

# ENSP – Global Environmental Change

**Effective -- Fall 2016**

Reviewed 10.12.16 - WW

| <b>ENSP Core</b>   |   |                                  |              | <b>General Education</b>   |               |           |
|--|---|----------------------------------|--------------|--|---------------|-----------|
| <b>All</b>   |   |                                  |              | <b>Fundamental Studies (15 credits)</b>                                  |               |           |
| <b>Course</b>  | <b>Title</b>  | <b>Offered</b>                   | <b>Grade</b> | <b>Requirements</b>  | <b>Course</b> | <b>Cr</b> |
| ENSP101 (NS)<br>ENSP102 (HS)<br>ENSP400 (SP)   | Intro to Env Science<br>Intro to Env Policy<br>Senior Capstone  | Fa<br>Sp<br>Fa,Sp                |              | Academic Writing (AW)  |               | 3         |
| <b>Applied Science and Policy (one)</b>  |   |                                  |              | <b>Distributive Studies (25 credits)</b>                                 |               |           |
| ENSP305<br>ENSP330<br>ENSP340<br>ENSP342<br>ENSP350  | Quant. Methods<br>Environmental Law<br>Sci, Ethics, Law: Water<br>Oceans: Integ. Policy<br>Energy & Science | Sp<br>Fa, Sp<br>Fa<br>Sp<br>TBA  |              | Professional Writing (PW)  |               | 3         |
| <b>Calculus (one)</b>  |   |                                  |              | <b>I-Series (6 credits)*</b>   |               |           |
| MATH120 (MA)<br>MATH140 (MA)   | Elementary Calculus<br>Calculus I ( <i>strongly recommended</i> )   | Fa,Sp,Su<br>Fa,Sp,Su             | <b>Grade</b> | Natural Sciences w/Lab (NL)  | ENSP Lab Sci  | 4         |
| <b>Statistics (one)</b>  |   |                                  |              | <b>Diversity (4-6 credits)*</b>  |               |           |
| BIOM301 (AR)<br>GEOG306 (AR) **<br>PSYC200 (AR)  | Intro to Biometrics<br>Intro to Quant Methods<br>Stat Methods in Psyc                                       | Fa,W,Sp<br>Fa,Sp,Su,<br>Fa,Sp,Su | <b>Grade</b> | Natural Science (NS)   | ENSP 101      | 3         |
| <b>One course from each group below:</b>   |   |                                  |              | <b>Humanities (HU1)</b>  |               |           |
| <b>Biology</b>   |   |                                  |              | <b>Humanities (HU2)</b>  |               |           |
| BSCI160/161 (NL)   | Ecology & Evolution/Lab   | Fa,Sp,Su                         | <b>Grade</b> | Scholarship in Practice (SP, major)                                      | ENSP 400      | 3         |
| <b>Chemistry</b>   |   |                                  |              | <b>Scholarship in Practice (SP, non-major)</b>                           |               |           |
| CHEM131/132 (NL)   | Gen Chemistry I/Lab   | Fa,Sp,Su                         | <b>Grade</b> |  |               | 3         |
| <b>Earth Sci</b>   |   |                                  |              | <b>Experiential Learning (0-3 credits)*</b>                              |               |           |
| GEOG201/211 (NL)   | Geog Environ Sys/Lab  | Fa,Sp,Su                         | <b>Grade</b> | <b>* May overlap with major requirements</b>                             |               |           |
| <b>Economics (one)</b>   |   |                                  |              | <b>Graduation Requirements</b>   |               |           |
| AREC240 (HS)<br>AREC241 (HS, IS)   | Intro to Econ and Env<br>Env, Econ, and Policy  | Sp<br>Fa                         |              | <b>_____ Up to 6 AP courses may be used for Gen Ed</b>                   |               |           |
| <b>Geography (one)</b>   |   |                                  |              | <b>_____ There are <u>at least 40 non-overlapping Gen Ed</u> credits</b> |               |           |
| GEOG130 (HS)<br>GEOG140 (IS)<br>GEOG170 (NS)<br>GEOG202 (CC)   | Developing Countries<br>Natural Disasters<br>Meth of Geospatial Anal<br>Intro to Human Geog                 | Fa,Su<br>Fa, Sp<br>Fa<br>Sp      |              | <b>_____ No more than 60 credits earned from Community College</b>       |               |           |
| <b>ENSP Graduation Requirements</b>  |   |                                  |              | <b>_____ Last 30 credits must be earned at Maryland</b>                  |               |           |
| _____ Students must earn <u>C- or higher</u> in all courses used for ENSP Core and Concentration requirements. |   |                                  |              | <b>_____ 120+ cumulative credits and 2.0+ cum GPA</b>                    |               |           |
| _____ Students' major GPA must be 2.0 or higher.   |   |                                  |              |  |               |           |

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### REQUIREMENTS:

