

Doing Research for Credit CHEG 473/474 versus UNIV 401/402 Sequence

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In general, one can do research in three ways: (1) research as a volunteer (2) research for money/pay (3) research for credit towards your degree. This document discusses only the “research for credit” option. You have a choice between two options if you want to do research for credit. You can either register for a sequence of two three-credit courses CHEG 473/CHEG 474 starting from the spring of your Junior year or the Fall of your Senior year and continuing on in the subsequent semester. Alternatively, you can register for the six-credit sequence of UNIV 401/402 in Fall/Spring of your senior year. In both cases, you will be doing a research project for a chemical engineering advisor and each of the courses can be used as a CHEG elective.

Option 1: CHEG 473/474 Senior Research Sequence in S13/F13/S14

Option 2: UNIV 401/402 Senior Research Sequence in F13-S14 (Degree with Distinction)

CHEG 473/474: The Chemical Engineering Department administers CHEG 473/474 and the requirements are different from UNIV 401/402. You are required to submit two progress reports in each semester (culminating in a thesis) but there is no formal defense as in UNIV 401/402. Admission to CHEG 474 is contingent on good progress in CHEG 473. Some students terminate their research with CHEG 473. The prerequisite for CHEG 473 is prior approval of research advisor and the CHEG 473 course instructor.

“Application for admission to CHEG 473 requires a one page document consisting of (1) Project Title (2) Name of Research Advisor (s) (3) Brief Objectives (4) Brief outline of research tasks to achieve the stated objectives (5) Metrics to evaluate successful attainment of the objectives.” The research advisor as well as the instructor for CHEG 473 must approve this document.

UNIV 401/402: The University administers UNIV 401/402 and there is a requirement to write a “formal senior thesis” at the end. There is also a formal “thesis defense” that is evaluated by a thesis committee. Students

who do UNIV 401/402 get a *Degree with Distinction*. Information on the University senior thesis and Degree with Distinction via UNIV 401/402 is available at the following url:

<http://www.urp.udel.edu/content/overview-program>

There is a formal application process with the Honors program before you can be admitted into UNIV 401/402. UNIV 401/402 requires a minimum overall of GPA of 3.0 and a GPA in the major of 3.5 at the time of graduation. The GPA average in the major is computed from the grades of all CHEG courses (and co-listed CHEG courses). More updated information on requirements can be provided by the undergraduate research office.

In both CHEG 473/474 and UNIV 401/402, you can earn six credits towards graduation. You must complete the entire six credits of UNIV 401/402 for a thesis and a degree with distinction. However, you can terminate the CHEG 473/474 sequence after only three credits of CHEG 473.

Selecting a Research Advisor: Many students start their research early in the summer after the sophomore year. It is important to determine what your interests are and then match them to those of the faculty. Do you like experimental work or do you prefer math and computation? Is there a particular course that you took that you found particularly interesting? Are you interested in biotechnology or catalysis or materials or thermodynamics or fluid mechanics, or energy or environment (etc.) or a combination of these? Once you have some idea of what you may like, it is recommended that you go to the Department web pages (<http://www.che.udel.edu>) and look at the research interests of the faculty. Send an email to the faculty member expressing your interest and set up an appointment to meet them in person. You have to find a research advisor who is willing to accept you. In special cases, you may also select a research advisor outside the chemical engineering department (assuming that there is chemical engineering content in the research).

There are several reasons why you should seriously consider doing research. You get a chance to work closely with a faculty member on an advanced research topic and explore a single research problem in depth. It is strongly recommended if you intend to go to graduate school. Even if you are not planning on graduate school, research gives you a chance to do independent

work in an unstructured environment and exercise your creativity. This experience is very different from structured and traditional coursework. Research opens up new horizons in subject areas that may not be covered in regular coursework. In several cases, it may be the only way as an undergraduate to find out in-depth about ongoing advanced Departmental research in new materials, biotechnology, nanotechnology, catalysis, energy, environment, etc. The Department of Chemical Engineering at Delaware is highly ranked because of the research in the Department. You are taking part in the pioneering research at the frontiers of the field by selecting the research option.

Teaching involves the transmission of existing knowledge in a structured environment consisting of lectures, homework and exams. Research consists in the expansion of the knowledge base and is usually done in an unstructured environment where you have more independence and can determine your own time schedules. The nature of your research experience does depend to a large extent on the choice of your research advisor, as each advisor is different not only in terms of research topics but also in terms of research management style. Many students who do not do well in the structured environment of coursework often find an outlet for their creativity in an environment where they have more freedom. Research is certainly worth considering as part of your undergraduate experience at UD. I strongly encourage it and if you have difficulty finding a research advisor or making a decision on what to do, please feel free to contact me.

Rules on waiver of CHEG 445 Senior Lab in case you do research

All students who enroll in UNIV 401 automatically get a waiver from CHEG 445 Senior Lab. Also, all students who take CHEG 473 and have a GPA of 3.2 or higher also get a waiver from Senior Lab. There may be selective waivers from Senior Lab for other students who have demonstrated a prior record of excellence in research. Such students have to petition to the associate chair (Prof. Buttrey) and the CHEG 473 instructor for such a waiver.

It is also possible for students to do both CHEG 445 and Research (UNIV 401 or CHEG 473). In such cases, the research can be used as a CHEG elective.