs	x	x		x		x	x	x	x	x		x	x	x	x
Ability to Collect Samples and Data for Environmental Purposes	x	x		x		x	x	x	x			x	x	x	x
Ability to Analyze and Interpret Environmental Samples and Data	x	x		x		x	x	x	x						x
Policy Development and Planning															
Ability to Develop Environmental Policies, Measures, and Standards															
Ability to Liaise and Partner with Stakeholders															
Planning, Monitoring and Reporting for Sustainability															
Ability to Develop Sustainable Development Indicators, Plans, and Strategies															
Ability to Implement/Monitor Sustainable Development Strategies and Programs	x	x					x								
Corporate Environmental Program Planning and Implementation															
Ability to Develop Corporate Environmental Plans, Policies, and Procedures															
Ability to Conduct Environmental Risk Assessments	x	x		x											
Ability to Implement Environmental Management Systems	x	x		x			x								
Ability to Manage Environmental Management Systems and Practices	x	x		x											
Ability to Coordinate Environmental Aspects of Facility Design and Operation															
Environmental Health and Safety															
Ability to Monitor/Address Occupational and Public Health and Safety	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Natural Resources Planning and Management															
Ability to Conduct Studies Related to Ecosystem and Habitat Preservation and/or Management of Natural Resources	x	x				x					x		x	x	x

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Environmental Competency Outcome Map – Appendix 5

Instructions: Mark an "x" in the appropriate cell to indicate whether the course referenced provides opportunities for development of the Environmental Competency Outcome

Course ID **Environmental Competency Outcomes**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Ability to Develop and Implement Plans, Programs and Practices for Ecosystem and Habitat Preservation and/or Management of Natural Resources	x	x				x					x		x	x	x
Ability to Monitor/Evaluate Effectiveness of Programs and Practices Related to Ecosystem and Habitat Preservation and/or Management of Natural Resources	x	x				x					x		x	x	x
Environmental Education and Training															
Ability to Develop Environmental Curricula and Programs	x	x	x	x	x	x	x	x	x	x	x			x	x
Ability to Implement Environmental Curricula and Programs	x	x	x	x	x	x	x	x	x	x	x			x	x
Ability to Evaluate/Mentor/Supervise Students/Practitioners				x				x							
Environmental Research and Technology Development															
Ability to Design/Develop Environmental Research and Development Proposals, Programs, and Projects	x	x		x								x	x		x
Ability to Conduct Environmental Research and Publish Results	x	x		x								x	x		x
Environmental Business, Technology and Product Development															
Ability to Develop/Coordinate/Implement Energy Efficiency Programs															
Ability to Identify/Implement Activities Pertinent to Commercialization of Environmental Technologies, Systems, and Equipment															
Environmental Communications and Public Awareness															
Ability to Develop/Implement Environmental Communications and Awareness Programs		x					x								
Ability to Present Expert Information on Environmental Matters		x					x								

Transferable Competency Outcome Map

<u>Instructions</u>: Mark an "x" in the appropriate cell to indicate whether the course referenced provides opportunities for development of the Transferable Competency Outcome

Course ID **Transferable Competency Outcomes**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Professional Ethics and Work Style	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Learning and Creativity	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Communicating Effectively	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Collaboration	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Critical Thinking/Judgment	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Planning and Organizing Work and Projects	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Leading and Influencing Others	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Business Acumen															

Course ID References

Instructions: Assign an ID to each course offered as part of the Program
Note: All courses referenced herein shall have a course syllabus submitted

ID	Course Name
1	Applied Ecology ECOS1
2	Constructed Wetlands ECOS4
3	Environmental Applications ENVR5
4	Environmental Site Assessment and Audit ENVR6
5	Environmental Technology ENVR12
6	Fall Field School APST28
7	Waste Management Approaches ENVR17
8	Behaviour of Contaminants ENVR3
9	Environmental Hydrogeology GEOL63
10	Environmental Laboratory Techniques ENVR7
11	Environmental Planning and Assessment ENVR9
12	Environmental Sampling and Analysis SCIE16
13	Industrial Placement FLPL71
14	Spill Response and Case Studies ENVR16
15	Winter Field School APST88

Fleming College

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Environmental Technician ETN			Vocational Outcomes																		Essential Employability Skills										
	Course #	Course Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	1	2	3	4	5	6	7	8	9	10	11
Semester 1	COMM 044	Communicating Technical Information								1					1		1	1			1	1				1	1		1	1	1
	ECOS013	Ecosystem Skills	*	*				*		*					*						1	1	1	1	1	1	1	1	1	1	1
	ENVR020	Ecology and the Environment	1	1				1	1		1						1							1	1	1	1	1	1	1	1
	GEOM 036	Geospatial Techniques						*		*											1	*	1	*	1	1	*		*	1	*
	MATH063	Applied Mathematics in NR Sciences				*				*													1	1	1					*	*
	NATR008	Environmental Leadership		*							*							*		1	1	1	*	1	1	1	1	1	1	1	1
Semester 2	COMM 034	Technical Reporting								*					1		1	1			1	1				1	1		1	1	1
	COMP 056	Introduction to Databases								*													*		1	1				1	1
	COMP 062	Introduction to Spreadsheets								*													1		1	1				1	1
	ENVR010	Environmental Principles	1	1	1			1	1	1					1	1	1			1	1	1			1	1		1	1	1	1
	ENVR011	Environmental Techniques			1	1	1	1	1		1			1			1				1	1	1	1	1		1		1	1	1

	FSTY050	Trees and Shrubs Of Ontario		1														1													
	SCIE062	Introductory Chemistry			1			1							*		1				1		1	1		1			1	1	
		General Education Elective																		1											
Semester 3	APST027	Field School	1	1	1		1	1	1	1		1	1	1	1		1	1	1		1	1	1	1	1	1	1	1	1	1	1
	ENVR008	Environmental Measurement	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1
	ENVR015	Land Reclamation Principles	1	1	1			1		1	1	1		1		1	1	1	1		1	1				1				1	1
	ENVR019	Watershed Management	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1
	MGMT005	Human Relations																													
	SCIE006	Aquatic Biology	1	1	1		1	1	1	1	1	1		1	1		1	1	1		1	1	1	1			1		1	1	
	SURV018	Geomatics in Surveying							1	1				1	1		1	1	1												
		General Education Elective																		1											
Semester 4	ENVR013	Erosion Control		1	1	1	1		1	1	1	1				1	1	1				1	1	1		1		1	1	1	1
	ENVR018	Water Treatment and Pollution Control			1	1	1	1	1			1		1	1	1	1	1			1		1	1	1		1		1	1	1
	ENVR021	Case Studies in Pollution Abatement			1	1	1		1	1		1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1
	GNED015	Environmental Issues: The Human Factor																			1	1		1	1	1	1	1	1	1	1
	LAWS056	Natural Resources and the Law					1			1		1			1		1	1	1												
	MATH025	Statistics								1													1	1						1	1
	SURV019	Geomatics for Environmental Engineering						1	1	1		1															1				

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Appendix 5 – Vocational Outcomes

Environmental Technician

1. Develop an understanding of ecosystem composition, structure, function and processes in a spatial and temporal context.

