UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Delphis Levia phone number 831-3218

Department: Geography email address dlevia@udel.edu

Action: Revise Major in Environmental Science (and concentrations)

Effective term 14F

Current degree BS

Proposed change leads to the degree of: BS

Proposed name: Environmental Science

Revising or Deleting:

Undergraduate major / Concentration: Environmental Science BS

Undergraduate minor:

Graduate Program Policy statement change:

Graduate Program of Study:

Graduate minor / concentration:

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.
List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations?
(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter “None”)

**ENSC 300 Earth Systems: Science and Policy** - This course provides students with an integrative framework necessary to understand the systems approach to environmental science and its intersection with environmental policy and management. Students will be introduced to systems theory within environmental science and its relevance to environmental policy to provide grounding to the interdisciplinarity to environmental science and environmental studies.

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: [http://www.ugs.udel.edu/gened/](http://www.ugs.udel.edu/gened/)

The Environmental Science Curriculum supports the 10 goals of undergraduate education in the following ways:

1. Courses in the major require that students communicate effectively in verbal and written ways.
2. Students will need to use information technologies, use quantitative reasoning and critical thinking skills.
3. Students will be asked to integrate in-class learning in solving real life problems.
4. Students will understand the impact of humans on the environment and **vice versa** locally and globally.
5. Students will work and learn independently and collaboratively, integrating various concentrations, perspectives and diverse ways of thinking that underlie the search for knowledge in the arts, humanities, sciences and social sciences.
6. Students will explore environmentally related ethical questions and implications of individual and societal choices on individuals, communities, and the planet.
7. Students will develop intellectual curiosity, confidence, and understand the need for lifelong engagement in learning.
8. Students will develop an integrated, international perspective regarding countries, populations and the environment.
9. Students will integrate and demonstrate classroom skills and knowledge in at least one field related experience.

Identify other units affected by the proposed changes:
(Attach permission from the affected units. If no other unit is affected, enter “None”)

Department of Applied Economics & Statistics  Department of Economics
Department of Biological Sciences  Environmental Humanities Program
School of Urban Affairs and Public Policy  School of Marine Science and Policy
Department of Materials Science & Engineering  Department of Political Science
Energy and Environmental Policy Program  Department of Geography
Department of Chemistry/Biochemistry  Department of Geological Sciences
Department of Chemical Engineering  Department of Mathematics
Department of Civil and Environmental Engineering  Department of Mechanical Engineering
Department of Electrical and Computer Engineering  Department of Plant and Soil Sciences
Department of Entomology and Wildlife Conservation

Describe the rationale for the proposed program change(s):
(Explain your reasons for creating, revising, or deleting the curriculum or program.)

As a part of its Path to Prominence™, the University of Delaware is focused on becoming a greener, more environmentally aware campus and on highlighting and enhancing opportunities for undergraduates to engage in environmental degree programs. Specifically, the goals outlined in the P2P state that UD will:

- Strive to make environmental awareness and stewardship an integral part of every student’s educational experience.
- Develop environmental degree programs that promote cross-fertilization of science and policy.
- Define additional degree tracks and concentrations as well as opportunities for self-designed programs.
• Develop environmentally focused study abroad programs.
• Enhance UD’s emphasis on interdisciplinary graduate programs
• Cultivate opportunities for science and engineering to interact with emerging business, social, and cultural issues of an environmentally aware world.

The above text provides the framework and context under which the environmental science and environmental studies programs at UD were revised and created, respectively, in 2009. Building upon the success of the major programmatic revisions of 2009, and seeking to improve the programs based on the past four years of experience, the Environmental Council (formed by Provost Rich in 2008 to reflect the multiple units engaged in delivering degree content) sought to revise the Environmental Science Program. Armed with a strategic assessment of UD’s Environmental Science and Studies Programs conducted by Dr. Shirley Vincent (Appendix A), an international authority on interdisciplinary environmental education from the National Council of Science and the Environment, the Environmental Council sought to revise the program. A primary goal of the Council was to utilize the constructive feedback contained within Dr. Vincent’s strategic assessment, while optimizing the uniquely Delawarean aspects of the program. The other primary goal of the programmatic revision is to streamline the administration and structure of the program in order to make it more functional and less confusing for UD students. The Council met regularly over the 2012-2013 academic year to discuss programmatic revisions that would be best for UD students. It is a faculty based Council with the following members:

Council members include:

• Tracy Deliberty (Geography)
• Paul Imhoff (Civil and Environmental Engineering)
• Jan Johnson (Political Science and International Relations)
• Murray Johnston (Chemistry and Biochemistry)
• Gerald Kaufmann (Urban Affairs and Public Policy)
• John Madsen (Geological Sciences)
• Tom Sims (Plant and Soil Science)
• Steven Hastings (Applied Economics and Statistics)
• Franklin Newton (CEOE)
• Del Levia (Director, Environmental Science and Environmental Studies Programs)
• Nancy Targett (Ex-officio, CEOE)

Nationally there are 652 institutions that award 804 undergraduate interdisciplinary environmental degrees (Vincent, personal communication). Of these, 373 (46%) are Environmental Science(s) programs, 255 (32%) are Environmental Studies, and 176 (22%) had other names such as environmental policy and management and water resources. Environmental Science programs on average graduate 26 students. Environmental Studies programs graduate, on average, more than twice that number (54).

In an effort to improve the Environmental Science degree at UD and to make the program more accessible and less structurally confusing to students, this proposal builds upon the strengths of the existing program and restructures the program’s administration. It aligns with the goals of the UD strategic plan in 3 ways:

1. It is more broadly interdisciplinary, integrated across academic units and includes cross-cutting themes which mirror the interdisciplinary core (explained in more detail in next section).
2. It includes courses in social science and policy that will help the environmental science major understand the societal context of his/her work. This foundation helps students appreciate the interconnectedness between understanding natural science processes and their applications and the social, political, and institutional frameworks in which environmental issues are considered. The new ENSC 300 course is a significant step in that direction.
3. It connects students majoring in Environmental Science and Environmental Studies (see separate proposal for a BA in Environmental Studies).

The goal is to give students in the program a broad-based, interdisciplinary introduction to the scientific concepts, policies, and issues; the common analytical tools needed to explore environmental issues in depth...
through their specific themes; and the ability to integrate and synthesize information from a multidisciplinary perspective in oral and written format through the capstone course.

In this proposal, the required introductory course (ENSC101 Introduction to the Environment) and a capstone course (ENSC 450 Proseminar: The Environment) would be complemented by the ENSC/ENVR 300 course required for both the BS in Environmental Science and the BA in Environmental Studies programs. One of the outcomes from such a requirement would be the exposure of students to a more integrated perspective toward the development of strategies, policies and approaches aimed at addressing complex environmental issues.

The prior version of the program consisted of a core heavy major and concentrations. While the core heavy major is justified given the breadth and scope of environmental science, the concentrations experienced some problems. In some cases they were too narrowly focused and did not reinforce the true cross-cutting nature of environmental science. In other cases, students sometimes had trouble meeting concentration requirements since some courses were not offered on a regular basis (or at all), despite an initial nod of approval from those units. More fundamentally, concentrations did not reflect the intrinsic interdisciplinarity of environmental science and serve more as “silos” than areas of concentration.

