

# ENSP – Environmental Economics

**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>  |  |  |              | Professional Writing (PW) 3   |               |           |               |  |  |   |
| 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                                    | Fa, Sp<br>Fa<br>Sp<br>Sp<br>TBA              |              | Oral Communication (OC)   |               | 3         |               |  |  |   |
| <b>Calculus (one)</b>  |  |  |              | Math (MA) Calculus 3-4  |               |           |               |  |  |   |
| MATH120 (MA)<br>MATH140 (MA)   | Elementary Calculus<br>Calculus I ( <i>recommended</i> )   | Fa,Sp,Su<br>Fa,Sp,Su                         | <b>Grade</b> | Analytical Reasoning (AR)   |               |           |               |  |  |   |
| <b>Statistics (one)</b>  |  |  |              | <b>Distributive Studies (25 credits)</b>  |               |           |               |  |  |   |
| See page 2.  | See page 2.  |  | <b>Grade</b> | <b>Requirements</b>   | <b>Course</b> | <b>Cr</b> |               |  |  |   |
| <b>Four (4) courses from the 5 groups below:</b>   |  |  |              | <b>I-Series (6 credits)*</b>  |               |           |               |  |  |   |
|  |  |  |              | * May double-count with Distributive Studies  |               |           |               |  |  |   |
|  |  |  |              | <b>Requirements</b>   |               |           | <b>Course</b> |  |  |   |
|  |  |  |              | Natural Sciences w/Lab (NL)   |               |           | ENSP Lab Sci  |  |  | 4 |
|  |  |  |              | Natural Science (NS)  |               |           | ENSP 101      |  |  | 3 |
|  |  |  |              | History and/or Social Sci (HS1)   |               |           | ENSP 102      |  |  | 3 |
|  |  |  |              | History and/or Social Sci (HS2)   |               |           | ECON201       |  |  | 4 |
|  |  |  |              | Humanities (HU1)  |               |           |               |  |  | 3 |
|  |  |  |              | Humanities (HU2)  |               |           |               |  |  | 3 |
|  |  |  |              | Scholarship in Practice (SP, major)   |               |           | ENSP 400      |  |  | 3 |
| Scholarship in Practice (SP, non-major)  |  |  |              |   |               | 3         |               |  |  |   |
| <b>Biology</b>   |  |  |              | <b>Diversity (4-6 credits)*</b>   |               |           |               |  |  |   |
| BSCI160/161 (NL)   | Ecology & Evolution/Lab  | Fa,Sp,Su                                     | <b>Grade</b> | * May double-count with Distributive Studies  |               |           |               |  |  |   |
| <b>Chemistry</b>   |  |  |              | <b>Requirements</b>   |               |           |               |  |  |   |
| CHEM131/132 (NL)   | Gen Chemistry I/Lab  | Fa,Sp,Su                                     | <b>Grade</b> | I- Series (IS)  |               |           |               |  |  |   |
| <b>Earth Sci (one)</b>   |  |  |              | I- Series (IS)  |               |           |               |  |  |   |
| AOSC200/201 (NL)<br>ENST200 (NL)<br>GEOG201/211 (NL)<br>GEOL100/110 (NL)<br>GEOL120/110  | Weather & Climate/Lab<br>Fund of Soil Science<br>Geog Environ Sys/Lab*<br>Physical Geology/Lab<br>Environmental Geology<br><i>*recommended</i> | Fa,Sp<br>Fa<br>Fa,Sp,Su<br>Fa,Sp,Su<br>Fa,Sp | <b>Grade</b> |   |               |           |               |  |  |   |
| <b>Economics (one, req'd)</b>  |  |  |              | <b>Experiential Learning (0-3 credits)*</b>   |               |           |               |  |  |   |
| AREC240 (HS)<br>AREC241 (HS, IS)<br>ECON200 (HS)   | Intro to Econ and Env<br>Env, Econ, and Policy<br>Princ of Micro-Econ  | Sp<br>Fa<br>F,S,Su,W                         |              | * May overlap with major requirements   |               |           |               |  |  |   |
| <b>Geography (one)</b>   |  |  |              | <b>Requirements</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                  |              | Practical experience is not required, but is strongly recommended.  |               |           |               |  |  |   |
| <b>ENSP Graduation Requirements</b>  |  |  |              | <b>Graduation Requirements</b>  |               |           |               |  |  |   |
| _____ Students must earn <u>C- or higher</u> in all courses used for ENSP Core and Concentration requirements.<br>_____ Students' major GPA must be 2.0 or higher. |  |  |              | _____ <u>Up to 6 AP courses</u> may be used for Gen Ed<br>_____ There are <b>at least 40 non-overlapping Gen Ed</b> credits<br>_____ No more than 60 credits earned from Community College<br>_____ Last 30 credits must be earned at Maryland<br>_____ 120+ cumulative credits <i>and</i> 2.0+ cum GPA |               |           |               |  |  |   |

