

UNIVERSITY OF MASSACHUSETTS BOSTON  
GRADUATE CHEMISTRY PROGRAM

**Graduate Program**  
**University of Massachusetts at Boston**

DEPARTMENT OF CHEMISTRY

HANDBOOK

Program Policies and Procedures  
2009

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## **Welcome to the University of Massachusetts Boston**

\*Most information regarding general university policies, procedures, and fees can be found on-line in the Graduate Bulletin on the UMass Boston website:  
[http://www.umb.edu/admissions/grad\\_catalog/index.html](http://www.umb.edu/admissions/grad_catalog/index.html)

UMass Boston, part of the five-member University of Massachusetts system, is an urban public university. Large enough to offer a broad range of academic choices, UMass Boston is also small enough to maintain a closeness of community. Its modern Harbor Campus, three miles from downtown, is situated on a peninsula surrounded by Boston Harbor and is adjacent to the John F. Kennedy Memorial Library and the Massachusetts State Archives. The campus houses research and teaching laboratories, a greenhouse, two theaters, an art gallery, intramural and intercollegiate athletic facilities, extensive computer resources, and the Healey Library. Concerts, lectures, and plays on campus offer additional opportunities for a rich and satisfying student life, and the extensive cultural resources of Boston are nearby.

### **Office of Graduate Studies**

Under the leadership of the Dean of Graduate Studies, this office oversees all graduate work at the university. In collaboration with the university's Graduate Studies Committee, the Office of Graduate Studies exercises overall review and supervision of graduate programs, and provides guidance for the development of new programs, as well as for the maintenance of academic standards within existing programs. At UMass Boston, graduate education is supported cooperatively and in accordance with the highest national professional standards by the university's College of Liberal Arts, College of Science and Mathematics, Graduate College of Education, College of Management, College of Nursing, John W. McCormack Graduate School of Policy Studies, and College of Public and Community Service. Intercampus programs provide students the opportunity to benefit from faculty expertise on multiple campuses of the University of Massachusetts system.

### **Further Information**

Further information regarding Graduate Studies at UMass Boston can be obtained directly from the Office of Graduate Studies or their website: <http://www.umb.edu/academics/graduate/>

Graduate Studies  
University of Massachusetts Boston  
100 Morrissey Boulevard  
Boston, MA 02125-3393  
CC-02-2100  
Tel: 617 287-5700

You can also contact the Chemistry Graduate Program Director, Dr. Marietta Schwartz at 617 287-6146 or [marietta.schwartz@umb.edu](mailto:marietta.schwartz@umb.edu).

## **I. The Graduate Program in Chemistry**

The Graduate program in chemistry offers a Master of Science degree in addition to a combined B.S./M.S. degree. The specialty of our Department is in the field of Green Chemistry, and we are proud to be the first school in the country to offer a doctoral degree via the Ph.D. in Chemistry/Green Chemistry Track. Our faculty are committed to research designed to benefit society, and this emphasis is reflected in our course selections at all levels of education. Detailed descriptions and requirements for both the MS in Chemistry and the PhD in Green Chemistry are outlined below.

### **The MS in Chemistry Program**

The Master of Science Program in Chemistry serves students with interests in chemical research or in various interdisciplinary chemistry-related fields. Featuring small classes in an informal setting, the program offers students opportunities to learn in an environment that fosters extensive direct contact with individual faculty members.

The requirements for the Master's Degree Program in Chemistry have been designed with a flexibility that accommodates not only students interested in the usual areas of concentration in chemistry, but also those with interests in other, interdisciplinary, chemistry-related fields. Students may take as many as nine of the required thirty-three graduate credits from a related area of study. Candidates may work in such areas as chemical physics and chemical biology, or in such divergent fields as chemical economics, chemical education, and chemical writing or editing.

The curriculum is built on a foundation of core courses with concentrations in organic, inorganic, and physical chemistry. All students will master these fundamental sub-disciplines leading to a comprehensive appreciation of chemistry at an advanced level.

To accommodate working students, all classes meet late in the day (4:30 pm or later) on either a Monday-Wednesday or Tuesday-Thursday schedule. The courses are offered on a rotating basis, with two graduate courses offered each semester. Students seeking the MS degree may pursue their studies on either a part-time or full-time basis; non-degree students with appropriate backgrounds also are welcome to enroll in courses, subject to approval of the graduate program director. Attempts will be made to arrange schedules for those who must study part time.

### **Special Opportunities**

Students whose interests lie in interdisciplinary studies may engage in cooperative research projects directed jointly by program faculty and faculty in other suitable research programs on the campus.

### **What Our Graduates Do**

Students enter the program with a variety of career goals. Some are seeking better job opportunities than those afforded by the bachelor's degree, while others are looking for advancement in their current employment settings. Still others see in the program an opportunity to test their abilities for continued graduate study at the doctoral level. Recent graduates have been successful in achieving all these goals. Those seeking advancement or new employment have found a generally warm reception from employers

in the New England area and beyond. Those who have decided to pursue the PhD degree in chemistry have been admitted to some of the most highly reputed programs in the country. Most graduates point to the extensive direct faculty involvement that characterizes the program as a key factor in preparing them for professional success.

## MS Degree Requirements

For the MS in Chemistry, 33 credits are required from courses, seminars (CHEM 691 & 692), and Thesis Research (CHEM 699), distributed as follows:

- Three Fundamental Graduate Courses in Chemistry must be passed with grades of B or better. Students must pass one course from each of the following areas
  - Physical Chemistry
    - CHEM 601 - Thermodynamics and Kinetics
    - CHEM 602 - Quantum Mechanics and Spectroscopy
  - Inorganic Chemistry
    - CHEM 611 - Inorganic Chemistry: Synthesis and Analysis
    - CHEM 612 - Inorganic Chemistry: Structure and Reactivity
  - Organic Chemistry
    - CHEM 621 - Synthetic Organic Chemistry
    - CHEM 622 - Physical Organic Chemistry
- Three elective courses selected from either the list of Fundamental Graduate Courses in Chemistry, the list of Elective Graduate Courses in Chemistry (CHEM 651, CHEM 653, CHEM 658, CHEM 666, CHEM 671, CHEM 687, CHEM 688, CHEM 689, CHEM 690, CHEM 696), or a list of Approved Elective Courses Outside of Chemistry (available from the Department) given by Biology or EEOS. Other graduate courses outside of Chemistry may be taken to fulfill this requirement, with the approval of the Graduate Program Director, if particularly relevant to the student's research. Beyond this requirement, students are encouraged to take additional elective courses relevant to their programmatic focus.
- Completion of the Annual Graduate Student Report (AGSR) (Appendix F) by the student and research advisor each year the student is in attendance (administered every January).
- Literature seminar presentation, based on a deep study of the scientific literature related to a selected topic of current chemical interest and sufficiently removed from research being conducted within the Chemistry Department or the student's own research. The literature seminar must be completed within the first two years of matriculation.
- Thesis and defense based on original research in chemistry.
- All students must acquire at least one semester of teaching or work experience in chemistry, subject to approval by the Graduate Program Director.
- Students must maintain a GPA of 3.0 or higher and may not receive a grade of "C" or less in more than one course to remain in the Chemistry Graduate Program.

### **The Thesis**

The master's thesis is based on original scientific work, conducted under the close supervision of a faculty director. Customarily, research for the thesis is conducted in a faculty member's laboratory. However, students employed in the chemical industry occasionally carry out projects related to practical problems in their job settings, directed jointly by a Chemistry Department faculty member and a supervisory professional chemist at the job location.

Subject to availability, continuing students may be appointed as research assistants with the support of external grant funding provided through their research directors.

### **Teaching and Research Assistant Awards**

All full-time students must acquire at least one semester of teaching or work experience in chemistry, subject to approval by the Graduate Program Director.

The program offers a limited number of teaching assistantships to highly qualified new and continuing students. These awards, which include a modest stipend and waiver of tuition and some fees, and a health insurance benefit, require recipients to serve up to eight contact hours per week as laboratory instructors in certain of the department's undergraduate courses during the regular academic year. Experienced laboratory instructors also may be able to receive additional compensation in a similar capacity during the summer term.

### **Ideal Timeline for Completion of the MS in Chemistry**

<b>Semester 1</b>	<b>Semester 2</b>	<b>Semester 3</b>	<b>Semester 4</b>	<b>Second Summer</b>
Two Courses	Two Courses	Two Courses	Finish Research	Defend Thesis
Choose Research Advisor	Begin Research	Literature Seminar	Write Thesis	---
Choose Thesis Committee Members	AGSR	Continue Research	AGSR	---

## **The Doctor of Philosophy in Chemistry Green Chemistry Track**

### **The Program**

Green chemistry involves an ecologically sustainable view of chemical research, development, and manufacture. Toxicological consequences and environmental fate are important factors in understanding the entire life cycle of any product or process. Issues related to energy, the environment and human health provide some of the most exciting and important research topics facing chemists today.

This Green Chemistry PhD Track within the Chemistry Doctoral Program was the first such program in the world. It focuses specifically on providing chemistry doctoral students with the skills and tools necessary to design and carry out chemistry that reduces or eliminates negative impact on human health or the environment. The program aims to provide chemistry doctoral students with the tools and experiences needed to understand and modify the impact of chemicals and chemical processes on the world around us and to conduct research in new, fundamental, and applied physical, analytical, organic, and inorganic chemistries. Examples of research topics include renewable energies, environmental sensors, atmospheric reaction pathways, minimizing the negative impact of manufacturing processes from “cradle to grave,” understanding the hazards associated with pollution, and reducing toxicological impacts on the biosphere. Fundamental processes that can be investigated include new synthetic and analytical methodologies, photon/matter interactions, reaction theory, fate and transport of chemicals, surface chemistry, charge transfer, and biochemical interactions.

There has been strong and steady growth in Green Chemistry over the past decade. The American Chemical Society has formed a Green Chemistry Institute. There is an annual Green Chemistry and Engineering Symposium in Washington, D.C., held at the National Academy of Sciences in conjunction with the awarding of the Presidential Green Chemistry Challenge (the only presidential level award given in the field of chemistry in the United States). *Green Chemistry* is a journal published by the Royal Chemistry Society in London dedicated to the field.

The American Chemical Society’s Green Chemistry Institute explains that green chemistry differs from previous approaches to many environmental issues. Rather than using regulatory restrictions, it unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials so that they provide increased performance and increased value while meeting all goals to protect and enhance human health and the environment. The Green Chemistry track of the Chemistry Doctoral program at UMass Boston firmly embraces this philosophy.

### **Job Opportunities for Green Chemistry Track Graduates**

The graduates of the Green Chemistry Track will have the broad knowledge and expertise in organic, analytical, physical, inorganic and environmental chemistry to compete successfully for jobs in the academic and private sectors.