2. Identify a wide range of biotic, abiotic and cultural components of ecosystems in natural and altered landscapes.

3. Apply the fundamental concepts of science to environmental and industrial processes.

4. Apply fundamental engineering principles to environmental and industrial processes.

5. Complete all work in accordance with applicable municipal, provincial, and federal environmental requirements.

6. Collect and perform standard tests on representative environmental samples and data.

7. Follow standard procedures and practices for conducting environmental projects or activities including the use of appropriate equipment and materials.

8. Employ various information technology tools to collect, assemble, synthesize and interpret environmental data effectively.

9. Apply the basic principles of ecosystem-based management for sustainability.

10. Contribute to the implementation, interpretation, and validation of environmental systems management.

11. Interpret and apply selected natural resources and environmental legislation to monitor, remediate and protect the environment.

12. Work safely in adherence to occupational health and safety standards.

13. Communicate technical information accurately and effectively in oral, written, and visual forms to a wide variety of individuals, groups and organizations.

14. Practice principles and ethics associated with environmental management issues.

15. Work effectively in a collaborative environment, demonstrating teamwork, interpersonal and intrapersonal skills.

16. Develop a portfolio which demonstrates knowledge, skills and experience reflecting progression in the discipline.

17. Perform basic project management support techniques.

18. Pursue inter-disciplinary areas of study related to social and cultural understanding, civic life, personal understanding, science and technology and arts in society.

19. Research, investigate and participate in the implementation of applied environmental projects.

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Appendix 6

Curriculum Vitae – Contract Faculty

A. Personal Data

Name: Kelly Cordick

Title: Professor

Academic Area: Environmental Resource Studies / Environmental Technology

Email Address: marwilli@flemingc.on.ca

Date of Appointment: 2006

B. Education

BEd	Lakehead University	Education	2005
BA(hon)	Trent University	Environmental Resource Studies	2004
Diploma	Fleming College	Environmental Technician	2000
Diploma	Fleming College	Forestry Technician	1999

D. Academic Positions Held

Fleming College	2006 – present	Environmental Technician/Technology Professor
Fleming College	2009 – present	Dual Credit/Specialist High School Liaison
Fleming College	2008 – present	BEAHR Environmental Aboriginal Training Program Liaison
Kawartha Pine Ridge School Board	2005 -2007	Occasional Teacher

E. Environmental Organizations/Industry Appointments

Niblett Environmental Associates Inc.	2004 – present	Junior Biologist (Terrestrial & Wetland)

Earth Kids Day Camp	2002	Program Director & Developer
Thunderhouse Forest Services	2001	Timber Cruiser, Forest Cut-Block & Road Layout Technician
Toronto Conservation Authority	2001	Private Land Stewardship Technician
City of Mississauga	2000	Urban Tree Health Surveyor
Bostock Tree Service, Scarborough	2000	Urban Tree Maintenance Technician

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Curriculum Vitae – Full Time Faculty

A. Personal Data

Name: Anne Van warmerdam

Title: Professor

Academic Area: Hydrogeology/Watershed Management/ Geology / Environmental Technology

Email Address: avanwarm@flemingc.on.ca

Date of Appointment: 1991

B. Education

BSc (hon)	University of Waterloo	Earth Science	1984

D. Academic Positions Held

Fleming College	1991 – present	Environmental Technician/Technology and Geology Professor

E. Environmental Organizations/Industry Appointments

Ontario Ministry of the Environment	1988 - 1991	Waste Management Hydrogeologist
Ontario Ministry of the Environment	1985 – 1988	Environmental Officer
Morrison Beatty Ltd.	1984	Hydrogeologist
South Lake Simcoe Conservation Authority	1983	Watershed Technician
Gulf Resources	1982	Geologist
Morrison Beatty Ltd.	1981	Hydrogeological Technician

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Curriculum Vitae – Full Time Faculty

A. Personal Data

Name: Mark Williamson

Title: Professor

Academic Area: Biology / Environmental Technology

Email Address: marwilli@flemingc.on.ca

Date of Appointment: 1992

B. Education

PhD	Trent University	Biology	2010
MSc	Queen's University	Biology	1987
BEd	University of Toronto	Education	1991
BSc(Hon)	Trent University	Biology	1984

C. Research Training

Fleming College	2002 – 2006	Research Director, Centre for Alternative Waste Water Treatment
INSTRUCT/CIDA	1998 – 2002	Constructed Wetland Project in Rio Texcoco. Mexico
Fleming College	1994 – present	Solar ecology experimental natural Wastewater treatment system
PhD Research	1998 – 2010	Ecological Energetics of the Semipalmated Plover (*Charadrius semipalmatus*), an Arctic-nesting Shorebird

D. Academic Positions Held

Fleming College	1992 – present	Environmental Technician/Technology Professor
Trent University	2001 – 2003	Biology Instructor

E. Environmental Organizations/Industry Appointments

Toronto Regional Conservation Authority	1991 – 1992	Biologist
Ontario Ministry of Natural Resources (Ottawa – Carleton)	1987 – 1991	Biologist/Consultant

F. Publications

Williamson, M., Visser, G. H. and E. Nol. 2010 **Daily Energy Expenditure of Semipalmated Plovers: Do Stay at Home Parents Work Harder?** (in prep)

Williamson, M., Williams, J.B. Nol. 2006 **Laboratory Metabolism of Incubating Semipalmated Plovers: Energetic Challenges and Physiological Responses.** *Condor 108: 966 – 970.*

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Curriculum Vitae – Contract Faculty

A. Personal Data

Name: Melanie Logan

Title: Professor
Academic Area: Environmental Technology
Email Address: melogan@flemingc.on.ca
Date of Appointment: 2011

B. Education

BET (Environmental Studies)	Cape Breton University (in progress)	
Terrain and Water Technology Diploma	Fleming College	1998
Terrain and Water Technician Diploma	Fleming College	1997

C. Research Training

Fleming College	2011 - present	Faculty Researcher, Centre for Alternative Wastewater Treatment

D. Academic Positions Held

Fleming College	2011 – present	Environmental Technician/Technology Professor – Full Time Faculty
Fleming College 2010	2011	Environmental Technician/Technology Professor – Contract Faculty

E. Environmental Organizations/Industry Appointments

Genivar Consultants Ltd.	2009 – 2011	Business Development Unit Leader – Phase I Environmental Site Assessments
Jagger Hims Limited	1998 – 2009	Project Manager Environmental Consulting

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Curriculum Vitae – Full Time Faculty

A. Personal Data

Name: Stephen Thompson
Title: Professor and Coordinator
Academic Area: Environmental Technology
Email Address: stevthom@flemingc.on.ca
Date of Appointment: 1987

B. Education

BSc	University of Waterloo (in progress)	
Fish & Wildlife Technologist Diploma	Fleming College	1978
Fish & Wildlife Technician Diploma	Fleming College	1977

C. Research Training

Fleming College	2005 - present	Associate Researcher, Centre for Alternative Wastewater Treatment
INSTRUCT/CIDA	1998 – 2001	Constructed Wetland Project in Rio Texcoco, Mexico.

