Articulation Agreement between

Fanshawe College

(Science Laboratory Technology and Environmental Technology Programs)

&

The University of Western Ontario

(Environmental Science and Chemistry Modules)

Faculty of Science
The University of Western Ontario

March 2011

This document is based on the original plan developed for students entering Western under the Articulation Agreement agreed to in March 2008. The revisions found here are based on changes made to modules and courses at Western and Fanshawe since the original document was produced. The substance of the original agreement has not changed, just the specific course selection at Western required to graduate with the degrees outlined within.

Advanced Standing Credits granted towards completion of a degree at Western

FANSHAWE SCIENCE LABORATORY TECHNOLOGY DIPLOMA

Fanshawe Courses:	**Western Advanced Standing credits:**
BIOL 1016 + 3010 + 5001	1.0 Year 1 Biology
CHEM 1003 + 1012	Chemistry 1100A/B and 1200B
MTHM 3030 + 3025 + 5008	1.0 Year 1 Math (antirequisite at Western to Calculus1000A/B, Calculus 1100A/B, Statistical Sciences 1024A/B)
PHYS 1001 + 1032 + 3003	1.0 Year 1 Physics
COMM 1004 + 3005	1.0 Year 1 Arts (Communications)
PHYSICS 5001 or BIOL 5003	0.5 senior-level Science
CHEM 3002 + 5001	Chemistry 2213A/B* or 2273A* + 0.5 senior-level Science option
CHEM 3003	Chemistry 2272F
CHEM 5004	Chemistry 3330F/G
CHEM 3004 + 5005	Chemistry 3372F/G
ENVR 1014 + 5005	0.5 senior-level Science
BIOL 3001 + 3003	0.5 senior-level Biology

* If a grade of at least A is achieved in each of CHEM 3002 and CHEM 5001, advanced standing credit for Chemistry 2273A will be granted. If a grade of either B or C is achieved in CHEM 3002 and CHEM 5001, advanced standing credit for Chemistry 2213A/B will be granted.

Advanced Standing Credits granted towards completion of a degree at Western

FANSHAWE ENVIRONMENTAL TECHNOLOGY DIPLOMA

Fanshawe Courses:	**Western Advanced Standing credits**:
BIOL 1016 + 3010 + ENVR 1014	1.0 Year 1 Biology
CHEM 1003 + 1012	Chemistry 1100A/B and 1200B
MTHM 3030 + 3025 + 5008	1.0 Year 1 Math (antirequisite at Western to Calculus1000A/B, Calculus 1100A/B, Statistical Sciences 1024A/B)
PHYS 1001 + 1032 + 3003	1.0 Year 1 Physics
COMM 1004 + 3005	1.0 Year 1 Arts (Communications)
CHEM 3002 + 5001	Chemistry 2213A/B* or 2273A* + 0.5 senior-level Science option
CHEM 3003	Chemistry 2272F
CHEM 3004 + 5005	Chemistry 3372F/G
ENVR 3001 + 3010 + 5003	0.5 senior-level Science
ENVR 5010 + 5006 + 5007	0.5 senior-level Science
ENVR 5005 + 5008	0.5 senior-level Science
BIOL 3001 + ENVR 3009	0.5 senior-level Science

* If a grade of at least A is achieved in each of CHEM 3002 and CHEM 5001, advanced standing credit for Chemistry 2273A will be granted. If a grade of either B or C is achieved in CHEM 3002 and CHEM 5001, advanced standing credit for Chemistry 2213A/B will be granted.

Notes for new Western students with diplomas in either Science Laboratory Technology or Environmental Technology from Fanshawe College