The Green Chemistry Track is being offered at an opportune time as both the Environmental Protection Agency and National Science Foundation have introduced major efforts to advocate Green Chemistry on a statewide, national and international level. The American Chemical Society, The Royal Chemical Society of London, and the Japan Chemical Society all have significant efforts aimed to disseminate Green Chemistry advances through industry and academia. University chemistry departments are now listing knowledge of Green Chemistry as a criterion for faculty hiring.

## PhD Degree Requirements

For the PhD in Chemistry/Green Chemistry Track, 60 credits are required from courses, seminars (CHEM 691 & 692), and Dissertation Research (CHEM 899), distributed as follows:

- Three Fundamental Graduate Courses in Chemistry must be passed with grades of B or better. Students must pass one course from each of the following areas
  - Physical Chemistry
    - CHEM 601 - Thermodynamics and Kinetics
    - CHEM 602 - Quantum Mechanics and Spectroscopy
  - Inorganic Chemistry
    - CHEM 611 - Inorganic Chemistry: Synthesis and Analysis
    - CHEM 612 - Inorganic Chemistry: Structure and Reactivity
  - Organic Chemistry
    - CHEM 621 - Synthetic Organic Chemistry
    - CHEM 622 - Physical Organic Chemistry
- CHEM 671 - Introduction to Green Chemistry **AND** EEOS 635 - Environmental Toxicology. Both CHEM 671 and EEOS 635 must be passed with grades of B or better.
- One elective course selected from either the list of Fundamental Graduate Courses in Chemistry, the list of Elective Graduate Courses in Chemistry (CHEM 651, CHEM 653, CHEM 658, CHEM 666, CHEM 687, CHEM 688, CHEM 689, CHEM 690, CHEM 696), or a list of Approved Elective Courses Outside of Chemistry (available from the Department) given by Biology or EEOS. Other graduate courses outside of Chemistry may be taken to fulfill this requirement, with the approval of the Graduate Program Director, if particularly relevant to the student's research. Beyond this requirement, students are encouraged to take additional elective courses relevant to their programmatic focus.
- Completion of the Annual Graduate Student Report (Appendix F) by the student and research advisor each year the student is in attendance (administered every January).
- CHEM 691 (Seminar I)/CHEM 692 (Seminar II) in every semester of attendance.
- Literature seminar presentation, based on a deep study of the scientific literature related to a selected topic of current chemical interest and sufficiently removed from research being conducted within the Chemistry Department or the student's own research. The literature seminar must be completed within the first two years of matriculation.
- A Written Comprehensive Examination and an Oral Examination to be admitted to candidacy.
- Dissertation and defense based on original research relevant to Green Chemistry.
- All students must acquire at least one year of teaching or work experience in chemistry, subject to approval by the Graduate Program Director.
- Students must maintain a GPA of 3.0 or higher and may not receive a grade of "C" or less in more than one course to remain in the Chemistry Graduate Program.

## The Dissertation

The doctoral dissertation is based on original scientific work, conducted under the close supervision of a faculty director. Customarily, research for the dissertation is conducted in a faculty member's laboratory. However, students employed in the chemical industry occasionally carry out projects related to practical problems in their job settings, directed jointly by a Chemistry Department faculty member and a supervisory professional chemist at the job location.

## Requirements for Candidacy to the Green Chemistry Doctoral Program

To be admitted to candidacy for the doctoral degree, each student will be subject to a Written Qualifying Examination and an Oral Examination. Students will be eligible to take the Written Qualifying Examination after completing the five required courses (three in the sub-disciplinary areas, Introduction to Green Chemistry, and Environmental Toxicology). The sixth elective course need not be completed prior to the examination. The test will consist of a number of questions related to the areas of these courses, and will be graded on a pass/fail basis. Students who fail the test may repeat it once at a subsequent regular testing session. Students who pass the Written Qualifying Examination may proceed to schedule the Oral Examination, which can be taken as soon as all six courses required for the degree have been taken. For the Oral Examination, the student will prepare an extensive research proposal, following the NSF proposal guidelines, relevant to Green Chemistry, which must be sufficiently removed from the student's dissertation research or research being conducted within the Chemistry Department. The research proposal will be presented to the student's committee, who will ask questions about the proposal in a private meeting following the defense, testing the student on their understanding of the chosen research field and the student's ability to competently defend their work and ideas. By vote of the examining committee, the student may be judged to have Passed, Passed Conditionally, or Failed.

A judgment of Passed admits the student to candidacy for the degree. Students judged Passed Conditionally will be required to satisfy additional requirements specified by the examining committee before being admitted to candidacy. Additional requirements might include preparing an extensive literature review paper on a topic in which the student appears to lack proficiency, or other remedial requirements the examining committee may deem appropriate, including recommended course work beyond the minimal requirements for the degree. Only one repeat of the Oral Examination will be allowed. Students judged Failed will be barred from proceeding in the doctoral program but may be offered the option of completing the research and thesis requirements to obtain the MS degree in Chemistry.

### Ideal Timeline for Completion of the PhD in Green Chemistry

Year 1	Year 2	Year 3	Year 4	Year 5
Four Courses	Two Courses	Written Qualifying Exam	Oral Qualifying Exam	Finish Research
Choose Research Advisor	Literature Seminar	Continue Research	Continue Research	Write Dissertation
Choose Dissertation Committee Members	Continue Research	AGSR	AGSR	Defend Dissertation
Begin Research	AGSR	---	---	AGSR
AGSR	---	---	---	---

## **II. Tuition, Fees, and Financial Aid**

Information on tuition and fees can be found in the Graduate Bulletin on the University website at [http://www.umb.edu/admissions/grad\\_catalog/tuition.html](http://www.umb.edu/admissions/grad_catalog/tuition.html). Information that can be found in the Graduate Bulletin includes a breakdown of tuition and fees, various sources of financial aid, scholarships, grants, and assistantships that all contribute to funding towards the graduate degree. For further information on these programs, qualifications, and how to apply, please refer to the bulletin.

### **Teaching and Research Assistant Awards**

The program offers a limited number of teaching assistantships to highly qualified new and continuing students. These awards, which include a modest stipend and waiver of tuition and some fees, and a health insurance benefit, require recipients to serve up to eight contact hours per week as laboratory instructors in certain of the department's undergraduate courses during the regular academic year. Experienced laboratory instructors also may be able to receive additional compensation in a similar capacity during the summer term. Subject to availability, continuing students may be appointed as research assistants with the support of external grant funding provided through their research directors.

### **Graduate Assistantships**

The university offers a limited number of graduate assistantships to qualified students. There are four types of assistantships:

**Teaching Assistant I (TA1)** - a graduate employee who is primarily assigned to instructional support activities

**Teaching Assistant II (TA2)** - a graduate employee who has independent responsibility for the teaching and grading of a lecture section of a course

**Research Assistant (RA)** - a graduate employee who performs work primarily related to academic research, including the gathering and analysis of data and conducting of bibliographical searches. Research assistants may be employed to perform research work not directly related to their own research

**Administrative Assistant (AA)** - a graduate employee who performs work of an administrative or technical nature.

All assistantships carry stipends and full tuition waivers. Some carry full or partial Education Operations fee waivers. Compensation levels and work conditions for graduate assistants are governed by a collectively bargained agreement between the University and the Graduate Employees' Organization (GEO), an affiliate of the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW) and its Local 1596. During AY '04-'05, the minimum full-time, nine-month stipend (where full-time is defined as twenty hours of work per week) is \$12,600. Stipends and workloads for part-time assistants are prorated according to the percentage of assistantship held. A new agreement is being bargained between the University and the GEO as this Bulletin goes to press.

## Graduate Student Assembly

The Graduate Student Assembly is the recognized graduate governance structure at the University of Massachusetts Boston. The Assembly seeks to advance the academic and professional interests of all UMass Boston graduate students, through planning and administering campus events; representing graduate student perspectives on issues affecting the university; funding grants for graduate students to attend professional conferences; and carrying out a range of other activities. GSA representatives are matriculated graduate students elected annually. Assembly meetings are open to all interested students. The GSA office phone number is 617.287.7975; email: [gsassembly@umb.edu](mailto:gsassembly@umb.edu), and their offices are located on the third floor of the Campus Center.

## III. Chemistry Research Faculty

**University of Massachusetts – Boston**  
**Department of Chemistry Graduate Program**  
[www.chem.umb.edu](http://www.chem.umb.edu)

### **Research Opportunities**

-A list of current research faculty in the Chemistry Department and their areas of research

Ph.D. in Physical Chemistry from Harvard University  
Assistant Professor  
Department of Chemistry  
S-1-85  
617-287-6143  
[Timothy.Dransfield@umb.edu](mailto:Timothy.Dransfield@umb.edu)

My lab explores Green Chemistry by seeking to understand human impacts on the chemistry of the atmosphere and environment. Particular emphasis is placed on understanding the links between the emission of volatile organic compounds and the formation of urban smog. Lab experiments are centered on a large flow tube into which gas phase reagents are injected, and the progress of a selected reaction is measured spectroscopically by observing the disappearance of reactants and appearance of products. Spectral analysis is done by Fourier-Transform Infrared Spectroscopy (FTIR), and plans call for the addition of mass spectrometry. Experiments are conducted over a range of temperatures and pressures. Each experiment is accompanied by an in-depth theoretical study to map out the potential energy surface on which the reaction takes place, identifying likely transition states and intermediates and allowing us to explain the pressure and temperature dependent effects observed in the experiments. Understanding these surfaces allows us to learn more about the reactivity of radicals and molecules, a field which is still not well understood. Students will learn about the physics and chemistry of the atmosphere, spectroscopic techniques, computational chemistry, gas phase kinetics, fluid mechanics, vacuum and pressure management, simple electronics, and instrument design and development. In addition, collaborations with researchers at Harvard University will expose students to more experimental techniques, including *in situ* detection of important gas phase molecules.

**Jason Evans**

Ph.D. in Analytical Chemistry from the University of Delaware  
Associate Professor and Graduate Program Director  
Department of Chemistry  
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Professor Evans' research group focuses on using high performance separation techniques and mass spectrometry to characterize biological samples. The two major areas of interest are lipidomics and proteomics. For instance, one of our externally funded projects involves the development of an LC-MS-MS method for the comprehensive analysis of complex mixtures of triglycerides, the major components of fats and vegetable oils. In addition, several collaborative projects are on-going with investigators in the Biology Department here at UMB. For further information, please see the Evans Group Research page at <http://alpha.chem.umb.edu/faculty/evans>.

