

# ENVIRONMENTAL TOXICOLOGY – SPECIALIZATION (SCIENCE) – BACHELOR OF SCIENCE (HONOURS)

## ETOX-P-BSH

**Subject:** Administered by the School of Environmental Studies.

**Plan:** Consists of 102.00 units as described below.

**Program:** The Plan, with sufficient electives to total 120.00 units, will lead to a Bachelor of Science (Honours) Degree.

Requirements for this program have been modified. Please consult the [2021-2022 Calendar](#) for the previous requirements.

| Code   | Title   | Units |
|--|---|-------|
| <b>1. Core</b>   |   |       |
| – CORE SCIENCE –                                       |   |       |
| <b>A. Complete the following:</b>                      |   |       |
| BIOL 102   | Fundamentals of Biology: Molecular and Cell Biology                                       | 3.00  |
| BIOL 103   | Fundamentals of Biology: Organisms to Ecosystems  | 3.00  |
| <b>B. Complete the following:</b>                      |   |       |
| CHEM 112   | General Chemistry   | 6.00  |
| <b>C. Complete the following:</b>                      |   |       |
| GPHY 101   | Human Geography   | 3.00  |
| GPHY 102   | Physical Geography and Natural Resources  | 3.00  |
| <b>D. Complete 3.00 units from the following: 3.00</b> |   |       |
| GEOL 104   | The Dynamic Earth   |       |
| GEOL 107   | History of Life   |       |
| <b>E. Complete 6.00 units from the following: 6.00</b> |   |       |
| MATH 111   | Linear Algebra  |       |
| MATH 120   | Differential and Integral Calculus  |       |
| MATH 121   | Differential and Integral Calculus  |       |
| MATH 123   | Differential and Integral Calculus I & MATH 124 and Differential and Integral Calculus II |       |
| – CORE ENVIRONMENTAL TOXICOLOGY –                      |   |       |
| <b>F. Complete the following:</b>                      |   |       |
| BIOL 200   | Diversity Of Life   | 3.00  |
| BIOL 205   | Mendelian and Molecular Genetics  | 3.00  |
| BIOL 212   | Scientific Methods in Biology   | 3.00  |
| BIOL 243   | Introduction to Statistics  | 3.00  |
| <b>G. Complete 9.00 units from the following: 9.00</b> |   |       |
| CHEM 213   | Introduction to Chemical Analysis   |       |
| CHEM 281   | General Organic Chemistry I (with Virtual Laboratory)                                     |       |

|  |  |      |
|--|--|------|
| CHEM 282   | General Organic Chemistry II or CHEM 2General Organic Chemistry II (with Virtual Laboratory) |      |
| <b>H. Complete the following:</b>  |  |      |
| ENSC 201   | Environmental Toxicology and Chemical Risks  | 3.00 |
| <b>I. Complete the following:</b>  |  |      |
| CHEM 326   | Environmental and Green Chemistry  | 3.00 |
| <b>J. Complete the following:</b>  |  |      |
| ENSC 425   | Ecotoxicology  | 3.00 |
| <b>K. Complete the following:</b>  |  |      |
| PHAR 416   | Xenobiotic Disposition and Toxicity  | 3.00 |
| – CORE SOCIAL SCIENCES AND HUMANITIES –  |  |      |
| <b>L. Complete the following:</b>  |  |      |
| ENSC 103   | Environment and Sustainability   | 3.00 |
| <b>M. Complete the following:</b>  |  |      |
| ENSC 230   | Principles of Sustainability   | 3.00 |
| ENSC 330   | Applications of Sustainability   | 3.00 |
| <b>N. Complete 6.00 units the following: 6.00</b>                              |  |      |
| ENSC 430   | Honours Projects in Environmental Sustainability   |      |
| ENSC 501   | Independent Environmental Study  |      |
| <b>2. Option</b>   |  |      |
| <b>A. Complete 3.00 units from the following: 3.00</b>                         |  |      |
| GEOL at any level  |  |      |
| <b>B. Complete 3.00 units from the following course list: 3.00</b>             |  |      |
| ENSC_Specialization_Options_B  |  |      |
| <b>C. Complete 3.00 units from the following course list: 3.00</b>             |  |      |
| ENSC_Interdisciplinary_Humanities  |  |      |
| <b>D. Complete 6.00 units from one of the following options: 6.00 options:</b> |  |      |
| <b>i. Biochemistry, Molecular Biology or Cell Biology Option:</b>              |  |      |
| a. ETOX_Molecular and Cell Biology   |  |      |
| <b>ii. Physiology Option:</b>  |  |      |
| a. ETOX_Physiology   |  |      |
| <b>iii. Ecology Option:</b>  |  |      |
| a. ETOX_Ecology  |  |      |
| <b>F. Complete 12.00 units from the following course list: 12.00</b>           |  |      |
| ETOX_Options   |  |      |
| <b>Electives</b>   |  |      |



|                    |               |
|--------------------|---------------|
| Elective Courses   | 18.00         |
| <b>Total Units</b> | <b>120.00</b> |

### 3. Substitutions

A. A course in statistics, as approved by the Chair of Undergraduate Studies, may be substituted for BIOL 243 in Core **1.F**.

B. ENSC 502 may be substituted for requirement **1.N**, and a further 6.00 units in electives and/or Plan requirements as approved by the Chair of Undergraduate Studies.

### 4. Notes

A. Students are strongly advised to complete all requirements for 100- and 200-level courses in their first and second year, paying special attention to prerequisites and corequisites needed in 300- and 400-level courses.

B. BIOL 206 is highly recommended as it is a prerequisite for upper-year Ecology courses (e.g., BIOL 300, 323).

C. A maximum of 6.00 units from courses offered by other Faculties and Schools may be counted toward the program and/or Plan requirements. This includes courses in BMED, COMM, GLPH, LAW, NURS and courses in the Faculty of Engineering and Applied Science.