This revision significantly enhances the interdisciplinarity of the core. For instance, Introduction to Soil Science and Geographic Information Systems have been added. To keep the core manageable, the tradeoff was one less semester of introductory chemistry OR biology. Thus, students take a full year of chemistry and one semester of biology or vice versa, depending on their chosen theme. Dr. Vincent’s report (Appendix A) argued that the present program has too many concentrations and fosters confusion among some students. As such, The Council has developed themes within the major that mirror the interdisciplinary core. The themes embrace the complex and varied nature of environmental science. They celebrate the cross-cutting activity which is the hallmark of environmental science. Arguably, such themes will better prepare students for careers and graduate school. Themes provide students more latitude to tailor their academic career and explore the cross-cutting issues of environmental science. While there were ten concentrations, there are only six themes. Nevertheless, the program offers more flexibility and student opportunities with the thematic approach. The revised symmetry between the core and themes puts UD at the forefront of environmental education. The idea was well received at an international meeting in Vienna, Austria from scientists and educators around the globe.

In this “thematic” degree program model, students can either:

1. Enter the program as an Environmental Science major with a theme already declared, OR
2. Enter the program as a general Environmental Science major and select a specific theme after taking some of the initial courses required for the major. Students MUST ultimately select a theme.

Students’ “home” college will be located within the College of Earth, Ocean and Environment. Dr. Vincent found that current UD students with varying concentrations identify CEOE as their “home College” and interdisciplinary programs benefit when students can form a cohort and benefit from social interactions. Many interdisciplinary programs face the challenge of creating a sense of identity among students since they take courses over multiple units; this sometimes prevents the growth of such programs. While students should and will take courses across UD, we can streamline processes, decrease their level of anxiety, and build a sense of community by housing them all in CEOE. This is consistent with Dr. Vincent’s recommendations (Appendix A).

Students will be assigned an advisor on the basis of their chosen theme. In those cases where the student has not yet selected a concentration, students will be assigned an academic advisor from one of the themes.

Recognizing that this is a degree program that leverages the expertise of many UD faculty members, the Environmental Council will continue to oversee the Program. The Council will continue to be composed of faculty from participating programs, provide oversight for curricular matters and student advisement within the program. The chair of the Council will be designated by the Dean of CEOE. Day-to-day operations will be administered by the faculty director of the Environmental Science/Studies Program who resides in the Department of Geography.
Upon completion of degree requirements, students will receive a Bachelor of Science in Environmental Science with a specific theme.

Program Requirements:

(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and include a side-by-side comparison of the credit distribution before and after the proposed change.)

**Bachelor of Science in Environmental Science (BS ENSC):** The BS in Environmental Science emphasizes a broad scientific understanding of the character, function, and analysis of environmental systems. Environmental Science BS students will be able to contribute to society’s understanding of and solutions to problems that arise from human occupancy and use of the planet and environment.

<table>
<thead>
<tr>
<th>CURRENT</th>
<th>PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General and University Requirements:</strong> ENGL 110 Critical Reading &amp; Writing (min grade C-) 3</td>
<td><strong>General and University Requirements:</strong> ENGL 110 Critical Reading &amp; Writing (min grade C-) 3</td>
</tr>
<tr>
<td>First Year Experience (fulfilled by ENSC 101 + FYE Seminar) 4</td>
<td>First Year Experience (fulfilled by ENSC 101 + FYE Seminar) 4</td>
</tr>
<tr>
<td>Discovery Learning Experience (fulfilled by field course) 3</td>
<td>University Breadth requirements 12</td>
</tr>
<tr>
<td>Multicultural requirement 3</td>
<td>Discovery Learning Experience (fulfilled by field course) 3</td>
</tr>
<tr>
<td>Second Writing Course (fulfilled by ENSC 450) 3</td>
<td>Multicultural requirement 3</td>
</tr>
<tr>
<td>Foreign Language 0-8</td>
<td>Second Writing Course (fulfilled by ENSC 450) 3</td>
</tr>
<tr>
<td>Math requirement (fulfilled by MATH 241/242) 0-4</td>
<td>Foreign Language 0-12</td>
</tr>
<tr>
<td>Math requirement (fulfilled by MATH 241/242) 0-4</td>
<td>Math requirement (fulfilled by MATH 241/242) 0-4</td>
</tr>
</tbody>
</table>

**Program Breadth Requirements:** (At least two different areas must be represented in each group.)

**Group A** Understanding and appreciation of the creative arts and humanities. 6

**Group B** The study of culture and institutions over time. 6

**Group C** Empirically based study of human beings and their environment. 6

**Core Requirements:**

| ENSC 101 Introduction to the Environment 4 | ENSC 101 Introduction to the Environment 4 |
| BISC 207 Introductory Biology I 4 | BISC 207 Introductory Biology I 4 |
| BISC 208 Introductory Biology II 4 | CHEM 103 General Chemistry I 4 |
| ENWC 201 Wildlife Conservation and Ecology 3 | BISC 208 Introductory Biology II OR |
| CHEM 103 General Chemistry I 4 | CHEM 104 General Chemistry II 4 |
| CHEM 104 General Chemistry II 4 | GEOL 107 General Geology 4 |
| PHYS 201 Introductory Physics I OR PHYS 207 Fundamentals of Physics* 4 | GEOL 107 General Geology 4 |
| GEOG 220 Meteorology 3 | GEOG 201 Meteorology 3 |
| GEOG 412 Physical Climatology 4 | GEOG 412 Physical Climatology 4 |
| MAST 482 Introduction to Ocean Science 3 | MAST 482 Introduction to Ocean Science 3 |
| POCS350 Politics and the Environment 3 | POCS350 Politics and the Environment 3 |
| FREC 100 Sustainable Development 3 | ECON 151 Introduction to Microeconomics OR |
| MATH 241 Analytical Geometry & Calculus A 3 | MATH 241 Analytical Geometry & Calculus A 4 |
| MATH 242 Analytical Geometry & Calculus B 3 | MATH 242 Analytical Geometry & Calculus B 4 |
| GEOG 271 Introduction to Geographic Data 4 | Analysis *Dependent on concentration, see concentration details for specifics |

*Dependent on concentration, see concentration details for specifics
Field Experience: (3-6 cr)
An approved science field experience in which the student integrates the components of his or her concentration in an experiential learning environment. Experience MUST include data collection, manipulation of data sets and weekly reports/field notes. This requirement could be fulfilled by an internship, study abroad experience and/or a research experience so long as the above criteria are met.

Science Concentrations: (15-18 cr)
5-6 courses clustered in concentrations that are distributed throughout the colleges and across disciplines (see listings below)

Capstone Course:
ENSC 450: Proseminar: The Environment 3
A capstone course that serves to be a culminating experience and is to be completed during the last semester of the senior year. This course will engage students in an exploration and discussion of the history and state of environmental studies and its connection to local, regional, national and global scale environmental issues. Students will develop and refine critical thinking skills and interdisciplinary problem-solving strategies. It serves to be a culminating experience for students on the “science-side” and the “studies-side” to collaboratively solve problems and discuss issues in the current environmental literature.