- no longer than 5 years should have elapsed between conferral of diploma and admission to Western (exceptions will be considered on an individual basis)
- a minimum cumulative GPA of 3.0 is required on all courses taken toward completion of diploma. Courses completed during the diploma program, which are not part of the Science Laboratory Technology or Environmental Technology program, and courses completed after the completion of the diploma program will not be counted in the overall cumulative GPA.
- a minimum grade of "C" is required in each course listed for advanced standing consideration
    - Note: if a grade of at least A is achieved in each of CHEM 3002 and CHEM 5001, advanced standing credit for Chemistry 2273A will be granted. If a grade of either B or C is achieved in CHEM 3002 and CHEM 5001, advanced standing credit for Chemistry 2213A/B will be granted.
- advanced standing in Mathematics has been approved in lieu of the usual Year 1 math requirement for entry into either a Major or Minor in Chemistry.
- the 9.0 advanced standing credits granted towards a degree at Western can only be applied toward the module/degree combinations specified below.
- students will be required to complete only 1.0 senior essay course(s) at Western (Environmental Science 3300F/G and 3350F/G will satisfy this requirement), having completed the equivalent of 2.0 essay courses at Fanshawe College.
- 0.5 course from category A (see the Academic Information section of the Academic Calendar) is required in addition to the required 0.5 course in Geography.
- an overall average of 60% is required on all courses taken at Western, and a cumulative average of 60% is required in all courses taken toward each module at Western, for graduation with either a 3-year BSc degree or a 4-year BSc degree.
- an overall average of 65% is required on all courses taken at Western, and a cumulative average of 70% is required in all courses taken toward each Honors Specialization or Major module (with a mark of at least 60% in each of these modular courses) at Western, for graduation with a 4-year BSc (Honors) degree.

3-Year BSc degree at Western

(i) Major in Environmental Science
9.0 advanced standing credits from Fanshawe College + 6.0 courses to be taken at Western:

6.0 courses toward **Major in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 6.5 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 2.5 courses from: Environmental Science 4970F/G or the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas

(ii) Minor in Environmental Science + Minor in Chemistry
9.0 advanced standing credits from Fanshawe College + 6.0 courses to be taken at Western

3.5 courses toward **Minor in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 4.0 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course as the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G

2.5 courses toward **Minor in Chemistry:**

- 1.0 course: Chemistry 2211A/B, 2214A/B
- 1.5 courses from: Chemistry 2223B, 3320A/B, 3364A/B, 3370A/B, 3393A/B

Note: Chemistry 3393A/B requires both Chemistry 2213A/B (or 2273A) and Chemistry 2223B as prerequisite

4-year BSc degree at Western

(i) Specialization in Environmental Science
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

8.5 courses toward **Specialization in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 9.0 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 0.5 course from: Environmental Science 4949F/G, 4970F/G, Biology 4230A/B, 4243G, 4405F/G, 4932F/G, Earth Sciences 4431A/B
- 2.0 courses from the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas
- 2.5 additional courses at the 3000 level or above from: Environmental Science 4970F/G, the Environmental Science Course List

2.5 option courses (2.0 option courses if Psychology 2810 is taken)

(ii) Specialization in Environmental Science + Minor in Chemistry
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

8.5 courses toward **Specialization in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 9.0 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 0.5 course from: Environmental Science 4949F/G, 4970F/G, Biology 4230A/B, 4243G, 4405F/G, 4932F/G, Earth Sciences 4431A/B
- 2.0 courses from the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas
- 2.5 additional courses at the 3000 level or above from: Environmental Science 4970F/G, the Environmental Science Course List

2.5 courses toward **Minor in Chemistry:**

- 1.0 course: Chemistry 2211A/B, 2214A/B

- 1.5 courses from: Chemistry 2223B, 3320A/B, 3364A/B, 3370A/B, 3393A/B

Note: Chemistry 3393A/B requires both Chemistry 2213A/B (or 2273A) and Chemistry 2223B as prerequisites

iii) Major in Environmental Science + Major in Chemistry
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

6.0 courses toward **Major in Environmental Science**:

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 6.5 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 2.5 courses from: Environmental Science 4970F/G, the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas

4.5 courses toward **Major in Chemistry**:

- Chemistry 2271A, 2281G, 2283G, 2374A, 2384B, 3300F/G, 3371F, 3373F, 3374A/B

0.5 option course (No option required if Psychology 2810 is taken)

Notes:

1. Students with less than an A grade in either CHEM 3002 or CHEM 5001 at Fanshawe College must take Chemistry 2273A in addition to the courses listed above for completion of the Major in Chemistry.
2. Enrolment in Chemistry 2281G requires completion of either Chemistry 2271A <u>or</u> 2211A/B (with a minimum mark of 80%).