## ENSP – Environmental Economics (p. 2 of 4)

### ECONOMICS FOUNDATION - Choose Track 1 or Track 2. (13-14 credits)

**Track 1: Preparation for PhD programs in Economics and quantitative careers that produce economic analysis.** Students who choose this track should strongly consider Area 4 Restricted Electives and/or a Minor in Mathematics.

| Course                   | Description   | Cr     | Offered           | Prerequisites                                | Grade |
|--------------------------|---|--------|-------------------|--|-------|
| ECON 201                 | Princ of Macro-Economics                                    | 3      | F,Sp              |  |       |
| MATH141                  | Calculus II   | 4      | F,Sp              | MATH140                                      |       |
| ECON321* or<br>STAT400 * | Economic Statistics<br>Applied Probability and Statistics I | 3<br>3 | F,W,Sp,Su<br>F,Sp | ECON200 and 201; MATH140 and 141.<br>MATH141 |       |
| ECON326                  | Intermediate Microecon Analysis                             | 3      | F,Sp              | ECON200 and 201; MATH140 and 141.            |       |

\* These courses fill the ENSP Core Statistics requirement

**Track 2: Preparation for Master's programs in Public Policy, Law, and careers that involve decision-making informed by economic analysis.**

| Course                  | Description                                    | Cr     | Offered         | Prerequisites   | Grade |
|-------------------------|--|--------|-----------------|---|-------|
| ECON201                 | Princ of Macro-Economics                       | 3      | F,Sp            |   |       |
| ECON230* or<br>BMGT230* | Applied Econ Statistics<br>Business Statistics | 3<br>3 | F,Sp<br>F,Sp,Su | ECON200 and 201; MATH111 or<br>MATH220;   |       |
| ECON300                 | Methods and Tools for Econ Anal                | 3      | F,Sp            | ECON200 and 201; and MATH220  |       |
| AREC326                 | Interm Applied Microecon                       | 3      | F,Sp            | ECON200 (or AREC240) and 201;<br>Calculus I (MATH220, 130, or 140); and<br>ECON300 (strongly recommended) |       |

\* These courses fill the ENSP Core Statistics requirement

### RESTRICTED ELECTIVES INSIDE ECONOMICS (15 credits)

**Choose four (4):** Speak with your advisor about which courses serve your interests best.

|          |  |   |       |                        |  |
|----------|--|---|-------|------------------------|--|
| AREC 446 | Sustainable Development                    | 3 | TBA   | ECON326 or AREC326     |  |
| AREC 453 | Natural Resources and Public Policy        | 3 | F     | ECON326 or AREC326     |  |
| AREC 454 | Economics of Climate Change                | 3 | Sp    | ECON326 or AREC326     |  |
| AREC 455 | Economics of Land Use                      | 3 | F     | ECON326 or AREC326     |  |
| AREC 456 | Energy and Environ Economics               | 3 | Sp    | ECON326 or AREC326     |  |
| ECON 481 | Environmental Econ ( <i>strongly rec</i> ) | 3 | Sp    | ECON 321 and ECON 326. |  |
| ECON 454 | Theory of Publ. Fin. & Fiscal Fed          | 3 | F, Sp | ECON 321 and ECON 326. |  |

**Choose one (1):** Courses selected here may not “double-count” as Restricted Electives.

|                                |  |        |              |  |  |
|--------------------------------|--|--------|--------------|--|--|
| AREC 365                       | Hunger, Pop, and Food Supplies                               | 3      | Sp, F        |  |  |
| AREC 382 <i>or</i><br>ENSP 305 | Computer-Based Anal in AREC<br>Applied Quant Methods in ENSP | 3<br>3 | Sp<br>Sp     | 60 credits, Calculus and Statistics                        |  |
| AREC 430                       | Intro to Agric and Resource Law                              | 3      | Fa           |  |  |
| AREC 433                       | Food and Agricultural Policy                                 | 3      | F            | ECON326 or AREC326   |  |
| AREC 445                       | Agric Dev., Pop Growth, & Env.                               | 3      | Sp           | ECON326 or AREC326   |  |
| AREC 489L                      | Agric Water Qual: Policy and Legal<br>Issues                 | 3      | Sp           |  |  |
| AREC 422 <i>or</i><br>ECON 422 | Econometrics<br>Econometrics I **                            | 3<br>3 | TBA<br>F, Sp | ECON326 <i>or</i> AREC326<br>ECON 321 <i>and</i> ECON 326. |  |
| ECON 456                       | Law and Economics **   | 3      | Sp           | ECON326 and [ECON230 or BMGT230].                          |  |

\*\* Due to severe over-enrollment in Economics, ENSP students should prepare to enroll in AREC courses in this category.