Electives: After required courses are completed, sufficient credits must be taken to meet the total minimum credits required for the degree.

Total Credits for Degree: 124

CONCENTRATIONS:
Concentration in Atmospheric Science study how energy and moisture are transferred among the environment systems and humans impact our weather and climate processes.

One of the following:
MATH 302 Ordinary Differential Equations
MATH 349 Elementary Linear Algebra
MATH 450 Statistics for Engineering & Physical Sciences
ENSC 475 Statistics for Environmental Science
STAT 657 Statistics for Earth Sciences

Three of the following:
GEOG 342 Bioclimatology
GEOG 420 Atmospheric Physics
GEOG 423 Atmospheric Dynamics
GEOG 451 Microclimatology
GEOG 453 Synoptic Climatology
GEOG 456 Hydroclimatology

Concentration in Environmental Chemistry study chemical and biochemical phenomena that help shape the natural environment and the human impact upon it. (also fulfills requirements for a Minor in Chemistry, College of Arts and Sciences)

One of the following:
-CHEM 220/221 Quantitative Analysis with Laboratory
-CHEM 321 Organic Chemistry I

Field Experience: (3-6 cr)
GEOG 372 Introduction to GIS OR APEC 480 Geographic Information Systems in Natural Resource Management
*Dependent on theme, see theme details for specifics

Electives: After required courses are completed, sufficient credits must be taken to meet the total minimum credits required for the degree.

Total Credits for Degree: 124

THEMES:
Theme in Atmospheric Science provides an opportunity for Environmental Science majors to study how energy and moisture are transferred among earth’s environmental spheres (e.g., biosphere-atmosphere, hydrosphere-atmosphere) and how humans impact our weather and climate. Emphasis is placed on the physical climatology of interactions among spheres, although courses within ecological climatology are also offered. Individual courses delve into the intricacies of atmospheric science above (e.g., GEOG 420, Atmospheric Dynamics) or within (e.g., Geog 451, Microclimatology) the boundary layer. Many aspects of atmospheric science are quantitative in nature, requiring knowledge of advanced calculus and/or statistics; thus MATH 243 is required, along with one additional course in differential equations, linear algebra, or statistics.

One of the following:
MATH 302 Ordinary Differential Equations
MATH 349 Elementary Linear Algebra
MATH 351 Statistics for Engineering & Physical Sciences
ENSC 475 Statistics for Environmental Science
STAT 657 Statistics for Earth Sciences

Three of the following:
GEOG 342 Bioclimatology
MAST/GEOG 408 Radiative Transfer in Ocean & Atmosphere
MAST/GEOG 409 The Ocean and Climate Variation
GEOG 420 Atmospheric Physics
GEOG 423 Atmospheric Dynamics
<table>
<thead>
<tr>
<th>One of the following:</th>
<th>GEOG 451 Microclimatology (cannot also count as field experience)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-CHEM 418 and 445 or 446 Physical Chemistry with Lab</td>
<td>GEOG 453 Synoptic Climatology</td>
</tr>
<tr>
<td>-CHEM 457/458 Inorganic Chemistry with Laboratory</td>
<td>GEOG 456 Hydroclimatology</td>
</tr>
<tr>
<td>-CHEM 527 Introductory Biochemistry</td>
<td>GEOG/GEOL/MAST 458 Paleoclimatology</td>
</tr>
<tr>
<td>One of the following:</td>
<td><strong>Theme in Ecoscience</strong> focuses on studying the nature of ecosystems as well as the interaction of organisms with their physical and biological environment. Courses cover the breadth of ecoscience. Students interested in studying ecoscience with an emphasis on the physical environment would best fit this theme. Graduates from the Theme in Ecoscience should be prepared to gain employment as environmental scientists or seek graduate education in Environmental Science.</td>
</tr>
<tr>
<td>-CHEM 608 Environmental Soil Chemistry</td>
<td>-BISC 302 General Ecology</td>
</tr>
<tr>
<td>-CHEM 683 Environmental Chemistry</td>
<td>Any four of the following:</td>
</tr>
<tr>
<td>-CIEG 632 Chemical Aspects of Environmental Engineering</td>
<td>BISC 321: Environmental Biology</td>
</tr>
<tr>
<td>-MAST 646 Chemical Oceanography</td>
<td>BISC 495: Evolution</td>
</tr>
<tr>
<td><strong>Concentration in Environmental Soil Science</strong></td>
<td>CHEM 683/MAST 683: Environmental Chemistry</td>
</tr>
<tr>
<td>study our expansive soil system and its relationship to environmental quality, plant growth and quality of life. (also fulfills requirements for a Minor in Environmental Soil Science, College of Agriculture and Natural Resources)</td>
<td>ENWC 419: Biological Control</td>
</tr>
<tr>
<td>-PLSC 204 Introduction to Soil Science</td>
<td>ENWC 444/BISC 440: Conservation of Tropical Biodiversity</td>
</tr>
<tr>
<td>-PLSC 205 Introduction to Soil Science Lab</td>
<td>ENWC 456: Conservation Biology</td>
</tr>
<tr>
<td>-PLSC 305 Soil Fertility and Plant Nutrition</td>
<td>ENWC 814: Landscape Ecology</td>
</tr>
<tr>
<td>Three of the following courses:</td>
<td>GEOG 342: Bioclimatology</td>
</tr>
<tr>
<td>-PLSC 151 Introduction to Crop Science</td>
<td>GEOG 431: Watershed Hydro-Ecology</td>
</tr>
<tr>
<td>-PLSC 319 Environmental Soil Microbiology</td>
<td>MAST 427/627: Marine Biology</td>
</tr>
<tr>
<td>-PLSC 401 Agronomic Crop Science</td>
<td>MAST 629: Topics in Marine Ecology</td>
</tr>
<tr>
<td>-PLSC 603 Soil Physics</td>
<td>PLSC 201/102: Botany II with laboratory</td>
</tr>
<tr>
<td>-PLSC 608 Environmental Soil Chemistry</td>
<td>PLSC 419: Soil Microbiology</td>
</tr>
<tr>
<td><strong>Concentration in GeoScience</strong></td>
<td><strong>Theme in Water Science</strong> provides an opportunity for Environmental Science majors to study the movement, distribution, quantity, and quality of water on Earth. Students pursuing this concentration will have the opportunity to study aspects of hydrology that range from the atmosphere to the Earth’s subsurface, and from biogeochemical processes to policy and water management. Eight courses in water science are offered from four Departments (Geological Sciences, Geography, and Civil and Environmental Engineering), of which three are required. Many aspects of hydrology are quantitative in nature, requiring knowledge of basic calculus and in some cases more advanced calculus and/or statistics; thus MATH 243 is required, along with one additional course in differential equations, linear algebra, or statistics.</td>
</tr>
<tr>
<td>explore how earth materials and processes impact the environment over both human and geologic time scales. (also fulfills requirements for a Minor in Geology, College of Marine and Earth Studies)</td>
<td>-MATH243 Analytical Geometry and Calculus C</td>
</tr>
<tr>
<td>One of the following year-long sets:</td>
<td><strong>One of the following:</strong></td>
</tr>
<tr>
<td>-GEOL 300 The Earth's Materials I: Minerals</td>
<td>MATH 302 Ordinary Differential Equations</td>
</tr>
<tr>
<td>GEOL 302 The Earth's Materials II: Rocks</td>
<td>MATH 351 Engineering Math I (Ordinary Differential Equations/Linear Algebra)</td>
</tr>
<tr>
<td>or -GEOL 303 The Earth's Surface I: Surficial Processes</td>
<td>Fundamental water courses</td>
</tr>
<tr>
<td>GEOL 304 Earth's Surface II: Stratigraphy</td>
<td><strong>One of the following:</strong></td>
</tr>
<tr>
<td>or -GEOL 305 Earth's Lithosphere I: Structural Geology &amp; Plate Tectonics</td>
<td>Applied water courses</td>
</tr>
<tr>
<td>GEOL 306 Earth's Lithosphere II: Field Geology</td>
<td>GEOEL 428 Hydrogeology OR CIEG 498 Groundwater flow and contaminant transport</td>
</tr>
<tr>
<td>or -GEOL 307 Earth's History I: Paleobiology</td>
<td>And</td>
</tr>
<tr>
<td>GEOL 308 Earth's History II: Earth System Science</td>
<td>GEOG 320 Water and Society OR UAPP 411 Regional Watershed</td>
</tr>
</tbody>
</table>
-MATH243 Analytical Geometry and Calculus C

