Coatings and Polymeric Materials

Program and Application Information	
Department Chair:	Dr. Dean Webster
Email:	Dean.Webster@ndsu.edu
Department Location:	Research I, Research Park
Department Phone:	(701) 231-7633
Department Web Site:	www.ndsu.edu/cpm/
Application Deadline:	April 15 for fall semester. Applications are reviewed for all semesters, however fall start is preferred.
Degrees Offered:	Ph.D., M.S.
Test Requirement:	GRE (required for international applicants, recommended for all applicants)
English Proficiency Requirements:	TOEFL ibT 79 IELTS 6.5

Program Description

The Department of Coatings and Polymeric Materials offers graduate studies leading to the M.S. and Ph.D. degrees in polymers and coatings science, and students in the department may also get a Ph.D. in the Materials Science and Nanotechnology program. The departmental research bridges between basic and applied research in the field of polymers and coatings. There is a unique atmosphere and opportunities for cross-disciplinary research experience, often accomplished by multi-disciplinary research activities with, for example, chemistry or engineering departments. Advanced research work involves specialized training in the following areas: colloidal and interfacial chemistry of polymers and coatings, polymer synthesis, adhesion, durability, spectroscopy, corrosion, electrochemistry, nanomaterials design and synthesis, and rheology. The department has an industrial advisory board consisting of leading industrial scientists and/or former graduates who provide new directions and other feedback to the program.

First-year students who enter the program may take entrance examinations, which are used by the graduate committee primarily for advisory purposes. During the fall semester, the faculty meet with the new students to acquaint them with the research programs in the department. Because students are required to team with a research adviser by the end of the first semester in residence, they are required to discuss research opportunities with all faculty members.

Admission Requirements

The Department of Coatings and Polymeric Materials graduate program is open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full standing status to the program, the applicant must meet the Graduate School admission requirements and have adequate preparation in a science or engineering field.

Financial Assistance

The student must first be accepted in full or conditional status before he/she is eligible for an assistantship in the Department of Coatings and Polymeric Materials. To be considered for an assistantship, the Graduate School application packet must be complete no later than April 15. International students must also submit a TOEFL score. General and subject GRE scores are highly encouraged if they are available to the student. Graduate students may be supported during both the academic year and summer months by either teaching or research assistantships.

The current monthly stipend is $1,750+ per month, for an annual stipend of $21,000+. University tuition is waived for qualified TAs and RAs.

Research Facilities and Equipment

The Department of Coatings and Polymeric Materials is housed in a new building in the NDSU Research and Technology Park on the northwest corner of the campus. This building consists of nearly 40,000 square feet of space for research and teaching. Modern equipment and instrumentation have profoundly influenced the development of instruction and are the cornerstones of research in the chemical sciences. The Department of Coatings and Polymeric Materials possesses extensive instrumentation to characterize polymers and colloids ranging from state-of-the-art spectrometers, thermal analysis systems, advanced electrochemical equipment to study corrosion, and atomic force microscopes, as well as equipment for paint making and testing. Other modern research facilities, including state-of-the-art electron microscopy, high-performance computing and NMR laboratories, are readily available to all researchers on the NDSU campus and in the NDSU Research and Technology Park.

The Master of Science program requires the completion of 16 credits of letter-graded course work with an overall GPA of 3.0 or better. The Ph.D. program requires the completion of 27 credits of letter-graded course work with an overall GPA of 3.0 or better. Each student must choose a thesis (research) adviser within three to six months of beginning graduate school. After two semesters, the student must also select a supervisory committee. This committee advises the student and administers oral examinations. Candidates for the M.S. program normally satisfy course requirements within one year of study. Ph.D. candidates typically take about two years to complete courses, leaving later years for full-time dissertation research.

Candidacy qualifying examinations are administered twice annually. All Ph.D. candidates are required to pass the qualifying exam and defend an original written research proposal at least eight months prior to the final dissertation examination. The proposal topic must be approved by the student's research adviser, and the supervisory committee administers the oral exam. Lastly, following completion of dissertation research and the presentation of an acceptable written dissertation, the candidate defends it before the supervisory committee.