D. Academic Positions Held

Fleming College	1987– present	Environmental Technician/Technology Professor
Fleming College	2000 – 2005	Coordinator, Environmental Tech Program
Fleming College	2007 – present	Coordinator, Environmental Tech Program
Ministry of the Environment	1987 – present	Development & Delivery of various courses

E. Environmental Organizations/Industry Appointments

Ontario Ministry of the Environment	1984 – 1987	Environmental Officer
Environment Canada	1982 – 1984	Senior Resource Protection Officer, Environmental Protection Service
Environment Canada	1982 – 1983	Acting Project Biologist, Environmental Protection Service
Ontario Ministry of the Environment	1980 – 1982	Mobile Lab Technician, Microbiology Section
Ontario Ministry of the Environment	1979 – 1980	Lab Toxicity Technician, Toxicity Section
Ontario Ministry of Natural Resources	1979	Lands Technician, Lands Branch
Ontario Ministry of Natural Resources	1978 – 79	Conservation Officer/Hunter Examiner, Fish & Wildlife Section
Ontario Ministry of the Environment	1977	Pesticides Research Technician, Pesticides Branch

F. Publications

Williamson, M., and Thompson, S. 2006**Adapting constructed Wetlands Technology for Developing Communities.** Ecological Engineering (in process).

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Appendix 7

Fleming College

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ACADEMIC & STUDENT AFFAIRS COMMITTEE

MANDATE

The Academic & Student Affairs Committee shall have the following duties and responsibilities:

1) Review all proposals for new programs of instruction for approval by the Board including those requiring submission to the Ministry of Training, Colleges & Universities, for funding approval.

2) Receive reviews of existing programs of instruction.

3) Review academic and student service policies and practices developed by faculty and administration in response to Board policies.

4) Receive reports on various student and academic activities and commission reports to be made on activities in those fields when the Committee so decides.

5) Ensure that the Advisory Committee system is working effectively.

6) Review any specific issue referred to the Committee by the Board.

7) Make recommendations to the Board.

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Appendix 8

BACKGROUND INFORMATION

ORIGIN/HISTORY OF COLLEGE COUNCIL

In January, 1986, the Minister for Colleges and Universities announced a number of new initiatives relating to the governance structures for Colleges of Applied Arts and Technology. One of these initiatives was the requirement that each college establish a College Council in accordance with specific guidelines.

MANDATE

Provincial Regulatory Provisions (According to Ontario Regulation 34/03)

Each Board of Governors shall establish, in accordance with the Minister's Binding Policy Directive, a college council through which college staff and students may provide advice to the President of the College.

Colleges of applied arts and technology are established and governed by the Ontario Colleges of Applied Arts and Technology Act, 2002 and O.Reg. 34/03. A policy framework, consisting of a number of documents, sets out the roles and responsibilities of colleges in more detail than in the Act and Regulation. Three types of policy framework documents are used to convey this information:

- **Minister's Binding Policy Directives** that *define the Ministry's expectations for the college system to comply with the Act and Regulation.*
- **Operating procedures** that *set out specific requirements and procedures to comply with the Act, Regulation and/or Minister's Binding Policy Directives.*
- **Resource documents** that set out *suggested or best practices, which colleges may choose to use at their discretion.*

The Minister's Binding Policy Directive on Governance and Accountability, states:

> *The board of governors is to ensure that an advisory college council is established, the purpose of which is to provide a means for students and staff of the college to provide advice to the president on matters of importance to students and staff. The board of governors is to ensure that the structure, composition, terms of reference and procedures for the council are established in by-law.*

TERMS OF REFERENCE

As stated in the Minister's Binding Policy Directive, the purpose of an advisory college council is to provide a means for students and staff of the college to provide advice to the President on matters of importance to students and staff. It is a corporate body in the sense that it will deal with issues that affect the entire college. It is a future oriented body involved with Strategic Planning. An underlying premise is that the Council will be a forum for communication between the President and College faculty, staff, and students regarding issues which are focussed on, or affect, the academic activities of the College.

Given the above, College Council's Terms of Reference for advisory capacity consist of, but are not limited to, the following:

- Strategic Planning
- Review of Annual Reports as each pertains to the College Strategic Plan
- Academic and Student Affairs
- Organizational Change
- Key Performance Indicators
- Fleming's Systems Renewal Project
- Consultation on a range of college projects

The President's Advisory Council may recommend policies, regulations and guidelines in respect of the above.

REPORTING

The President's Advisory Council reports to the President of the College.

Policy and Procedures Critical Path

In 1992, College Council developed a Policy and Procedures Critical Path in conjunction with the Executive Director of Student and Staff Development. *Please see Appendix C.*

STRATEGIC PLAN

Our Strategic Plan is founded on our vision, our underlying mission and four abiding values. The plan articulates the character of Fleming – what is different about our College. The Core Promise to Students states what students experience at the College and why people should choose Fleming, as students and as employees. Finally, our plan leads to a destination – one that we will arrive at through concerted work on six priorities.

VISION

Students succeeding through personalized learning.
Innovation and achievement powered by people.

MISSION

Fleming champions personal and career success through applied learning. We contribute to community success and sustainability through programs, services and applied research.

VALUES

1. The student learning experience is our first priority.

2. We value people and community.

3. Fleming is committed to a sustainable future.

4. We are inspired by Sir Sandford Fleming to innovate with vision and implement with excellence.

Six Strategic Priorities

1.0 Achieving Excellence in Student Learning
2.0 Providing Superior Services and Facilities
3.0 Leading in Sustainability
4.0 Growing with Positive Results
5.0 Building Community Success
6.0 Developing the Fleming Working Environment

2010-2015
Strategic Plan

ROLES AND RESPONSIBILITIES

Reference: Policy 1-102K, Advisory College Council
In accordance with the Minister's Binding Policy Directive, the College shall establish an Advisory College Council. At Fleming College, this is known as the "President's Advisory Council". *rev Sept 2007 - approved by Board of Governors June 22, 2011*

COMPOSITION OF COUNCIL

The President's Advisory Council will consist of twenty-four to twenty-six representatives from full-time and part-time faculty, students, support staff, and administration (including 3 ex-officio members). The composition will be as follows:

		# of Reps
1.	**ACADEMIC**	
	School of Education, Health and Wellness	1
	School of Justice and Business Studies and	1
	School of Trades and Technology	1
	School of Environmental and Natural Resource Sciences (SENRS)	2
	School of General Arts and Science	2
	Student Services (all campuses) and Centre for Learning and Teaching	1
2.	**STUDENTS**	
	President, SA - Frost Campus (standing member)	1
	President, SAC - Sutherland Campus (standing member)	1
	Frost Campus	1
	Sutherland – Brealey and McRae Campuses	1
	Cobourg/Sutherland Campuses	1
	Haliburton Campus	1

Note: An additional representative will be elected from the closest campus, if no nomination is received from a particular campus.

3.	**SUPPORT STAFF**	
	Sutherland Campus – Brealey	2
	Sutherland and Cobourg	1
	Frost Campus	2
	Haliburton Campus	1
4.	**ADMINISTRATION**	
	College-wide	1

EX OFFICIO MEMBERS (**3 non-voting members**)

1. One member (rotating liaison role) from the Board of Governors
2. The President, who serves as an Ex-officio member of all College committees
3. Secretary, President's Advisory Council

APPOINTED MEMBERS
One or two in total

If the election/appointment processes for the above members fail to produce representation of all areas, Council will request that the *President appoint a maximum of two additional members on the recommendation of The President's Advisory Council*.