One of the following:
- MATH 302 Ordinary Differential Equations
- MATH 349 Elementary Linear Algebra
- MATH 450 Statistics for Engineering & Physical Sciences
- ENSC 475 Statistics for Environmental Science
- STAT 657 Statistics for Earth Sciences

Three of the following:
- GEOL 428 Hydrogeology
- GEOL411/611 Fluvial Geomorphology
- GEG 320 Water and Society
- GEG 431 Watershed Ecology
- GEG 456 Hydroclimatology
- CIEG 443 Watershed Engineering, Planning and Design
- BREG 321 Storm-Water Management (pre-requisite)
- BREG 622 Watershed Modeling (pre-requisites)

Concentration in Marine Science study the role of the oceans in the biological, geological, chemical, and physical processes that affect the Earth’s environment. (also fulfills requirements for a Minor in Marine Studies, College of Marine and Earth Studies)

Marine Ecosystems Track:
- MAST 427/627 Marine Biology
- MAST 492 Seminar: Marine Environmental Case Studies

Three of the following:
- BISC 302 General Ecology
- ENWC/MAST 314 Comparative Terrestrial and Marine Ecology
- MAST 421/621 Coastal Field Biology
- MAST 451/651 Marine Invertebrate Diversity
- MAST 629-011 Topics in Marine Ecology: Ichthyology
- BISC 637 Population Ecology

OR

Physical Ocean Science Track:
- MAST 402/602 Introduction to Physical Ocean Science
- MAST 492 Seminar: Marine Environmental Case Studies

Three of the following:
- GEOG 420 Atmospheric Physics
- GEOG 357 Paleoclimatology
- GEOL 414/614 Quaternary Geology and Geochronology
- GEOL 434/634 Geology of Coasts
- MAST 437/637 Geological Oceanography
- MAST 628 Offshore Wind Power: Science, Engineering and Policy

Theme in Marine Science allows students to study and better understand the environment of the ocean, the seabed, and the coastal zone. Building on the foundation of MAST 482 Introduction to Ocean Sciences in the ENSC core, students choose coursework in the physical ocean or in the marine ecosystem. Students must complete 5 courses that assist students in gaining a depth of understanding of the Marine Environment.

- MAST 492 Seminar: Marine Environmental Case Studies

Four of the following:
- BISC 302 General Ecology
- BISC 637 Population Ecology
- ENWC/MAST 314 Comparative Terrestrial and Marine Ecology
- MAST 402/902 Introduction to Physical Ocean Science
- MAST/GEOG 408 Radiative Transfer in Ocean & Atmosphere
- MAST 421/621 Coastal Field Biology
- MAST 427/627 Marine Biology
- MAST 437/637 Geological Oceanography
- MAST 441 Algal Ecological Physiology
- MAST 442 Coral Reef Ecology
- MAST 451/651 Marine Invertebrate Diversity
- MAST 628 Offshore Wind Power: Science, Engineering and Policy
- MAST 630 Ichthyology
- MAST 646 Chemical Oceanography
- GEOG/GEOL/MAST 341 Climate and Climate Change
- GEOG 357 Paleoclimatology
- GEOG 420 Atmospheric Physics
- GEOL 414/614 Quaternary Geology and Geochronology
- GEOL 434/634 Geology of Coasts

Theme in the Critical Zone The “Critical Zone” is Earth’s near-surface environment. It includes the land surface and its vegetation, rivers, lakes, and shallow seas, and it extends through the underlying soils, rocks and groundwater. Interactions at this dynamic zone are governed by complex linkages and feedbacks among a vast range of physical, chemical and biological processes and they determine the availability of nearly every life-sustaining resource. A better understanding of the Critical Zone is necessary to assess the impact of human activities on Earth’s surface and to adapt to their consequences.

The Critical Zone theme of study requires 15 credits as follows:
- GEOL203 Surficial Processes
- GEOG/GEOL/MAST 341 Climate and Climate Change

One of the following:
- PLSC419 – Soil Microbiology
- PLSC438 – Fate/Transport Soil Contaminants
- PLSC603 – Soil Physics

Concentration in Ecology and Organismal Biology study the interaction of organisms with their physical and biological environment.

- BISC 302 General Ecology
- BISC 495 Evolution
- ENWC 205 Elements of Entomology
- ENWC 325 Wildlife Management
-Six additional credit hours from the following:
  BISC 317 Tropical Ecology
  BISC 321 Environmental Biology
  ENWC 418 Ornithology
  ENWC 419 Biological Control
  ENWC 425 Mammalogy
  ENWC 435 Wildlife Population Dynamics
  ENWC 444/BISC440 Conservation of Tropical Biodiversity
  ENWC 456 Conservation Biology
  ENWC 620 Behavioral Ecology
  MAST 427/627 Marine Biology
  MAST 629 Topics in Marine Ecology

**Concentration in Pollution Control** explore the strategies used to clean our air, water and soil, using chemical, physical, and biological technologies.

