Energy and Environmental Policy

Doctor of Philosophy

PhD Handbook 2017-2018

Energy and Environmental Policy Program
278 Graham Hall
University of Delaware
http://enep.udel.edu

TABLE OF CONTENTS

WELCOME TO THE PH.D.-ENEP DEGREE PROGRAM

The document before you was prepared by ENEP faculty in coordination with the Energy and Environmental Policy Student Association (EEPSA). It is intended as a supporting tool throughout your academic pursuit of a Ph.D. The handbook contains information that will be relevant in all phases of your study and serves as a 'start-to-finish' guidebook. The degree of Doctor of Philosophy signifies that the holder has undertaken a substantial piece of original research, rigorous in content, thoughtful in analysis, and demonstrating a distinct contribution to knowledge. To allow you to focus on meeting the requirements of the University of Delaware and ENEP, this document helps in providing you an adequate overview of issues you might encounter throughout your study.

Energy and Environmental Policy

The ENEP program provides leadership for the PhD-ENEP degree. The degree is one of the first interdisciplinary graduate degrees in the U.S. in Energy and Environmental Policy. The PhD-ENEP provides opportunities for collaboration with faculty working on research projects in conjunction with local, state, national, international and non-governmental partner organizations, and pressing for the integration of social justice in energy and environmental policy development by engaging academic and professional discourses.

The Ph.D.-ENEP degree is aptly positioned within this context of rigorous academic study, praxis in the analysis and development of energy and environmental policies through coordination with partner organizations and governments, and the wider dissemination of knowledge about the need for the consideration of equitable futures in the analysis and development of energy and environmental policies.

ENEP FACULTY

Core Faculty

Dr. Ismat Shah
Director of the Energy and Environmental Policy Program
Professor, Materials Science & Engineering, Physics & Astronomy, and Energy & Environmental Policy
Office: 201 Dupont Hall
Office Phone: 831-1618
Email: ismat@udel.edu

Dr. Lawrence Agbemabiese
Research Associate Professor, Energy and Environmental Policy
Acting Director, Center for Energy & Environmental Policy
Office: 272 Graham Hall
Office Phone: 831-3623
Email: agbe@udel.edu

Dr. Saleem Ali
Blue and Gold Distinguished Professor of Energy and the Environment, Geography and Energy & Environmental Policy
Office: 220 Pearson Hall
Office Phone: 302-831-0871
Email: saleem@udel.edu

Dr. John Byrne
Director, Center for Energy and Environmental Policy
Distinguished Professor of Energy and Climate Policy
Office: 278 Graham Hall
Office Phone: 302-831-8405
Email: c/o PhD Candidate Jeongseok Seo jsseo@udel.edu

Dr. Biliana Cicin-Sain
Director, Mangone Center for Marine Policy
Professor, Marine Science & Policy
Office: 301B Robinson Hall
Office Phone: 302-831-8086
Email: bcs@udel.edu

Dr. Lado Kurdgelashvili
Assistant Research Professor, Energy & Environmental Policy
Office: 274 Graham Hall
Office Phone: 831-3232
Email: ladokurd@udel.edu

Dr. William Latham
Director, Center for Applied Business and Economic Research
Associate Professor, Economics
Office: 316B Purnell Hall
Office Phone: 831-6846
Email: latham@udel.edu

Dr. William F. Ritter
Professor, Civil & Environmental Engineering (Retired, December 2014)
Office: 265 Townsend Hall
Office Phone: 302-831-2468
Email: William.ritter@udel.edu

Dr. Ray Scattone
Assistant Research Professor, Energy & Environmental Policy
Office: 274 Graham Hall
Office Phone: 831-3232
Email: rayscatt@udel.edu

Affiliated Faculty

Dr. Cristina Archer
Associate Professor, Physical Ocean Science & Engineering, Marine Science & Policy, and Geography
Office: 371 ISE Lab
Office Phone: 302-831-6640
Email: carcher@udel.edu

Dr. Nii Attoh-Okine
Professor, Civil & Environmental Engineering
Office: 352 Dupont Hall
Office Phone: 831-4532
Email: okine@udel.edu

Dr. Steven Hegedus
Scientist, Energy Conversion
Office: 174 IEC Building
Office Phone: 302-831-6253
Email:ssh@udel.edu

Dr. Willet Kempton
Professor, Marine Science & Policy, Public Policy & Administration, and Electrical & Computer Engineering
Office: 374 ISE Lab
Office Phone: 302-831-0049
Email: willet@udel.edu

CHOOSE YOUR CAREER PATH

Candidates who successfully complete the Ph.D.-ENEP degree are prepared for rewarding academic or professional careers in sustainable energy and water development, environmental protection, E4 development, climate change policy and green economics. Careers include energy and environmental planning, policy analysis, management and administration, and research in the public, private and non-profit sectors. Graduates of the program will be qualified to assume positions in universities, governments, international agencies, research and policy institutions, consulting firms, energy utilities, and corporate departments with responsibilities in energy and environmental matters.

Degree Specializations

The Ph.D.-ENEP has three components: a) a 21 credit core curriculum; b) the development of a research area and the dissertation proposal involving at least 24 credit hours; and c) the writing of the dissertation itself. The Ph.D.-ENEP degrees are directly administered by ENEP with the support of five colleges at the University of Delaware: Agriculture and Natural Resources; Arts and Science; Business and Economics; Earth, Ocean and Environment; and Engineering. The support of these colleges reflects the interdisciplinary character of the Ph.D. ENEP degree.

The interdisciplinary structure of the Ph.D.-ENEP degree, ENEP offers several specializations that allow the candidate to develop the skill set of their choice. The degree specializations enable candidates to choose an approach to energy and environmental policy that suits their own career desires.

Energy Sustainability: Existing reliance on fossil and nuclear fuels is giving way to an emerging sustainable energy economy and society. The costs of conventional energy sources are becoming unacceptably high, leading to a shift toward energy conservation, improved energy efficiency, and renewable energy. Issues addressed by ENEP include: energy for sustainable development, energy and developing countries, environmental and social assessments of energy policies, the role of energy in climate change, the political economy of nuclear power, community-scale energy planning, and the requirements for energy justice.

Water Sustainability: ENEP embraces a “soft path” to issues of water resources and ecosystems. It seeks to move beyond reliance upon conventional supply-side approaches by focusing on conservation and the sharing of best management practices of water resources. The candidate with a water sustainability specialization incorporates concerns of social equity, conflict management, stream flow impacts and ecosystem sustainability in his/her research.

Environmental Justice: This specialization expands the challenge of environmental issues to include patterns of environmental injustice and recognizes the contemporary tendency to ignore issues of race, class, and gender in setting agendas for social action.

Candidates with a specialization in environmental justice gain a comprehensive perspective of the issues and viewpoints of environmental injustice and the growing movement to produce ideas and practices for an ecologically just society.

Political Ecology: Often identified with political economy, political ecology frequently takes political economy's interest in the expression and influence of state and corporate power on environmental politics and combines this with insights derived from understanding and analyzing environmental influences on social activity. In this manner, political ecology extends theoretical inquiry beyond the insights of the conventional social and natural sciences. Political ecology's ability to engage the philosophy and values of ecological justice has made it attractive to many who expect analysis to facilitate social change.

Global Environments: Global environmental issues can include issues of social conflict (such as unequal distribution of risks and costs), questions of ecological integrity (e.g. the loss of biodiversity or disruption of commons systems), and problems that require international response because they have global causes or significance (e.g. climate change). Climate change has been the most popular of the global environments issues for graduate study at ENEP, but other areas of interest include international trade and environment, globalization, and biodiversity protection. Global environmental issues have also been examined in the context of sustainable development and the implications for ecological justice.