It is recognized that there are areas that do not have designated positions, but will be considered when Council looks at the appointment of two additional positions.

With the inclusion of Ex-officio members, the total possible number of representatives serving on The President's Advisory Council is twenty-four (24).

See *Appendix A* for Current Membership List.

SELECTION PROCESS FOR CONSTITUENTS

CHAIR
Election occurs at May meeting for term to begin in September.

VICE-CHAIR
Election occurs in alternating years from that of Chair for term to begin in September.

STUDENTS
The two Student Government Presidents are members by virtue of their office and terms begin in March of each year. A Call for Nomination/Election is issued from the President to all students (full and part-time) in February/March of each year to represent their constituent group for the term September to May.

ACADEMIC / SUPPORT / STAFF / ADMINISTRATION
Call for Nominations/Election in March

APPOINTED MEMBERS
Appointment by College President as requested by Council

EX OFFICIO
Board of Governors' member - by appointment of the Board

SECRETARIAL SUPPORT - Secretary, President's Office

NOMINATION PROCESS

- It was agreed at Fleming's Union/Management Partnership meetings in June 1992 that all college governing body elections, pertaining to members of the union, would be carried out under the direction of the local union presidents.
- February/March - A Notice of Election and Call for Nominations for *Student Representation* and *Staff Representation* is sent to all *students and staff* outlining the vacant positions.
- All full-time and part-time faculty, support staff, administration and students are eligible to vote and serve on The President's Advisory Council.
- Nomination forms are submitted to the Secretary of the President's Advisory Council. Individuals may nominate interested persons. The nominee must sign the nomination form and provide a brief statement about how he/she would be an effective representative to The President's Advisory Council.
- Nomination results will be posted on The President's Advisory Council's web page as well as communicated via email to the college community.
- During voting days, Staff and Students will elect members from their respective constituent groups.
- Ballots will be counted by the Union Presidents and the Secretary of The President's Advisory Council.
- Election results will be posted on The President's Advisory Council's web page and communicated via email to the college community.

SCOPE OF ACTIVITIES

The President's Advisory Council has developed its role since inception to deal with a variety of college initiatives:

The following is a list of major topics that have been consulted and advice provided:

Academic Regulations including Students Rights and Responsibilities	Fleming College Sustainability Plan
High Expectations and Positive Faculty-Student Interaction	Organizational Change
College Safety Preparedness	Orientation and Start-Up
Frost Campus Initiatives	International Enrollment
Diversity at Fleming	Progress of Strategic Plan
Faculty and Course Evaluation	Enrollment
PAC Structure and Effectiveness	Sutherland Campus Master Plan
Key Performance Indicators	Student Health and Wellness
Developing a College Budget	External Web Site College Portal

Communications

- Developed specific recommendations and procedures for receipt and dissemination of information internally

Strategic Planning

- Address specific questions and provide feedback on a continual basis

Policies and Procedures

- Sub-Committees formed to review specific areas
- Policies and Procedure Critical Path Developed
- Recommendations made to Senior Leaders

Operational Plans

- Review process developed
- Sub-Committees formed to look at specific areas
- Recommendations forwarded to the President

Barriers to Student Success

- Theme of one day Retreat
- Brainstormed ideas in small groups
- Presented a Paper outlining recommendations

Consultation Process

- Process developed to handle issues with a short time line
- Hosted Open Forums

Interconnectivity

- Established List Serve for discussion/communication amongst members

Restructuring

- Paper presented to Restructuring Design Team
- Held a Retreat to brainstorm ideas
- Formed a sub-committee to look at specific restructuring items
- Focus group session held to give feedback to Design Team on design principles and attributes

Participation in Hiring of Senior-Level Administrators

- Selection Committee members must complete Recruitment and Selection Training per Human Resources (HR) prior to sitting on a R&S committee

MEMBERSHIP: ROLES, RESPONSIBILITIES AND FUNCTIONS

Chair

- Two-year term beginning in September
- Sets meeting agenda in consultation with College President, Vice-Chair and Secretary
- Plans methods by which objectives of meetings will be accomplished
- Provides leadership and direction to Council
- Conducts meetings
- Maintains a climate conducive to open discussion
- Encourages presentation of views
- Keeps meetings focussed
- Ensures follow-up and action as required
- Sets deadlines for completion of activity
- Monitors and evaluates meetings and outcomes
- Ensures dissemination of information
- Represents PAC at meetings of the Service Leaders Team (SLT)

Vice-Chair

- Two-year term begins in September in alternate year from Chair's term
- Designate to the Chair - conducts meetings in the absence of the Chair
- Shadows position of Chair

Members

- Represents the interests of their constituents while bringing a broad perspective of advice
- Submit items for agenda topics
- Reports back to constituent group
- Reads materials distributed in advance of meetings
- Attends meetings on a regular basis
- Arranges for a designate from same constituent group if unable to attend a meeting and notifies the secretary
- Engages in decision-making, problem solving, and information sharing

Ex-Officio

- The College President and one member appointed by the Board of Governors on a rotating basis
- Any other Non-voting members

Secretary

- Responsible for recording the business of The President's Advisory Council
- Distributes agenda, minutes, and supporting documentation in advance of meetings
- Coordinates follow-up from meetings and prepares correspondence as required
- Coordinates hospitality arrangements
- Organizes and processes Council elections in conjunction with the Chair of The President's Advisory College Council and the Union Presidents

COUNCIL STRUCTURE

COMMITTEES

Sub-Committees
Committees are sub-groups of the Council. Smaller and more flexible, they provide an effective means of getting business completed. They report to Council. Terms of reference give the committee authority to perform its task and provide clear expectations of function and purpose.

TERMS OF OFFICE

- The term of office for *employee* representation is for two years, September 1 to August 31 (Council does not meet in June, July, August and December).
- The term of office for student representation is for a one-year period, September 1 to August 31 with the exception of the Student Presidents in accordance with the Student Administrative Council and Student Association elections (under the auspices of SAC and SA)

ABSENTEEISM

A motion was passed at a meeting on September 5, 1991, as follows:

> *After 30% of College Council meetings are missed by a participant of the college council in a calendar year, the Chair will request his/her resignation.*

VACANCIES

In the event of a vacancy, the runner-up from the last election would be approached to accept the position. If he/she was not available, then Council may request that an appropriate person be appointed by the President.

In the event that a member of College council who was elected or appointed has to vacate their position, that the official designate be the one to represent the constituent group and further, that they be endorsed by the particular constituent group they will represent.

Where there has not been an election, be it resolved that the candidate select/appoint a designate and that the designate fill the vacancy for the balance of the term of office.

From the April 1997 meeting

MEETING PROCESS

President's Advisory Council meetings are semi-formal, using standard procedural rules (Roberts or Canadian Parliamentary Procedures) to facilitate decision making.