(iv) Major in Environmental Science + Minor in Chemistry
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

6.0 courses toward **Major in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 6.5 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List

- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 2.5 courses from: Environmental Science 4970F/G, the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas

2.5 courses toward **Minor in Chemistry**:

- 1.0 course from: Chemistry 2211A/B, 2214A/B
- 1.5 courses from: Chemistry 2223B, 3320A/B, 3364A/B, 3370A/B, 3393A/B

2.5 option courses (2.0 option courses if Psychology 2810 is taken)

Note: Chemistry 3393A/B requires both Chemistry 2213A/B (or 2273A) and Chemistry 2223B as prerequisites

(v) Major in Chemistry and Minor in Environmental Science
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

4.5 courses toward **Major in Chemistry**:

- Chemistry 2271A, 2281G, 2283G, 2374A, 2384B, 3300F/G, 3371F, 3373F, 3374A/B

3.5 courses toward **Minor in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 4.0 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G

3.0 option courses (2.5 option courses if Psychology 2810 is taken)

Notes:

1. Students with less than an A grade in either CHEM 3002 or CHEM 5001 at Fanshawe College must take Chemistry 2273A in addition to the courses listed above for completion of the Major in Chemistry.
2. Enrolment in Chemistry 2281G requires completion of either Chemistry 2271A <u>or</u> 2211A/B (with a minimum mark of 80%).

BSc (Honors) degree at Western

(i) Honors Specialization in Environmental Science
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

8.5 courses toward **Honors Specialization in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 9.0 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 0.5 course from: Environmental Science 4949F/G, 4970F/G, Biology 4230A/B, 4243G, 4405F/G, 4932F/G, Earth Sciences 4431A/B
- 1.5 course: Environmental Science 4999E
- 2.0 courses from the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas
- 1.0 additional courses at the 3000 level or above from the Environmental Science Course List

2.5 option courses (2.0 option courses if Psychology 2810 is taken)

(ii) Honors Specialization in Environmental Science + Minor in Chemistry
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

8.5 courses toward **Honors Specialization in Environmental Science**

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 9.0 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 0.5 course from: Environmental Science 4949F/G, 4970F/G, Biology 4230A/B, 4243G, 4405F/G, 4932F/G, Earth Sciences 4431A/B
- 1.5 course: Environmental Science 4999E
- 2.0 courses from the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas
- 1.0 additional courses at the 3000 level or above from the Environmental Science Course List

2.5 courses toward **Minor in Chemistry**:

- 1.0 course from: Chemistry 2211A/B, 2214A/B
- 1.5 courses from: Chemistry 2223B, 3320A/B, 3364A/B, 3370A/B, 3393A/B

Note: Chemistry 3393A/B requires both Chemistry 2213A/B (or 2273A) and Chemistry 2223B as prerequisites

(iii) Major in Environmental Science + Major in Chemistry
9.0 advanced standing credits from Fanshawe College + 11.0 courses to be taken at Western:

6.0 courses toward **Major in Environmental Science**:

- 0.5 course: Chemistry 2210A/B
- 0.5 course from: Biology 2244A/B, Statistical Sciences 2141A/B, 2143A/B, 2244A/B, Psychology 2810 (module will be 6.5 courses if Psychology 2810 is taken)
- 0.5 course from: Biology 2483A or 2485B
- 0.5 course at the 2000 level from Earth Sciences courses in the Environmental Physical Science Course List
- 0.5 course from: Geography 2220A/B (strongly recommended) or a Geography 0.5 course from the Environmental Science Course List
- 1.0 course: Environmental Science 3300F/G, 3350F/G
- 2.5 courses from: Environmental Science 4970F/G, the Environmental Science Course List, including at least 0.5 course from each of the 3 subject areas

4.5 courses toward **Major in Chemistry**:

- Chemistry 2271A, 2281G, 2283G, 2374A, 2384B, 3300F/G, 3371F, 3373F, 3374A/B

0.5 option course (No option required if Psychology 2810 is taken)

Notes:

1. Students with less than an A grade in either CHEM 3002 or CHEM 5001 at Fanshawe College must take Chemistry 2273A in addition to the courses listed above for completion of the Major in Chemistry.
2. Enrolment in Chemistry 2281G requires completion of either Chemistry 2271A <u>or</u> 2211A/B (with a minimum mark of 80%).

Western ENVIRONMENTAL SCIENCE COURSE LISTS

Environmental Life Science Courses

Biology 2290F/G, 2404A, 2217B, 2471A/B, 2484A, 2486A, 3220Z, 3404F/G, 3421F, 3435F/G, 3436F/G, 3440A/B, 3442F/G, 3445F, 3446B, 3475A/B, 4223F/G, 4230A/B, 4243G, 4257Z, 4258Z, 4259F/G, 4405F/G, 4436F/G, 4441F;
Earth Sciences 2265A/B, 3369A/B;
Geography 2131A/B, 2320A/B, 3321A/B;
Pathology 3240A, 3245B;
Pharmacology 3560A/B or the former 357;
Microbiology and Immunology 2100A;
Or a course approved for this category by an Environmental Science counsellor.