-MATH243 Analytical Geometry and Calculus C
-CIEG 233 Environmental Engineering Processes OR CHEG112 Introduction to Chemical Engineering

Three of the following:
  CIEG 438 Water and Wastewater Engineering
  CIEG 433 Hazardous Waste Management
  CIEG 436 Processing, Recycling, Management of Solid Wastes
  CHEG 4xx Environmental Sustainability/Industrial Ecology
  BREG 424 Wastewater Supply and Water Treatment Systems

**Concentration in Sustainable Energy Technology** learn the engineering approaches to sustainability, particularly toward increased energy efficiency and the use of renewable sources of energy like wind power, photovoltaic (solar) technology, and biofuels. (also fulfills requirements for a minor in Sustainable Energy Technology, College of Engineering)

-POSC424/UAPP625 Energy Policy and Administration

-Three (9 credits or more) out of the following set of courses (*including any required prerequisites):
  CHEG616 Chemistry and Physics of Surfaces and Interfaces*
  CHEG625 Green Engineering
  CIEG351 Transportation Engineering
  MEEG425 Automotive Powertrain Theory*
  MEEG442 Introduction to Fuel Cells*
  MEEG435 Wind Power Engineering*
  EGT456 Fundamentals of Heating, Ventilation and Air Conditioning*
  ELEG620 Solar Electric Systems
  ELEG415/615 Electric Power and Renewable Energy Systems*
  ELEG467/667 Low Power Electronics and Lighting
  CHEG612 Applied Process Heat Transfer*
  CHEG614 Special Topics in Energy
  CHEG468 Research (3 cr)

-One course from the following list:
  GEOG622 Resources, Development & Environment
  GEOG236 Conservation: Global Issues
  MAST675 Economics of Natural Resources
  MAST628 Offshore Wind Power: Science, Engineering, and Policy
  GEOG617 Seminar in Climate Change*

-PLSC608 – Environmental Soil Chemistry

A minimum of 4-5 credits from the following (NOTE: PLSC course completed from above list) may not be used to satisfy this requirement:
  GEOG 432 Environmental Hydrology
  GEOG 456 Hydroclimatology
  GEOG/GEOL 485 Geomorphology
  GEOL 202 Earth Materials
  GEOL304 Sedimentology and Stratigraphy
  GEOL/GEOG411 Fluvial Geomorphology
  GEOL414 Quaternary Geology and Geochronology
  GEOL428 Hydrogeology OR CIEG498 - Groundwater Flow and Contaminant Transport
  GEOL434 Geology of Coasts
  PLSC419 Soil Microbiology
  PLSC438 Fate/Transport Soil Contaminants
  PLSC603 Soil Physics
  PLSC608 Environmental Soil Chemistry
  PLSC421 Nonpoint Source Pollution
  PLSC467/667 – Watershed Hydrochemistry

**Theme in Energy and Environment** Discovering new energy sources that have minimal environmental impact is one of the greatest challenges of our society. The term “sustainable” is used when talking about energy that meet our current needs without endangering future generations from being able to meet their future needs. Topical areas that students in this theme explore include the science and policy aspects of renewable energy sources like wind energy, biofuels, solar energy and fuel cells as well as assessing the economic, local and global environmental impact of alternative energy sources.

Two from the following:
  APEC 324 Natural Resource Economics
  ECON 320 Energy Economics
  ENEP 425 Energy Policy and Administration
  ENEP 426 Climate Change: Science, Policies, & Political Economy
  ENEP 427 Sustainable Energy Policy & Planning
  GEOG/GEOL/MAST 341 Climate and Climate Change
  GEOG 422 Resources, Development, & the Environment
  MAST 408 Radiative Transfer in Ocean and Atmosphere
  MAST 622 Conservation and Renewable Energy Policy

Three (9 credits or more of the following [*not including any required prerequisites]). Please note: some of these courses have multiple prerequisites):

  CHEG 667 Environment and Energy
  ELEG 415 Electric Power and Renewable Energy Systems
  ELEG 437 Energy Systems*
  ELEG 628 Solar Energy Technology and Application
  MAST 467014 Seminar: Electric Vehicles and the Grid
  MAST 467015 Seminar: Wind Power Meteorology
  MAST 628 Offshore Wind Power: Science, Engineering, & Policy
  MEEG 435 Wind Power Engineering*
  MSEG 470 Solar Energy*
Concentration in Water Quality and Resources apply science and engineering principles to assure that the world's water needs are met while adapting to effects of future climate change.

- MATH243 Analytical Geometry and Calculus C
- MATH 302 Differential Equations

- CIEG 223 Environmental Engineering Processes
  or CHEG112 Introduction to Chemical Engineering
  or CIEG331 Environmental Engineering

- CIEG 305 Fluid Mechanics
  or MEEG331 Fluid Mechanics I
  or CHEG341 Fluid Mechanics

-Two of the following:
  CIEG 430 Water Quality Modeling
  CIEG 438 Water and Wastewater Engineering
  CIEG 440 Water Resources Engineering (requires CIEG305/6)
  CIEG 468 Principles of Water Quality Criteria
  CIEG 498 Groundwater Flow and Contaminant Transport
  BREG 423 Advanced Storm-Water Management
  BREG 621 Nonpoint Source Pollution

ROUTING AND AUTHORIZATION:  

(Please do not remove supporting documentation.)

Department Chairperson ____________________________ Date 20 Feb 2014

Dean of College _______________________________________ Date 20 Feb 2014

Chairperson, College Curriculum Committee _______________________ Date 17 Feb 2014

Chairperson, Senate Com. on UG or GR Studies ______________________ Date

Chairperson, Senate Coordinating Com. ____________________________ Date

Secretary, Faculty Senate ________________________________ Date

Date of Senate Resolution ____________________ Date to be Effective __________________

Registrar __________________________________________ Program Code __________________ Date

Vice Provost for Academic Affairs & International Programs ______________ Date

Provost ________________________________________________ Date

Board of Trustee Notification _____________________________ Date

Revised 10/23/2007  /khs
Letter of Support by Dr. Shirley Vincent, NCSE
[program evaluator; see Appendix A]

&

Approvals from Departments and Programs
Affected by Programmatic Revisions
February 4, 2014

University of Delaware Faculty Senate

Dear Members of the Senate,

Delphis Levia, the Director of the Environmental Science and Environmental Studies (ESS) programs, asked me to comment on the proposed changes to the degrees and their concentrations. The changes are informed by the recommendations made in my 2011 strategic and comparative assessment, which compares the ESS programs to their peers nationally and draws upon the extensive research conducted by the National Council for Science and the Environment on trends and best practices for interdisciplinary environmental programs. The recommendations were also based upon interviews with the programs’ students, faculty and administrators.

I strongly support the four key changes to the ESS programs as described in the proposals. These changes build upon the programs’ existing strengths while enhancing their ability to prepare students for environmental careers and will position the ESS programs more competitively in the national interdisciplinary environmental education landscape. The key changes include: 1) redesigning the concentrations to represent interdisciplinary themes that align with environmental career paths and include the key knowledge and professional skills required for interdisciplinary environmental professionals; 2) adding an additional core course in Earth Systems: Science and Policy for both majors to develop knowledge and skills in systems understanding and approaches for complex environmental/sustainability problem-solving; 3) requiring a series of three shared core courses that bring the environmental science and studies student cohorts together at the beginning, middle and end of their studies in a shared problem-solving capstone course; and 4) restructuring the administration of the programs to reflect the students’ desire that their home college be the College of Earth, Ocean and Environment which will facilitate their sense of belonging, allow more interaction with other environmental science and studies students, and provide consistency in their advising and program requirements.