**Michelle Foster**

Ph.D. in Chemical Physics from the University of Texas at Austin  
Associate Professor and Associate Dean for Student Success  
Department of Chemistry  
S-1-87  
617-287-6096  
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The Foster group uses traditional **surface science and experimental physical chemistry** techniques, such as Fourier Transform Infrared Spectroscopy and Atomic Force Microscopy, to investigate complex interfacial systems. There are a number of interesting projects being actively pursued in the Foster Lab. These include, but are not limited to, the following areas. **Atmospheric Chemistry** is being investigated by means of spectroscopic measurements examining the heterogeneous chemistry of volatile organic compounds (VOCs) and other trace atmospheric constituents on the surface of atmospherically relevant substrates to determine the fate and transport of these chemicals in the troposphere. The quest for **Alternative Energy Processes** is the motivation for our investigations of adsorption mechanisms on activated carbon surfaces for use both as hydrogen storage devices and in water filtration processes. **Green Chemistry** is being pursued by investigating the mechanisms of catalytic reactions occurring on solid acid catalysts. Lastly, there is a project in **Biophysical Chemistry** which involves the use of our AFM to visualize biological macromolecules. This varied and yet intertwined collection of projects is made possible by rich collaborations with many members of the UMass Boston Chemistry faculty.

**Deyang Qu**

Ph.D. in Electrochemistry from the University of Ottawa, Canada  
Assistant Professor  
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My research interests are in the areas of renewable energy, biosensor and hydrogen storage. Both experimental and theoretical approaches are involved in the studies. All my research areas are balanced

between scientific significance and potential practical industrial applications. The current three research projects aim to address the increasing concern of global warming and other automobile caused environmental issues by searching for high energy battery systems to meet the requirements for the next generation of PHEV (Plug-in Hybrid Electric Vehicle) and EV.

- 1) Rechargeable Li-air cells in non-aqueous electrolyte (Ph.D). The objective is to design and test the high voltage, high energy density Metal/Air (Li, Al/air) cells using non-aqueous electrolytes and determine the feasibility of the systems. The research will include understanding the mechanism of redox reaction on air cathode by using in-situ electrochemical spectroscopic methods e.g. GC/MS, LC/MS and synchrotron based X-ray techniques (in Brookhaven National Lab); developing high efficient non-noble metal catalyst and selecting non-aqueous electrolytes especially low temperature molten salts (ionic liquid). The project needs frequent co-operations with other groups within and outside the department. Reasonable knowledge of non-aqueous systems and basic analytical skills are essential.
- 2) Rechargeable Zn-air cells in alkaline electrolyte (Ph.D). This research will be two-fold: 1<sup>st</sup> to understand the fundamental mechanism of carbon corrosion during recharge (oxidation), in-situ electrochemical EPR and UV-Visible will be the leading techniques; 2<sup>nd</sup> to explore the novel rechargeable Zn-air package design for PHEV. The second part of the research requires basic engineering skills (hands-on) and computer programming (LabView environment for power management design) experience.
- 3) Electrochemical investigation on Supercapacitor (M.S.). This project is heavily focused on engineering design of supercapacitor devices e.g. cell balance, self-discharge, energy/power balance. The project will only fly if the DOE funding can be secured.

### **Jonathan Rochford**

Ph.D. in Inorganic Chemistry from Dublin City University, Ireland.

Assistant Professor

Department of Chemistry

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My current research interests are focused in the field of renewable energy. The security of an energy supply, its sustainability and environmental consequences are concerns at a national and global level in our society today. The exploitation of natural resources has led to an enormous increase of energy usage in our society, as well as a significant rise of CO<sub>2</sub> levels in the atmosphere. Solar energy has enormous potential as a clean, abundant and economical energy source, however first it must be captured and converted into useful forms of energy such as electricity or fuels. There are two primary research topics within the Rochford laboratory

#### *1. Photoelectrochemical Catalysis*

This research topic involves the study of transition metal catalysts in condensed phase and on solid oxide electrode supports. Projects include water oxidation and hydrogen evolution as well as carbon dioxide reduction. Employing a concerted approach, solar energy is used as a means of reducing large overpotentials for driving environmentally significant catalytic cycles.

## 2. Photoinduced Charge-Separation

The principle objective of this project is to investigate the dynamics of photoinduced charge-separation processes in supramolecular porphyrin systems in both the condensed phase and chemisorbed to metal oxide semi-conducting nanoparticles such as TiO<sub>2</sub> or ZnO. The contribution of these electron-transfer processes to solar cell efficiencies will be ultimately investigated in a working DSC device by measurement of *current-voltage* (IV) and *incident photon to current efficiency* (IPCE) responses.

In addition, side projects include fundamental studies on redox-active ligands, electrochromic displays and porphyrin synthesis. A combination of synthetic and physical chemistry approaches are involved in all studies where group members can gain valuable experience in organic and inorganic synthesis as well as photochemical and electrochemical methods. Collaborations are in development with Brookhaven National Laboratory NY, University of North Dakota ND, and the Indian Institute of Science, Bangalore, India.

### **Hannah Sevian**

Ph.D. in Physical Chemistry from the University of Wisconsin  
Associate Professor  
Departments of Curriculum & Instruction and Chemistry  
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Research in the Sevian group is concerned with how people learn chemistry, how specific teaching practices influence student learning in chemistry, how scientists can learn from teachers to communicate science more effectively, and what is needed particularly by and for underrepresented minority students to better enable them to study science. The unifying feature of our work is that it is directed at improving equity and creating capacity for more students to have access to learning science. Alongside our work in developing inquiry-based high school and undergraduate-level chemistry labs, our research also includes physical chemistry mixed experimental/theoretical studies of light emitting thin ruthenium-polymer diode films. For more information on the Sevian research group, please see: <http://hsevian.googlepages.com/>

### **Bela Torok**

Ph.D. in Organic Chemistry from the University of Szeged  
Associate Professor  
Department of Chemistry  
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The current focus of my research group's efforts is to develop new, environmentally benign chiral synthetic methods for biologically active compounds. These studies are based on metal nanoparticle catalysts and readily available, chiral ligands (preferably natural products). Our goal is to contribute to the development of new efficient chiral catalysts fulfilling the demand for *green* processes in asymmetric catalysis. As these processes already started to produce biologically active chiral compounds we launched another major area, the application of these compounds for medically relevant problems. Thus, our recent efforts focus on two major research topics. These major areas are:

(1) Organic Synthesis. Development and Application of New Metal Nanoparticle Based Catalysts for Organic Synthesis.

**(2) MEDICINAL CHEMISTRY. SYNTHESIS AND APPLICATION OF CHIRAL ORGANOFLOURINE COMPOUNDS AS NOVEL THERAPEUTICS FOR ALZHEIMER'S DISEASE.**

Minor Research projects, which accompany the above mentioned major areas:

Chiral organocatalytic Friedel-Crafts hydroxyalkylation reactions.

Development of polymer stabilized Pt and Pd nanoparticle catalyst.

Organic synthesis by microwave irradiation and/or ultrasounds.

Besides organic synthesis, during their work students also learn to use state of the art analytical methods used for the identification and analysis of our products (multinucleii NMR spectroscopy, gas-chromatography-mass spectrometry, high performance liquid chromatography, chiral separations).

**Marianna Torok**

Ph.D. in Biochemistry from the University of Szeged, Hungary

Assistant Professor

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Misfolded protein aggregates in the form of amyloid fibrils are related to many human diseases, including Alzheimer's disease (AD), Parkinson's disease, Type II diabetes, Huntington's disease, etc. Structural and mechanistic studies on amyloid fibrillogenesis are in the focus of our research. Particular emphasis is placed on two amyloidogenic peptides: Alzheimer's amyloid  $\beta$  ( $A\beta$ ), and diabetes-related amylin (human islet amyloid polypeptide, h-IAPP). We are also interested in biomedical and nanotechnological applications of the information gained from these studies.

For further information, please see:

<http://alpha.chem.umb.edu/faculty/mtorok/MariannaTorok.htm>

**Wei Zhang**

Ph.D. in Organic Chemistry from the University of Pittsburgh

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Research projects in the Zhang group cover the following areas: 1) *Fluorous Chemistry*. This new platform technology has been making increasing impact on many aspects of organic, biological, separation, and material sciences. Our group is a leader in the development of new fluoros reaction, separation, and immobilization techniques for solution-phase parallel and high-throughput synthesis. 2) *Organic Synthesis*. To develop new synthetic methodologies based on microwave reactions, multicomponent reactions, free radical reactions, and asymmetric organocatalysis. 3) *Medicinal Chemistry*. To design and synthesize drug-like molecules and natural product analogs for biological screening. 4) *Green Chemistry*. To develop new synthetic and separation processes which have the characteristics of high efficiency, easy product separation, easy reagent/catalyst recovery, and minimal waste disposal. Graduate students in this group will gain a significant amount of experience in advanced synthetic and analytical skills related to HPLC, NMR, LC-MS, and chiral separations

## IV. TASKS OF THE CHEMISTRY GRADUATE STUDENT: YEAR 1

*MS Seeking Students: Semester 1*  
*PhD Seeking Students: Semester 1*

### **Choosing a Research Advisor**

Students are required to choose a research advisor within their first semester of enrollment in the Chemistry Graduate Program. In order to make an informed choice, students are required to speak with at least 5 chemistry faculty members currently conducting research within the department. Students must complete the “Choosing a Research Advisor” form (APPENDIX A) by having each faculty member sign the form after meeting with the student. This form must be handed in to the GPD when it is complete.

Once a student has decided which faculty member(s) they would like to work with, they must formally request the faculty member(s) to serve as their research advisor. If the faculty member agrees, both the student and faculty member sign the “Research Advisor Acceptance” form (APPENDIX B) and hand this in to the GPD.

### **Choosing a Committee**

Once a student has chosen their research advisor, they must set up either a thesis committee (for MS students) or a dissertation committee (for PhD students). Students are required to choose their committee members during their first semester of enrollment, however, committee members may be changed in the future if such changes make sense for the direction of the student’s research.

**Choosing a Thesis Committee:** MS students must choose the 3 faculty members (including their research advisor/chair of the committee) to serve on their committee

**Choosing a Dissertation Committee:** PhD students must choose the 3 faculty members from the chemistry department (including their research advisor/chair of the committee) by the end of their first semester. PhD students may wait until further in their research development to choose the fourth, outside faculty member to serve on their committee.

As with choosing a research advisor, students must bring either the “Thesis Committee” (for MS students) form (APPENDIX C) or the “Dissertation Committee” (for PhD students) form (APPENDIX D) to their chosen committee members to sign as proof of their agreement to serve on the student’s committee. Once these forms are complete, they must be turned in to the GPD.

## V. TASKS OF THE CHEMSITRY GRADUATE STUDENT: YEAR 2

### Literature Seminar

During the second year of enrollment in the Chemistry Graduate Program, students are expected to fulfill their literature seminar requirement. The literature seminar, required of both MS and PhD students, requires the student to deliver a talk presenting current research on a topic of their interest. The research must be sufficiently removed from the student's thesis or dissertation research as well as any ongoing research within the Chemistry Department. The student is expected to work closely with their advisor and obtain their approval for their topic as well as the approval of the GPD before preparing their talk. Detailed information on the Literature Seminar follows.