#### >>> LOWER LEVEL requirements (18-19 credits):

| Course  | Description  | Cr            | Offered                 | Prerequisites                                   | Grade                |
|---|--|---------------|-------------------------|---|----------------------|
| GEOL 100                                      | Introduction to Geology  | 3             | F, Sp, Su               |   |                      |
| MATH 141 <i>or</i><br>MATH 121                | Calculus II [ <i>strongly recommended</i> ] <i>or</i><br>Elementary Calculus II                            | 4<br>3        | F, Sp, Su<br>F, Sp, Su  | MATH 140<br>MATH 220                            | ____<br>____         |
| PHYS161/174<br>PHYS 141 <i>or</i><br>PHYS 121 | Gen Phys: Mechanics and Particle Dyn /Lab<br>Prin of Physics [ <i>strongly recomm</i> ]<br>Fund of Physics | 3/1<br>4<br>4 | F, Sp<br>F, Sp<br>F, Sp | MATH141<br><i>No longer offered</i><br>MATH 115 | ____<br>____<br>____ |
| CHEM 231/232                                  | Organic Chemistry I  | 4             | F, Sp, Su               | CHEM 131/132                                    | ____                 |
| ENST 200 <i>or</i><br>GEOL 102                | Introduction to Soil Science* <i>or</i><br>Historical Geology  | 4<br>4        | Fa<br>Sp                | CHEM 131/132<br>GEOL 100                        | ____<br>____         |

>>> **UPPER LEVEL requirements (18-19 credits):** Special care needs to be taken in planning your junior and senior years, as many courses and their pre-requisites are offered only once annually. Please see your advisor for help with this as early as possible!

| Course  | Description   | Cr                    | Offered                             | Prerequisites  | Grade                                |
|---|---|-----------------------|-------------------------------------|--|--------------------------------------|
| GEOG 342 <i>or</i><br>BSCI 361  | Intro to Biogeography <i>or</i><br>Principles of Ecology  | 3<br>4                | Sp<br>Fa, Sp                        | <i>No longer offered.</i><br>BSCI 160/161  | ____<br>____                         |
| GEOG 331  | Intro to Hum Dimen of Global Chng   | 3                     | Sp                                  | GEOG 201 <i>or</i> GEOG 202  |                                      |
| GEOG 345 <i>or</i><br>GEOG 398B   | Intro to Climatology<br>Adv Geographical Environmental Systems  | 3<br>3                | F<br>S                              | <i>No longer offered</i><br>GEOG201  |                                      |
| GVPT 306 <i>or</i><br>AREC 332 <i>or</i><br>ENSP340 <i>or</i><br>ENSP342 <i>or</i><br>ENSP350 | Global Ecopolitics <i>or</i><br>Intro to Natural Resource Policy<br>Science, Ethics, and Policy of Water<br>Env Threats to Oceans and Coasts:<br>Energy Resources: Science and Policy | 3<br>3<br>3<br>3<br>3 | Fa,Sp,Su<br>F<br>Sp<br>TBA          | GVPT 200<br><i>No longer offered.</i><br>60 credits; ENSP101 and 102<br>60 credits; ENSP101 and 102<br>60 credits; ENSP101 and 102 | ____<br>____<br>____<br>____<br>____ |
| GEOG 442 <i>or</i><br>GEOG 445 <i>or</i><br>AOSC 400 <i>or</i><br>GEOL 437                    | Biogeography and Enviro. Change <i>or</i><br>Climatology <i>or</i><br>The Atmosphere <i>or</i><br>Global Climatic Chng: Past and Pres   | 3<br>3<br>3<br>3      | F<br>Sp<br>F<br>Sp, even #<br>years | GEOG301, GEOG201/211; <i>or</i> perm.<br>GEOG 345<br>MATH 140<br>CHEM 131/132, MATH 140, GEOL 100                                  | ____<br>____<br>____<br>____         |
| ENSP 386  | Internship  | 3-6                   | F, Sp, Su                           | Perm.  |                                      |

>>> **TECHNIQUES & METHODS (9 credits):** Select at least 3 courses and 9 credits in consultation with your advisor. Selections must be approved in advance.

| Course                          | Description  | Cr     | Offered        | Prerequisites   | Grade |
|---------------------------------|--|--------|----------------|---|-------|
| GEOG 372                        | Remote Sensing   | 3      | Sp, Su, W      |   |       |
| GEOG 373 <i>or</i><br>ENST 415  | Geographic Information Systems<br>GIS Applications in Soil Science | 3<br>3 | F,W, Su<br>F   | <i>No longer offered.</i>   |       |
| GEOG 418                        | Field & Lab Techniques in Env Science                              | 3      | F              | <i>The field component is taught in Sum Session; check Sched of Classes</i> |       |
| GEOG 472                        | Advanced Remote Sensing  | 3      | F              | GEOG 372  |       |
| GEOG 473                        | GIS & Spatial Analysis   | 3      | Sp             | GEOG 373  |       |
| GEOG 498C <i>or</i><br>MATH 246 | Climate Modeling and Analysis <i>or</i><br>Differential Equations  | 3<br>3 | F<br>F, Sp, Su | GEOG 445<br>MATH 141 and 240 <i>or</i> PHYS 161                             |       |
| MATH 240                        | Introduction to Linear Algebra                                     | 4      | F, Sp, Su      |   |       |
| MATH 241                        | Calculus III   | 4      | F, Sp, Su      |   |       |
| PHYS 165                        | Intro to Programming in the Phys Sci                               | 3      | F              | PHYS 141 <i>or</i> Physics AP score 3+                                      |       |