Sustainable Development: A graduate study with the specialization of sustainable development covers contending perspectives on national and global sustainability, explores the relationship between human society and the natural environment, and investigates the values that encourage standards that are within the bounds of the ecologically possible and the socially reasonable. The sustainable development specialization further carries a strong intra- and inter-generational focus.

Design your own: Candidates may design a Specialization with the approval of their faculty advisor.

PH.D.-ENEP DEGREE REQUIREMENTS

There are several requirements that you will need to meet throughout your pursuit of the Ph.D. degree. Your advisor will be critical in this process as a source of information, support, and advice as you register for classes and seek to meet your requirements.

Meeting with your Advisor

Your advisor is your assigned faculty member that will help guide you through the ENEP program. Your faculty advisor must be a member of the core faculty. The frequency with which you meet your advisor depends on many issues. We ask you to meet with your advisor on a regular basis. Of course, the frequency also differs as to your personal preference, but most students meet with their advisor at least once a month. This will keep your advisor updated on your general progress, and will give you the opportunity to inform your advisor about any new potential plans you might have. Your advisor can help you with a range of different issues such as selecting a specific course that fits your plan of study, and advise you of internship possibilities for you are qualified, and can help you with general advisement.

Registering for Classes

New students should wait to register for courses until the day of orientation. At orientation, the ENEP faculty will introduce themselves and there is an opportunity to meet with your advisor and discuss your plan of study. Your advisor will go through the first semester with you to ensure that your course package is suitable for your plans and fits with ENEP course requirements. Continuing students should meet with their faculty advisor before registering for courses.

You can register for courses through the University of Delaware website (http://www.udel.edu/). At the menu bar, select *Students*, and then *UDSIS.* After you log-in onto the UDSIS, you should go to your personal Student Center. Here, you can get information on a wide range of topics, such as your grades, transcripts, your financial standing with UD, courses taken, and your demographic data. But, importantly for this section, you can also register for the courses you're planning on taking next semester. When you select *Registration & Drop/Add*, you get to a new window that allows you to select the courses you want to take. The website shows you how many seats are still available in the course and the schedule of the course.

Registration for independent study courses (ENEP666, ENEP866, ENEP868 and ENEP870) requires the assistance of the ENEP Program Coordinator. A form (see Appendices) must be completed with the instructor's signature before registration.

Not sure about which courses you can choose from? A selection of courses is included in this handbook to provide you with an idea of the courses that fit well with the ENEP requirements. If you want to see which courses are offered outside of the courses mentioned here, you can take a look at the UD course catalog. You can find the catalog on

the UD home website (http://www.udel.edu/). Just select *Students* from the main menu bar, then *Academic Resources*, followed by *UD catalog*.

Throughout your study, we recommend that you discuss your selection of courses with your advisor. You are also encouraged to discuss your course selection with fellow students. Make sure to select your courses prior to the start of the semester (except for your very first semester as you need to wait for orientation) and on time.

Course Requirements

In terms of course requirements, the Ph.D.-ENEP degree consists of several obligatory courses and a selection of courses that fall within a methods requirement section, a social science requirement section, and a science, engineering, and public policy requirement section. In addition, there is a specialization requirement.

Required courses:

ENEP 821 – Technology, Environment, and Society (TES) (Fall)
ENEP 820 – International Perspectives on Energy and Environmental Policy (Spring)

Methods Requirements:

Six credits of methodology course work is selected from the following list of 3-credit courses. (Substitutions are available by permission of the student's Ph.D. advisor and the ENEP Graduate Program Director).
Note: not all courses are offered annually.

ENEP 660 Engineering Economic Analysis for Sustainable Energy (Fall)
APEC 807 Math Programming with ECON App (Fall)
ECON 801 Microeconomics (Fall)
ECON 802 Macroeconomics (Fall)
ENWC 615 Wildlife Research Techniques (Spring)
GEOG 604 GIS for Environmental Research (Spring)
GEOG 670 Geographic Information Systems and Science (Fall)
GEOG 671 Advanced Geographic Information Systems (Fall) Not offered in Fall 2015
MAST 663 Decision Tools for Policy Analysis (Fall)
MAST 672 Cost-Benefit Analysis (Fall)
MAST 681 Remote Sensing of the Environment (Fall) - Not offered in 2015 Fall
POSC 816 Philosophy of Science and Research Design (Fall)
STAT 608 Statistical Research Methods (Fall & Spring)
UAPP 691 Quantitative Analysis in the Public and Non-profit Sectors (Fall)
UAPP 801 Processes of Social Inquiry (Spring)
UAPP 808 Qualitative Research Methods for Program Evaluation (Spring)

For individuals with strong backgrounds in economics, the following 3-credit methods courses may be added to the above list for selection:

ECON 803 Applied Econometrics I (Fall)
ECON 804 Applied Econometrics II (Spring)
ECON 810 Mathematics for Economics (Fall)
ECON 822 Econometric Theory I (Fall)
ECON 823 Econometric Theory II (Spring)

Social Science Requirements:

Six credits of courses are selected to meet the social science requirement.

List of social science courses satisfying the Social Science Requirement:
Note: not all courses are offered annually.

ENEP 625 Energy Policy and Administration (Fall)
ENEP 626 Climate Change: Science, Policy and Political Economy (Spring)
ENEP 661Sustainable Energy Finance (Spring)
ENEP 802 Electricity Policy and Planning (Fall)
ENEP 810 Political Economy of the Environment (Fall)
ENEP 824 Sustainable Energy Policy and Planning (Spring)
ENEP 666 Special Problem: Topics in Energy Policy (Fall & Spring)
ENEP 666 Special Problem: Topics in Political Economy of Energy & Environment (Fall & Spring)
ENEP 666 Special Problem: Topics in Sustainable Development (Fall & Spring)
ENEP 666 Special Problem: Comparative Environmental Politics (Fall & Spring)
ENEP 868 Research: Environmental Justice Issues (Fall & Spring)
ENEP 868 Research: Political Economy of Energy & Environment (Fall & Spring)
ENEP 868 Research: Sustainable Development Issues (Fall & Spring)
ENEP 868 Research: Sustainable Energy Policy (Fall & Spring)
ENEP 868 Research: Sustainable Water Policy (Fall & Spring)
ENEP 870 Readings: Climate Change Politics and Policy (Fall & Spring)
ENEP 870 Readings: Energy Economics (Fall & Spring)
ENEP 870 Readings: Energy Policy (Fall & Spring)
ENEP 870 Readings: Environmental Ethics (Fall & Spring)
ENEP 870 Readings: Environmental Justice (Fall & Spring)
ENEP 870 Readings: Political Economy of Energy & Environment (Fall & Spring)
ENEP 870 Readings: Postmodernism and Environmentalism (Fall & Spring)
ENEP 870 Readings: Sustainable Development (Fall & Spring)
ENEP 870 Readings: Sustainable Energy Options (Fall & Spring)
ENEP 870 Readings: Sustainable Water Options (Fall & Spring)
DISA 666 Special Problem: Disaster Science and Management (Fall & Spring)
DISA 866 Special Problem: Disaster Science and Management (Fall & Spring)
ECON 862 Topics in Industrial Organization and Regulation (Fall) Not offered in Fall 2015
ENWC 613 Wildlife Policy and Administration (Fall)
GEOG 622 Resources, Development and the Environment (Spring)
MAST 660 International Ocean & Environmental Policy (Fall)
MAST 675 Economics of Natural Resources (Fall)

MAST 676 Environmental Economics (Spring)
SOCI 671 Disasters, Vulnerability and Development (Fall)
UAPP 611 Regional Watershed Management (Spring)

Science, Engineering, and Public Policy Requirement:

Students complete the science, engineering and public policy requirement by choosing a three-credit graduate course (including a tutorial course with a number such as ENEP666, ENEP866, ENEP868 or ENEP870) in a natural science or engineering related topic to meet the science, engineering and public policy requirement. The course must be taken with a member of the University's science or engineering faculty and should be linked to the student's research interest.