#### Guidelines for Literature Seminar Presentations

*MS Seeking Students: Semester 3*

*PhD Seeking Students: Semester 3*

The oral presentation of seminars constitutes an important and integral part of a graduate education in chemistry. An A grade is not automatically awarded for seminar presentations. Thus it is important that a great deal of effort and care be invested in the selection of the topic and the preparation of your presentation. You must show that you understand the material deeply enough to make an effective presentation and to answer follow-up questions from faculty and fellow students clearly and completely.

There are two major benefits derived by students from literature seminar presentations. First, you will learn how to locate, gather, organize, summarize, and present a body of work. Second, you will gain practice in the art of public speaking. This experience also prepares you for writing and defending your thesis. Looking ahead to your professional career, sooner or later—in class, at your thesis defense, at group meetings, in a job interview, or at work-site meetings—you will be required to present information orally.

The topic of your literature seminar should be based on a primary research article (**not** a review) and be selected with the advice and assistance of your research advisor. You should select a topic of interest to you, *but one that is sufficiently removed from research happening in the department or your own research*. Bear in mind that you are pursuing a degree in chemistry (not biology or biological biochemistry). The focus of your presentation must be on the *chemistry* of the topic. To ensure that this is done, **you will be required to submit to the Graduate Program Director (1) the complete title of your proposed seminar; (2) a one-page abstract of your seminar, which clearly indicates the chemistry involved; (3) a proposed date for the seminar; and (4) a signed note from your research advisor indicating that he/she approves your selected topic.**

Once the topic has been selected, the relevant references must be read, digested, condensed, and arranged into a well-organized and cogent oral presentation of roughly 40 minutes in length. *Any presentation that falls significantly short of this will not receive a passing grade and will require you to repeat the presentation at a later date.* On the other hand, the presentation should allow sufficient time for questions (about 10 minutes), keeping in mind that there is another class that starts at 5:30pm. The preparation of a credible literature seminar will take a considerable amount of your time, and it should involve the active guidance, advice, and assistance of your advisor. Even experienced speakers find it necessary to revise, reorganize, and refine their initial drafts of a presentation, often many times. You cannot “whip something up” a week or two before the scheduled date of your presentation.

Your presentation should be accompanied by suitable graphical materials. Today, PowerPoint is the preferred medium for seminar presentations, although slides and overheads are still often used. The printing on the projected images should be neat, sufficiently large to be legible at the back of the room, and should not be crammed with too much information to be readily digested by the viewing audience. On the other hand, the audience should not be overwhelmed with a deluge of slides, each with little information, flashed on the screen every few seconds like a jerking movie. While PowerPoint has many “cute” features for sound and animation, these quickly become tedious to the audience and are the mark of an amateur presenter.

Once the material has been assembled, you need to prepare an effective, interesting, and understandable oral presentation. *It is imperative that you perform many “dry run” practice presentations, preferably at least once or twice in front of your advisor, before you make your actual seminar presentation.* Practice! Practice! Practice! You must speak loudly enough so that your voice projects to the back of the room. You must speak slowly and distinctly so that you are easily understood. Seminar presentation is an exercise in extemporaneous (not impromptu) speaking. Do not attempt to memorize your presentation like a play’s script, but rather have a clear sense of the points you wish to make, the order in which you will make them, and the ways in which you intend to explain the material as each slide is presented. While it is perfectly reasonable to use notes as memory aids, it is imperative that you do not read from a prepared text. Thoroughly knowing the material will go a long way in giving you the confidence to make an effective presentation with a minimal need for memory aids. If English is not your native language, ask someone who is a native speaker to listen to one of your practice presentations and point out and pronunciation difficulties that might get in the way of your audience’s understanding. Be sure to speak to the audience, trying to maintain frequent eye contact with individuals throughout the room. Do not fall into the trap of simply talking to your thesis advisor or a friend sitting in the audience or (worse) to the screen or blackboard. Try to engage your audience in your topic by showing some enthusiasm for it. Again, the involvement and help of your advisor are extremely important in the delivery of an effective, interesting and stimulating oral presentation.

Although the prospect of making a formal oral presentation may be discomforting to you as a neophyte, look upon this experience as an opportunity to acquire an essential professional skill.

Once ready to deliver the literature seminar, you must contact the Graduate Program Secretary to make appropriate arrangements for the event.

Revised September 10, 2009

## Approximate Timeline for Meeting the Literature Seminar Requirement

12 weeks prior	Begin to peruse the most current issues of the ACS journals ( <a href="http://pubs.acs.org/wls/journals/query/subscriberSearch.html">http://pubs.acs.org/wls/journals/query/subscriberSearch.html</a> ) and/or skim your favorite journals to find exciting topics that you are motivated to explore further in great detail. Select a primary article as the basis of your talk. Do not be afraid to stop and start on a different topic several times before finding the right one for you. It is difficult to give a good presentation that is based on a bad research article. The time wasted on dead ends in this initial phase will pay off later!!! And keep in mind that it is always better to go in depth than to go too broad and only scratch the surface.
10 weeks prior	Submit a primary article from the recent literature that discusses the topic you have selected for your literature seminar to your research advisor for their approval. Do not use review articles as the basis of your seminar!!!! Also, your seminar should not be a book report on this primary article, but the idea is to use this article as a springboard for investigating a fairly narrowly-focused topic. It's a good idea to use references from your primary article to obtain secondary articles.
8 weeks prior	Projects will be officially approved by the research advisor and graduate program director or you must redevelop your ideas and submit a new idea within 2 weeks. Turn an abstract of your presentation into your advisor and graduate program director.
8-5 weeks prior	Obtain all of the pertinent papers to your topic (secondary references from primary article, PubMed/Scifinder searches, inter-library loan, trips to the MIT library). Five weeks prior to your presentation present to your advisor a binder full of articles that will form the basis of your presentation.
3 weeks prior	Submit a draft of your PowerPoint Presentation to your advisor for review and revision. Schedule a meeting with your advisor to discuss your PowerPoint presentation. Your advisor will inform the GPD of your progress.
2 weeks prior	Submit a revised draft of your PowerPoint presentation to you advisor for review and further revision.
1 week prior	Practice your presentation in front of your advisor/research group/friends to get feedback. Then practice several additional times. Your advisor will inform the GPD of your progress.
Presentation Day	Make us proud!

## Graduate Literature Seminar – Common Points from Faculty and Student Feedback

1. Summary of Science
  - More Chemistry Content
  - Framing of the problem
  - Big Picture
  - References
  - Research
  - Primary Literature (good)
  - Books (not heavily relied upon)
  - Review Articles (not heavily relied upon)
  - Background information presented clearly
  - Theory explained
  - Subject interesting and timely
  - Topic Choice
  - Green? discuss
  - Motivation
  - Breadth vs. Depth
  
2. Putting together a clear, well-ordered presentation
  - Balance information on slide
  - Roughly 40 minutes long
  - Bring audience up to speed
  - Slides easy to understand
  - Topic presented in context with current science
  - Unbiased
  - Data presented and used effectively to draw conclusions
  - Spelling
  - Slide design
  - Clear flow to talk
  - Organization of talk
  - Number of points per slide
  - Unnecessary information presented
  
3. Presenting to audience – teaching the audience
  - Time management
  - Professionalism
  - Engage the room
  - Make eye contact
  - Don't read the slides
  - Don't read your notes
  - Present topics at a Graduate Level, but bring audience up to speed quickly
  - Answer questions
  - Familiarity and comfort with information
  - Explaining figures in slides
  - Explaining equations in context of talk
  - Speak slowly and clearly

## VI. TASKS OF THE CHEMISTRY GRADUATE STUDENT: YEAR 3

*Form for PhD students ONLY*

### Written Qualifying Exam

The written qualifying exam for the Chemistry Doctoral Program is designed to test each student's mastery of fundamental material covered in the required courses of the Green Chemistry Track. The exam is administered in two 3 ½ hour testing sessions in one day, administered twice per year (in January and June). Students have two chances to pass the WQE. If the student fails their second attempt at the WQE, the student will be asked to write up and defend their research as a MS thesis.

University of Massachusetts Boston  
Department of Chemistry  
Chemistry Doctoral Program  
Green Chemistry Track  
**Written Qualifying Exam**  
*PhD Seeking Students: Year 3*

### Purpose

The written qualifying exam for the Chemistry Doctoral Program is designed to test each student's mastery of fundamental material covered in the required courses of the Green Chemistry Track. The required courses are Introduction to Green Chemistry (Chem 671), Environmental Toxicology (EEOS 635), and three chemistry sub-discipline courses. The sub-discipline courses comprise one course in Physical/Analytical Chemistry (Chem 601 or 602), one course in Inorganic Chemistry (Chem 611 or 612), and one course in Organic Chemistry (Chem 621 or 622). The written tests are meant to determine if the student has acquired broad mastery of material expected of a general doctoral student in chemistry, and of the material expected of one with special commitment to the practice of green chemistry.

### Test Procedures

- Only students who have completed the five required courses are eligible to take the written comprehensive examination. The sixth elective course need not be taken prior to the examination.
- **SIX** research articles will be made available to students. Students will need to pick the packet up in person from the Graduate Program Secretary. It is the responsibility of the student to pick up the packet in a reasonable time frame.
- Students have **six weeks** to study, research, and learn the background, methodologies, results, and conclusions of the research papers.
  - It is suggested that the students not limit their study to only the given paper and textbooks from their graduate courses.
- The six research articles will include two papers from each of the following sub-disciplines:

- Inorganic Chemistry
- Organic Chemistry
- Physical Chemistry
- A single faculty member will be responsible for each of the following:
  - Selection of a journal article
  - Writing the examination questions pertaining to that article
  - Grading student responses to said questions
- The examination will be administered in a single day in two 3-½ hour testing sessions. The dates, times, and locations of the testing session will be announced in advance.
- The written qualifying exam is given twice a year, in January and June.

### **Test Structure**

- Each of the two testing sessions will consist of three separate exams.
  - Each exam will be designed to take approximately one hour to complete and will focus on the material from a single research article.
    - Students will NOT have access to the article during the examination process
  - The three exams in each session will include one exam from each sub-discipline (inorganic, organic and physical chemistry).
  - As a part of each sub-discipline test, there will be at least one question about Green Chemistry (including toxicology) to illustrate that Green Chemistry is a philosophy that weaves itself through all the disciplines.
    - The Green Chemistry questions will be explicitly labeled.
  - At the beginning of each testing session, students will be given all three exams and allowed to use their allotted 3-½ hours as they see fit.
  - Students will be provided with a test booklet for each exam and may use calculators during the testing process.
    - No notes, books, supplementary material, etc. may be used during the testing process.
    - Use of a computer and specific software will be permitted only if announced in advance and may be limited to only certain tests (e.g., for quantum mechanical calculations related to a physical chemistry test.)

