

Master of Science in Coatings Technology

Curriculum and Graduation Requirements

◆ Program Objectives

Modern coatings, the products of a \$10 billion industry in the United States, protect and beautify our surroundings. The need for improved products, concern for their effects on the environment, and the need to conserve petroleum resources used in their manufacture all challenge the coatings industry and present new opportunities for chemists trained in coatings technology.

DePaul University is one of only four institutions in the United States offering graduate study in the coatings field. Established in 1985, the Coatings Technology Program at DePaul University graduates six to eight students with a Master of Science each year.

The main objectives of the program are twofold:

1. To satisfy the demand for technical professionals in the coatings industry at an advanced level
2. To provide an opportunity for Bachelor of Science-level coatings chemists in the Chicago area to enhance their knowledge and skills in order to improve their performance and gain advancement in salary and rank.

◆ Expert Faculty

The department of chemistry at DePaul University has nine full-time faculty members. Although the Coatings Technology program was established in 1985, DePaul University has been offering courses in polymer chemistry since 1971. Coatings chemists from local industries teach some of the specialized coatings courses.

◆ Professional Endorsement

The Coatings Technology Program at DePaul University has received the endorsement and active support of the Chicago Society for Coatings Technology, the largest section in the Federation of Societies for Coatings Technology.

◆ Admission Requirements

The program requires graduate admission to the chemistry department at DePaul University. Candidates should have earned the Bachelor of Science degree in chemistry or its equivalent. The twelve-course curriculum will require about nine quarters of evening study. Required courses include five advanced courses in organic, inorganic, and physical chemistry; three courses in polymer chemistry (synthesis, characterization and physical chemistry), and four courses in coatings technology, two of which are coatings laboratories.

◆ Course Schedule

The specific schedule of courses taken will depend upon when the program is started, when courses are offered, and the student's personal preference regarding sequencing and course loads. Please note that all course sequences are offered only every other year.

- **Autumn Quarter 2004**
Advanced Physical Chemistry I, CHE 470
Advanced Biochemistry I, CHE 442
- **Winter Quarter 2005**
Advanced Physical Chemistry II, CHE 472
Polymer Characterization, CHE 434
Advanced Biochemistry II, CHE 444
- **Spring Quarter 2005**
Quantum Chemistry, CHE 412
Physical Chemistry of Polymers, CHE 432
Coatings Technology I, CHE 460
Coatings Technology I Lab, CHE 461
Biochemistry III, CHE 440
- **Autumn Quarter 2005**
Advanced Organic Chemistry I, CHE 450
Coatings Technology II, CHE 462
Coatings Technology Lab II, CHE 463
Special Topic in Analytical Chemistry, CHE 480
- **Winter Quarter 2006**
Advanced Inorganic Chemistry I, CHE 422
Advanced Organic Chemistry II, CHE 452
Statistical Analysis of Data, CHE 490
- **Spring Quarter 2006**
Polymer Synthesis, CHE 430
Advanced Inorganic Chemistry II, CHE 424
Biochemistry III, CHE 440
- **Autumn Quarter 2006**
Advanced Physical Chemistry I, CHE 470
Advanced Biochemistry I, CHE 442

All graduate courses are taught in the evening, with labs on Saturday morning. Students may enroll in Coatings and Polymer courses as non-degree students to enhance their knowledge.

◆ Graduation Requirements Polymer Chemistry and Coatings Technology (Non-thesis M.S.)

This program, which has been established with the cooperation of the Chicago Society for Coatings Technology, is designed to provide students with the skills necessary for work in research and development in the coatings field. Since coatings systems are complex combinations of polymers, pigments, and other chemicals, the course of study

involves most branches of chemistry including organic, polymer, physical, inorganic, and analytical chemistry.

Courses: A minimum of 44 quarter hours, including any five **chemistry** courses from this set of eight (substitutions with other 300- or 400-level chemistry courses may be made with permission of the chemistry chair):

422, 424 Advanced Inorganic Chemistry I, II

442, 444 Advanced Biochemistry I, II

450, 452 Advanced Organic Chemistry I, II

470, 472 Advanced Physical Chemistry I, II

All of the following:

430 Polymer Synthesis

432 Physical Chemistry of Polymers

434 Polymer Characterization

460 Coatings Technology I

461 Coatings Technology Laboratory I

462 Coatings Technology II

463 Coatings Technology Laboratory II

Written examination testing the candidates general knowledge of chemistry

◆ **Research and Analytical Services**

We offer research and analytical services for characterization and analysis of organic and inorganic compounds, polymers, and polymeric coatings. The following instrumentation is available for analysis and characterization:

- Infrared Spectrometer (FT-IR), Perkin-Elmer, for non-destructive testing of coatings, pastes, gels, powders, and liquids by spectral analysis.
- Nuclear Magnetic Resonance Spectrometer (NMR), Varian EM360 (60 MHz), for spectral analysis of organic compounds and polymers.
- GC-Mass Spectrometer (Hewlett Packard), for analysis of organic compounds.
- Gel Permeation Chromatograph (GPC), Waters, for analysis of molecular weight and molecular weight distribution of resins and additives.
- High Pressure Liquid Chromatograph (HPLC), Spectra Physics, for analysis of additives.
- Differential Scanning Calorimeter (DSC), Polymer Laboratories, for analysis of thermal transitions (T_g, melting range), oxidative stability, and curing processes.
- Thermal Gravimetric Analysis (TGA), Polymer Laboratories, for analysis of thermal and chemical stability, degradation, weight loss, VOC, and moisture content.
- Universal Mechanical Testing Machine (QTEST), for tensile and compression testing of materials.

◆ **For more information contact**

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