Courses satisfying the Science, Engineering and Public Policy Requirement include (but are not limited to):
Note: Not all courses are offered annually. Also, please see your faculty advisor for more options.

BISC 635/ENWC 635 Population Ecology (Spring) Not offered in Spring 2016
CIEG 632 Chemical Aspects: Environmental Engineering (Fall)
CIEG 636 Biological Aspects: Environmental Engineering (Fall)
CIEG 650 Urban Transportation Systems (Fall)
CIEG 654 Urban Transportation Planning (Spring)
CIEG 655 Civil Infrastructure Systems (Fall) Not offered in Fall 2015
CIEG 666 Special Problem: Science & Engineering Aspects of Agricultural Systems (Fall & Spring)
CIEG 666 Special Problem: Science & Engineering Aspects of Water Systems (Fall & Spring)
ELEG 620 Photovoltaic Materials and Devices (Fall)
ELEG 628 Solar Energy Technology and Application (Spring)
ELEG 637 Energy Systems (Fall)
ENWC 620 Behavioral Ecology (Spring)
GEOG 652 Seminar in Climatology (Fall) Not offered in Fall 2015
MAST 601 Introduction to Oceanography (Fall) Not offered in Fall 2015
MAST 606 Ocean & Atmosphere Remote Sensing (Spring)
MEEG 642 Introduction to Fuel Cells (Fall & Spring)

Specialization Requirement:

Fifteen credit hours including the 3 credit Doctoral Dissertation Proposal (ENEP 863). Contact the ENEP Graduate Program Director for more information.

Courses not taken from the list under the social science requirement above can be used to build a specialization. Coursework other than offerings listed in the social science requirement can be included with the approval of the student’s advisor.

ENEP Course Descriptions

The Graduate Catalog (http://academiccatalog.udel.edu/) provides an overview of the courses offered at UD. More specifically, the UD Course Catalog (http://primus.nss.udel.edu/CourseDesc/index.action) allows a detailed search and description of all the courses offered at UD. Below, we describe some of the core ENEP courses. Graduate courses have numbers that are 600 or higher.

For courses with an asterisk (*), students are required to complete a Tutorial Course Registration form and submit it to ENEP Administrative Staff. Only Office Staff can register a student for this course.

ENEP 625: Energy Policy & Administration

This course analyzes energy use and energy policy with respect to politics, society, economics, finance, political economy, technology, resources, and environment. The course focuses on interrelationships among energy, environment, economy and equity (E^4). It considers the energy policy options needed to achieve a more sustainable world. Students successfully completing this course will achieve an understanding of the major issues in energy policy. They will be prepared to conduct energy policy analysis and they will have a basic knowledge of energy concepts and energy systems.

ENEP 626 Climate Change: Science, Policy and Political Economy

In the last decade, science has gained increasing confidence that anthropogenic release of CO_2, largely from fossil fuel combustion, is driving a change in atmospheric concentrations of greenhouse gases, with implications for earth's climate and ecosystems. The scale of implied change, while uncertain, stands to affect human populations (and other species) in potentially very negative ways, from altered patterns of rainfall and drought to the emergence of new pathogens, rising sea levels, and the migration of species to new territories. Indigenous livelihoods, crop production, urban infrastructure, present patterns of trade and migration, and quite possibly human survival – all may be threatened under more severe scenarios of climate change.

This course attempts to explain the science of climate change and to characterize existing policy responses, to date. Specific attention is given to exploring the political-economic dimensions of current policy pathways in most of the world's nations, which have yet to produce a meaningful response to the phenomenon of ever-increasing CO2 emissions. Also explored are theoretical perspectives grounded in the discourses of sustainability and equity, which are critical of current pathways and seek opportunities for energy reform that can advance both meaningful CO2 reductions and opportunities for wider socially beneficial outcomes.

ENEP 660 Engineering Economic Analysis for Sustainable Energy

The course covers economic evaluation approaches, metrics, and level of detail required for making sound economic decisions in sustainable energy project development. Students will learn about discounting (i.e. time value of money), financing methods (loans, mortgages, bonds, etc.), economic metrics (NPV, IRR, BCR, LCOE, etc.), and policy impacts (tax credits, capital rebates, accelerated depreciation, RECs, etc.) on wider adoption of sustainable energy systems.

ENEP 661 Sustainable Energy Finance

This course covers the financing structures and strategies utilized in developing sustainable energy projects, including solar, wind, hydroelectric, biomass and energy efficiency. This course is built on real-world examples from projects implemented around the world to provide a practical understanding of the financial analysis, policies and business perspectives required to implement sustainable energy projects. This course explores traditional project finance (debt and equity) and emerging structures (Investment Trusts, Energy Service Agreements, Crowd-Funding, and others) as tools to evaluate the financial value and project risk profile from the perspective of all the relevant parties of a successful transaction. This course is designed to be interactive utilizing a combination of lectures, guest practitioner discussions, in-class exercises and a group project to engage students in a participatory learning process to explore issues regarding sustainable energy finance.

ENEP 666 Special Problem*

The course is an in-depth independent study between a student and professor to provide students with the opportunity to investigate an energy or environmental policy area of their choice.

ENEP 802: Electricity Policy and Planning

This course analyzes the technological and regulatory policy evolution of the electricity industry. Emphasis is placed on the American experience with a comparative analysis of other national experiences. It also considers how technology innovations and policy/regulatory actions have guided the planning of the industry from its early days, and current technology and policy issues facing the industry and regulators.

ENEP 810: Political Economy of the Environment

Relations between societies and nature are, and have always been, complex. But contemporary relations and their manifestations are signals for many that fundamental problems exist. For example, socio-physical phenomena such as acid rain, urban air pollution, deforestation, thinning of the upper atmospheric ozone layer, rising rates of species extinction, mounting threats to biodiversity, and the prospect of global warming suggest that human activities are disrupting ecosystems. Political-economic phenomena

such as ecological imperialism, environmental commodification, unsustainable development, widening environmental injustice, and increasing threats to the livelihood basis of indigenous peoples suggest that the human toll of modern life is equally serious.

This course provides an interdisciplinary review and analysis of several theories and policy orientations developed over the last half century to explain and shape nature-society relations. A Policy Critique examining the issue of Global Climate Change is offered in the seminar as an example of how to evaluate the current range of political-economic explanations of nature-society relations.

ENEP 820: International Perspectives on Energy & Environmental Policy

The core focus of this course is government activity in the environmental and energy realms and the factors influencing policy formulation, application and effectiveness. We are free to analyze what government(s) has/have done, or not done, within the realm of the natural environment.