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**RESTRICTED ELECTIVES OUTSIDE ECONOMICS: At least 12 credits in one (1) supporting area below.** Other courses are allowed as Restricted Electives with advisor approval *in advance*. Additionally, consider the benefits of Minors in GIS and/or Statistics; note, however, that only 6 credits may overlap between a major and minor; and there may be no overlap between two minors.

>>> **Area 1. Social Science.** *At least 9 credits must be 300- or 400-level.*

| Course          | Description   | Cr | Offered   | Prerequisites                         | Grade |
|-----------------|---|----|-----------|---------------------------------------|-------|
| ANTH 266        | Changing Climate, Changing Cultures                         | 3  | F         |                                       |       |
| ANTH 450        | Theory & Practice of Environ Anthro                         | 3  | Sp        |                                       |       |
| GEOG 335 or 435 | Population Geography – renumbered                           | 3  | Sp F      |                                       |       |
| GEOG 421        | Regional Geography: China                                   | 3  | Sp        |                                       |       |
| GEOG 422        | Regional Geography: Sub-Saharan Africa                      | 3  | F         |                                       |       |
| GEOG 423        | Regional Geography: Latin America                           | 3  | Sp        |                                       |       |
| GEOG 331        | Intro to Human Dimen of Global Chng                         | 3  | F         | GEOG 201 or 202; or ANTH 220 or 260   |       |
| GEOG 332        | Economic Geography  | 3  | F         |                                       |       |
| GEOG 373        | Geographic Information Systems                              | 3  | F, Su,W   | -                                     |       |
| GEOG 415        | Land Use, Climate Change and Sust                           | 3  | Sp        | GEOG 306 or permission.               |       |
| GEOG 416        | Conceptualizing and Modelling Human-Environment Interaction | 3  | Sp        | GEOG 306 and MATH 220.                |       |
| GEOG 431        | Culture and Natural Resource Mgt                            | 3  | F         |                                       |       |
| GEOG 437        | Political Geography   | 3  | F         | -                                     |       |
| GVPT 200        | International Political Relations                           | 3  | Sp,Su,F,w | GVPT 100 or ENSP102                   |       |
| GVPT 273        | Intro to Environmental Politics                             | 3  | Sp        |                                       |       |
| GVPT 306        | Global Ecopolitics  | 3  | Sp        | GVPT 200                              |       |
| GVPT 406        | International Political Economy                             | 3  |           | GVPT 200                              |       |
| HIST 405        | Environmental History                                       | 3  | varies    |                                       |       |
| SOCY 305 or 405 | Scarcity and Modern Society                                 | 3  | Sp        | 3 credits of sociology                |       |
| SOCY 406        | Globalization   | 3  | F         | 6 credits of sociology or dept. perm. |       |
| SOCY 410        | Social Demography   | 3  | Sp, F     | 6 credits of sociology or dept perm   |       |
| SOCY 415        | Environmental Sociology                                     | 3  | F         | 6 credits of sociology or dept perm.  |       |

>>> **Area 2. Earth Science**

| Course             | Description                           | Cr  | Offered | Prerequisites   | Grade |
|--------------------|---------------------------------------|-----|---------|---|-------|
| AOSC375 or GEOL375 | Intro to the Blue Ocean               | 3   | F       | MATH 140  |       |
| CHEM231/231        | Organic Chemistry I                   | 3/1 | Sp, F   | CHEM131/132   |       |
| ENST 200           | Fundamentals of Soil Science          | 4   | F       | CHEM131/132 strongly recommended                          |       |
| ENST 413           | Soil and Water Conservation           | 3   | Sp      | ENST200   |       |
| ENST 423           | Soil-Water Pollution                  | 3   | Sp      | ENST200 and CHEM 231/232 or perm.                         |       |
| ENST 430           | Wetland Soils                         | 3   | Sp      | ENST 200  |       |
| ENST 440           | Crops, Soils, and Civilization        | 3   | Sp      |   |       |
| ENST 441           | Sustainable Agriculture               | 3   | Fa      |   |       |
| ENST 451           | Water Quality: Field and Lab Analysis | 3   | Sp      | CHEM 231/232  |       |
| GEOG 301           | Adv Geographical Environmental Sys    | 3   | Sp      | GEOG 201/211  |       |
| GEOG 441           | The Coastal Ocean                     | 3   | Sp      | GEOG 201/211  |       |
| GEOL 340           | Geomorphology                         | 4   | Sp      | GEOL 100 or 120, GEOL110                                  |       |
| GEOL 451           | Groundwater                           | 3   | F       | CHEM 131/132, GEOL 100 or 120, GEOL110, and MATH141       |       |
| GEOL 452           | Watershed and Wetland Hydrology       | 3   | F       | CHEM 131/132 and GEOL 100/110 or perm.                    |       |
| GEOL 453           | Ecosystem Restoration                 | 3   | F       | CHEM131/2, MATH 220 or 140; GEOL100, GEOL120, or ENST200. |       |
| LARC 450           | Environmental Resources               | 3   | F       | ENST 200 or permission of dept.                           |       |