I believe these changes will be of great benefit to the ESS students, will further enhance the reputation and competitiveness of the ESS programs, and will position the programs for additional growth and development.

I would be pleased to answer any questions the Senate may have and can be reached by phone at 918-629-5143 or by email at svincent@NCSEonline.org.

Sincerely,

Shirley Vincent, PhD
Director of Education Research
National Council for Science and the Environment
February 4, 2014

MEMORANDUM

TO:       Dr. Del Levia, Professor and Faculty Director  
            ENSC and ENVR Programs

FROM:     Dr. Nancy M. Targett  
            Dean

SUBJECT: Support for changes proposed for the Environmental Science program

I write to formalize my support for the proposed revisions to the Environmental Science program that has been submitted for review.

These curricular and administrative changes are a result of recommendations from a program review conducted by an external nationally recognized expert with the specifics developed by the UD multi-college faculty committee that advises you as faculty director of the program.

The changes reflect best practices in the environmental field and bring the degree programs in line with current practices and processes at UD. Additionally and more importantly, the changes help eliminate confusion for students and are in their best interests from a cohort, curricular and preparation standpoint. The thematic areas give students more ability to explore current and future environmental issues such as water resources, renewable energy and earth system and societal connections in a cross and multidisciplinary way.

The Department of Geography and the College of Earth, Ocean, and Environment stand ready to implement these proposed changes. We are committed to serve our students while working closely with our colleagues throughout the university’s many colleges and disciplines.

If you have questions or require additional information, please feel free to contact me.
Dear Colleague,

I write to you regarding programmatic revisions to the Environmental Science and Environmental Studies degree programs (see attached) which I intend to submit to the Faculty Senate for approval by February 15, 2014. These revisions are the culmination of a year long discussion by the Environmental Council composed of faculty from your College or Department. [Faculty members that served on the Council were: Delphis Levia, Tracy Deliberty, Paul Imhoff, Janet Johnson, Jerry Kaufman, John Madsen, and Steven Hastings. Tom Sims and Murray Johnston participated in initial discussions.]

As Director, I respectfully request an email confirmation or approval from you, on behalf of your College or Department, that you are okay with the Program’s continued listing and use of your courses. Many of you have approved use of your courses in the current version of the majors. With a few of exceptions, the reconfigured majors are largely the same so the course demand should remain the same. The big change was a reduction in the number of concentrations to a lower number of more cross-cutting themes that mirror the interdisciplinary core of the majors.

The big course additions are:
- PLSC 204/205 for environmental science majors
- GEOG 372 or APEC 480 added to core of both majors
- ENSC/ENVR 300 for both majors
- ECON 151 or APEC 150 for environmental science majors [APEC100 no longer required for environmental science]
- Broaden list of theme classes in environmental studies, for example, in UAPP and POSC

Again, I would very much having an email approval from you on or before February 14th.

I thank you for your support of these two important undergraduate interdisciplinary environmental programs.

Kind regards,

Del Levia

--

Delphis F. Levia, Ph.D.
Professor of Ecohydrology
Director, Environmental Science & Environmental Studies
University of Delaware, Newark, DE 19716-2541, USA
Series Editor, Springer-Verlag, Ecological Studies Series
Skype: del.levia; Tel: (302) 831-3218; Fax: (302) 831-6654

2 attachments
Dear Del,
I approve the use of our classes in the Environmental Science and Environmental Studies degree programs.

best,
Blake

-----------------------------
Blake C. Meyers, Ph.D.
Edward F. and Elizabeth Goodman Rosenberg Professor and Department Chair
Department of Plant and Soil Sciences
University of Delaware

E-mail: meyers@dbi.udel.edu
Phone: 302-831-3418

From: "Delphis Levia" <dlevia@udel.edu>
To: "Delphis Levia" <dlevia@udel.edu>
Sent: Thursday, February 6, 2014 6:35:40 PM
Subject: Email approval requested for proposed program revisions by Feb 14th, please

[Quoted text hidden]

Delphis Levia <dlevia@udel.edu>
To: Blake Meyers <meyers@dbi.udel.edu>

Dear Blake,

Thank you for your support.

Take care,
Del

[Quoted text hidden]
Dear Delphis,

The Department of Mathematical Sciences is happy to continue to support your program and your revisions.

Best,

John A. Pelesko

--
John A. Pelesko
Professor and Chair
Department of Mathematical Sciences
University of Delaware
Dear Professor Levia,

As a co-director of the Environmental Humanities minor, I approve of these revisions to your programs. Especially given the growing variety of environmental programs on campus, I think fewer concentrations with more interdisciplinary opportunities for our students is a fine idea indeed.

Best of luck with the proposal,

mckay jenkins

---------
mckay jenkins
tilghman professor of english
journalism and environmental humanities
university of delaware
www.mckayjenkins.com
Dear Dr. Levia,

The proposed changes to your major requirements in Environmental Science and Environmental Studies are consistent with our teaching mission. The Department of Biological Sciences supports these changes.

Best regards,

Randy

Randall L. Duncan, Ph.D.
Professor and Chair
Dept. of Biological Sciences
University of Delaware

“Never...never...never...never give up!!.”

Winston Churchill

From: Delphis Levia [mailto:dlevia@udel.edu]
Sent: Thursday, February 06, 2014 6:36 PM
To: Levia, Delphis F, JR
Subject: Email approval requested for proposed program revisions by Feb 14th, please
Email approval requested for proposed program revisions by Feb 14th, please

Murray Johnston <mvj@udel.edu>  Sun, Feb 9, 2014 at 7:32 PM
To: Delphis Levia <dlevia@udel.edu>

Dear Del,
On behalf of the Chemistry and Biochemistry Department, I confirm that we approve of these program revisions. Thank you for shepherding this program so well.
Best,
Murray

Murray V. Johnston
Professor and Chair
Department of Chemistry and Biochemistry
University of Delaware
Newark, DE 19716

Office: Brown Laboratory, Room 102C
Phone: 302.831.1247
Fax: 302.831.6335
Email: mvj@udel.edu
Internet: www.udel.edu/chem/johnston/
Dear Del,

I approve of the continued listing of Economics courses for your programs.