Agenda

- sets priorities for the meeting
- identifies areas for discussion
- establishes the order for discussion
- allocates time frame for each item

Quorum

- the minimum number of members who must be present in order to conduct business
- a College Council quorum would be 50% of the current voting members

Call to Order

- at the appointed time the Chair calls the meeting to order and begins the meeting

Approval of Agenda

- approved at the beginning of each meeting
- order of business may be changed and additional items added or tabled (deferred) as required

Approval of Minutes

- Errors and omissions are corrected and the minutes of the previous meeting approved as an accurate record of the proceedings

Contents of Minutes

- name of group; date, time and place of meeting
- list of those present, regrets, and absences
- a concise summary of significant discussion
- a full statement of the motions, including names of mover and seconder, and result of the vote
- an indication of follow-up action
- identification of reports and documents presented under each agenda item
- time of adjournment

Matters Arising

- members have an opportunity to raise matters arising from previous meetings
- more substantive issues deserve an agenda item in their own right - they can be deferred to "Other Business" or added to the agenda under College Issues

Motions

- a motion is a proposal for action or an opinion which is placed before a meeting for discussion and decision
- a motion should be presented in language which is clear, simple, and concise, and understood by all present
- a motion is intended to precede discussion, thereby providing a focus to the debate
- once moved a motion must be seconded to ensure that there is sufficient interest in the matter to warrant discussion
- a motion can "die" if there is no seconder

Amendments

- once moved and seconded, the motion becomes the property of the meeting, not the originator
- reasonable additions, deletions, and substitutions can be suggested in order to refine the motion

Discussion

- all remarks should be addressed to the Chair who will take them in rotation

The Vote

- a majority vote is based on a majority of votes cast by show of hands
- the Chair has a casting vote
- ex-officio members are not eligible to participate in motions or voting

Other Business

- when all business on the approved agenda has been dealt with, other items may be raised for discussion under College Issues (Other Business)

Adjournment

- at the conclusion of the agenda the Chair invites a motion for Adjournment

NOTE: See Kerr & King, Procedures for Meetings and Organizations for more information.

BUDGET

College Council has a budget which falls under the direction of the President's Office. Members are entitled to be reimbursed for mileage as per College's established rate for travel to and from meetings. Expense reports should be forwarded to the Secretary of College Council for processing.

COLLEGE ORGANIZATION

BOARD OF GOVERNORS

- Board of Governors Standing Committees:
  - *Executive*
  - *Academic and Student Affairs*
  - *Audit*
  - *Finance and Property*
  - *Human Resources*
- *Other Committees:*
  - *Advancement*
  - *Naming*
- *Advisory Councils and Committees*
  - *President's Advisory Council (PAC)*
  - *Advisory Committees - Programs*

Key College Committees and Councils

- Academic Leaders Team (ALT)
- Academic Planning and Development Committee (APDC)
- Academic Union/College (AUCC)
- Aboriginal Education Council (AEC)
- Archives
- Diversity
- Enrollment Management
- Executive Leaders Team (ELT)
- Employee Engagement Task Team (EETT)
- Joint Occupational Health and Safety
- Service Leaders Team (SLT)
- Strategic Planning
- Student Success and Retention Committee
- Support Staff Union/College (SSUP)
- Wellness

ORGANIZATIONAL CHARTS

Please visit Fleming's web site for organizational charts:

http://fleming0.flemingc.on.ca/hod/orgchart/welcome.htm

COMMUNICATIONS

VEHICLES

One of the major objectives of The President's Advisory Council is to *develop and maintain communication mechanisms for the college community on topics that are brought forward.* A Sub-Committee was formed to establish a number of communication vehicles to ensure the proper dissemination of information which is outlined below:

- President's Advisory Council web page is maintained where minutes, and membership lists are posted along with detailed information about the President's Advisory Council: http://fleming0.flemingc.on.ca/ccouncil/welcome.htm

- A PAC distribution list is maintained by the Secretary in order to facilitate timely communications.

- Information about The President's Advisory Council issues may be communicated to the College as a whole through Membership as listed on Council's web page.

- Student representatives are encouraged to report at any appropriate forum.

- Members poll their constituents for potential topics to be brought forward to The President's Advisory Council and report back to their constituents.

- A library of The President's Advisory Council reference material will be maintained by the Secretary.

CURRENT DOCUMENTATION

LIST OF CURRENT DOCUMENTATION

The following is a sample list of current documentation and resources which may be useful background information. These resources are available on Fleming's *web site and portal* and/or you can request further information by contacting the Secretary of The President's Advisory Council.

- Financial Plan 2012 - 2013
  http://fleming0.flemingc.on.ca/ff/welcome.htm
- Financial Statements as of March 31, 2012
  http://fleming0.flemingc.on.ca/ff/accounting/FinancialStatement2012.pdf
- Fleming College Business Plan 2012 – 2013
  http://www.flemingc.on.ca/PDF/Fleming-College-Business-Plan-2012-2013.pdf
- Fleming Strategic Plan 2010 – 2015
- Councils and Committees
- Policies and Procedures
  http://fleming0.flemingc.on.ca/hod/Pages/Policies-Procedures/Brd-Policy-welcome.html
- Strategic Planning Report
- Workplace Wellness Report – March 2005
- Student Learning First
- Resources for Students
- Department Web Pages
- Freedom of Information and Protection of Privacy Act
- Staff Recognition
- Health and Safety
- Emergencies - College Closing Procedures
- Freedom of Information and Protection of Privacy

GLOSSARY OF ACRONYMS

See Appendix D

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Appendix 9

Year One - Common Semester 1

Course	Abilities/Knowledge	Examples of Skills
Communicating Technical Information	This course focuses on the development of fundamental writing and speaking skills, both individually and in teams, within the context of program and work needs in the environmental field. Also, students will be required to apply and to demonstrate fundamental research skills, including an analysis of library and Web resources pertaining to program-related topics. Assessment strategies will be tied closely to other common first semester courses.	- use computerized library system to perform searches - use Internet search engines - accurately reference electronic resources - Identify and correct common errors in English grammar, punctuation, and spelling - Present verbal and written communications to diverse audiences using appropriate media - Letter & Resume preparation - Team Building and Managing
Ecology and Environment	Learn how nature works by studying the key components of the ecosystems in the Kawartha Lakes Region. Through field and lab exploration of wild life, landforms, forests, lakes, rivers and wetlands, students will see the connections between themselves, the environment and ecosystems that surround them.	- Identify landscape features and geological landforms characteristics - identification of physiographic regions and ecosystems - knowledge of impact of human activity within a given watershed - knowledge of abiotic, biotic and cultural characteristics - knowledge of energy conservation strategies - atmospheric quality impacts on human health, the environment and quality of life - terrestrial, aquatic, wetland Ecosystems

Course	Abilities/Knowledge	Examples of Skills
Ecosystem Skills	This course will focus on three areas of study: identification, field and lab skills. Students will identify and classify the living and non-living components of the specific ecosystems described in the Ecology and Environment (ENVR020) course. Field skills to be developed include the ability to navigate through the natural environment and use a variety of ecosystem inventory techniques. Special emphasis will be placed on safe work habits in lab and field.	- Record data and observations using a standardized protocol -Collect and analyze data in order to assess the health of aquatic ecosystems -identify specific examples of fish, rocks and minerals, trees, birds, mammals -Use a compass and Global Positioning Systems (GPS) under field conditions -Identify specific drilling equipment and methods - Use aerial photography
Environmental Leadership	This course will enable students to develop a personal position and direct their career path within the context of the environmental and natural resource industry. A dynamic, interactive case study approach will be used to examine issues arising from environmental disputes and conflicts, and to develop an understanding of ecological sustainability. .	- knowledge of occupations in the environment and natural resources industry - assess personal aptitude for a given career path - career/program choice based on an understanding of the industry sectors and the skills and performance expectations - personal understanding of leadership and the qualities that contribute to leadership