### Environmental Toxicology Course Lists

The following lists contain courses offered through other Departments. In accordance with Academic Regulation **2.5** (Access to Classes), students do not have enrolment priority in all of these courses. Access to these courses may only be made available during the Open Enrolment period, and then only if space permits.

#### ENSC\_Specialization\_Options\_B

| Code   | Title                                       | Units |
|--|---|-------|
| <b>Options in the Environmental Science Specialization Plans, List B</b> |   |       |
| BIOL 335   | Limnology and Aquatic Ecology               | 3.00  |
| ENSC 307   | Marine Environmental Issues                 | 3.00  |
| ENSC 201   | Environmental Toxicology and Chemical Risks | 3.00  |
| ENSC 301   | Environmental Assessment                    | 3.00  |
| ENSC 320   | Wildlife Issues in a Changing World         | 3.00  |
| ENSC 407   | Global Water Issues                         | 3.00  |
| ENSC 425   | Ecotoxicology                               | 3.00  |
| ENSC 471   | Environmental Analysis Methods              | 3.00  |
| ENSC 480   | Special Topics in Environmental Science     | 3.00  |
| GEOL 106   | Environmental Geology and Natural Hazards   | 3.00  |

|          |                                  |      |
|----------|----------------------------------|------|
| GEOL 107 | History of Life                  | 3.00 |
| GEOL 200 | Oceanography                     | 3.00 |
| GPHY 207 | Principles Of Biogeography       | 3.00 |
| GPHY 209 | Weather and Climate              | 3.00 |
| GPHY 304 | Northern and Arctic Environments | 3.00 |
| GPHY 306 | Natural Environmental Change     | 3.00 |
| GPHY 312 | Watershed Hydrology              | 3.00 |
| GPHY 314 | Climate Change                   | 3.00 |
| GPHY 317 | Soil, Environment, and Society   | 3.00 |
| GPHY 318 | Advanced Biogeography            | 3.00 |
| GPHY 319 | Contemporary Energy Resources    | 3.00 |

#### ENSC\_Interdisciplinary\_Humanities

| Code  | Title   | Units |
|---|---|-------|
| <b>Environmental Science/Studies Interdisciplinary Humanities Options</b> |   |       |
| CLST 214  | Ancient Science                                   | 3.00  |
| DEVS 220  | Introduction to Indigenous Studies                | 3.00  |
| DEVS 221  | Indigenous Studies II - Resistance and Resurgence | 3.00  |
| PHIL 203  | Science and Society                               | 3.00  |
| PHIL 293  | Humans and the Natural World                      | 3.00  |
| PHIL 310  | Development Ethics                                | 3.00  |
| PHIL 493  | Ethics and the Environment                        | 3.00  |
| RELS 235  | Religion and Environment                          | 3.00  |

#### ETOX\_Ecology

| Code   | Title  | Units |
|--|--|-------|
| <b>Environmental Toxicology Ecology Option</b> |  |       |
| BIOL 300                                       | Ecology  | 3.00  |
| BIOL 323                                       | Vertebrate Diversity and Evolution             | 3.00  |
| BIOL 335                                       | Limnology and Aquatic Ecology                  | 3.00  |
| BIOL 410                                       | Ecology of Lakes and Streams                   | 3.00  |
| BIOL 416                                       | Terrestrial Ecosystems                         | 3.00  |
| BIOL 509                                       | Limnological Environmental Studies             | 3.00  |
| BIOL 510                                       | The Biology of Sustainability                  | 3.00  |
| BIOL 527                                       | Paleolimnology and Global Environmental Change | 3.00  |

#### ETOX\_Molecular and Cell Biology

| Code  | Title                              | Units |
|---|------------------------------------|-------|
| <b>Environmental Toxicology Molecular and Cell Biology Option</b> |                                    |       |
| BCHM 218  | Molecular Biology                  | 3.00  |
| BIOL 330  | Cell Biology                       | 3.00  |
| BIOL 334  | Comparative Biochemistry           | 3.00  |
| BIOL 403  | Experimental Techniques in Biology | 3.00  |

|          |  |      |
|----------|--|------|
| BIOL 404 | Techniques in Molecular Biology                          | 3.00 |
| BIOL 430 | Molecular Genetics of Development                        | 3.00 |
| BIOL 431 | Cellular Basis of Adaptation                             | 3.00 |
| BIOL 502 | Plant Cell Responses to Environmental Stress             | 3.00 |
| BIOL 506 | Biochemical Adaptations to Life Under Extreme Conditions | 3.00 |
| BIOL 508 | Biology of the Cell Cycle                                | 3.00 |
| MICR 360 | Immunology   | 3.00 |

### ETOX\_Options

| Code  | Title | Units |
|---|-------|-------|
| <b>Options in the Environmental Toxicology Plan</b> |       |       |
| BIOL at the 300-level or above                      |       |       |
| CHEM at the 300-level or above                      |       |       |
| ENSC at the 300-level or above                      |       |       |
| EPID at the 300-level or above                      |       |       |
| GEOL at the 300-level or above                      |       |       |
| GPHY at the 300-level or above                      |       |       |

### ETOX\_Physiology

| Code  | Title  | Units |
|---|--|-------|
| <b>Environmental Toxicology Physiology Option</b> |  |       |
| BIOL 322  | Environmental Physiology of Animals          | 3.00  |
| BIOL 339  | Animal Physiology                            | 3.00  |
| BIOL 341  | Plant Physiology                             | 3.00  |
| BIOL 401  | Experimental Approaches to Animal Physiology | 3.00  |
| BIOL 402  | Experiments in Plant Physiology              | 3.00  |