### **Test Scoring**

- Each of the six exams will be worth a total of twelve (12) points.
  - Ten (10) points towards the General Chemistry Score
  - Two (2) points towards the Green Chemistry Score
- Passing the General Chemistry aspect of the Written Qualifying Exam.
  - Students must earn at least 40 points of a possible 60 points from the exams covering all

six research articles.

- Passing the Green Chemistry aspect of the Written Qualifying Exam.
  - Students must earn at least 8 points of a possible 12 points from the labeled green chemistry questions on all six exams.
- Students must pass **both** sections of the Written Qualifying Exam. Failure to pass both sections results in the student having to retake the entire written qualifying exam.
- Students have TWO chances to pass the written qualifying exam.
  - If students are unable to pass the written qualifying exam they will not earn candidacy into the doctoral program.
  - Students who are unable to pass the written qualifying exam in two attempts will be asked to present their research as a Master's Thesis and if successful the student will earn an MS in Chemistry from UMass Boston.
- Students who pass the Written Qualifying Examination may proceed to schedule the Oral Examination, which can be taken as soon as all six courses required for the degree have been taken.

Revised September 8, 2009

## **VII. TASKS OF THE CHEMISTRY GRADUATE STUDENT: YEAR 4**

*Form for PhD students ONLY*

### **Oral Qualifying Exam**

Generally, within one month following the written exam (or after completion of the student's 6<sup>th</sup> elective course), the student should submit a brief description of his or her oral proposal to their research advisor and the GPD. The proposal should be 10-15 pages and should include a brief background description, hypotheses to be tested, appropriate methodology, anticipated results, potential pitfalls and literature citations. The oral defense should concentrate on research sufficiently removed from either the student's research or ongoing research within the Chemistry Department. Once the student passes the OQE, admission to PhD candidacy is granted.

University of Massachusetts Boston  
Department of Chemistry  
Chemistry Doctoral Program  
Green Chemistry Track  
**Oral Qualifying Exam**  
*PhD Seeking Students: Year 4*

Before the examination, the student should confer with the members of their committee regarding the soundness of their proposal.

### **Written Research Proposal**

- The proposed work should be in the student's chosen discipline (physical, organic, inorganic, biochemical, education, materials, etc), but must not overlap with the student's dissertation research or research being conducted within the Chemistry Department
- There should be a green focus to the proposed research
- The proposal must follow federal guidelines, either NSF or NIH in terms of formatting the sections of the proposal (not the page limit).
- 10-15 pages long
- Based on a literature review of the field
- Should provide a clear rationale for the work (why is it significant) and it should detail the specific goals or aims of the proposed work prior to providing a brief introduction.
- If the proposed research were successfully completed it should result in a series of publications
- Must be approved by the student's advisor, with various drafts exchanged between the student and his/her advisor before final submission to the dissertation committee
- Completed proposal must be presented to the dissertation committee two weeks prior to the defense date

## **Oral Presentation and Defense**

- Once the student is ready to deliver his or her oral defense, the student must contact the Graduate Program Director to make appropriate arrangements for scheduling the defense. The GPD will check with your committee about whether the written proposal is in acceptable form to warrant the scheduling of the defense
- 45 minute seminar
  - Dissertation committee
  - General public
- Questions and discussion from the general public
- Private examination based on proposal and presentation
  - Probe the students understanding of the proposed experiments
  - Examine in depth the student's understanding of their chosen research field
  - Test the student's ability to think on their feet and competently defend their work and ideas
- Dissertation Committee Judgment
  - Passed Unconditionally
    - Candidacy into the doctoral program granted
  - Passed Conditionally
    - Student must satisfy conditions spelled out explicitly by the dissertation committee before being granted candidacy into the doctoral program.
  - Failed
    - Candidacy denied

## **VIII. Thesis and Defense**

After successfully completing the Literature Seminar, MS students are expected to focus on completing and writing up their research. Many drafts of the MS thesis should be exchanged between the student and research advisor before handing a completed copy of the thesis to committee members. Once the committee members agree that the thesis is in acceptable form, the GPD will schedule a date for the defense.

The defense will be open to the public in addition to the thesis committee. A private oral exam between the student and thesis committee will be held following the defense, in order to establish the student's understanding of the research. Passing of the defense in conjunction with publishing the thesis through the Office of Graduate Studies will result in the awarding of the MS degree in Chemistry.

## **IX. Dissertation and Defense**

The dissertation committee will generally, but not necessarily, comprise three members from the Chemistry Department and one member from outside the program. With the approval of the GPD and the Graduate Committee, faculty from outside the Green Chemistry Track or non-UMASS Boston faculty will be permitted to co-sponsor a student's dissertation work.

Before the expected completion of the dissertation, the student will periodically (at least annually) present his/her work to the dissertation committee. The committee will discuss the work with the student, possibly to make suggestions about the direction of the research project. The student will be expected to defend a scholarly dissertation based on original research.

After successfully completing the Oral Qualifying Exam, Ph.D. students are expected to focus on completing and writing up their research. Many drafts of the dissertation should be exchanged between the student and research advisor before handing a completed copy of the dissertation to committee members. Once the committee members agree that the thesis is in acceptable form, the GPD will schedule a date for the defense.

### **Dissertation Defense**

The defense will be open to the public in addition to the dissertation committee. The Green Chemistry Program GPD or (if the GPD is already on the dissertation committee, a member of the graduate committee) serves as a fifth member of the dissertation defense panel. A private oral exam between the student and panel will be held following the defense, in order to establish the student's understanding of the research. Passing of the defense in conjunction with publishing the thesis through the College of Graduate Studies will result in the awarding of the Ph.D. degree in Chemistry.

## **X. University Policies and Procedures**

\*The information comprising this section can be found on-line in the Graduate Bulletin on the UMass Boston website:  
[http://www.umb.edu/admissions/grad\\_catalog/index.html](http://www.umb.edu/admissions/grad_catalog/index.html)

### **Graduate Catalog — General Academic Regulations**

All students should be familiar with the regulations and procedures described below. Note: none of these regulations or procedures shall preclude the development of more restrictive regulations and procedures by any individual graduate program.

### **Graduate Course Numbering System**

#### **Course Levels**

500-599: These are graduate courses equivalent in workload and standards to 600-level courses. 500-level numbers are assigned (a) to graduate courses offered by departments that do not grant a graduate degree; examples are 500-level courses in Mathematics, Spanish and Latin that count toward the Teacher Education Track with Professional Licensure; or (b) as a signal to the Registrar that a course given by a graduate-degree-granting unit does not normally count toward that degree. 500-level courses are characteristically found in interdisciplinary programs and certificate programs. The transferability of these courses into a particular degree program, if not indicated in that program's section of this bulletin, should be checked with the program director.

600-699: Master's or doctoral graduate courses within degree programs.

700-899: Doctoral graduate courses within degree programs.

900-999: Post-terminal degree courses.

5A00-5Z99: Post-baccalaureate courses. These courses are not transferable into degree programs at the graduate or undergraduate levels. Rather, they are professional-development courses created in response to particular vocational and training needs within the public and private sectors. Currently, most reside in the Graduate College of Education and carry the prefix PRFDVL, e.g., PRFDVL 5T22.

#### **Fixed Numbers**

691-694, 791-794, 891-894: Seminars, variable titles

695-696, 795-796, 895-896: Independent Study

697, 797, 897: Special Topics, variable titles

698: Practicum

699: Master's thesis

899: Doctoral dissertation

### **Graduate Degrees and Certificates**

The University of Massachusetts Boston offers graduate degree programs at the master's and doctoral levels, certificates of advanced graduate study, and graduate certificates.

- A degree program is a coherent course of study of at least 30 credit hours leading to the master's degree or at least 60 credit hours leading to the doctoral degree. A track is a coherent course of study within a degree program; the track curriculum will consist of at least 30 credit hours for a master's degree or 60 for a doctoral degree, a core portion of which is often shared by other tracks in the same program. A course of study leading to a degree may further include one or more concentrations of at least nine credits each. Such concentrations are open only to students matriculated in the program.
- A separate course of study of at least 30 credits beyond the master's level may lead to a certificate of advanced graduate study (CAGS).
- A coherent course of study of at least 12 hours leads to a graduate certificate at either the post-bachelor's or the post-master's level. Graduate certificate programs may be either independent or connected to a degree program.

All students wishing to enroll for graduate degrees, tracks within degrees, certificates of advanced graduate study, or graduate certificates must file applications for admission to those programs through the Office of Graduate Admissions. In some cases, students already matriculated in a graduate program may be admitted to an additional certificate program without filing a formal admissions application through Graduate Admissions.

### **Academic Honesty Policy**

It is the express policy of the university that every aspect of graduate academic life, related in whatever fashion to the university, shall be conducted in an absolutely and uncompromisingly honest manner by graduate students. For complete information on university policy in this area, see “Code of Student Conduct” later in this section.

### **Graduate Grading Policy**

For graduate students, the university uses a system of letter grades that are equivalent to numerical “quality points,” according to the following table.

<b>Letter Grade</b>	<b>Quality Point Equivalent</b>
A	4.00
A-	3.75
B+	3.25
B	3.00
B-	2.75
C+	2.25
C	2.00
F	0

The quality points for each grade are multiplied by the number of credits for the course, and the totals for all courses are added; this result is the student’s cumulative quality point figure. The cumulative quality point figure is divided by the number of cumulative credit hours carried; this result is the student’s cumulative quality point average. Graduate students may also be given grades of “NA” (Not Attending), “Inc” (Incomplete), “Y” (In Progress), “SAT” (Satisfactory), “AUD” (Audit). Explanations of these grades appear below.

The lowest passing grade for a graduate student is a “C.” Grades lower than “C” which are submitted by faculty will automatically be recorded as “F.” This graduate grading policy also applies to graduate students enrolled in undergraduate courses.

The instructor of a class has full responsibility for grading and is the best judge of student performance; there may, however, be instances in which a graduate student believes that a grade has been assigned unfairly. In such cases, the student should discuss the grade with the instructor. If they are unable to resolve the issue between them, the student should make a written request to the graduate program director asking for a formal meeting among the three parties to explain, discuss, and/or reconsider the grade. Although the graduate program director serves as mediator in this meeting, the faculty member remains the final authority for any grading decision.

### **Pass/Fail Grading Option**

Graduate students may not elect the pass/fail grading option for any graduate or undergraduate course.

### **Not Attending (NA)**

The Not Attending (NA) grade signifies that although a student registered for a course and appeared on the class roster, the student never attended the class. The NA grade is not a substitute for dropping or withdrawing from a course. A student is still responsible for all tuition and fee charges for courses designated NA on his/her record. The NA grade has no effect on the student's cumulative grade point average.