Among the objectives of the course are to:

- Present a political, economic and policy analysis of energy & environmental policy issues with emphasis on the international realm;
- Introduce a global energy scenario and explores its limitation;
- Review energy vulnerabilities faced by the South and examine issues associated with technology transfer from North to South;
- Examine global energy security and cooperation and explore global solar economy as an alternative to fossil fuel economy
- Examine the rise, development and prospects for global and international environmental governance;
- Review energy and environmental treaties, framework conventions, protocols, and other forms of agreements arising from international negotiations;
- Examine specific global environmental issues, such as biodiversity protection, environmental security, global warming, globalization, stratospheric ozone depletion, urban development, and freshwater resources; an
- Consider and evaluate a range of concepts in global environmental politics, including the global commons, international economy, sustainable development, the role of scientific knowledge, scale of governance, and social movements.

ENEP 821: Technology, Environment, & Society (TES)

The “Technology, Environment and Society” seminar is a core course for the Ph.D. program in Energy and Environmental Policy and a proseminar for the core program of the Ph.D. in Urban Affairs and Public Policy. This seminar introduces students to important theoretical perspectives that populate the energy, environmental, urban and public policy spaces. It maps the interaction between technology, the environment and society, as well as a range of critiques, to furnish the vocabulary for Ph.D. students to creatively imagine alternatives to our many urgent energy, environmental, urban and public policy challenges.

The seminar commences with a discussion of two distinctive ideas, viz. progress and technology that have significantly shaped the modern world. In Part II, the seminar examines prominent theories of political economy that furnish explanations for the industrial, as well as what some have offered is a post-industrial, transformation. The seminar then proceeds to consider the modern transformation of Asia, Africa and Latin America and its reception among numerous and diverse peoples and societies of these regions. In Part III, the seminar introduces students to critiques of the modern transformation including "post-modernism" and those that spring from the experience of Asia, Africa and Latin America. In Part IV, the seminar discusses the environmental critiques offered with regard to the modern transformation. In this context not only are the environmental implications of development examined, but also several critiques of modern efforts to redress its environmental consequences are considered. In its conclusion, the seminar focuses on new frontiers that are being encroached by the modern transformation and the conflicts that they engender.

ENEP 824: Sustainable Energy Policy and Planning

Sustainable energy paths are characterized by high levels of energy efficiency, extensive use of distributed energy resources and energy storage, reliance on natural gas as a transitional fuel, increasing dependence on hydrogen as an energy carrier, and a gradual shift to renewable energy sources. This course enables students to analyze sustainable energy strategies in terms of their economics, impacts on the environment (especially on climate change) and governance attributes. The course will also analyze policy options to facilitate a sustainable energy future.

ENEP 866 Special Problem *

The course is an in-depth independent study between a student and professor to provide students with the opportunity to investigate an energy or environmental policy area of their choice.

ENEP 868 Research*

The research course is an in-depth independent study between a Ph.D. student and professor to provide students with the opportunity to investigate an energy or environmental policy area of their choice. Through guided interaction with their professor, students will investigate this topic and write a research paper. Weekly or bi-weekly meetings must be scheduled with the professor in the first week of the semester in which the student enrolls in the course.

ENEP 870 Readings*

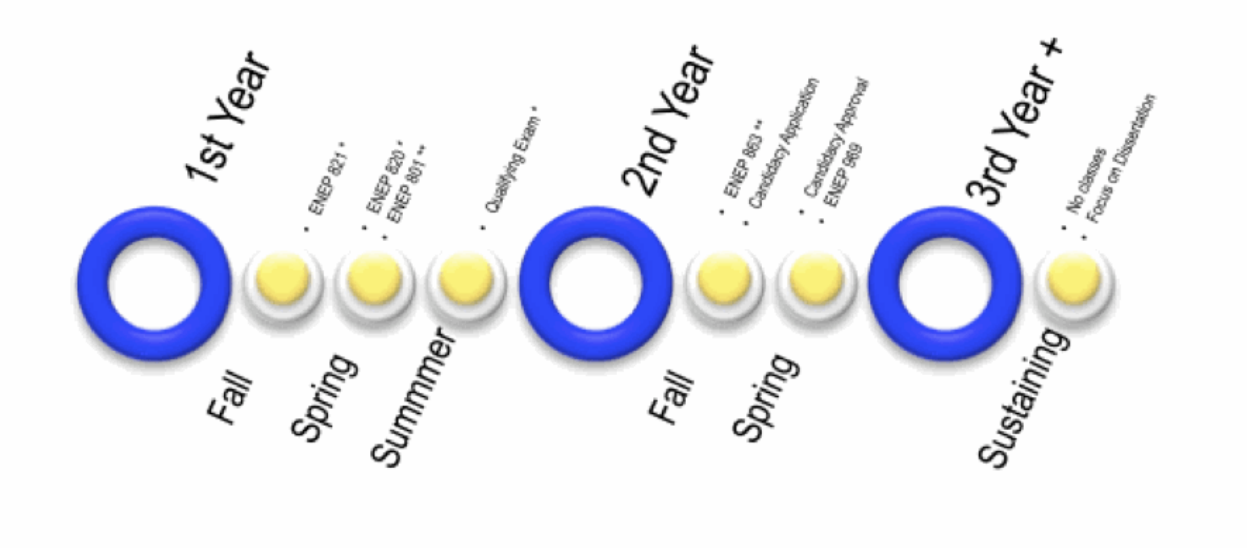
The readings course is an in-depth independent study between a student and professor to provide students with the opportunity to investigate an energy or environmental policy area of their choice. Through guided interaction with their professor, students will read an extensive body of literature on their topic, discuss these works with their professor and write

a draft and final bibliographic essay. Weekly or bi-weekly meetings must be scheduled with the professor in the first week of the semester in which the student enrolls in the course.

* Students are required to complete a Tutorial Course Registration form and submit it to ENEP Program Coordinator. Only Office Staff can register a student for this course.

PLAN OF STUDY

This student guide details the core requirements and schedule of events of the Ph.D. program in Energy and Environmental Policy at the University of Delaware; it gives students a brief explanation of the order and process, with optional methods to reach sustaining status for the third year of study. This document does not include details on other required courses and electives; those choices are more flexible, and discussions about what other courses to take should include your academic advisor. Disclaimer: As a general guide, this schedule and information is "ideal"; however, variation to this process can occur. The student should consult fellow students and academic advisors for a more thorough understanding of specific situations.



Year One: 1st semester (9 credits)

- ENEP 821 Technology, Environment, and Society (TES) (3 credits)
  This is a core requirement course; it is the basis for 50% of Qualifying Examinations. It is recommended that through this course the students focus on developing an ability for constructive discursive arguments on issues related to the technology, environment and society nexus.
- Six credits in selected courses.

Year One: 2nd semester (9 credits and a one-credit class to audit)

- ENEP 820: International Perspectives on Energy and Environment (3 credits)
  This is a core requirement course; it is the basis for 50% of Qualifying Examinations. For the qualifying exams on the first part of this course, it is recommended that the student focuses on understanding the significance of Kaya Identity as a policy tool.
- Six credits of selected courses.
  Recommended: UAPP 801: Processes of Social Inquiry (3 credits)
  This class is not required, but it structures proposal writing and critical research in alignment with the process required for ENEP 863: Dissertation Proposal. This course is not for everyone and their research process. However, it does provide a structured approach for writing an initial proposal and creating a research design.
- One credit class to audit: ENEP Colloquium Series

Summer (after 2nd semester and before 3rd semester):

Qualifying Examinations:

Approximately two weeks after the end of the second semester, all PhD students are required to take qualifying examinations to be accepted to the next stage of their PhD course. The qualifying exam consists of

- 2 questions based on issues discussed in ENEP 821 (a choice of 2 out of 3 is given) – essay time response
- 1 question based on the concerns raised in the Energy Policy section of ENEP 820 (no choice) – white paper
- 1 question based on the perspectives discussed in the Environmental Policy of ENEP 820 (no choice) – academic paper style response

The class as a group decides on the exact date of receiving the question paper, but it can be no longer than two weeks from the end of the spring semester. Students get 15 days to write responses, during which time it is expected that students do not discuss the questions with each other. EEPSA will hold a 'Qualifying Exam Support Session' sometime during the second semester to answer all questions and doubts students might have about the examination. Students are notified in August by letter with one of five different grades: pass with distinction, strong pass, pass, conditional pass, or fail.

