

MATERIALS CHEMISTRY SPECIALTY AREA

Members: Professors George Barany, Frank Bates, David Blank, Philippe Buhlmann, Peter Carr, Daniel Frisbie, Wayne Gladfelter, Christy Haynes, Marc Hillmyer, Timothy Lodge, Kent Mann, Lee Penn, Louis Pignolet, Jeffrey Roberts, Ilja Siepmann, Andreas Stein, Andrew Taton, Donald Truhlar, Michael Ward, Xiaoyang Zhu

Area Coordinator: Professor Andrew Taton

Materials Chemistry at the University of Minnesota crosses boundaries between many of the more traditional areas of chemistry. Research interests of our faculty include biomaterials, solid state inorganic materials, polymers, materials for separations and environmental applications, surfaces and interfaces, materials characterization, simulation and modeling. Graduate students often enjoy the opportunity to become involved in existing collaborative programs between several faculty members in our department or in other departments, such as Chemical Engineering and Materials Science, Mechanical Engineering, Biochemistry and Physics. The course program and examination requirements for graduate students in Materials Chemistry have been specially designed to emphasize the interdisciplinary nature of this field.

I. Coursework for Students Specializing in Materials Chemistry

A total of at least 24 credits of coursework are required. At least 20 credits must be completed in the first year with a B- or better, and a GPA of at least 3.0 must be maintained. Students are given wide latitude to take courses appropriate to their research, and it is expected that they will consult with their advisors about this subject once they join a group.

The following is a selection of recommended courses for Materials Chemistry students:

*Materials Chemistry (Chem. 8201, fall)

*Introduction to Polymer Chemistry (Chem. 8221, fall)

Mechanisms of Chemical Reactions (Chem. 8011, fall)

Materials Characterization (Chem. 5210, spring)

Physical Chemistry of Polymers (Chem. 8211, offered spring 2006)

Polymer Chemistry Lab (Chem. 5223, spring)

X-Ray Crystallography (Chem. 5755, spring)

Other appropriate courses from chemistry, chemical engineering, materials science, physics, etc.

†Seminar (Chem. 8601/8602, both semesters)

†Professional Conduct of Chemistry Research (Chem. 8066, fall)

A minimum of 4 credits must be taken outside the student's major area.

*Highly recommended for Materials Chemistry students.

†Required for all chemistry graduate students.

Seminar: Students specializing in the Materials Chemistry program are required to participate in the seminar program. They are expected to attend at least one of the departmental seminars (or named lecture series) each week. In their first year, students need to register for the seminar course (Chem. 8601/8602). During their third year of study, students present a seminar describing their dissertation research.

II. Choice of Research Advisor

New graduate students entering in the Fall may choose a research advisor any time during fall semester but no later than the first Monday on or following January 15 of the student's first year in residence. They are encouraged to do so during Fall semester. In choosing a research advisor, graduate students are expected to interview at least four faculty members regarding their research. Once they have selected a research advisor, students should submit their choice, along with dated signatures of interviewed faculty, to the Graduate Operations Office. (See the attached form at the back of the Bulletin.)

III. Written Preliminary Examination

Overview: The written preliminary examination is in the form of an extensive *research dossier*, which is *written and prepared by the candidate* in consultation with his or her research advisor. The dossier should succinctly describe in detail the research the student is engaged in carrying out as the dissertation thesis. In particular, the following subjects should be discussed: the motivation for the proposed research, the methods that will be employed, the potential impact of the research in terms of well-defined, existing practical and/or fundamental problems, and research progress made to date. It is anticipated that the dossiers will be close to 40 double-spaced typed pages including a table of contents, references, tables, figure legends, and figures.

The following schedule will apply to the written candidacy examination for second year graduate students in the program.

September 16, 2005: The candidate provides the coordinator of the Materials Chemistry Specialty Area with a short abstract (max. 2 pages) of his or her planned research dossier which covers each of the categories described in the Overview.

October 7, 2005: The Materials Chemistry Specialty Area Coordinator informs the student of the names of three faculty members who will comprise the student's written preliminary committee. The student's research advisor serves as a member of this committee.

November 1, 2005: This is the deadline for handing in the Research Dossier to each of the committee members.

November 22, 2005: The committee chair sends a letter to the candidate (copied to the Area Coordinator) to inform the student of the opinions of the committee. Often this will be in the form of specific criticisms and suggested revisions for the candidate. If more

than one member of the committee feels that the Research Dossier is so poorly prepared that adequate revision seems highly improbable, the committee will inform the Director of Graduate Studies that the candidate has failed the written preliminary examination.

December 9, 2005: This is the deadline for submission of the revised copy of the Research Dossier to each of the committee members.

January 13, 2006: The student will be informed of the final decision of the committee. A **yes** vote by two or three members of the committee constitutes a passing grade.

IV: Oral Preliminary Examination

The oral examination for Ph.D. will consist of a short presentation of the background and research accomplished on the project up to the time of this examination. A 25 minute presentation is expected. Longer presentations are discouraged. Following the presentation, the student should anticipate that questions on the dossier presentation and program will be posed by the committee.

Students must file their Degree Program Form and oral examination committee request forms no later than *January 6, 2006*. It is advisable to file your degree program form much earlier, by *October 1, 2005*. The preliminary oral examination must be taken no later than *March 29* of the second year. If students fail this examination, they have a one week deadline in which to schedule a retake examination. This schedule accommodates the minimum period of 10 weeks required by the Graduate School before any retakes. All students are expected to complete the oral examination before the beginning of the summer term.