Course	Abilities/Knowledge	Examples of Skills
Geospatial Techniques	This course is designed around the four pillars of Geomatics: Remote Sensing, Cartography, Surveying and GIS. Students will develop entry-level skills in data capture, surveying, (computer) drafting, principles of remote sensing, air photo interpretation, and in usage of representative Geomatics-related software.	- Design and produce an effective cartographic product (including maps, charts, figures and tables) - Apply basic math skills in making accurate scale measurements and calculations, and in calculating UTM plane co-ordinates - Produce accurate survey plots using GPS and digital plotting techniques - Use GPS to record and map ecosystems in a basic GIS application - Use geomatics-related software for basic functions such as plotting and digital map creation
Applied Mathematics in Natural Resource Sciences	This course will enable students to apply specific mathematical concepts and acquire foundation skills important in the Natural Resource and Environmental Sciences. It is designed to complement and reinforce learning within other first semester courses and program areas.	- convert units in and between the metric and imperial units - use a metric ratio scale to determine scale measurement - calculate compass declination and azimuth - organize data, use a scientific calculator to obtain common statistical parameters including mean and standard deviation and create graphics using Excel

Year One - Semester Two

Course	Abilities/Knowledge	Examples of Skills
Introductory Chemistry	Development of an understanding of the basic concepts of chemistry ie atomic structure, properties and nomenclature of compounds, chemical bonding. Exposure to laboratory setting and protocol.	- conductivity readings - titration techniques - lab safety protocol

Course	Abilities/Knowledge	Examples of Skills
Technical Reporting	Developing competence in oral and written communications ie: includes identifying steps in writing process, developing and organizing ideas in paragraphs, and applying principals of language usage.	- writing business letters, memos and short reports - preparing and delivering oral reports.
Introductory Computing	Windows XP environment, computer basics (computer terminology, e-mail, file management), application, word processing, spreadsheet, and presentation software using Microsoft Office 2007. - attain the International Computer Driving Licence (ICDL) Start Certification with four ICDL Start Certification tests.	- WebCT - Windows XP operating system functions - Fleming e-mail system - describe hardware and software components of a desktop computer and network - Excel 2007 to create spreadsheets in the presentation and analysis of numerical data - PowerPoint 2007 to create presentations and slide shows - Word 2007 to present information
Environmental Principles	Development of an understanding of geological and biological process e.g; plate tectonics, rock types, weathering, soils & the atmosphere, biodiversity, biogeography, conservation biology.	- resources conservation - biodiversity preservation - community descriptions
Environmental Techniques	Exposure to fundamental technical abilities in the areas of testing and identification of earth materials, vegetation/soil relationship, basic hydrogeology and monitoring/sampling	- sieve analysis - hydrometer test - Atterberg test - proctor test - soil/profile ID - piezometers - surface/groundwater sampling - Test pit logging
Trees & Shrubs of Ontario	Development of a strong foundation & knowledge of the woody flora of Ontario, with emphasis on species & community assemblages	Field I.D. of species (□100 species) - in winter conditions - field I.D. of species in summer conditions - bark characteristics I.D

Year Two - Semester Three

Course	Abilities/Knowledge	Examples of Skills
Field School	Basic introduction and exposure to field sampling and measurement techniques	- BOAT operation - water sampling and interpretation - aquatic survey - invertebrate I.D. - GPS
Human Relations	Enhanced knowledge in areas of self awareness, verbal and non-verbal communications, stress response, self motivation and leadership management.	- preparation and presentation of oral seminars.
Aquatic Biology	Understanding and recognizing characteristics of aquatic communities, water chemistry, riverine and lacustrine ecosystems, wetlands, and aquatic responses to human induced stresses	- invertebrate I.D. - plant & plankton I.D. - fish & algae I.D. - I.D. of bioindicators - water quality indicators
Land Reclamation Principles	Familiarization with existing types of industrially stressed land and the principles of land reclamation/rehabilitation e.g. aggregate industry & mining industry	- test plot establishment and monitoring - vegetation I.D. and site application - soil analysis (NPK) - soil ph/line requirement
Environmental Measurement	Knowledge of field sampling protocols and ability to use field monitoring equipment for water pollution studies. Knowledge of surface and groundwater chemistry and lab techniques, microbiological culture, flow measurement and water quality objectives for interpretation and reporting	- water chemistry - water quality field instrument use and laboratory analysis - collection of surface, sediment, microbiological and groundwater samples - microbiological culture and assessment - flow measurement
Watershed Management	Understanding the components of a watershed (limnology, hydrogeology, hydrology), stream flow sampling techniques and applications; and related legislation such as the Conservation Authorities Act and the Drainage Act.	- watershed mapping - hydrograph interpretation - stream flow measurement - stream profile construction

Course	Abilities/Knowledge	Examples of Skills
Geomatics in Surveying	- fundamental principles of Geomatics in Surveying. -Electronic instruments with emphasis on data loggers - field locations and attributes used to create GIS related survey plans. - Coordinate Geometry used in the computation of boundaries areas and volumes. - GIS features implemented using practical field projects and projects related to land information systems	- field notations - transit and theodolite usage - boundary survey - topographic survey - Total Station/GPS intro

Year Two - Semester Four

Course	Abilities/Knowledge	Examples of Skills
Environmental Issues	Expansion of existing knowledge of environmental issues, development of an understanding of complexity of issues and understanding of environmental decision making eg; population trends & economics, public perspective	- organization and presentation of environmentally related seminars.
Case Studies in Pollution Abatement	Course content includes in-depth studies of pollution events in various settings with a focus on how and why the event occurred, related industrial and other processes involved and the environmental effect/impact created. Subsequently, legislative abatement techniques available in various Acts including the Environmental Protection Act, Ontario Water Resources Act, Nutrient Management Act and other environmental Regulations, as well as, applicable pollution abatement equipment and techniques	- knowledge of air pollution abatement equipment - interpretation and application of environmental legislation - case studies - approval procedures
Statistics	Familiarization with the operation use and application of the basic statistical analysis	- hypothesis testing (eg. ANOVA, correlation analysis, F and T - Tests)

Course	Abilities/Knowledge	Examples of Skills
Natural Resources and the Law	This course provides an introduction to laws that have an impact on the use of natural resources in Ontario. The course will deal with an overview of the legal system, the underlying principles of gaining compliance, and specific legislation that may be encountered in the natural resources field.	- legal notation and sampling techniques - legal interpretation
Water Treatment and Pollution Control	Understanding water, sewage, industrial wastewater treatment and alternative treatment technology, the function of home water treatment devices, relevant legislation, guidelines, water/wastewater characteristics and process control. (i.e. MLSS, MLVSS, F/M, Ratio, S.U.R., Chlorine and Jar tests).	- sewage, water and industrial wastewater treatment and water plant inspections and reporting - alternative wastewater treatment systems - sewage and water plant process control lab tests -Water and Wastewater "Operator-in-Training" Certificates
Erosion Control	Acquisition of knowledge of erosion types, erosion control practices, approaches and causes of erosion in the urban, shoreline and agricultural sectors, eg. mass movement bioengineering, geotextiles, rip rap, erosion types and site inspection.	- Bioengineering approaches - slope determination - rip rap and retention pond sizing - recognition of site and types of erosion - Rational Method.
Geomatics for Environmental Engineering	-Familiarization with Land Information System and the Land Registry System. Collection of digital files with Total Station GPS technology.	COGO computer techniques - AutoCAD drafting - cross section profiles - production of plans from digital files.