Year Two: Third semester (12 credits)

- ENEP 863: Dissertation Proposal (3 credits)
  Use methods of research design to prepare a graded "draft" proposal. A grade for this course must be received at the end of the third semester.
- 9 credits in selected courses

Year Two: Fourth semester (15 credits) and a one credit class to audit

- ENEP 964: Pre-Candidacy Status (9 credits)

This course is graded pass/fail. You must have a grade for ENEP 863 to enroll in this course. The Office of Graduate Studies enrolls you in these credits.

- Specialization coursework (6 credits)

Illustrative timeline Dissertation Proposal up to Dissertation Proposal Defense (ENEP 964)

- End of 3rd semester: Graded Proposal for ENEP 863
- End of 4th semester: Section II of "Recommendation for Candidacy for Doctoral Degree" form (see below in appendix) submitted to ENEP Program Coordinator and the Graduate Office
- 2 weeks before the start of the 5th semester: Student must have been admitted to Doctoral Candidacy and the initial three (3) person Dissertation Committee must have received a professional presentation of the proposal and agreed to continue guidance of the student's doctoral research project.

Milestone Chart	
Beginning of Month 1 of the 4th semester	Student submits an improved proposal based on their ENEP 863 graded submission
End of Month 1 of the 4th semester	Student receives advice from the chair of the initial three (3) person Dissertation Committee regarding necessary improvements
Beginning of Month 2 of the 4th semester	Student improves the proposal and re-submits the document to the Committee Chair
Middle of Month 2 of the 4th semester	With approval of the Committee Chair student submits draft of improved proposal to 3 Committee members
Middle of Month 3 of the 4th semester	Committee Members are given 3-4 weeks to review the improved proposal and to forward comments to the Chair, who discusses them with the Students
End of Month 3 of the 4th semester	The student meets with the Chair to set a Committee Meeting for review of the new proposal
Beginning of Month 4 of the 4th semester	After public display in the ENEP lobby for at least 5 week days, the Committee meets to receive a professional presentation of the student regarding the proposal research. The Committee identifies additional revisions, if any, and the student launches the research project under the day-to-day guidance of the Chair.

Year Three to Dissertation Defense

The Ph.D. candidate is expected to write a doctoral dissertation. This includes nine credits of registration in ENEP 969 for doctoral research supervision. ENEP 969 in the fourth semester needs to be successfully completed to advance into sustaining status. The Ph.D. in ENEP is awarded upon the successful defense of the dissertation before a committee of four faculty, two of whom – including the chair – must be selected from the core faculty of the ENEP program. At least one committee member must be selected from non-ENEP core faculty and may hold an appointment from another institution. It is expected that an external faculty member from another institution with expertise in the regional focus of the dissertation will be selected when the research concerns an international topic.

Sustaining Status

Note: sustaining status is not the same as “approved” candidacy!
Sustaining status normally recognizes you as a student who has completed all coursework. ENEP funding will only cover your sustaining fee and stipend, not tuition charges for any courses taken after the second year of study. Classes can be audited, but this is just an official method of simply sitting in on a course.

2 months before Dissertation Defense: at least 2 months before the Defense of the Dissertation, a 4th Committee Member must be added with the approval of the Chair.

Committee Members can be consulted at any time during the preparation of the dissertation. However, coordination should always take place with the Chair of the Committee.

Dissertation Manual

A thesis and dissertation manual is prepared and edited by the Office of Graduate and Professional Education. The requirements published therein are effective for all students submitting theses, dissertations, and executive position papers. All graduate students and their advisors are responsible for understanding and following these standards. The manual can be found at: http://www.udel.edu/gradoffice/polproc/manual.html.

An Illustrative Timeframe for Defense of the Dissertation for May Graduation:

- October 1: First complete draft of dissertation (all chapters except conclusion) submitted to Committee Chair.
- November 1: Student meets with Committee Chair only for discussion of needed revisions. (Chair needs 4 weeks to read 1st draft)
- December 1: Second complete draft of dissertation submitted to Committee Chair.
- December 15: Student meets with Committee Chair only to define revisions needed before draft is ready for full Committee review.
- January 1: Third complete draft of dissertation submitted to ALL Committee Members. (Allow 4 weeks for Committee Members to thoroughly read the draft)
- February 1: Meeting of full Committee to discuss preparations for scheduling the Defense of the Dissertation.
- February 15: Revised draft, based on full Committee review, is placed on Public Display for two weeks (University requirement)
- March 1: Defense of Dissertation
- March 15: Submission of Revised Dissertation to Committee Chari based on Committee comments at Defense.
- April 1: Signatures of Chair and Committee Members on Dissertation Approval Pages (University requirement)
- April 15: Signature of Dissertation Page by Dean (allow 10 days for receipt of Dean's signature) and Submission to the Office of Graduate Studies.
- NOTE: Check Academic Calendar for deadline for receipt of Doctoral dissertation papers for degrees. Allow at least 6.5 months from the submission of the 1st complete draft of the dissertation to submission of the final version to the Office of Graduate Studies.

Graduation

A “Step by Step Graduation Guide” from the Graduate Office is available at http://grad.udel.edu/policies/step-by-step-guide-to-graduation/.

All graduate students must file an Application for Advanced Degree in order for the degree to be awarded. The deadline for application for advance degrees is available at link above.

Preparing for Your Internship

Internships are an important part of the ENEP program. In the summer, you have the opportunity to apply for internships at institutions and organizations outside of ENEP to enrich your professional experience and to gain an understanding of your potential future employment. We recommend that you discuss your ambitions and plans for internships with the ENEP director and your advisor. While you are free to apply for the internship of your choice, it is oftentimes better to wait until you have met with your advisor as they can write a recommendation letter or help you in other ways. It is important to recognize that some internships are unpaid positions. The Ph.D.-ENEP program does not require completion of an internship. It is an option that you can consider.

RESEARCH AT ENEP

Each year, ENEP operates a multi-project research agenda of collaborative projects among faculty and students. Research at ENEP creates opportunities for students to learn more about the academic research process, for thesis and dissertation development, and enables students to engage in community and professional relationships. Research projects are a valuable component of an education here at ENEP since they provide a means to apply learned theories and skills in a practical and professional setting. ENEP's research groups are akin to professional employment students will encounter after graduation and, as such, there are certain expectations from ENEP of participants.

To ensure a good working environment, the production of quality research, and to contribute to your future career opportunities, this section briefly outlines the functioning of research here at ENEP. Each research group will be provided with a more detailed document that outlines the particulars of that research project. The approach ENEP utilizes towards a professional working environment is threefold as it contains the following:

1. A matching of research needs with students' interest;
2. A process for research quality improvement; and
3. A process to address poor performance and misconduct

ENEP tries to align interests with research needs. Orientation is the annual moment at which the ENEP community is informed of the research portfolio of ENEP that will be operated that year. The description of the project will be included in the ENEP Research Portfolio handed out during Orientation and it will give you an initial glimpse into the dimensions of that particular project. It will also contain contact information if you want to find out more about the research project and possibly want to get involved.