Jim Butkiewicz

From: Delphis Levia [mailto:dlevia@udel.edu]
Sent: Thursday, February 06, 2014 6:36 PM
To: Levia, Delphis F, JR
Subject: Email approval requested for proposed program revisions by Feb 14th, please

Dear Colleague,

[Quoted text hidden]
[Quoted text hidden]
[Quoted text hidden]
[Quoted text hidden]
I would like to document the support of the School of Marine Science and Policy for the programmatic revisions of both the ENSC and ENVR programs. Both programs draw significantly from a broad set of courses offered in the School and uniquely integrate courses from other University units to offer students a strong curriculum in these growing interdisciplinary areas. Courses from SMSP that this two programs draw on include the following:

MAST 200 The Oceans
MAST 673 International Law (LEST 673, POSC 604)
MAST 663 Decision Tools for Policy Analysis
MAST 692 Environmental Values, Movements And Policy
MAST 620/POSC/UAPP 424/624 Energy Policy And Administration
MAST 670 United States Ocean And Coastal Policy
MAST 671 Coastal Processes And Management
MAST 462 Climate Change: Policy, Equity, and Mitigation
MAST 628 Offshore Wind Power: Science, Engineering & Policy
MAST 622 Conservation and Renewable Energy Policy
MAST 660 International and National Ocean Policies
MAST 482 Introduction to Ocean Science
MAST/GEOG 408 Radiative Transfer in Ocean & Atmosphere
MAST/GEOG 409 The Ocean and Climate Variation
MAST 427/627: Marine Biology
MAST 629: Topics in Marine Ecology
MAST 402/902 Introduction to Physical Ocean Science
MAST/GEOG 408 Radiative Transfer in Ocean & Atmosphere
MAST 421/621 Coastal Field Biology
MAST 427/627 Marine Biology
MAST 437/637 Geological Oceanography
MAST 441 Algal Ecological Physiology
MAST 442 Coral Reef Ecology
MAST 451/651 Marine Invertebrate Diversity
MAST 630 Ichthyology
MAST 646 Chemical Oceanography

Representing the faculty of the School, we are fully supportive of formalizing these programs and look forward to continued interaction with these students.

Regards,

Mark

Mark A. Moline, Director
School of Marine Science and Policy
College of Earth, Ocean, and Environment
University of Delaware
700 Pilottown Road
Lewes, DE 19958
(302) 645-4263
mmoline@udel.edu
Email approval requested for proposed program revisions by Feb 14th, please

From: Delphis Levia [mailto:dlevia@udel.edu]
Sent: Thursday, February 06, 2014 6:36 PM
To: Delphis Levia
Subject: Email approval requested for proposed program revisions by Feb 14th, please

Dear Colleague,

[Quoted text hidden]
[Quoted text hidden]
[Quoted text hidden]
[Quoted text hidden]

2 attachments

- FINAL_BS_ENSC_ProgRev_6Feb14.pdf
  79K

  41K
Delphis, I approve the courses from our School with one change. UAPP 604 Leadership should be UAPP 697 Leading Organizations in Public and Nonprofit Sectors. The other changes are all fine.

Thanks and best wishes, Maria

Maria P. Aristigueta
Director, School of Public Policy and Administration
Charles P. Messick Professor of Public Administration
Vice President, American Society for Public Administration
(302) 831-4570
www.sppa.udel.edu
http://www.ipa.udel.edu/directory/homepages/arishtigueta.html
Email approval requested for proposed program revisions by Feb 14th, please

Advani, Suresh G <advani@udel.edu>  
To: "Levia, Delphis F, JR" <dlevia@udel.edu>  
Cc: "Keefe, Michael" <keefe@udel.edu>

It won't have an impact on ME so I approve

Sent from my iPhone

[Quoted text hidden]

<FINAL_BS_ENSC_ProgRev_15Feb14.pdf>
<FINAL_BA_ENVR_ProgRev_15Feb14.pdf>
Levia:

ECE approves the inclusion of the ECE courses listed below.

One minor point should be addressed, however. In the PDF attachments, reference is made to ELEG 467/667 Low Power Electronics and Lighting. We have not developed that course to date and do not expect to offer it in the foreseeable future.

Ken
Thank you, Ken. I appreciate your affirmative and quick response. ELEG 467/667 is not listed in the proposed programmatic revision (on the right side) so we'll be all set. It is only listed on the left side and those courses would no longer be in effect once the revision is approved.

Thanks,
Del Levia
Email approval requested for proposed program revisions by Feb 14th, please

Martin, David C. <milty@udel.edu>  
To: "Levia, Delphis F, JR" <dlevia@udel.edu>  
Cc: "Shenton, Tripp" <shenton@udel.edu>, "Barner, Kenneth E." <barner@udel.edu>, "Advani, Suresh G" <advani@udel.edu>, "Lenhoff, Abraham M" <lenhoff@udel.edu>, "Ogunnaike, Babatunde A." <ogunnaik@udel.edu>, "Imhoff, Paul T." <imhoff@udel.edu>

This is fine with me…

David C. Martin, Ph.D.
Karl W. and Renate Böer Professor and Chair
Materials Science and Engineering
Professor of Biomedical Engineering
The University of Delaware
201C DuPont Hall
Newark, DE 19716
(302) 831-2062 Office
(734) 276-0409 Mobile
(508) 256-8352 FAX
miltydcm Skype
Google Scholar: http://tinyurl.com/98geuvt
http://www.mseg.udel.edu
http://cubic.mseg.udel.edu
http://udel.edu/~milty
milty@udel.edu

On Feb 15, 2014, at 1:53 PM, Delphis Levia <dlevia@udel.edu> wrote:

[Quoted text hidden]

Email approval requested for proposed program revisions by Feb 14th, please

Shenton, Tripp <shenton@udel.edu>                             Mon, Feb 17, 2014 at 9:31 AM
To: "Levia, Delphis F. JR" <dlevia@udel.edu>
Cc: "Ogunnaike, Babatunde A." <ogunnaik@udel.edu>, "Imhoff, Paul T." <imhoff@udel.edu>, "Barner, Kenneth E." <barner@udel.edu>, "Advani, Suresh G" <advani@udel.edu>, "Lenhoff, Abraham M" <lenhoff@udel.edu>, "Martin, David C." <milty@udel.edu>

Approved

Harry W. "Tripp" Shenton III, Ph.D.
Professor and Chair
Department of Civil and Env. Engineering
301-B Dupont Hall
University of Delaware
Newark, Delaware 19716
(302)831-2447
(302)831-3640 Fax
Email: shenton@udel.edu

From: Delphis Levia [mailto:dlevia@udel.edu]
Sent: Saturday, February 15, 2014 1:54 PM
To: Shenton, Tripp; Barner, Kenneth E.; Advani, Suresh G; Lenhoff, Abraham M; Martin, David C.
Cc: Ogunnaike, Babatunde A.; Imhoff, Paul T.
Subject: Re: FW: Email approval requested for proposed program revisions by Feb 14th, please

[Quoted text hidden]
Email approval requested for proposed program revisions by Feb 14th, please

A. M. Lenhoff <lenhoff@udel.edu>  
To: Delphis Levia <dlevia@udel.edu>  
Mon, Feb 17, 2014 at 9:40 AM

Dear Dr. Levia,

CHEG has a relatively small footprint in the proposed program, via a few courses listed as electives (CHEG 616, 625, 667). I should note that the 667 course listed will be up for receiving a permanent course number this year and so the designation will change at that point. I will also add, as noted in your documents, that some of the courses have prerequisites that may raise the bar somewhat for interested students. Beyond this, however, these are elective courses that can in general accommodate small numbers of additional students. (CHEG 625 has been quite crowded in recent years, and there have been occasions where we have had to limit enrollment.)

Given this context, we have no objections to your listing the courses as appropriate electives.