The NA grade designation may be replaced on a student's record by a "W" (withdrawal) provided that the student submits a withdrawal form to the Office of the Registrar before the withdrawal deadline.

### **Incomplete**

A grade of Incomplete (INC) is not automatically awarded when a student fails to complete a course. Incompletes are given at the discretion of the instructor. They are usually awarded when satisfactory work has been accomplished in the majority of the coursework and the student is unable to complete course requirements as a result of circumstances beyond his/her control. The student must negotiate with and receive the approval of the course instructor in order to receive a grade of incomplete; a copy of a written agreement between the faculty member and the student specifying the work to be completed and the terms and deadline for completion must be kept on file in the program office. Please note: The initiative in arranging for the removal of an "Incomplete" rests with the student. After a one-year period, if a grade is not submitted by the faculty member, a Failure will be recorded, turning the grade on the transcript to an IF. After the end of this period, the student must re-register for the course, pay for it again, and complete all its requirements in order to receive credit and a grade. Please note that individual programs may set more stringent rules on incompletes, and individual faculty members may set more stringent timetables for completion of course requirements than the general one-year deadline.

### **INC/IF Registration Policy**

Any graduate student who has accumulated more than 4 INC/IF grades will be considered not to be making satisfactory progress toward the degree, will be placed on probation, and will normally be barred from registering for additional classes until the INC/IF grades are cleared. Additional registrations may be approved by the graduate program director and Dean of Graduate Studies.

### **"Y" and "SAT" Grades for Practicum (698), Thesis (699), Dissertation (899), and Capstone Credits**

The required number of practicum, thesis, dissertation, and capstone credits varies by program. While in progress, these credits will be graded Y (in progress) for thesis and dissertation credits and, at the discretion of the program, for practicum and capstone credits. Normal tuition rates will apply. Upon satisfactory completion of these projects, these credits will be converted to SAT (satisfactory).

### **Audits**

A graduate student may audit any class on a space-available basis, but may not use that course to complete any degree requirement. Registration for audits is not permitted during pre-registration. To register as an auditor, a student must complete the regular registration or add/drop form (including written permission from the instructor to audit the course), write "AUD" in the course credit column, and submit the form to the One Stop Student Service Center by the end of the add-drop period. Once the course is designated "AUD," the student cannot receive a grade for it. Students are assessed full tuition

and fees (including lab fees) for an audited course. Conditions for the audit are negotiated by the student and the instructor.

### **Academic Average for Graduate Degrees and Certificates**

A student must maintain a cumulative average of at least 3.0 during his/her studies. The computation of the grade point average will include all graduate and upper-level undergraduate courses (taken as a matriculated student) that are eligible to count toward the student's graduate degree or certificate program. Grades for any courses taken at UMass Boston as a non-matriculated student but later transferred into the program are also included in the calculation of the GPA; grades for courses transferred into the program from other institutions are not calculated into the GPA. Graduate students with a cumulative GPA lower than 3.0 will not be eligible to graduate until they raise their GPA to a 3.0.

### **Satisfactory or Reasonable Progress, Academic Probation, and Academic Dismissal**

A student must make satisfactory or reasonable progress toward completion of a degree program within the university's policy on time limits for that degree. A student who is not making satisfactory or reasonable progress is subject to probation and dismissal upon the recommendation of the graduate program director to the Dean of Graduate Studies. A student who in any two semesters, consecutive or otherwise, has semester grade point averages of below 2.8 is subject to academic dismissal for failure to make satisfactory progress upon recommendation to the Dean of Graduate Studies.

Graduate students whose cumulative grade point average falls below 3.0 will automatically be placed on academic probation. Both the student and his/her graduate program director will be notified of this probationary status. While on academic probation, a student shall be ineligible to hold office in any recognized student organization or recognized professional association, to represent the University in any sense on or off campus, or to hold a graduate assistantship. Students will be removed from academic probation either when their cumulative grade point average meets or exceeds 3.0 or upon approval of a formal request by the relevant graduate program director to the Dean of Graduate Studies.

A student who in any two semesters, consecutive or otherwise, has been placed on academic probation is subject to academic dismissal upon recommendation of the graduate program director to the Dean of Graduate Studies.

### **Statute of Limitations Policy**

Achievement of a master's or doctoral degree or a Certificate of Advanced Graduate Study signifies mastery of one's chosen discipline. Rather than being merely a collection of courses, a graduate degree requires intense commitment to scholarship and practice within a specific period of time. Such focus and coherence is lost if the degree is not completed within a reasonable time period. Therefore, each program requires that students complete their course of study within designated time limits.

Each program has established its own time limit, approved by faculty governance. A student who fails to complete a program within that established time limit is subject to dismissal. Specific information about time limits is available from each program office and in the "Graduate Program Requirements" section of this bulletin; in exceptional cases, an extension of the time limit may be recommended by the graduate program director and granted by the Dean of Graduate Studies. In such cases, the student must submit a request to the graduate program director with a letter of explanation accompanied by a detailed schedule for completion. A letter from the student's graduate program director concurring with the request must be submitted to the Dean of Graduate Studies with the student's request.

### **Continuous Registration**

Each degree-seeking graduate student must maintain continuous registration until the degree sought by the student has been formally awarded. If in any semester, for any reason, the student does not register for

course, thesis, or dissertation credits, he/she may maintain continuous registration by paying a program fee equivalent to one credit of tuition. For further information, see under “Program Fee” in the “Tuition, Fees, and Payments” section of this publication.

### **Leave of Absence Policy**

A student may obtain a leave of absence up to a maximum of two years by filing a request that must be approved by the graduate program director and the Dean of Graduate Studies. A leave of absence extends the time limit by the length of the leave, but the student must pay the program fee for each semester of the leave (see under “Continuous Registration” and “Tuition and Fees: Program Fee” in this Bulletin).

### **Transfer Credit**

#### **Transfer of Courses and Credits**

Applicants who have completed graduate course work at other accredited institutions or as undergraduate or non-degree students at UMass Boston may normally transfer toward the completion of a UMass Boston graduate degree up to the equivalent of 6 credits from courses in which the applicant received a grade of B or higher, provided these are courses that

- have not been used to fulfill requirements for another degree, and
- were earned no more than seven years before matriculation in the program into which the student wishes to transfer credit.

A University of Massachusetts Boston undergraduate student in the senior year who will earn during this year more credits than needed for the bachelor’s degree may register concurrently for graduate credits at the University of Massachusetts Boston, after securing the permission of the graduate program director and of the graduate course instructor. A maximum of six credits earned in this way may be accepted for transfer into a UMass Boston graduate degree (subject to approval by the graduate program director and the Dean of Graduate Studies), provided that they are from courses in which the student received a grade of “B” or better and were earned no more than seven years before matriculation in the program into which the student wishes to transfer credit. After completing such a course, if the student wishes to transfer the credits to a graduate program, the graduate program director should submit a transfer credit approval form to the Office of the Registrar. Please note: Pass/fail credits may not be transferred.

Transfer credit is subject to the final approval of the graduate program director and the Dean of Graduate Studies.

### **Registration Procedures**

Both newly accepted and currently enrolled students must begin the course registration process by conferring with their graduate program directors. New student registration is scheduled by each individual graduate program. Currently enrolled degree-seeking (matriculated) students register, using the university’s Web or Touch-Tone telephone registration system, during the early registration periods beginning in April (for the fall semester) and November (for the spring semester). Students may continue to make changes to their schedule through the first week of classes.

### **Full-Time and Part-Time Status**

For most purposes, full-time graduate study is defined as nine or more credits, part-time as eight or fewer credits, and half-time as six credits. Doctoral candidates engaged in dissertation research may be considered full-time students, for some purposes, regardless of the number of dissertation credits for which they register, provided their graduate program director certifies that they are working full time on research. Students seeking financial aid should be certain to obtain detailed information about full-time and part-time status requirements from the Office of Financial Aid Services.

### **Maximum Credit Load**

A graduate student may register for up to 12 credits during the fall and spring semesters and nine credits during the summer. Any student who wishes to register for more than the maximum credit load must secure written permission from the graduate program director.

### **Retaking Courses**

A student may repeat any course, provided the student has not taken and passed a more advanced course for which it is a prerequisite. The course may be repeated regardless of the grade received, but there may be only one such repetition per course. If a student repeats a course, both grades will appear on the student's transcript, but only the second grade will be computed in the student's cumulative average.

### **Course Changes and Withdrawals**

#### **Adding or Dropping Courses**

During the registration period a student may add, drop, or change courses without penalty; that is, no entry will be made on the student's permanent record. No courses may be added after this period. Please note: a student wishing to drop all courses he/she is enrolled in during a particular semester must either pay the program fee to remain active in the program, or withdraw from the program.

#### **Withdrawing from Courses**

After the registration period, a student may withdraw from a course by using the Web or Touch-Tone registration system or by completing a course withdrawal form before the withdrawal deadline noted for each term in the academic calendar. Withdrawal forms are available from the One Stop Student Service Center and must be submitted to that office by the published deadline. A grade of W will appear on the student's transcript for a course from which the student has withdrawn.

#### **Withdrawing from the University**

The effective date of withdrawal from the university is that on which all forms are completed, signed, and returned to the One Stop Student Service Center. The last day students may withdraw is the last day of classes of the semester. Students withdrawing receive a W for each course in which they are enrolled. Failure to complete a withdrawal form will result in the recording of the grade of F (failure) for all courses at the end of the term. To withdraw from the university, a student must do the following:

1. Consult with the graduate program director.
2. Receive clearance from the appropriate university offices.

#### **Refunds and Reductions**

Please note: Students receive a full tuition refund for each course dropped during the registration period. No refunds are given for course withdrawals after the registration period. Students withdrawing from the university may receive partial refunds depending on when the withdrawal takes place. For more information, see "Refunds and Reductions in Tuition and Fees" in the "Tuition, Fees, and Payments" section of this publication.

#### **Readmission**

Graduate degree candidates must maintain continuous registration, either by enrolling for course, capstone, thesis, or dissertation credits; or by paying a program fee. Any student who has failed to maintain continuous registration and who wishes to resume his/her pursuit of the degree must apply for readmission and will be subject to the policies and requirements in effect at the time of readmission. The applicant must complete a readmission application form and pay readmission and all back program fees to a maximum of six semesters. Before the applicant can be readmitted, the application must be approved by the appropriate program director. The deadline for readmission applications is one month before the beginning of the semester for which application is being made.

Any student wishing readmission should contact the Office of the Registrar for further information. Eligibility for readmission is limited to students who were in good standing at the time of their

withdrawal, and who are still in compliance with the statute of limitations policy governing the completion of the degree, as described earlier in this section.

### **Administrative Withdrawal and Reinstatement**

A student may be administratively withdrawn from the university if, after due notice, the student fails to satisfy an overdue financial obligation to, or to comply with certain administrative requirements of, the university.