You're encouraged to consider joining a research project. If you want more information about the research project, it is easiest to contact the Student Lead of the project. After identifying your research interests among all the projects listed in the ENEP Research Portfolio, you should send your preferences (1 to 3) to the ENEP Academic Coordinator.

Sometime after Orientation, the research groups will start to convene. It is important that the first research group meeting is attended by Faculty Supervisor (i.e. the main faculty member involved in the project), the Student Lead, and any interested ENEP students. At this meeting, the research objectives and research plan will be discussed. The status of ENEP students in relation to the project (such as, for example, volunteer or research assistant) will be recorded and tasks and responsibilities will be outlined.

ENEP RESEARCH/TEACHING ASSISTANTSHIP POLICY STATEMENT

ENEP provides excellent opportunities for graduate students to contribute to research projects as well as gain teaching experience. ENEP research and teaching assistantships are designed to financially support graduate students and cultivate a culture of co-operative inquiry and academic rigor, enriching them as researchers and instructors.

ENEP researchers work in teams in keeping with ENEP's holistic and inter-disciplinary character. This offers student researchers at ENEP the unique experience of working closely with people from different academic fields, countries and cultures. The Faculty at ENEP plays a supervisory role giving the projects a definitive direction. The day to day decision making within the project is the responsibility of the student members under the leadership of a Student Lead, nourishing a sense of ownership among the students.

ENEP has limited funding but tries to support all of its graduate students from the second year onwards and tries to align interests with research needs. To ensure fairness in funding decisions, equality in work load distribution and quality of the research conducted, the Center abides by the following research and teaching assistantship policies.

General Student Funding Policy

In accordance with University Policy, an Energy and Environmental Policy graduate student studying with ENEP and receiving a Tuition Scholarship, University Fellowship, or ENEP Research or Teaching Assistantship may not earn income from a second source. Funded students must contribute 20 hours per week to their assignments and the quality of their contribution should meet the high standards of scholarship and analysis expected from professional researchers in the field.

Students with ENEP Research or Teaching Assistant appointments are entitled to the same legal holidays as other University academic personnel. Responsibilities continue through the month of January (after Christmas break) and through the University Spring recess. Students will be required to seek express permission from their faculty advisor and from the Center Director prior to planning time away from the Center, in January and/or after University Spring recess.

Students studying with ENEP who are presently unfunded but hope for future appointment as ENEP Research Assistants must consult with their Faculty advisor and the Program Director before exploring funding opportunities within the University, or with non-University organizations in the field of energy and environmental policy. The ability to consistently support students by placing them in research assistantships relevant to their interests depends (among other things) upon close relationships with University and non-University agencies. It is important that such relationships are considered in order to ensure favorable long term and fair levels of student support.

Research Assistantship Policy

In-office obligations of RAs

All ENEP graduate students receiving partial or full funding from ENEP research assistantships (RAs) are expected to adhere to the following policies regarding in-office obligations:

- All RAs have an obligation to spend 20 hours per week on their research assignments; 16 of those hours per week must be provided in-office. Project meeting hours will be counted towards the fulfillment of the required in-office research hours. Off-campus RA contributions are permitted but are limited to 4 hours per week.
- All RAs are required to work minimum of 4 hours in their assigned ENEP office or ENEP Computer Lab between the hours of 9am and 5pm on 4 weekdays of each week (University holidays can only be included as a substitute with prior, written approval of your Faculty Supervisor.)
- All RAs have an obligation to fulfill in-office obligations during each semester from September 1-January 15 for fall semester support; and January 16-May 31 for spring semester support. This includes both, Winterim & Spring Break.
- Students will be required to seek express permission from their faculty advisor and from the Program Director prior to planning time away.
- RAs have no in-office obligations during the University Holiday Break beginning on the last day for submission of fall semester grades and the first weekday opening of University Offices after January 1.

STUDENT LIFE

Energy and Environmental Policy Student Association (EEPSA)

The Energy and Environmental Policy Student Association (EEPSA) is the main contact-point outside of your own advisor and the overall faculty of ENEP. The EEPSA board consists of seven students, both master and PhD students. EEPSA organizes both academic events for academic enrichments and social events. In the past, we have organized a wide variety of different kinds of events such as conferences, workshops, camping trips, and much more. This year, we have a range of activities planned that we hope you will all enjoy.

To stay up to date on the EEPSA activities, check out the group's website:

https://sites.udel.edu/eepsa/about-eepsa/

Make sure to sign up for the EEPSA-listserv, which provides you with a regular update on any news, new activities, or interesting events at UD. Finally, to further smoothen your transition into the ENEP and EEPSA community, we're starting a mentor program. Each one of you will be assigned a second, third, or fourth-year student as your mentor. Your mentor will help your introduction into the wider group of students and can answer all academic questions you might have. While your advisor is usually the first person to go to for such questions, we recognize that our faculty is already very busy and, as such, might not always have time on a short-term. To help you with questions of an academic nature – such as which courses to take – and to lighten the load on our faculty, your mentor is the right person to approach.

The EEPSA board and the wider ENEP community looks forward to having you as part of ENEP and EEPSA!

President	Christopher Oster
Vice President/Senator Proxy	Apratim Mishra
Academic Chair	Fan Yang
Career Chair	Mayank Saraswat
Social Chair	Sang Hun Lee
GSG Senator	Mayank Saraswat

Campus Services

The University of Delaware provides students with assistance in classes, personal development, and finding a job after graduation.

Office of Academic Enrichment

The Office of Academic Enrichment provides students with the skills needed to succeed in classes, including tutoring and study skills, much of which is free of charge.

Office of Academic Enrichment
148-150 S. College Ave
(302) 831-4555
UD-aec@udel.edu
http://ae.udel.edu/

University Writing Center

The University Writing Center helps students to improve their writing skills through one-on-one and small group tutorials. Writing tutors will review written assignments to strengthen organization, documentation and grammar.

University Writing Center
016 Memorial Hall
(302) 831-1168
writing-center@udel.edu
https://www.writingcenter.udel.edu/

Career Services Center

Career Services Center provides career advice and help finding employment for UD students and alumni.

Career Services Center
401 Academy Street
(302) 831-2392
udcareers@udel.edu
http://www.udel.edu/students/career-services-center/

Office for International Students and Scholars (OISS)

For international students, the OISS is a very important service. The OISS has a separate orientation in which they will inform you of all the services they provide. Here, we provide you with their contact information for your convenience:

Office for International Students and Scholars
44 Kent Way
(302)831-2115

oiss@udel.edu
http://www1.udel.edu/oiss/

UD Electronic Communications & Administration
As a student at UD you will need to access forms and view information over the internet, so the links below represent the most important places to find the information you are seeking.

ENEP's homepage	http://ENEP.udel.edu/
UDSIS	http://www.udel.edu/udsis-student
Webviews (paystubs, etc.)	http://www.udel.edu/webviews
People search	http://www.udel.edu/peoplesearch/
UD Maps	http://www.udel.edu/maps/
Sakai	http://www.udel.edu/sakai
Courses Search	https://primus.nss.udel.edu/CoursesSearch/
UD Classifieds	www.udel.edu/classifieds

USEFUL INFORMATION

Where to Go on Campus

Here is the UD map: http://primus.nss.udel.edu/buildings/main.action

UD Library
Recently renovated in the summer of 2014, the Morris Library is an unparalleled resource for research and study – both in the stack and on the web: www.lib.udel.edu. As a graduate student, you can reserve a carrel in the library to store books and study in a quiet environment. You can also reserve private research/study meeting rooms for project meetings.