Year 3 – Semester 5

Course	Abilities/Knowledge	Examples of Skills
Constructed Wetlands	Constructed wetlands are an innovative technology that makes use of natural processes to treat wastewater from a variety of sources including industrial and human waste and	- understand the application of constructed wetlands for wastewater treatment - understand the key natural processes operating within constructed wetlands

Course	Abilities/Knowledge	Examples of Skills
	are becoming increasingly popular in North America. In this advanced course, students will develop practical skills by learning to design, construct and monitor artificial wetlands for a variety of applications as well as working with the Environmental Technology Program's Solar Ecology wastewater treatment system. Topics covered include wetland processes, biochemistry, wetland design, and sizing calculations, case studies, field trips to wetland projects and construction of functional scale models.	- able to design and construct a wetland system for specific applications in wastewater treatment - monitor and analyse data acquired from wetland systems in order to measure system efficiency - understand the legal and regulatory framework applicable to wetland construction and operation
Environmental Applications	In this course, landscape character is examined, with an emphasis on the biophysical characteristics of the site. This field-based activity will be linked to new development initiatives and/or remediation efforts, as linked to the appropriate legislation and regulation.	-topographic survey implementing differential leveling - biophysical site inventory - evaluate lands in terms of their sensitivity to anthropogenic influences - conduct an environmental impact study (EIS) -understand Ecological Land Classification (ELC) -understand Natural Channel Design - understand stream rehabilitation techniques
Environmental Site Assessment	In this course, the application of audits and site assessments will be examined. The ability to conduct a phase 1, 2, and 3 environmental site assessment on a property that has been disturbed by human activity is provided. Decommissioning processes and guidelines will be covered. As well , standards used to establish criteria for conducting audits and assessments (including ISO 14000 requirements).	- soil vapour survey - Phase I, II and III Environmental Site Assessment - record of site condition - designated substance survey - EPA Reg 153/04
Environmental Technology	This course examines the	-Total station surveying and

Course	Abilities/Knowledge	Examples of Skills
	technological tools that are available in the environmental sector. Technological skill development, environmental application, and problem solving represent typical areas of study.	levelling Data manipulation using: - Auto Desk Map - Auto Cad - Pathfinder Office GPS software - Arc Pad - Nomad -Excel
Fall Field School	In this course, students take part in practical field exercises in the Fall Semester (Semester 5) that build on the skill set developed from the Technician Level program. These exercises and areas of specialized training for the fall setting may take place at off-campus locations. In some instances, elements are mandatory, and additional specialized training take place on an optional basis. The course is designed to promote a more comprehensive understanding of environmental activity.	-Wetland evaluation -Electro Fishing - Water Safety - First Aid - WHMIS - TDGA Certification note: some of these areas represent optional areas of training.
Waste Management Approaches	This course is designed to provide an understanding of current waste management practices in Ontario, waste management problems and environmental effects, governing legislation, regulatory practices and enforcement, integrated waste management components, landfill site selection, development of waste management system applications, site closure, and post-operational uses.	- knowledge of waste generation characteristics of municipalities and industries -leachate plume sampling and monitoring, chemical characterization and mapping - landfill site selection and application process (EPA and EAA) - waste disposal site inspection and reporting -integrated waste management approaches - waste auditing (personal and institutional) - EPA Reg 347 - Waste Diversion Act

Year 3 – Semester 6

Course	Abilities/Knowledge	Examples of Skills
Behaviour of Contaminants	In this course, the unique nature and behaviour of some environmental contaminants are examined. Concepts introduced will include contaminant transport and fate, toxicity measurement, and hazard assessment. Case studies of current environmental problems will be used to illustrate the ecological complexity of some of these reactions.	- inorganic and organic chemical Nomenclature - Site decommissioning procedures/methods. -stock solution preparation - bioassay procedures and experimentation.
Environmental Hydrogeology	This course introduces the fundamental theories and applications of groundwater studies. Lecture topics will include basic principles of groundwater, aquifer investigation, wells, groundwater management, and groundwater geotechniques. Lab efforts will be directed to hydraulic conductivity determinations, flow nets, pump tests, piezometric tests, and uses of test data.	- hydraulic conductivity determination - piezometer and permeameter testing - flow net construction - well log and record examination - Theis and Jacob Methods for Aquifer Testing - Pump Tests -geochemistry
Environmental Laboratory Techniques	This course gives students experience in analytical laboratory techniques and instrumentation associated with the environmental workplace. Laboratory work will include hands-on experience in sample collection, preparation, and analysis for both organic and inorganic contaminants as well as exposure to standard laboratory procedures. The theory and practical applications of a variety of	- Atomic Absorption Analysis - lab work with immunoassays, semi-permeable membranes devices (SPMD's) - Chlorophyll a analysis - Anion chromatography

Course	Abilities/Knowledge	Examples of Skills
	standard laboratory methods and instrumentation will also be examined.	
Environmental Planning and Assessment	This course studies two distinct disciplines: environmental planning and environmental assessment. The environmental planning component applies development related scenarios to provide knowledge in such areas as the Planning Act, zoning by-laws, official plans, Provincial Policy Statement, Oak Ridges Moraine Conservation Plan and ecosystem based planning approaches. The environmental assessment component deals with federal and provincial assessment processes including Class EA's, screening, public participation and implications for the environment.	- subdivision assessment - official plans interpretation - severance application - EA screening - Federal EA review - municipals EA preparation
Environmental Sampling and Analysis	This course involves the development and analysis of experimental design. Students will also be introduced to some of the methods of statistical analysis frequently used in the environmental field such as two-way ANOVA, cluster analysis, multiple regression, population estimation models	- manipulation of all statistical methods using Microsoft Excel software. - research and oral presentations of a statistical method.
Industrial Placement	This course is designed to allow students an opportunity to obtain program-related experience while working independently off campus in the public or private sectors of the workplace. It will also provide students with an opportunity to apply existing knowledge and	- dependent upon the specific type of placement chosen by each individual

Course	Abilities/Knowledge	Examples of Skills
	gain new insights into the area of placement. This activity will occur after final examinations. Students will be required to seek a placement location of their choice and then apply to the course co-ordinator for approval.	
Spill Response and Case Studies	This advanced course focuses on current concerns related to commodity spills to the environment as well as techniques for environmental cleanup through containment, recovery, and disposal. Course topics will include legislation, oil/gas/chemical spills, leaking underground storage tanks, DNAPL's, operation of gas monitoring equipment, and confined space entry. A number of case studies and videos will be used to reinforce the key course components.	- on site investigation of spill occurrences - site assessment & implementation of appropriate remediation measures - spill response/cleanup - confined space entry
Winter Field School	In this course, students take part in practical field exercises in the Winter (Semester 6) that build on the skill set developed from the Technician Level program. These exercises and areas of specialized training for the winter setting and may take place at off-campus locations. In some instances, elements are mandatory, and additional specialized training take place on an optional basis. The course is designed to promote a more comprehensive understanding of environmental activity.	-ice safety -Winter Water Quality Sampling

The Skills Level Matrix

Each skill or knowledge area possesses a level of proficiency which should have been obtained by the student during his or her education and it is listed in column two (2) of the table. The definition of these levels is listed below.