Environmental Physical Science Courses

Chemical and Biochemical Engineering 4409A/B or the former 3363A/B;
Chemistry 2213A/B, 2272F, 3372F/G;
Civil and Environmental Engineering 3328A/B, 3362A/B, 4405A/B, 4465A/B, 4477A/B;
Earth Science 2200A/B, 2220A/B, 2222A/B, 2230A/B, 2240F/G, 3320A/B, 3321A/B, 3340A/B, 3341A/B, 4431A/B, 4440A/B;
Geography 2122A/B, 2210A/B, 2220A/B, 2230A/B, 2240A/B, 2310A/B, 2330A/B, 3221A/B, 3222A/B, 3223A/B, 3231A/B, 3260A/B, 3311A/B, 3312A/B, 3331A/B, 3333A/B, 3334A/B, 3341A/B, 3342A/B, 3350A/B, 3351A/B, 3352A/B;
Medical Biophysics 3336F/G;
Physics 2070A/B, 2700A/B;
Or a course approved for this category by an Environmental Science counsellor.

Environmental Philosophy, Policy and Political Science Courses

Anthropology 2203F/G, 3369F/G;
Economics 2172A/B or 3374A/B;
Economics 2170A/B (Huron);
First Nations 2111E, 2132F/G, 2203F/G, 2218F/G, 2601F/G, 3140F/G, 3722F/G;
Geography All courses in the 2010-2090 series, the 2151-2162 series, and the 2410-2460 series, 3250A/B, 3432A/B, 3441F/G, 3451A/B, 3452A/B, 3453F/G, 3459A/B, 4430A/B;
History 3225F/G (additional antirequisite, History 2123), History 3407F/G; History 2123 (Brescia College; additional antirequisite, History 3225F/G), History 2211E, 3217E, 4705E;
Political Science 2137, 2235E; Political Science 3379E (Huron);
Philosophy 2033A/B, 2035F/G;
Sociology 2103F/G, 2104F/G, 2107A/B, 2151A/B;
Or a course approved for this category by an Environmental Science counsellor.

Advanced Standing Credits for completion of degree at Western towards a diploma at Fanshawe College

Completion of a 3-year or 4-year Bachelor Degree at The University of Western Ontario, including one or more of the following modules:

- Minor in Environmental Science
- Major in Environmental Science
- Specialization in Environmental Science
- Honors Specialization in Environmental Science

The degree must include the following credits, not necessarily required in the Environmental Science modules:

- 1.0 course from Physics 1028A/B or 1301A/B or 1501A/B and 1029A/B or 1302A/B or 1502A/B, or the former Physics 022, 025, 1020, or 1024
- 1.0 course from Year 1 Earth Science courses
- Earth Sciences 3340A/B and 4440A/B
- Chemical and Biochemical Engineering 3363A/B, formerly Engineering 363a/b

In cases where the Western course complement differs from the above, please contact the Fanshawe College Environmental Technology Coordinator.

The degree should include both Chemistry 2213A/B or 2273A, and 2272F. If these courses are not successfully completed at Western, comparable courses will be required at Fanshawe College, increasing the time needed to complete the diploma. Should a student lack Chem 2272F, it may be necessary to first enrol in Fanshawe's Summer Semester to take CHEM 3003.

Assistance in obtaining a Co-op position will be available following successful completion of 10 Fanshawe College credits.

Successful completion of a degree, including the above-mentioned modules and courses, will permit completion of a diploma in Environmental Technology in 20 months, including a summer coop placement. Because of course prerequisites and schedules, it is most desirable to enter Fanshawe College in the Summer Semester. The courses required at Fanshawe are as follows:

Summer semester	**Fall Semester**	**Winter Semester**	**Summer semester**	**Fall Semester**
ENVR-3010 *	ENVR-5010	ENVR-3009	4 month Coop work term	ENVR-5005
ENVR-3001*	ENVR-3007	CHEM-3004		ENVR-5008
GEOL-3001	ENVR-5003	BIOL-3001		ENVR-5006
MATH-3030				ENVR-5007
CHEM-3003**				CHEM-5005

* Combined as one course.
** Only for students who have not taken Chem 2272F at Western.