Online, you will find access to many databases (JSTOR, RefWorks, Academic OneSource, Lexis Nexis, etc.) and hundreds of journals, to which you have subscription access as a UD student.

Aside from books, the basement of the Morris library offers access to a wide range or resources and services. The Student Multimedia Design Center is stocked with many computers, both PC and Mac, as well as free rental of high-tech audio, video and photographic equipment. They even offer professional quality video and audio recording studios. In addition to basic self-service scanning, printing and copying services, they also offer large-format poster printing.

The adjacent Film and Video Collection houses over 14,000 DVD/Blu-ray discs of movies, TV shows, etc. If you can't find what you're looking for, the Inter-Library Loan department located on the first floor can get almost any book or film from an affiliated library.

Beginning the 2014-15 academic year, the library will be home to an all new graduate student lounge located on the north side or the first floor.

Student Centers
Perkins Student Center (on Academy Street, just past the construction to the south of Graham Hall) Perkins contains a food court (nice mix of fresh and made-to-order food), Dunkin Donuts, study space, and a copy center. Downstairs is the Hen Zone (arcade) and Baccus Theater, a location for any number of student plays, concerts, and other activities. There is an Amazon Locker on the first floor where you can receive secure shipments from the online retailer.

Trabant Student Center (on the corner of South College and Main Street) Trabant contains another (though much busier and louder than Perkins) food court, a PNC bank, multi-purpose rooms (job fairs, lectures, campus events, etc.), a copy center, and a travel agency. Downstairs is a movie theater.

UD Fitness Centers Various locations (http://www.udel.edu/fitness/)
All full-time students have free gym membership, which includes an Olympic sized pool, cardiovascular exercise equipment, weights, aerobics classes, basketball courts and racquetball courts. Volleyball and Badminton nets are available at no charge upon request. Just bring your student ID (it acts as your membership card).

UD Parking
The campus has undergone extensive change during the last several years, thus you should make sure you know the parking rules if you chose to drive to campus. UD Parking home: http://www.udel.edu/transportation/parking/index.html
The best way to figure out what sort of pass you need is to follow the technocratic money categorization. http://www.udel.edu/transportation/parking/permit-prices.html and remember to take the UD Shuttle (by seeing its location online real-time: http://www.udel.edu/udshuttle/)

Parking Services
325 Academy Street
147 Perkins Student Center
(302)-831-1184
parking@udel.edu

Health Care on Campus

In the event of an emergency call 911. If you wish to drive to the closest hospital, then visit Christiana (www.christianacare.org/) or Union Hospital in Elkton Maryland (www.uhcc.com/).

For general primary doctor care, students can visit the Student Health Services (SHS), which is located in Laurel Hall (on the main campus south green area at the intersection of South College Avenue and East Park Place). Information on their services is located here: http://www.udel.edu/studenthealth/index.html

For student insurance, the plans that are made available are introduced here:
http://www.udel.edu/studenthealth/insurance/index.html
http://www.udel.edu/RM/student-insurance.html

Where to buy your books
UD bookstore at Barnes & Noble

Barnes & Noble UD Bookstore
83 East Main Street
Newark, DE 19717
Website: http://udel.bncollege.com/

On main street:
Lieberman's Bookstore – (www.lubonline.com),

Used Books Only:
Bookateria –70 E Cleveland Ave. (302) 737-4933
Manor Books –1005 N. Dupont Hwy., New Castle, DE (302) 322-5584

May find books, as well as jobs, housing, and other items on UDel Classifieds:
www.udel.edu/classifieds

How to reserve a room at UD

One option is to submit a room request form with the Registrars Office:
http://www.udel.edu/registrar/forms/specev.html.

There is a second option, but it requires collaborating with a Graduate Student Organization (GSO) such as EEPSA or a Registered Student Organization (RSO) such as Students For the Environment (S4E), which have room reservation privileges in the Perkins and Trabant Student Centers. [NOTE: The designation of an RSO is restricted to undergraduate student associations.]

Where to go in Newark

Parks:

- White Clay Creek State Park (closest to campus) - 425 Wedgewood Rd (www.destateparks.com/wccsp/).Other State Parks, see **www.destateparks.com/**
- Fair Hill Natural Resource Management Area (**http://www.dnr.state.md.us/publiclands/central/fairhill.asp**) - good hiking and mountain biking trails, about 5 minutes from campus

- Longwood Gardens (**www.longwoodgardens.com**) - for beautiful planned and wild gardens, forests, fountains, conservatories, and DuPont opulence

Where to go outside of Newark

- Wilmington- 13 miles (http://www.ci.wilmington.de.us/)
- Philadelphia- 45 miles (www.gophila.com)(www.uwishunu.com)
- Baltimore- 60 miles (www.baltimore.org)
- Rehoboth Beach, DE- 90 miles (www.beach-fun.com www.rehoboth.com)
- Washington DC- 95 miles (www.washington.org)
- New York- 130 miles (www.nycvisit.com)

How to get around
Newark has a very walkable and bike able downtown. For greater distances, you may want to use a car or take public transportation.

Newark
UD Shuttle Bus Service, around campus for free - (www.udel.edu/bus), see also the real-time tracker: http://www.udel.edu/udshuttle/
Newark UNICITY bus system – (http://www.udel.edu/SuppSrvc/bus/Unicity.html) (Newark service)
Delaware Area Rapid Transit (DART) - (www.dartfirststate.com)

Zipcar at the University of Delaware

Fast. Convenient. Affordable. Environmentally friendly.
With Zipcar on campus, it just got easier to live without owning a car.
(http://www.udel.edu/transportation/zipcar.html)

Delaware
DART buses – offers statewide service
Southeastern Pennsylvania Transportation Authority (SEPTA) trains –
The R2 line runs through Newark to Wilmington and Philadelphia

Philadelphia and beyond- SEPTA, Amtrak, private bus companies
www.septa.org www.megabus.com
www.amtrak.com www.boltbus.com

Megabus: Baltimore, New York, Philly, DC, Richmond (VA), Hampton (VA)

MARC Train Perryville, MD to Baltimore and Washington DC –
http://www.perryvillemd.org/train_station.html

APPENDICES: FORMS

Ph.D.-ENEP Tutorial Course Registration Form

Please type on form; form is writable

ENEP 666

ENEP 866

ENEP 868

ENEP 870

Semester of Tutorial: **Credit Hours:**

Student Name:

Student ID:

Instructor Name: _____

Instructor Signature: _____

Summary of the Course Description

Bases for Grading:

Course Requirements Worksheet

Energy and Environmental Policy (ENEP)

45 credits required to graduate

Requirement	Course	Credits	Semester	Grade
Obligatory Courses	ENEP 820	3		
	ENEP 821	3		
	ENEP 863	3		
	ENEP 969	9		
Social Science Requirements(6 credits)	Course 1 from selection	3		
	Course 2 from selection	3		
Methods Requirements (6 credits)	Course 1 from selection	3		
	Course 2 from selection	3		
Science, Engineering and Public Policy Requirement (3 credits)	Course from selection	3		
Specialization Coursework	Course 1	3		
	Course 2	3		
	Course 3	3		
	Course 4	3		
Qualifying Examination (2 weeks)		n.a.		

