

Ph.D. in Engineering and Public Policy

- **Residency Requirement**

Students are expected to be in residence, on-campus for fall and spring semesters of the first three years.

- **Course Requirements**

The doctoral program requires 42 credits including 9 credits of dissertation. The program requirements are shown in the following table.

| Course | Title | Credits |
|----------------------|--|---------|
| CIEG 880 – NEW | Seminar: Engineering & Public Policy | 0 |
| CIEG 881 – NEW | Case Studies in Engineering & Public Policy | 3 |
| UAPP 701 | Public Policy | 3 |
| UAPP 707 | Public Policy Analysis | 3 |
| See Option (1) | Qualitative methods | 3 |
| See Option (2) | Advanced (policy) quantitative methods | 3 |
| UAPP 693 or UAPP 709 | Public Economics | 3 |
| CIEG 646- NEW | Convex Optimization | 3 |
| See Options (3) | Engineering Technical Electives | 6 |
| See Options (4) | Electives | 6 |
| CIEG 882 | Summer Field Experience | 0* |
| CIEG 969 | Doctoral Dissertation | 9 |
| SPPA 861 | Academic and Professional Development for UAPP, DISA, ENEP Doctoral Students | 0 |
| Total | | 42 |

For each of the options (1) Qualitative methods; (2) Quantitative methods; (3) Engineering Technical Electives; and (4) Electives, potential courses are listed below.

Option (1) Qualitative Research Methods Options (select one):

EVAL 755 Evaluation Models and Approaches (c/I UAPP755)

SPPA 808 Qualitative Methods

UAPP 684 Performance Management & Program Evaluation

Option (2) Quantitative Methods Course Options (select one):

BUAD 621 Decision Analytics & Visualization

BUAD 831 Operation Management & Management Science

CIEG 641 Risk Analysis

CIEG 642 Data Analysis

CIEG 647 Network Optimization

ECON 804 Applied Econometrics

ECON 825 Time-Series Econometrics

GEOG 670 Geographic Information Systems GIS

GEOG 671 Advanced Geographic Information Systems

MAST 663 Decision Tools for Policy Analysis (c/I UAPP663)
MAST 672/ECON 670 Benefit-Cost Analysis
MISY 631 Data Mining for Business Analytics
MISY 840 Project Management & Costing
SOCl 605 Data Collection & Analysis
SPPA-704-Advanced Quantitative Methods
STAT 608 Statistical Research Methods
STAT 609 Regression & Experimental Design
STAT 611 Regression Analysis
STAT 612 Advanced Regression Techniques
STAT 617 -Multivariate Methods
UAPP 718 Survey Research Methods

Option (3) Engineering Technical Elective Course Options (select two):

Engineering technical electives are selected in consultation with the student's advisors to reflect the area of interest.

For example, a student interested in transportation and infrastructure policy might choose from the following courses:

CIEG 617 Introduction to Railroad Safety & Derailment Engineering
CIEG 618 Railroad Engineering
CIEG 652 Transportation Facilities Design
CIEG 653 Roadway Geometric Design
CIEG 654 Urban Transportation Planning
CIEG 655 Civil Infrastructure Systems
CIEG 657 Contemporary Topics in Transportation
CIEG 658 Pavement Analysis & Design
CIEG 663 Traffic Engineering & Modeling
CIEG XXX Sustainable Transportation

Option (4) Illustrative Elective Course Options (select as needed):

APEC 611 Regional Watershed Management (c/I UAPP)
DISA 650 Overview of Disaster Science & Management
DISA 651 International Comparative Analysis of Disasters
DISA 670 Issues in Disaster Response
ENEP 625 Energy Policy & Administration
ENEP 626 Climate Change: Science, Policies and Political Economy
ENEP 660 Engineering Economic Analysis for Sustainable Energy
ENEP 810 Political Economy of the Environment
ENEP 820 International Perspectives on Energy & Environment
ENEP 821 Technology, Environment and Society
ENEP 824 Sustainable Energy Policy and Planning
GEOG 649 Environment & Society
MAST 660 International & National Ocean Policies
MAST 662 Climate Change: Policy, Equity & Mitigation