Introductory Student has obtained a rudimentary awareness of the topic.

Basic Student possesses a working or functional knowledge in the area of concern.

Advanced Student possesses a higher level of understanding and/or skill in the topic beyond a basic level. As a consequence less direction for skill implementation is required.

Inspection/Measurement

Skill or Knowledge Area	Level
Environmental Site Inventories - Shoreline - Bioengineering	Basic
Flow Measurement	Advanced
Groundwater Sampling Methods	Advanced
Soil Sampling Methods	Advanced
Water and Sewage	Advanced
Aquatic & Terrestrial Biological Inventory	Basic
Population & Community Analysis	Basic
Wetland Evaluations	Basic
Environmental Assessment and Audit Procedures	Basic

Guidelines

Skill or Knowledge Area	Level
Decommissioning and Cleanup of Sites in Ontario	Basic
Provincial Water Quality Objectives	Basic
Ministry of Environment Sampling Protocols	Basic
Ministry of Environment "Reasonable Use Guidelines"	Basic

Ontario Water Drinking Standards	Advanced
Municipal Industrial Strategy for Abatement (MISA)	Basic
Fill Quality Guidelines for Lakefilling in Ontario	Introductory
Guidelines for the Protection & Management of Aquatic Sediment Quality in Ontario	Introductory
Guidelines for Use of Contaminated Sites in Ontario	Basic

Guidelines

Skill or Knowledge Area	**Level**
EPA Part II Sec 7 - Control Orders	Basic
EPA Reg. 358	Introductory
EPA Part II - Sec 9 - Certificate of Approval Reg 419/05	Advanced
Part II Sec 14 - Main Prohibition Clause	Advanced
EPA Part V Regulation 347, Reg 362	Advanced
EPA Part X – Spills	Advanced
EPA Part XI - Control/Stop Orders	Basic
EPA Part XV.1 – Records of Site Condition	Advanced
OWRA - General Provisions	Advanced
OWRA Regulations and Approvals	Basic

Industrial Process / Pollution Control

Skill or Knowledge Area	**Level**
Mining/Smelting	Basic
Pulp and Paper	Basic
Municipal Sewage Treatment	Advanced

Industrial Waste Water Treatment	Advanced
Drinking Water Treatment	Advanced
Private Wells	Basic
Septic Systems	Basic
Solid Waste Management	Basic
Landfill Technology	Basic
Air Pollution Control	Basic
Visible Emissions	Basic
Waste Water Treatment Via Natural Systems	Basic
Constructed Wetland Design	Basic

Equipment

Skill or Knowledge Area	Level
pH Meter calibration, measurement and maintenance	Advanced
Dissolved Oxygen meter calibration, measurement and maintenance	Advanced
Conductivity meter calibration, measurement and maintenance	Advanced
Hach DR/2400 Portable Spectrophotometer	Advanced
LaMotte Water Quality/Parameter Test Kits	Advanced
LaMotte Colorimeter	Advanced
Portable Composite Sampler	Advanced
Teledyne Gurley - Price Meter Flow Meter	Advanced
Teledyne Gurley - Price Pygmy Type Flow Meter	Advanced
Wildco Kemmerer Bottle	Advanced
Ward's VanDorn Bottle	Advanced
Ekman Dredge Sediment Sampler	Advanced

Skill or Knowledge Area	Level
Wildco Ponar Grab Sampler Device	Intro
Tree Corer	Advanced
Hester-Dendy Aquatic Invertebrate Sampler	Basic
Peterson Benthic Sampler	Basic
Schindler Plankton Sampler	Advanced
Surber Sampler	Advanced
Pole D - Frame Net	Advanced
Data Logger	Basic
Mini Rae Gas Monitor	Basic
Gastech Surveyor Model 1238 (Toxic, Combustibles)	Basic
Gastec Air Quality Sampler and Tubes	Basic
Mini-Rae Gas Sampler	Basic
Wildco Sediment Sampler	Basic
Birge Closing Net	Basic
American Sigma INC. Streamline	Basic
Phipps & Bird INC Stirring Apparatus & floc Illuminator	Basic
Water Well Bailers	Advanced
Peristalic Pump	Advanced
Well Wizard Groundwater Bladder Sampler	Basic
WaTerra Groundwater Sampler	Advanced
Spill Response Equipment (absorbents, booms)	Intro
Automatic Level, Wild NA - 20	Basic
Automatic Level Wild NAK - 1	Basic

Skill or Knowledge Area	Level
TOPCON RL - 10 Rotating Level	Basic
Thoedolite Wild T - 16	Basic
TOPCON ET - 1 Total Station	Advanced
Sherman (small mammal) live traps	Basic
Marsh McBurney Velocity Meter	Advanced
A.A. Spectroscopy	Intro
SPMD's	Intro
Elisa Immunoassay Kit	Intro
Anion Chromatograph	Intro

Related Legislation

Skill or Knowledge Area	Level
Environmental Protection Act	Advanced
Environmental Assessment Act	Advanced
Environmental Bill of Rights	Basic
Pesticides Act	Basic
Ontario Water Resources Act	Advanced
Municipal Act	Basic
Planning Act	Basic
Wetland Policy	Basic
Dangerous Goods Transportation Act	Intro
Transportation of Dangerous Goods Act	Intro
Canadian Environmental Protection Act	Basic
Drainage Act	Introductory

Lakes and Rivers Improvement Act	Basic
Conservation Authorities Act	Basic
Aggregate Resources Act	Basic
Safe Drinking Water Act	Basic
Nutrient Management Act	Basic
Navigable Water Protection Act	Introductory
Fisheries Act	Basic
Canadian Shipping act	Introductory
Migratory Birds Convention Act	Introductory
Petroleum Resources Act	Introductory
Natural Heritage Policy	Intro
Mining Act	Introductory
Ontario Building Code	Intro
Technical Safety and Standards Act	Introductory

Legal Procedures

Skill or Knowledge Area	**Level**
Origin and Nature of Law	Basic
Court System	Basic
Information & Prosecutions	Introductory
Evidence & Search Warrants	Introductory
Power of Provincial Officers	Basic
Giving Testimony	Introductory
Legal Sampling	Basic
Photography	Basic

Note Taking	Basic
Ontario Land Registry System	Basic
Shorelines Application	Basic
Hearing Procedures	Introductory

Interpersonal Skills

Skill or Knowledge Area	Level
Effective Communication	Advanced
Technical Writing	Basic
Presentation Skills	Advanced
Skills for Public Meetings	Advanced
Problem Solving	Advanced
Interviews	Basic

Science and Technology

Skill or Knowledge Area	Level
Windows XP	Advanced
Microsoft Excel 2007	Advanced
Microsoft Office 2007	Advanced
Word for Windows 2007	Advanced
Microsoft Access 2007	Basic
AutoDesk Maps 3-D 2009	Basic
TOPOS Survey Software	Introductory
COGO	Introductory
Experimental Design	Basic

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Eros Cad	Basic
ARC-GIS version 9.3	Basic