Preventing ENEP Majors to Design, Conduct and Write Research Papers

The ENEP major was created from the experience of the faculty at the Center for Energy & Environmental Policy who have administered master’s (MEEP) and PhD (PhD-ENEP) degrees for more than 20 years. The major finishes with a 6-credit Senior Research Paper (ENEP 472) defended before two Program Faculty members who must be from different departments. The Senior Research Paper is expected to be 35-50 pages in length (double-spaced). All students enrolled in the major must complete and defend their Senior Research Paper in order to graduate.

The Senior Research Paper requirement grows out of two findings of the Program Faculty:

1. The major prepares graduates to enter private, public and non-profit organizations seeking analytically trained individuals. The demand for individuals trained in the field is mainly to fill policy/regulatory analyst, researcher and program evaluation positions. Often, organizations are looking for individuals who have a basic or better understanding of the underlying science and engineering aspects of energy and environmental challenges and who also have training in economic and policy analysis, with an ability to advise decision makers, through objective analysis, of the appropriate courses of action.

2. Students accepted into the MEEP degree program over the last 20 years who defended theses in order to graduate performed noticeably better than counterparts with similar academic records but who did not have this skill at graduation. The Program Faculty see the major as preparation for graduate study for a sizable percentage of graduates and, therefore, inclusion of this requirement improves the competitiveness of its graduates.

To prepare students for the several skills needed to succeed in the field, the Program Faculty built into the major distinct activities for students to learn how to design and conduct research and to write high-quality policy/economic/technical research papers. The defended Senior Research Paper is the outgrowth of these activities. They are as follows:

- Completing ENEP courses designed to fulfill second writing requirements – all 400-level ENEP courses include writing requirements that meet the University second-writing requirement. These include:
- ENEP 410 (3 cr): Environmental Sustainability: Economic and Policy Analysis – requires a 12-15 pp. book review. In consultation with a CEEP graduate student (who provides in-class and out-of-class training on how to prepare the book review) assigned to the course, students select a book from a published list (all are research-based), prepare an outline, submit a draft and then submit a final paper (accounting for 30% of their grade).

- ENEP 425 (3 cr): Energy Policy and Administration – requires a 10-12 pp. final paper on a subject involving at least one thematic section of the course. Preparation of the paper occurs in consultation with the CEEP graduate student assigned to the course for this purpose. At least two out-of-class meetings with the graduate student are required. The final paper accounts for 25% of their grade.

- ENEP 426 (3 cr): Climate Change: Science, Policies and Political Economy – requires two research essays of 7-8 pp. each and the completion of a spreadsheet analysis of the UD carbon footprint based on data provided to them. An in-class presentation of each student’s spreadsheet reports on 4 topics – the estimated carbon content of the University’s energy supply, the estimated carbon content of the University’s vehicle fleet and commuters (faculty, staff and students), the carbon impact of the University’s building stock and associated plug loads, and the estimated effects of specified University policy changes. Together, these activities account for 85% of the final course grade.

- ENEP 427 (3 cr): Sustainable Energy: Economics and Policy Analysis – requires a 17-20 pp. research paper and a poster. Students are graded on their research proposal, their research outline, their final paper, their poster, and their in-class presentation of their poster. Together these separately graded activities comprise 50% of the final course grade. Students work with two CEEP graduate students assigned to the course.

Students in each concentration of the major take at least 3 of the second-writing courses listed above. Honors students must write more advanced research papers, and in ENEP 427 (formerly ENEP 424) prepare more than one conference poster.

