1.0 Degree Title
Specify the two degrees for concurrent degree programs
B.Sc.

1.1 Major (Legacy = Subject) (30-char. max.)
Earth System Science

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)

1.3 Minor (with Concentration, if applicable)
(30 char. max.)

1.4 Category

- [ ] Faculty Program (FP)
- [ ] Honours (HON)
- [x] Major
- [ ] Joint Honours
- [ ] Component (HC)
- [ ] Internship/Co-op
- [ ] Thesis (T)
- [ ] Non-Thesis (N)
- [ ] Other

Please specify

1.5 Complete Program Title
Major in Earth System Science

2.0 Administering Faculty/Unit

Science

2.1 Offering Faculty/Department
AOS/EPS/GEOG

3.0 Effective Term of revision or retirement
Please give reasons in 5.0 “Rationale” in the case of retirement
(Ex. Sept. 2004 = 200409) □ Retirement

Term: 200709

4.0 Existing Credit Weight
57

Proposed Credit Weight
57

5.0 Rationale for revised program
These changes were required by MELS before approval of the program was granted. They include incorporation of a course dealing with social science issues in the Required List, removal of a set of complementary courses to the more general list and inclusion of several courses in Resources and Natural Risks and Hazards.

6.0 Revised Program Description (Maximum 150 words)

These changes were required by MELS before approval of the program was granted. They include incorporation of a course dealing with social science issues in the Required List, removal of a set of complementary courses to the more general list and inclusion of several courses in Resources and Natural Risks and Hazards.
### 7.0 List of existing program and proposed program

<table>
<thead>
<tr>
<th>Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)</th>
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</table>
| **MAJOR IN EARTH SYSTEM SCIENCE**  
(57 credits)  
(Awaiting approval of the Ministère de l’Éducation, du Loisir, et du Sport)  
**Required Courses**  
(33 credits)  
| ATOC 214  
(3) Introduction: Physics of the Atmosphere  
| BIOL 215  
(3) Introduction to Ecology and Evolution  
| ENVR 200  
(3) The Global Environment  
| ESYS 200  
(3) Earth System Processes  
| GEOG 203  
(3) Environmental Systems  
| MATH 203  
(3) Principles of Statistics 1 (or equivalent course)  
| MATH 222  
(3) Calculus 3  
| ATOC 308  
(3) Principles of Remote Sensing  
| or GEOG 308  
| ESYS 300  
(3) Investigating the Earth System  
| ESYS 301  
(3) Earth System Modelling  
| ESYS 500  
(3) Earth Systems Applications  |
| **Complementary Courses**  
(24 credits)  
| 3 credits, one of the following courses:  
| EPSC 210  
(3) Introductory Mineralogy  
| EPSC 220  
(3) Principles of Geochemistry  
| 3 credits, one of the following courses:  
| ATOC 215  
(3) Oceans, Weather and Climate  
| EPSC 212  
(3) Introductory Petrology  
| GEOG 272  
(3) Earth’s Changing Surface  |
| 18 credits from the following course list, with at least 3 credits from each of subject codes ATOC, EPSC, and GEOG. At least 9 of the 18 credits must be at the 400 level or higher.  
| ATOC 309  
(3) Weather Radars and Satellites  
| ATOC 315  
(3) Water in the Atmosphere  
| ATOC 412  
(3) Atmospheric Dynamics  
| ATOC 419  
(3) Advances in Chemistry of Atmosphere  
| ATOC 512  
(3) Atmospheric and Oceanic Dynamics  
| ATOC 513  
(3) Waves and Stability  
| ATOC 530  
(3) Climate Dynamics 1  
| ATOC 531  
(3) Climate Dynamics 2  
| ATOC 540  
(3) Synoptic Meteorology 1  
| ATOC 541  
(3) Synoptic Meteorology 2  
| BIOL 308  
(3) Ecological Dynamics  
| BIOL 309  
(3) Mathematical Models in Biology  
| BIOL 432  
(3) Limnology  
| BIOL 441  
(3) Biological Oceanography  
| BIOL 465  
(3) Conservation Biology  
| BIOL 534  
(3) Theoretical Ecology  
| BIOL 540  
(3) Ecology of Species Invasions  
| BREE 319  
(3) Engineering Mathematics (offered on Macdonald Campus)  |

<table>
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<tr>
<th>Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)</th>
</tr>
</thead>
</table>
| **MAJOR IN EARTH SYSTEM SCIENCE**  
(57 credits)  
(Awaiting approval of the Ministère de l’Éducation, du Loisir, et du Sport)  
**Required Courses**  
(36 credits)  
| ATOC 214  
(3) Introduction: Physics of the Atmosphere  
| BIOL 215  
(3) Introduction to Ecology and Evolution  
| ENVR 200  
(3) The Global Environment  
| ESYS 200  
(3) Earth System Processes  
| GEOG 203  
(3) Environmental Systems  
| MATH 203  
(3) Principles of Statistics 1 (or equivalent course)  
| MATH 222  
(3) Calculus 3  
| ATOC 308  
(3) Principles of Remote Sensing  
| or GEOG 308  
| ESYS 300  
(3) Investigating the Earth System  
| ESYS 301  
(3) Earth System Modelling  
| ESYS 500  
(3) Earth Systems Applications  |
| **Complementary Courses**  
(21 credits)  
| 3 credits, one of the following courses:  
| EPSC 210  
(3) Introductory Mineralogy  
| EPSC 220  
(3) Principles of Geochemistry  
| 3 credits, one of the following courses:  
| ATOC 215  
(3) Oceans, Weather and Climate  
| EPSC 212  
(3) Introductory Petrology  
| GEOG 272  
(3) Earth’s Changing Surface  |
| 18 credits from the following course list, with at least 3 credits from each of subject codes ATOC, EPSC, and GEOG. At least 9 of the 18 credits must be at the 400 level or higher.  
| ATOC 309  
(3) Weather Radars and Satellites  
| ATOC 315  
(3) Water in the Atmosphere  
| ATOC 412  
(3) Atmospheric Dynamics  
| ATOC 419  
(3) Advances in Chemistry of Atmosphere  
| ATOC 512  
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<th>Course Code</th>
<th>Course Title</th>
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<td>EPSC 312</td>
<td>Spectroscopy of Minerals</td>
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<td>EPSC 320</td>
<td>Elementary Earth Physics</td>
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<td>EPSC 331</td>
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<td>EPSC 334</td>
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<td>EPSC 425</td>
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<td>GEOG 522</td>
<td>Advanced Environmental Hydrology</td>
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<td>GEOG 535</td>
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<td>GEOG 536</td>
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<td>GEOG 537</td>
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<td>PHYS 342</td>
<td>Electromagnetic Waves</td>
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</table>

Note: Courses at the 300 level or higher in other departments in the Faculties of Science and Engineering may also be used as complementary credits, with the permission of an academic adviser. Please see the list posted on the Departmental webpage.
8.0 Consultation with Related Units

<table>
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Attach list of consultations

9. Approvals

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Submitted by

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Program/Major or Minor/ Concentration Revision Form P2-4