MAST 674 Legal Aspects of the Coastal Zone
MAST 675 Economics of Natural Resources
MAST 676 Environmental Economics
MAST 684 Electric Vehicles & the Grid
MAST 802 Case Study in Environmental Decision Making
PHIL 648 Environmental Ethics (c/I UAPP648)
POSC 818 Environmental Politics & Policy (c/I UAPP)
UAPP 606 Local Economic Development
UAPP 608 Poverty, Neighborhoods and Community Development
UAPP 613 Planning Theory and Public Policy
UAPP 675 Land Use & Transportation Linkages (1cr)
UAPP 706 Planning Sustainable Communities and Regions

- **Qualifying Exam**

The objective of the EPP Qualifying Examinations is to assess the student's ability to do interdisciplinary analysis, based on sound knowledge of core themes, good analytical methods, and the ability to structure and analyze public problems in a way that appropriately integrates the required knowledge, methods, and judgment of both engineering and public policy. The levels of synthesis and evaluation to be demonstrated in these examinations go beyond those expected in most courses, although each student's plan of study is aimed at developing and exercising this level of problem solving. After the fourth semester of equivalent full-time course work (approximately 36 credits) has been graded, the student must pass a written and oral qualifying examination prepared by the Qualifier Exam Committee for the cohort of students seeking Ph.D. student candidacy.

- **Field Experience**

Students must complete a summer policy field experience (CIEG 882) with a local, state, or federal government agency or other appropriate organization related to the student's major area focus. Ideally the field experience will be paid and completed after the first year of study. The field experience will result in a policy paper of publishable quality to be evaluated by the student's advisors. Students participating in the field experience will carry the title "Policy Fellow."

- **Dissertation Proposal:**

The format of the dissertation proposal must adhere to guidelines specified in the University's Thesis and Dissertation Manual. The manual is available electronically on the Web at <http://www.udel.edu/gradoffice/current/thesismanual.html>. A copy of the dissertation proposal must be available to EPP faculty at least one week prior to the proposal defense. A copy of the dissertation proposal must be delivered to the members of the dissertation committee at least two weeks in advance of the proposal defense.

The dissertation proposal defense will be scheduled only after a majority of members of the dissertation committee have determined that a defense is appropriate. The dissertation proposal defense will be open to the public, and invitations will be sent to all EPP faculty and students at least one week prior to the defense date. The candidate will present a

summary of the proposed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the dissertation committee will meet to decide whether the proposal is accepted, rejected, or accepted with stipulations. Results of the meeting will then be presented to the student. The student may not receive more than one dissenting vote from members of the committee to receive a passing grade.

Dissertation committee members should sign the final copy of the approved proposal. A signed copy of the approved dissertation proposal should be forwarded to the program director. Students who fail the dissertation proposal defense will receive one additional opportunity to repeat the process and defend a new or modified dissertation proposal. The program director signs the candidacy form.

- **Defense of the Dissertation:**

The format of the dissertation must adhere to guidelines specified in the University's Thesis and Dissertation Manual. A copy of the dissertation must be made available to Engineering and Public Policy faculty at least two weeks prior to the proposal defense. The dissertation defense will be scheduled only after the advisor of the dissertation committee has determined that a defense is appropriate.

The dissertation defense will be open to the public, and invitations will be sent to all Engineering and Public Policy faculty and students at least two weeks prior to the defense date. The candidate will present a summary of the completed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the dissertation committee will meet to decide whether the dissertation is accepted, rejected, or accepted pending revisions. Results of the meeting will then be presented to the student. The student may not receive more than one dissenting vote from members of the committee to receive a passing grade.