*Cont'd (over) →*

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**RESTRICTED ELECTIVES (9 credits):** Select at least 6 credits from one area and 3 credits from the other. Also, course selections may not “count” twice, e.g., once in “Upper Level Requirements” and again in “Restricted Electives.”

### >>> Area 1 - Physical and Biological Components

| Course                         | Description                              | Cr     | Offered   | Prerequisites  | Grade        |
|--------------------------------|--|--------|-----------|--|--------------|
| AOSC 400                       | The Atmosphere                           | 3      | F         | MATH 141, PHYS 161 or 171, or perm.                              |              |
| AOSC 401                       | Global Environment                       | 3      | Sp        | AOSC 400   |              |
| AOSC 434                       | Air Pollution                            | 3      | Sp        | CHEM 113 and MATH 241 or perm.                                   |              |
| BSCI 460 <i>or</i><br>BSCI 462 | Plant Ecology<br>Population Ecology      | 3<br>3 | F<br>F    | BSCI 160/161<br>BSCI 160/161 and MATH 220                        | ____<br>____ |
| ENST 450                       | Wetland Ecology                          | 3      | F         | BIOM 301.  |              |
| GEOG 340 <i>or</i><br>GEOL 340 | Geomorphology <i>or</i><br>Geomorphology | 3<br>4 | TBA<br>Sp | GEOG 201<br>GEOL 100 or GEOL 120                                 | ____<br>____ |
| GEOG398B                       | Adv Geographical Environmental Systems   | 3      | Sp        |  |              |
| GEOG 441                       | The Coastal Ocean                        | 3      | Sp        | GEOG 201.  |              |
| GEOG 442                       | Biogeography and Environmental Change    | 3      | F         | GEOG301, GEOG201/211; or perm.                                   |              |
| GEOG 445                       | Climatology                              | 3      | Sp        | GEOG 345   |              |
| GEOL 437                       | Global Climatic Chng: Past and Present   | 3      | Sp        | CHEM 103, MATH 140, GEOL 100                                     |              |
| GEOL 444                       | Low Temperature Geochemistry             | 3      | F         | GEOL 100/110, GEOL 322, CHEM 131/132, MATH115 or perm.           |              |
| GEOL 452                       | Watershed and Wetland Hydrology          | 3      | Fa        | MATH 140, GEOL 100, CHEM 131/132, or perm                        |              |
| GEOL453                        | Restoration Ecology                      | 3      | F         | BSCI 160/161   |              |
| ENST 479                       | Tropical Ecology and Resource Mgt        | 3      | Sp        | BSCI 160/161. <i>Course has required travel-study component.</i> |              |
| PLSC 471                       | Forest Ecology                           | 3      | Sp        | BSCI 160/161   |              |

### >>> Area 2 - Human Dimensions

| Course                         | Description  | Cr     | Offered  | Prerequisites  | Grade |
|--------------------------------|--|--------|----------|--|-------|
| ANTH 450                       | Environmental Anthropology   | 3      | S        | Jr. standing   |       |
| AREC 453                       | Natural Resources and Public Policy                                  | 3      | F        | ECON200, 201, and AREC 326   |       |
| AREC 454                       | Economics of Global Change   | 3      | Sp       | ECON200, 201, and AREC 326   |       |
| AREC 455                       | Economics of Land Use  | 3      | F        | ECON200, 201, and AREC 326   |       |
| GEOG 330                       | Society and Sustainability (Gen Ed UP, IS)                           | 3      | F        |  |       |
| GEOG 431                       | Culture & Natural Resource Mgt                                       | 3      | F        |  |       |
| GEOG 435 <i>or</i><br>GEOG398C | Population Geography<br>Population Geography                         | 3<br>3 | Sp<br>Sp |  |       |
| GVPT 306                       | Global Ecopolitics   | 3      | Sp       | GVPT 200   |       |
| ENST 440                       | Crops, Soils and Civilization  | 3      | Sp       |  |       |
| ENST 441                       | Sustainable Agriculture  | 3      | F        |  |       |
| SOCY 305 <i>or</i><br>SOCY 405 | Scarcity and Modern Society<br>Scarcity and Modern Society (seminar) | 3<br>3 | Sp<br>Sp | 3 cr. in SOCY or ENSP 102 or perm.<br>3 cr. in SOCY or ENSP 102 or perm. |       |

**Advisor notes, approved course substitutions, etc:**