Regards,

Bramie Lenhoff
You have my approval.

Babatunde A. Ogunnaike

William L. Friend Chaired Professor of Chemical Engineering

Dean, College of Engineering

University of Delaware,

Newark, DE 19716

302-831-8017

Dear Dean Ogunnaike,

All of the COE departmental chairs [CIEG, ELEG, MEEG, MSEG, CHEG] have now given support for the proposed environmental science and studies programmatic revisions. Thank you. If it is possible, and you wish to send an email approval as well, it would also be greatly appreciated. Thank you.

Kind regards,

Del Levia

Delphis F. Levia, Ph.D.
Professor of Ecohydrology
Director, Environmental Science & Environmental Studies
University of Delaware, Newark, DE 19716-2541, USA
Series Editor, Ecological Studies- Analysis and Synthesis (Springer-Verlag)
Skype: del.levia; Tel: (302) 831-3218; Fax: (302) 831-6654

On Mon, Feb 17, 2014 at 9:40 AM, A. M. Lenhoff <lenhoff@udel.edu> wrote:
Dear Del, the department of political science and international relations is pleased to support and participate in the Environmental Science and Environmental Studies degree programs, including the revisions that you have proposed.

Gretchen Bauer

Professor and Chair

Political Science and IR

University of Delaware

302 831 2357

www.udel.edu/poscir
Geological Sciences supports the revised ENSC and ENVR program

James Pizzuto <pizzuto@udel.edu>  
To: Delphis Levia <dlevia@udel.edu>, James Pizzuto <pizzuto@udel.edu>  

I am happy to report that our faculty voted today to approve the proposed revisions to the ENSC and ENVR programs. We look forward to working with you to successfully implement the new program.

Best,

--
Jim Pizzuto  
Professor and Interim Chair  
Dept. of Geological Sciences  
101 Penny Hall  
255 Academy Street  
University of Delaware  
Newark, DE 19716  
302-831-2710  
pizzuto@udel.edu

Changes to Environmental Studies Major

Awokuse, Titus O <kuse@udel.edu>  
To: "Levia, Delphis F, JR" <dlevia@udel.edu>

Yes; I also support the use of APEC courses listed in the BS in environmental science degree.

Thanks.

Titus Awokuse

Professor and Chair  
Dept. of Applied Economics & Statistics  
213 Townsend Hall  
University of Delaware  
Newark, DE 19716  
Phone: 302-831-1323

-------- Original message --------
From: Delphis Levia  
Date: 02/18/2014 7:36 PM (GMT-05:00)  
To: "Awokuse, Titus O"

[Quoted text hidden]
Delphis Levia <dlevia@udel.edu>

Request for email approval for use of a few ENEP classes in program revisions

John Byrne <jbbyrne@udel.edu>

To: Delphis Levia <dlevia@udel.edu>, Syed Shah <ismat@udel.edu>
Cc: Lisa Schulz <lschulz@udel.edu>

Dear Del,

I give my email approval for the programmatic changes in both environmental science (with the theme name change stated) and environmental studies.

Regards,

JB

--------------------------------------------------------------------------------------------------

John Byrne, Director and
Distinguished Professor of
Energy and Climate Policy
Center for Energy &
Environmental Policy
University of Delaware
Newark, DE 19716-7301 USA

Phone: (302) 831-8405
Fax: (302) 831-3098
Website: http://ceep.udel.edu/
Biosketch: http://ceep.udel.edu/Bios/Byrne.pdf

--------------------------------------------------------------------------------------------------

On Wed, Feb 19, 2014 at 3:45 PM, Delphis Levia <dlevia@udel.edu> wrote:

Dear JB (and Lisa),

I am happy to report that the Council supports the name change of the theme from "Sustainable Energy" to "Energy and Environment". I know that you liked this renaming as well, JB, based on our telephone conversation. I agree that this will lead to less confusion among students.

JB, I now ask for a quick email approval for the programmatic changes in both environmental science (with the theme name change as stated above) and environmental studies. I am thrilled we were able to resolve this to everyone’s satisfaction so quickly.

Cheers,

Del

Delphis F. Levia, Ph.D.
Professor of Ecohydrology
Director, Environmental Science & Environmental Studies
University of Delaware, Newark, DE 19716-2541, USA
Series Editor, Ecological Studies- Analysis and Synthesis (Springer-Verlag)
Skype: del.levia; Tel: (302) 831-3218; Fax: (302) 831-6654

On Wed, Feb 19, 2014 at 8:17 AM, Delphis Levia <dlevia@udel.edu> wrote:

Thanks.

__________
20 February 2014

MEMO TO: Del Levia
    Director of Environmental Science & Studies Program

MEMO FROM: Tracy DeLiberty
    Chair of Geography

On behalf of Geography Department, we are pleased to support the revisions to the Environmental Science and Studies Programs. Changes in the core provide students with additional breadth and the themes are more appropriately aligned with fields of employment. Moreover, the changes are in line with the external program review.

Our Department will support the revisions in a number of ways. Our faculty will continue to serve as advisors and mentors, and we will offer the geography core and concentration courses as needed given our faculty resources.
Delphis Levia <dlevia@udel.edu>

Mtg request

Bowman, Jacob L <jlbowman@udel.edu>Thu, Feb 20, 2014 at 1:58 PM

Del, 

You have my full approve.

Take care, 

Jake

Sent from my iPhone

On Feb 20, 2014, at 1:40 PM, "Delphis Levia" <dlevia@udel.edu> wrote:

Jake,

Given the below, I would like your full approval now so I can finish this paperwork.

I am okay with the change of the theme description. Good catch. I changed one word. Now reads: "**Theme in Ecoscience** focuses on studying the nature of ecosystems as well as the interaction of organisms with their physical and biological environment. Courses cover the breadth of ecoscience. Students interested in studying ecoscience with an emphasis on the physical environment would best fit this theme. Graduates from the theme in Ecoscience should be prepared to gain employment as environmental scientists or seek graduate education in Environmental Science."

With regard to your final point, there will still be an Environmental Council. It is the intent to have faculty from all participating colleges on the Council. This is a plus and benefits students.

Thanks for all your help,

Del

Delphis F. Levia, Ph.D.
Professor of Ecohydrology
Director, Environmental Science & Environmental Studies
University of Delaware, Newark, DE 19716-2541, USA
Series Editor, Ecological Studies- Analysis and Synthesis (Springer-Verlag)
Skype: del.levia; Tel: (302) 831-3218; Fax: (302) 831-6654

On Thu, Feb 20, 2014 at 12:16 PM, Bowman, Jacob L <jlbowman@udel.edu> wrote:

Del, 

My department approves of the Ecoscience theme under the Environmental Science degree. We also approve of the courses listed for the major and theme. The number for landscape ecology is ENWC820. We also approve of listing ENWC413 under the Environmental Studies degree.
Appendix A

Strategic Programmatic Assessment

Prepared by

Dr. Shirely Vincent, National Council of Science and the Environment (NSCE)

Expert on interdisciplinary environmental education

Appendix A is included as a separate file since it is a secured document.