Rules and Regulations Governing Administrative Withdrawal

#### **I. Conditions Warranting Administrative Withdrawal**

Any of the following conditions may warrant administrative withdrawal.

##### **A. Failure to comply with administrative requirements, specifically:**

1. Failure by a student to satisfy an overdue financial obligation to the university, consisting of tuition, loans, library charges, or other student charges, including orientation, student activities, health services, child care, and other such fees as may be established from time to time.
2. Failure to comply with other administrative requirements, such as the submission of health forms, etc.

**B.** Forgery, fraud, or falsification of information on any official university form or document, such as grade report, recommendations, transcripts, etc.

**C.** Certified physical health or mental health problems of a hazardous nature.

#### **II. Effects of Administrative Withdrawal**

If administratively withdrawn, a student shall:

cease to be enrolled and shall not be allowed to complete the current semester or to register for future semesters;

return his/her identification card and any and all other property belonging to the university currently in his/her possession;

receive no further material or notification from the Office of the Registrar concerning university affairs.

#### **III. Procedures for Implementing Administrative Withdrawal**

**A.** Procedures to be applied to cases brought under the conditions of Section I.A.

1. The appropriate administrative official may recommend to the Office of the Registrar that a student be administratively withdrawn from the university.
2. The administrative official shall make his/her recommendation in writing to the Office of the Registrar, detailing his/her compliance with the following requirements:
  - a. The recommendation must be based on one of the grounds set forth in Section I.A.
  - b. The facts upon which the recommendation is based must be ascertained and stated precisely and accurately.
  - c. An attempt to resolve the matter must have been made by the administrative official by mailing to the student at his/her last known address a written notice of the proposed recommendation for withdrawal and the reasons therefore, such matter not having been successfully resolved within fourteen calendar days of the mailing of said notice.
3. If the director of the Administrative Withdrawal Review Committee is satisfied that the conditions specified in paragraph 2 of this section have been satisfied, he/she shall send a certified letter to the student at his/her last known address setting forth the recommendation for withdrawal and the reasons therefore, and notifying said student that he/she may within fourteen calendar days after said letter is mailed request a hearing on the matter with the director. The director shall include with the certified letter a copy of the Rules and Regulations Governing Administrative Withdrawal.
4. If the student does not request a hearing with the director or take action satisfactory to the director to resolve the matter within the time allotted in paragraph 3 of this section, the director shall administratively

withdraw the student from the university no sooner than the fifteenth calendar day following the mailing of the notice provided for in said paragraph.

5. If a student requests a hearing within the time allotted in paragraph 3 of this section, the director shall schedule a hearing at the earliest practicable date. If the director decides in favor of the administrative withdrawal, the director shall forthwith withdraw the student.

**B. Procedures to be applied to cases brought under conditions B and C of Section I.**

1. The appropriate administrative official may recommend to the Administrative Withdrawal Review Committee (see "V") that a student be administratively withdrawn from the university.

2. The administrative official shall make his/her recommendation in writing to the Administrative Withdrawal Review Committee detailing his/her compliance with the following requirements:

a. The recommendation must be based on one of the grounds set forth in Section I.B or C;

b. The facts upon which the recommendation is based must be ascertained and stated precisely and accurately;

c. An attempt to resolve the matter must have been made by the administrative official by mailing to the student at his/her last known address a written notice of the proposed recommendation for withdrawal and the reasons therefore, such matter not having been successfully resolved within fourteen calendar days of the mailing of said notice.

3. If the Administrative Withdrawal Review Committee is satisfied that the conditions specified in paragraph 2 of this section have been satisfied, it shall send a certified letter to the student at his/her last known address setting forth the recommendation for withdrawal and reasons therefore and notifying said student that he/she may within fourteen calendar days after said letter is mailed request a hearing on the matter with the committee.

4. If the student does not request a hearing with the committee or take action satisfactory to the committee to resolve the matter within the time allotted in paragraph 3 of this section, the committee shall instruct the director of the Office of the Registrar to administratively withdraw the student no sooner than the fifteenth calendar day following the mailing of the notice provided for in said paragraph.

5. If a student requests a hearing with the committee within the time allotted in paragraph 3 of this section, the committee shall schedule a hearing at the earliest practicable date. The student shall have the right to testify and to present witnesses or such other evidence as may be relevant; in addition the student shall have the right to have a physician or attorney present, or to cross-examine witnesses; or all of these. The committee shall hear the case and decide whether facts exist which warrant administrative withdrawal under Section I.B or C. If the committee decides in favor of administrative withdrawal it shall submit to the student a written statement of its findings, its decision, and the conditions under which the student may be reinstated.

6. The student may appeal a decision by the committee in favor of withdrawal to the Vice Chancellor of Student Affairs (Dean of Students) within seven calendar days of the committee's decision. If the student does not appeal the committee's decision within the seven calendar days allotted, the committee shall instruct the director of the Office of the Registrar to withdraw the student. If the student does appeal to the Dean of Students within the time allotted, the Dean shall schedule an appointment at the earliest practicable date and at that time shall confer with the student, accompanied by counsel if the student so wishes, regarding the committee's finding, decision, and determination of reinstatement conditions. If the Dean affirms the committee's decision, he/she shall notify the student of his/her decision, and instruct the director of the Office of the Registrar to withdraw the student. On appeal from the student, the Dean of Students may modify the reinstatement conditions.

#### **IV. Reinstatement**

**A. Reinstatement from administrative withdrawal brought under the conditions of Section I.A.**

1. Any student who has been administratively withdrawn under Section I.A may make arrangements with the director of the Office of the Registrar for the resolution of the matter. Upon such a resolution

satisfactory to the director, the director shall forthwith reinstate the student to active enrollment status. The determination of whether a reinstated student shall receive credit for the period for which he/she was withdrawn shall be made by the instructor for each course involved.

2. A student who fails to resolve the matter in the semester during which he/she is withdrawn can be reinstated in a subsequent semester upon satisfaction of the administrative requirements at issue in the university's withdrawal of the student.

**B. Reinstatement from administrative withdrawal brought under conditions B or C of Section I.**

Any student who has been administratively withdrawn under conditions B or C shall be reinstated only upon satisfaction of the conditions established by the Administrative Withdrawal Review Committee, or by the Dean of Students where the Dean has changed reinstatement conditions appealed by the student.

## **V. Administrative Withdrawal Review Committee**

The Administrative Withdrawal Review Committee shall be appointed each year by the Chancellor. The director of the Office of the Registrar shall not be a member of said Committee except that the director shall sit in place of a regular member in any case wherein said regular member is the administrative official recommending withdrawal. The committee shall be empowered to make decisions concerning administrative withdrawal as provided above.

## **Code of Student Conduct**

### **I. Purpose:**

The Code of Student Conduct provides a framework of standard acceptable behavior for students. It is set forth to give students general notice of prohibited conduct; it should not be regarded as an exhaustive definition of misconduct or construed as a contract between the student and the University. Students are responsible for understanding and complying with this Code. Copies of the Code of Student Conduct are available in the Office of the Vice Chancellors for Academic and Student Affairs, in the undergraduate catalog and graduate bulletin, in the UMass Boston Student Handbook, and on the University's website.

### **II. Authority:**

Ultimate authority for student discipline is vested in the Board of Trustees of the University of Massachusetts. Disciplinary authority is delegated to the Chancellor of the University of Massachusetts Boston, who in turn has delegated authority over student misconduct to the Vice Chancellor for Student Affairs and authority for student academic dishonesty to the Vice Chancellor for Academic Affairs/Provost. In accordance with Family Education Rights and Privacy Act (FERPA) regulations, the Vice Chancellor of Student Affairs is responsible for maintaining all student judicial records.

### **III. Governing Principles:**

A. The University reserves the right to take appropriate disciplinary action when student conduct constitutes misconduct or academic dishonesty, as defined in this Code. The University may also take disciplinary action for student conduct off campus, when such conduct constitutes misconduct, as defined in this Code, is serious in nature, and adversely impacts the University and/or the campus community. Such action may include pursuing disciplinary action for any violation of local, state, or federal law, on or off campus, that affects the University's educational interests.

B. In any instance where the continued presence of an individual on campus may pose an

imminent threat to his/her own well being or to that of others, or to the rights or property of the University community, the Vice Chancellor of Student Affairs may impose an interim suspension. This action is designed to prohibit the presence of the student on campus until the case can be resolved in accordance with prescribed campus procedures. This interim suspension is not entered on a student's record and does not affect the student's status except as described below.

C. This Code is independent of any proceeding in civil or criminal law in which a student may also be held accountable. Disciplinary action at the University may proceed despite the pendency of any other civil or criminal proceedings and shall not be subject to dismissal solely because of the result of any such proceeding.

D. Formal rules of evidence shall not be observed; any information having reasonably probative value as to a relevant fact may be admitted.

E. Students found responsible for unacceptable conduct will be subject to the complete range of sanctions and penalties provided in the Code of Student Conduct.

F. Failure by any student to cooperate with these proceedings, or any attempt to impede an investigation is, in itself, a violation of the Code of Student Conduct and may lead to sanctions.

G. Failure by any student to comply with imposed sanction(s) may result in more severe disciplinary action, up to and including suspension or expulsion from the University.

H. Any time requirements set forth in this Code may be extended by agreement of the parties, or as may be required.

I. The University reserves the right to amend any provision of this Code with appropriate notice to the campus community.

#### **IV. Definitions:**

A. "*University*" refers to the University of Massachusetts Boston and all of its undergraduate, postbaccalaureate, and graduate colleges, schools, divisions, and programs.

B. "*Student*" is defined as any person enrolled in or accepted for any course or academic program regardless of credits or competencies carried, at the University.

C. "*Faculty*" refers to any person hired by the University to conduct classroom activities.

D. "*Advisor*" refers to any member of the University community who assists and accompanies the student to meetings and/or hearings. The advisor may not be an attorney, unless criminal charges are pending.

E. "*Code*" refers to this Code of Student Conduct.

F. "*Policy*" is defined as written regulations and procedures of the University as found in, but not limited to, the Code of Student Conduct, Graduate/Undergraduate Bulletin/Catalog, Student Handbook, and Trustee Documents.

G. "*Student Affairs Designee*" is a member of the Division of Student Affairs or appointed representative.

H. “*Appeal Panel*” is the hearing panel consisting of selected members of the standing Joint Discipline and Grievance Committee.

I. “*Joint Discipline and Grievance Committee*” is a standing committee of the Faculty Council and the Student Governments – Undergraduate Student Senate and Graduate Student Assembly.

J. “*Appellate body*” refers to any person designated to review an appeal, including but not limited to, the Vice Chancellors, Deans, and the Appeal Panel.