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>>> **Area 3. Life Science** *At least 9 credits must be 300- or 400-level.*

| Course   | Description                             | Cr | Offered | Prerequisites                               | Grade |
|----------|---|----|---------|---|-------|
| BSCI 207 | Organismal Biology                      | 4  | Sp,Su,F | BSCI 170/171, BSCI 160/161 and CHEM 131/132 |       |
| BSCI 361 | Principles of Ecology                   | 4  | Sp      | BSCI 160/161 and (MATH 140 or MATH 220)     |       |
| BSCI 363 | Biol of Conserv and Extinction          | 3  | Sp      | BSCI 160/161                                |       |
| BSCI 370 | Principles of Evolution                 | 3  | F       | BSCI 160/161                                |       |
| BSCI 460 | Plant Ecology                           | 3  | TBA     | BSCI 160/161                                |       |
| BSCI 461 | Plant Ecology lab                       | 2  | TBA     | Pre- or corequisite: BSCI 460               |       |
| BSCI 462 | Population Ecology                      | 3  | F       | BSCI 160/161 and MATH 220                   |       |
| BSCI 473 | Marine Ecology                          | 3  | F       | BSCI 207                                    |       |
| ENST 214 | Intro to Fisheries and Wildlife Science | 3  | F       |   |       |
| ENST 314 | Fisheries Mgmt and Sustainability       | 3  | Sp      | Spring of “even” years (2016, 2018, etc.)   |       |
| ENST 373 | Natural History of the Ches Bay         | 3  | F       |   |       |
| ENST 410 | Ecosystem Services: Integ. Anal.        | 3  | F       | BSCI 361                                    |       |
| ENST 450 | Wetland Ecology                         | 3  | F       | BIOM 301 or permission of dept.             |       |
| ENST 460 | Principles of Wildlife Mgmt             | 3  | F       | -   |       |
| ENST 461 | Urban Wildlife Management               | 3  | F       | -   |       |
| ENST 464 | Wildlife Habitat Modeling               | 3  | Sp      | BSCI361 and GEOG373                         |       |
| ENST 479 | Trop Ecol and Resource Mgmt.            | 3  | Sp      |   |       |
| GEOG 442 | Biogeography                            | 3  | F       | BSCI361 or GEOG301                          |       |
| PLSC 471 | Forest Ecology                          | 3  | Sp      | BSCI 160/161                                |       |

>>> **Area 4. Preparation for Graduate Work in Environmental Economics:** Mathematics, Theory, Econometrics. Note: courses selected here may not “double-count” with courses in the Choose (4) area of Concentration requirements on page 2. Please discuss with your advisor other, additional coursework that may be helpful.

| Course               | Description                                | Cr | Offered     | Prerequisites  | Grade |
|----------------------|--|----|-------------|--|-------|
| MATH 240             | Introduction to Linear Algebra             | 4  | Sp, Su, F   | MATH 141 or equivalent                               |       |
| MATH 241             | Calculus III                               | 4  | Sp, Su, F   | MATH 141 and MATH 240                                |       |
| ECON 325             | Intermediate Macroeconomics                | 3  | Sp, Su, F   | ECON 200 and 201; and MATH141.                       |       |
| ECON 414             | Game Theory                                | 3  | Sp, F       | ECON306 and [ECON230 or BMGT230]                     |       |
| ECON 422 or AREC 422 | Econometrics I<br>Econometric Applications | 3  | Sp,F<br>TBA | ECON 321 and [ECON325 or 326]<br>ECON 306 or AREC326 |       |
| STAT 401             | Applied Probability and Stat II            | 3  | Sp, F       | STAT 400   |       |