- Completing a Research Internship (ENEP 364) – all students in the major are required to complete a research internship for 3 credits. In order to register for the course, each student must complete a form and obtain their faculty advisor’s signature. On the form, the student defines the nature of the research activity, the organizational host and the benefits to the student’s program of study. A 12—15 page paper, developed with the student’s faculty advisor, is the main basis for the final course grade. Internships are developed in one of three ways:
  - Option 1: a) Students identify the proposed topic(s) of their undergraduate research to their advisor; b) The advisor indicates whether s/he has industry, government or other contacts in the student’s area of interest and suggests an application process by the student with the support of the advisor; if the advisor
does not have relevant contacts, c) the student’s interest is communicated to
CEEP’s director and associate director who identify contacts for the student.
  o Option 2: In parallel, the student can explore on the Internet and elsewhere
opportunities and then elicit the assistance of their advisor and, if needed, the
Center’s director and associate director.
  o Option 3: The student reviews the annually published CEEP Research
Portfolio (which contains 12-17 research projects) and decides if volunteering
on any of the projects would meet their needs for a research internship. If yes,
they can volunteer, for a CEEP project, with the support of their advisor.

- Completing a Readings Tutorial (ENEP 470) – Some students in the major
complete a 3-credit tutorial with a faculty expert for the purpose of preparing a
draft of the research literature review that can be used in the Senior Research
Paper. Depending upon the type of research a student has selected, it is
possible to select a 3-credit Research Tutorial (ENEP 468) instead of the
Readings Tutorial. Both tutorials include a 10-12 pp. paper which accounts for
the bulk of the final course grade. Prior permission to enroll in the tutorial is
required.

With this preparation, the student then enrolls in ENEP 472, the Senior Research Paper
course for 6 credits, and, with their committee’s advice, prepares the Senior Research
Paper. Students enroll for 6 credits in their senior year, typically either in the previous
Summer Session or Fall Semester for students who plan to graduate in the
Spring. Students normally will receive an ‘S’ grade until defense of the paper occurs
during the Semester they are graduating.

As a widely recognized hallmark of undergraduate distinction, a Senior Research Paper
demonstrates to graduate schools, fellowship committees, and employers a student’s
intellectual achievement and sophistication as well as their initiative and self discipline.

As the capstone of their undergraduate experience, a Senior Research Paper provides
students with the opportunity to draw upon what they have learned in and beyond their
work for the major and to make a significant contribution of their own. Students who
complete a Senior Research Paper may earn either a Degree with Distinction (DwD)
or—if they are pursuing an Honors Degree—they will earn an Honors Degree with
Distinction (HDwD). Requirements for earning the DwD or the HDwD include the
successful research, writing, and defense of the 6-credit ENEP 472, and meeting certain
GPA and course requirements outlined on the URP website. The University
Undergraduate Research Program has agreed to accept senior theses written for ENEP
472 in lieu of the UNIV 401-402 sequence.
Students enrolled in ENEP 472 will also have the same opportunities as students enrolled in the University’s senior research thesis courses (UNIV 401 & 402) to participate in additional activities, which include the following:

1. *Attending an orientation session at the beginning of each semester.

2. *Presenting their work to a small group of students twice a year, once in the fall, and again in the spring. Students in ENEP 472 may also have the option of attending another group’s presentations and providing those students with feedback on their work.

3. Attending a session demonstrating how to format a Paper (e.g., incorporating figures, tables, and graphs into a paper). Sessions are held twice in the fall and twice in the spring; students only have to attend one session.

4. Attending and having the option to present their work at the Senior Research Thesis Symposium, held on the first Saturday each May.

5. Receiving a graduation medal for their senior research paper. The medal signifies the student has earned a Degree with Distinction, which is an enriched degree indicating a student’s success in researching, writing, and defending their work, and the meeting of specific GPA requirements.

6. Students who complete ENEP 472 have the option of depositing their Senior Research Paper into the University’s institutional repository, an online archive that makes the student’s work publicly accessible. (Note: this is not mandatory. Students must opt in by granting the URP permission to deposit their work, and students retain copyright of their work.)

*The orientation session and the presentations are scheduled for Monday afternoons from 3:35 pm – 5:30 pm. If students enrolled in ENEP 472 would like to participate in these sessions, they may want to keep their Monday afternoon class time (3:35 pm – 5:30 pm) open on their schedule.