Accelerated M.S. Program

An accelerated M.S. degree program is available for students enrolled in a major at NDSU and the Coatings and Polymeric Materials minor program. This program will allow qualified students to complete a B.S. plus M.S. degree in as little as five years. Students should declare their intent to enroll in the accelerated M.S. program during their sophomore year. Contact the department for more information on the requirements for the program.

Gordon P. Bierwagen, Ph.D.
Iowa State University, 1968
Research Interests:Surface Chemistry of Coatings Materials, Corrosion Protection by Coatings, Electrochemical Characterization of Coatings and Polymers, Coating Lifetime Prediction, Concentrated Random Composites

Stuart G. Croll, Ph.D.
University of Leeds, 1974
Research Interests: Weathering Durability of Coatings, Service Lifetime Prediction, Colloidal Stability, Molecular Modeling, Pigment-Polymer Interactions, Film Formation Processes, Coating Physics, Art Conservation

Erik Hobbie, Ph.D.
University of Minnesota, 1990
Research Interests: Nanotechology, Nanoparticles Polymers, Optics and Rheology

Andriy Voronov, Ph.D.
Lviv Polytechnic National University, 1994
Research Interests: Synthesis of Polymers for Stimuli-Responsive Materials, Including Micellar Assemblies, Nanoparticles, Functional Capsules, Colloidosomes. Responsive Amphiphilic Macromolecules for Biomedical Applications, Including Drug Delivery

Dean Webster, Ph.D.
Virginia Polytechnic Institute and State University, 1984
Research Interests: Synthesis of High Performance Polymers, Polymerization Reactions, Crosslinking Chemistry, and Quantitative Structure-Property Relationship

Research Faculty

Dennis E. Tallman (formerly of NDSU Dept. of Chemistry)
The Ohio State University, 1968
Research Interests: Analytical And Physical Electrochemistry, Corrosion Mechanisms, Corrosion Control By Coatings, Electroactive Conducting Polymers, Scanning Probe Techniques Microelectrodes And Microelectrode Arrays

Adjunct Faculty

Dante Battocchi, Ph.D. (Center for Surface Protection, NDSU)
University of Trento, 2001
North Dakota State University, 2012
Research Interests: Electrochemical Noise Measurements, Scanning Vibrating Electrode Technique (Svet), Organic Metal-Rich Primers Characterization and Development, Materials Protection and Metal Corrosion

Bret Chisholm, (CNSE, NDSU)
University of Southern Mississippi, 1993
Research Interests: Electrochemical Noise Measurements, Scanning Vibrating Electrode Technique (Svet), Organic Metal-Rich Primers Characterization and Development, Materials Protection and Metal Corrosion

Matthew S. Gebhard (DSM)
Stanford University, 1990
Research Interests: Rheology in Coatings Processes, Final Film Properties, Architectural Binder Technology

Victoria Gelling, Ph.D. (Valspar)
North Dakota State University, 2002
Research Interests: Electrochemistry, Corrosion, Environmentally Compliant Corrosion Inhibitors

Loren W. Hill, Ph.D. (Consultant)
Pennsylvania State University, 1965

Research Interests: Structure-Property Relationships of Thermoset Coatings, Dynamic Mechanical Analysis

Theodore Provder, Ph.D. (Consultant)
University of Wisconsin, 1965
Research Interests: Chromatographic and Separation Methods of Polymers, Particle Size Measurements

Richard R. Roesler, Ph.D. (Consultant)
University of Washington, 1969
Research Interests: Blocked Polyisocyanates, Polyurethane Pispersions, High Solids Amine Functional Coreactants for Polyisocyanate

Brian S. Skerry, Ph.D. (Sherwin-Williams)
University of Manchester, 1980
Research Interests: Corrosion and Coatings