

Coatings & Polymeric Materials

Department Information

- **Department Chair:**
Dean C. Webster, Ph.D.
- **Department Location:**
Research I, Research Park
- **Department Phone:**
(701) 231-7633
- **Department Web Site:**
www.ndsu.edu/cpm/
- **Application Deadline:**
April 15 is the priority deadline for fall consideration. Applications are reviewed on a rolling basis.
- **Credential Offered:**
Ph.D., M.S.
- **Test Requirement:**
GRE: Required for international applicants (unless the applicant has earned a bachelor's degree from a regionally accredited university within the United States); 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 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, computational modeling, life cycle assessment, 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.

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.

Research Facilities and Equipment

The Department of Coatings and Polymeric Materials is housed in a modern 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 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 or IELTS 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.

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.

Dante Battocchi, Ph.D.

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

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: Nanotechnology, Nanoparticles Polymers, Optics and Rheology

Ghasideh Pourhashem, Ph.D.

Drexel University, 2014

Research Interests: Environmental impact assessment to inform decision making, Life cycle assessment (LCA) and techno-economic analysis (TEA) of bio-based products, Industrial Ecology, bio-based product policy

Mohiuddin Quadir, Ph.D.

Freie University Berlin, Germany, 2010

Research Interest: Organic Polymer Chemistry, Functional self-assembly of polymers, Biomaterials, Application-guided modification of polymers for pharmaceutical and medical use, Bio-based materials

Bakhtiyor Rasulev, Ph.D.

Uzbek Academy of Science, 2002

Research Interests: Cheminformatics, Computational Chemistry of Polymers and Coating Materials, Quantitative Structure-Activity Relationship, Predictive Models Development, Molecular Modeling, Nanoparticles, Physico-Chemical Properties and Toxicity Assessment

Andriy Voronov, Ph.D.

Lviv Polytechnic National University, 1994

Research Interests: Polymer Synthesis, Micellar Self-Assembly, Sustainable Biobased Polymeric Materials, Responsive Polymers for Biomedical Applications, Polymers for Biomimetic Conversion of Biomass, Polymer Latexes, Polymer Hydrogels, Polymer Thin Films.

Dean Webster, Ph.D.

Virginia Polytechnic Institute and State University, 1984

Research Interests: Polymer Synthesis, Thermosets, Polymerization Reactions, Bio-based materials, Marine Coatings, Combinatorial and High Throughput Methods.

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

Bret Chisholm, (PolyOne Corporation)

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. (Sherwin-Williams)

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 Dispersions, High Solids Amine Functional Coreactants for Polyisocyanate

Brian S. Skerry, Ph.D. (Sherwin-Williams)

University of Manchester, 1980

Research Interests: Corrosion and Coatings