Detailed Plan of Study Form

UNIVERSITY OF DELAWARE
Energy and Environmental Policy Program

Name (Last, First, M.I.)	Entry Term

DEGREE REQUIREMENTS

1. Required Courses			
Course Number and Title	Credits	Semester/Year	Grade
ENEP 821 Technology, Environment and Society (Fall)	3		
ENEP 820 International Perspectives on Energy & Environmental Policy (Spring)	3		

2. Methods Requirements

Six credits of methodology course work are selected from the following list of three-credit courses.

List of methodology courses satisfying the Methodology Requirement:
ENEP 660 Engineering Economic Analysis for Sustainable Energy (Fall)
APEC 807 Math Programming with ECON App (Fall)
ECON 801 Microeconomics (Fall)
ECON 802 Macroeconomics (Fall)
ENWC 615 Wildlife Research Techniques (Spring)
GEOG 604 GIS for Environmental Research (Spring)
GEOG 670 Geographic Information Systems and Science (Fall)
GEOG 671 Advanced Geographic Information Systems (Fall) Not offered in Fall 2015
MAST 663 Decision Tools for Policy Analysis (Fall)
MAST 672 Cost-Benefit Analysis (Fall)
MAST 681 Remote Sensing of the Environment (Fall) - Not offered in 2015 Fall
POSC 816 Philosophy of Science and Research Design (Fall)
STAT 608 Statistical Research Methods (Fall & Spring)
UAPP 691 Quantitative Analysis in the Public and Non-profit Sectors (Fall)
UAPP 801 Processes of Social Inquiry (Spring)
UAPP 808 Qualitative Research Methods for Program Evaluation (Spring)

For individuals with strong backgrounds in economics, the following 3-credit methods courses may be added to the above list for selection:

ECON 803 Applied Econometrics I (Fall)
ECON 804 Applied Econometrics II (Spring)
ECON 810 Mathematics for Economics (Fall)
ECON 822 Econometric Theory I (Fall)
ECON 823 Econometric Theory II (Spring)

Note: All courses on the above list are offered annually.

Course Number and Title	Credits	Semester/Year	Grade
	3		

	3		

3. Social Science Requirements

Six credits of social science course work are selected from the following list of 3 credit courses

List of social science courses satisfying the Social Science Requirement:
ENEP 625 Energy Policy and Administration (Fall)
ENEP 626 Climate Change: Science, Policy and Political Economy (Spring)
ENEP 661 Sustainable Energy Finance (Spring)
ENEP 802 Electricity Policy and Planning (Fall)
ENEP 810 Political Economy of the Environment (Fall)
ENEP 824 Sustainable Energy Policy and Planning (Spring)
ENEP 666 Special Problem: Topics in Energy Policy (Fall & Spring)
ENEP 666 Special Problem: Topics in Political Economy of Energy & Environment (Fall & Spring)
ENEP 666 Special Problem: Topics in Sustainable Development (Fall & Spring)
ENEP 666 Special Problem: Comparative Environmental Politics (Fall & Spring)
ENEP 868 Research: Environmental Justice Issues (Fall & Spring)
ENEP 868 Research: Political Economy of Energy & Environment (Fall & Spring)
ENEP 868 Research: Sustainable Development Issues (Fall & Spring)
ENEP 868 Research: Sustainable Energy Policy (Fall & Spring)
ENEP 868 Research: Sustainable Water Policy (Fall & Spring)
ENEP 870 Readings: Climate Change Politics and Policy (Fall & Spring)
ENEP 870 Readings: Energy Economics (Fall & Spring)
ENEP 870 Readings: Energy Policy (Fall & Spring)
ENEP 870 Readings: Environmental Ethics (Fall & Spring)
ENEP 870 Readings: Environmental Justice (Fall & Spring)
ENEP 870 Readings: Political Economy of Energy & Environment (Fall & Spring)
ENEP 870 Readings: Postmodernism and Environmentalism (Fall & Spring)
ENEP 870 Readings: Sustainable Development (Fall & Spring)
ENEP 870 Readings: Sustainable Energy Options (Fall & Spring)
ENEP 870 Readings: Sustainable Water Options (Fall & Spring)
DISA666 Special Problem: Disaster Science and Management (Fall & Spring)
DISA 866 Special Problem: Disaster Science and Management (Fall & Spring)
ECON 862 Topics in Industrial Organization and Regulation (Fall) Not offered in Fall 2015
ENWC 613 Wildlife Policy and Administration (Fall)
GEOG 622 Resources, Development and the Environment (Spring)
MAST 660 International Ocean & Environmental Policy (Fall)
MAST 675 Economics of Natural Resources (Fall)
MAST 676 Environmental Economics (Spring)
SOCI 671 Disasters, Vulnerability and Development (Fall)
UAPP 611 Regional Watershed Management (Spring)

Note: Not all courses on the above list are offered annually.

Course Number and Title	Credits	Semester/Year	Grade
	3		

	3		

4. Science, Engineering and Public Policy Requirement

Students complete the science, engineering and public policy requirement by choosing a three-credit graduate course (including a tutorial course with a number such as ENEP 666, ENEP 866, ENEP 868 or ENEP 870) in a natural science or engineering related topic to meet the science, engineering and public policy requirement. The course must be taken with a member of the University's science or engineering faculty and should be linked to the student's research interest.

Example courses satisfying the Science, Engineering and Public Policy Requirement include (but are not limited to):

BISC 635 Population Ecology (Spring) Not offered in Spring 2016
CIEG 632 Chemical Aspects: Environmental Engineering (Fall)
CIEG 636 Biological Aspects: Environmental Engineering (Fall)
CIEG 650 Urban Transportation Systems (Fall)
CIEG 654 Urban Transportation Planning (Spring)
CIEG 655 Civil Infrastructure Systems (Fall) Not offered in Fall 2015
CIEG 666 Special Problem: Science & Engineering Aspects of Agricultural Systems (Fall & Spring)
CIEG 666 Special Problem: Science & Engineering Aspects of Water Systems (Fall & Spring)
ELEG 620 Photovoltaic Materials and Devices (Fall)
ELEG 628 Solar Energy Technology and Application (Spring)
ELEG 637 Energy Systems (Fall)
ENWC 620 Behavioral Ecology (Spring)
GEOG 652 Seminar in Climatology (Fall) Not offered in Fall 2015
MAST 601 Introduction to Oceanography (Fall) Not offered in Fall 2015
MAST 606 Ocean & Atmosphere Remote Sensing (Spring)
MEEG 642 Introduction to Fuel Cells (Fall & Spring)

Note: All courses on the above list are offered annually. Please see your faculty advisor and ENEP director for more options.

Course Number and Title	Credits	Semester/Year	Grade	
	3			

5. Qualifying Examination in Theory, Methodology and Policy Analysis

Date Passed Qualifying Exam: _____

6. Specialization Requirement[1]

Fifteen credit hours including the 3 credit Doctoral Dissertation Proposal (ENEP 863)

Title: _____

_____

Course Number and Title	Credits	Semester/Year	Grade	
	3			
	3			
	3			
	3			
ENEP 863 Doctoral Dissertation Proposal	3			

7. Doctoral Dissertation Requirement

Course Number and Title	Credits	Semester/Year	Grade	
ENEP 969 Doctoral Dissertation	9			

Date of Admission to Candidacy: _____

Dissertation Title: _____

_____

_____

Dissertation Committee:

Chair: _____

Member: _____

Member: _____

Member: _____

Approval of Advisor: _____ Date: _____

Recommendation for Candidacy for Doctoral Degree Form

Download: http://www.udel.edu/gradoffice/forms/candidacyform.pdf