GRADUATE PROGRAM IN CHEMICAL ENGINEERING

The department participates in graduate education leading to the master of professional studies (M.P.S.), master of science (M.S.) and doctor of philosophy (Ph.D.) degrees in the following disciplines:

- Paper Science and Engineering (PSE)
- Bioprocess Engineering (BPE)
- Sustainable Engineering Management (SEM) MPS only

The graduate program allows students to investigate a diverse range of topics in the area of pulp and paper design, process and product development, and manufacturing, as well as the production of chemicals, energy and other products from sustainable raw material sources using both chemical and biological methods. The overall objective of the option is to educate students at the M.P.S., M.S. and Ph.D. level in the development of new processes and products that can be produced in an ecologically sound and sustainable manner.

Research Areas

Paper Science and Engineering

- Pulping and Bleaching Processes
- Colloidal Chemistry and Fiber Flocculation
- Fiber and Paper Physics
- Process and Environmental Systems Engineering
- Pulp and Paper Technology

Bioprocess Engineering

- Biocatalysis and Bioreaction Engineering
- Bioseparations Engineering
- Bioprocess Design, Simulation and Control
- Bioenvironmental Engineering
- Renewable Energy and Biofuels
- Biopharmaceuticals
- Industrial Biological Processes
- Biocomposite Materials, Biopolymers
- Bioactive Materials and Biosensors
- Nanocomposites and Nanostructured Materials

Sustainable Engineering Management (SEM)

The program in Sustainable Engineering Management allows students to investigate a variety of science and engineering topics together with courses in business, management, policy, law and other fields to form a Professional Science Master's program (PSM) recognized by the Council of Graduate Schools.

Students in this program must complete a total of 36 credit hours. The topical core of the program consists of 21 credit hours of courses in their technical field. An additional 12 credits of courses in business, management, policy, law and other areas constitute the "plus" courses in the degree. An integrative experience (3 credit hours) in the form of an internship or research experience is also required. The selection of the "plus" courses as well as technical electives allows students to develop study programs tailored to their individual interests and strengths.

The M.P.S. program in Sustainable Engineering Management is intended for students who:

- have a B.S. degree in an appropriate STEM field and wish to extend their technical knowledge in this area together with obtaining professional skills characterized by the “plus” courses
- have worked in the industry and wish to return for a professional degree that incorporates business skills into the program.

Students entering the M.P.S. program should have a B.S. degree in a science- or engineering-related field. In terms of coursework, students should have the necessary prerequisites to take the courses that are required for the degree or be prepared to take these courses prior to taking the required courses. In general, students should have taken as part of their undergraduate program at least two semesters of calculus, two semesters of general chemistry, a semester of physics and a semester of biology. Additional chemistry, biology, and computer science courses, while not required, would be helpful.

The SEM M.P.S. offers areas of study in:

- Bioprocess Engineering
- Paper Engineering

* ***Special Course Codes*** *(Code indicates course meets certain program or accreditation requirements. Ignore if there is no relevance to this program of study.)* ***G*** *= General Education Course (GenEd),* ***E*** *= Engineering,* ***ES*** *= Engineering Sciences,* ***M*** *= Mathematic,* ***NS*** *= Natural Sciences,* ***PE*** *= Professional Education,* ***S*** *= Summer-only*