K. “*Director/Dean*” refers to the Director of Undergraduate Education and the Dean of Graduate Studies.

## **V. Student Protections:**

Students accused of violating the Code are entitled to the following procedural protections:

A. To be informed, in writing, of the alleged violation, and its outcome.

B. To be informed of the substance of the information or evidence against them.

C. To be given an opportunity to respond to the charges.

D. To be accompanied at any proceeding by an Advisor. If the student wishes to have an Advisor but is unable to obtain one, the Student Affairs Designee shall assist the student in finding one. Advisors may not directly participate in the hearing process.

E. To be accompanied by legal counsel only if criminal charges are pending against the student. In such case, legal counsel will take on the role of Advisor as defined above. A student who wishes to be accompanied by legal counsel is required to give (3) three business days’ advance notice to the Vice Chancellor for Student Affairs.

F. To present relevant information and witnesses and to question other witnesses who participate in the hearings.

G. To be assured confidentiality of all information exchanged, both verbal and written, in accordance with the Family Education Rights and Privacy Act (FERPA).

H. To appeal as outlined in this Code in §VI B4 and §VII B3.

The University Code is divided into two subsections: Academic Honesty (§VI below) and Student Conduct (§VII below).

## **VI. ACADEMIC HONESTY**

It is the expressed policy of the University that every aspect of academic life not only formal coursework situations, but all relationships and interactions connected to the educational process, shall be conducted in an absolutely and uncompromisingly honest manner. The University presupposes that any submission of work for academic credit indicates that the work is the student’s own and is in compliance with University policies. In cases where academic dishonesty is discovered after completion of a course or degree

program, sanctions may be imposed retroactively, up to and including revocation of the degree. Any student who reasonably believes another student has committed an act of academic dishonesty should inform the course instructor of the alleged violation.

### **A. Academic Honesty Violations**

The University defines violations to include, but not be limited to, the following:

A. Submitting as one's own an author's published or unpublished work (e.g. material from a journal, Internet site, newspaper, encyclopedia), in whole, in part, or in paraphrase, without fully and properly crediting the author.

B. Submitting as one's own work or materials obtained from another student, individual, or agency without full and proper attribution.

C. Submitting as one's own work material that has been produced through unacknowledged or unauthorized collaboration with others.

D. Submitting substantially the same work to more than one course without prior approval from all instructors involved: i.e., dual or multiple submission.

E. Using any unauthorized material during an examination, such as notes, tests, calculators, cell phones, PDAs, or other electronic or mechanical communication devices. Abuse of cellular devices with photographic capabilities and use of devices for purposes of photographing test questions or other notes and materials are also prohibited.

F. Obtaining answers to examination questions from another person with or without that person's knowledge; furnishing answers to examination questions to another student; using or distributing unauthorized copies of or notes from an examination.

G. Submitting as one's own an examination taken by another person; or taking an examination in another person's place.

H. Gaining or seeking to gain unauthorized access to, or altering or destroying the paper or electronic files of a student, faculty member, or staff member for the purpose of gaining better academic standing and success.

I. Failing to adhere to professional standards or ethics of a discipline and/ or violating the rules of an agency in the course of completing field work, internship, practicum, student teaching, or clinical placement.

J. Interfering with an instructor's ability to evaluate accurately a student's competence or performance; misleading any person in connection with one's academic work.

### **B. Academic Dishonesty Procedures:**

1. Prior to reporting a suspicion of academic dishonesty, the faculty member may discuss the matter with the student and/or the faculty member's chair (in cases involving undergraduate students) or graduate program director (in cases involving graduate students), or otherwise investigate the circumstances of the alleged violation. If, after such consultation and investigation, the faculty member determines that academic dishonesty did not, in fact, occur, no formal charge of academic dishonesty will be made.

2. To initiate formal proceedings, a faculty member who suspects a student of academic dishonesty must inform the student in writing of that fact within ten (10) business days of the discovery of the alleged violation. Such written notice should inform the student of the factual basis for the charge, and the specific sanctions the faculty member proposes to impose and any University Sanctions he/she may recommend to the Director of Undergraduate Education or the Dean of Graduate Studies, as appropriate. The letter should also inform the student that s/he may be subject to University Sanctions imposed directly by the Dean/Director beyond those recommended by the faculty member. The faculty member shall offer to meet with the student and the faculty member's chair (in cases involving undergraduate students) or graduate program director (in cases involving graduate students), to discuss the case. No more than ten (10) business days after meeting (or offering to meet) with the student, the faculty member may impose penalties within his/her purview, and so inform the Director/Dean. If, upon meeting with the student, the faculty member determines that the student did not commit academic dishonesty, s/he will so inform the student and Director/Dean in writing. If no penalty has been imposed within the specified timeframe, the charges shall be considered dropped. All correspondence concerning an allegation of academic dishonesty should be copied to the faculty member's department chair (for undergraduates) or the faculty member's graduate program director (for graduate students), the faculty member's collegiate dean, the Director of Undergraduate Education or the Dean of Graduate Studies, depending on whether the student is an undergraduate or graduate student, and the Office of the Vice Chancellor for Student Affairs. The chair/graduate program director and/or relevant collegiate dean(s) may, at their option, consult with the faculty member and/or student, review the case and make separate recommendations to the Director/Dean regarding University sanctions.

3. Academic dishonesty by graduate students lies primarily within the purview of the Dean of Graduate Studies, who will determine whether University sanctions should be applied in a particular case. The Dean's decision will be informed by any recommendations made by the student's graduate program director and/or collegiate dean. Academic dishonesty by undergraduate students lies primarily within the purview of the collegiate deans. For the purposes of these procedures, the collegiate deans delegate responsibility for determining whether University sanctions should be applied in a particular case to the Director of Undergraduate Studies. The Director's decision will be informed by any recommendation made by the faculty member's chair and will be made in consultation with the collegiate dean(s) involved; it is further subject to review and revision by the faculty member's collegiate dean. Within (10) ten business days of the notification of the faculty member's imposition of sanctions, the Director/Dean will review the case. In doing so, s/he may choose to interview or question the parties involved or otherwise investigate the case. The purpose of this review is to consider the imposition of University sanctions. At the end of this review, the Director/Dean may impose additional University Sanctions, including but not limited to those listed in VII for misconduct. University Sanctions will normally be imposed for violations of an especially serious nature or in cases of repeat offense.

4. Within (10) ten business days of the Director/Dean's imposition of University

Sanctions, or (10) ten business days of the expiration of the period of time available to the Director/Dean to impose such sanctions, whichever comes first, the student may submit an appeal in writing to the Provost/Vice Chancellor for Academic Affairs, copying the Office of the Vice Chancellor of Student Affairs. The Vice Chancellor of Academic Affairs/Provost will convene an Appeal Panel, consisting of 34 faculty members and 2 students from the standing membership of the Joint Discipline and Grievance Committee and instruct the Panel to review the case by convening a hearing. At this hearing, at which, at minimum, the panel will interview and question the student and faculty member. The Vice Chancellor for Academic Affairs/Provost will appoint a member of the panel to serve as the Chair.

5. Within (10) ten business days after completion of its hearing and review, the Panel will make a report of its findings and recommendations to the Vice Chancellor for Academic Affairs /Provost. Within (5) five business days of receiving this report, the Provost/Vice Chancellor for Academic Affairs will uphold, reverse, or modify the faculty member's and Director/Dean's decisions. Modifications may include any of the sanctions listed in VII c for misconduct. The decision of the Provost/Vice Chancellor for Academic Affairs is the final University disposition of the matter and is not subject to further appeal, except in cases of expulsion. Expulsions may be appealed to the Chancellor within 10 business days of the Provost/Vice Chancellor for Academic Affairs' decision to expel.

### **C. Academic Dishonesty Sanctions:**

1. Sanctions to be imposed by faculty members may include one or more of the following:

- a. Failure in the assignment in which the infraction occurred.
- b. Forced withdrawal: the student is required to withdraw from the course. A grade of W will appear on the transcript, and no refunds of tuition, fees, or other charges will be made.
- c. Failure in the course or competency in which the infraction occurred.
- d. Recommendation of additional Sanctions: The faculty member, in cases of an especially serious nature, may recommend to the Director/Dean the imposition of additional penalties, including those listed in VII c for misconduct.

2. Sanctions to be imposed by the Director of Undergraduate Education and/or the Dean of Graduate Studies are University Sanctions and are described in detail in the University/Misconduct Sanctions section (§VII c) of this Code.

## **VII. STUDENT CONDUCT**

This Code is intended to create an environment supportive of a diverse academic experience, in which individual students' behavior does not infringe upon the rights of others or upon the educational process of the University. The expectation is that students will understand the extent to which their personal growth depends upon the maintenance of self-discipline, responsibility, and respectful interactions with others, and high standards of honesty and moral conduct.

### **A. Conduct Violations:**

The University defines student conduct violations to include, but not be limited to, the following:

1. Forgery, alteration, misuse, or destruction of, or unauthorized access to, official University records, documents, forms, or identification cards.
2. Furnishing of false or incomplete information to the University.
3. Disruptive conduct, including any attempt to impair, interfere with, or obstruct the orderly operations of the University community.
4. Obstruction or disruption of teaching, research, or other academic or administrative activities.
5. Harassment or intimidation of others, including stalking.
6. Violence, threats of violence, disorderly, lewd, or indecent conduct on University property or at a University sponsored or supervised function.
7. Trespass or unauthorized entry.
8. Unlawful assembly on University property or at a University sponsored or supervised function.
9. Theft of or damage to University property or the property of others on the University premises.
10. Possession or use on University property or at a University sponsored or supervised function of firearms or other weapons, fireworks, or chemicals of a dangerous or explosive nature, except as specifically authorized by the Department of Public Safety.
11. Manufacture, or attempted manufacture, or use, possession, or distribution of narcotic or dangerous drugs or controlled substances, including but not limited to marijuana and lysergic acid diethylamide (LSD), except as expressly permitted by law. Please note: The fact that conduct in violation of this Code may have been influenced by the use of drugs or alcohol shall not in any way limit the responsibility of the student for the consequences of his/her actions.
12. Violation of campus alcohol and drug policies.
13. Violation of the campus smoking policy
14. Unauthorized possession, use, distribution, or duplication of any key or keys issued for a University building, laboratory, room, or facility.
15. Failure to comply with directives of University officials or other public officials acting in the performance of their duties. Directives must be lawful and conform to University policy and may not abridge the rights of directed individuals. Also, officials must identify themselves prior to initiating said directives to all parties involved.
16. Hazing—defined as any conduct or method of initiation into any student organization, whether on public or private property, which willfully or recklessly endangers the physical or mental health of any student or other person, as set out in Massachusetts General Law c.269 §17 & 18.
17. Use of the University Internet/Vax accounts for criminal or unauthorized purposes.
18. Harassment Complaints of sexual harassment, or harassment on the basis of age, race, national origin, religion, sexual orientation or disability, should be reported to the University's Office of Affirmative Action and Multicultural Relations.
19. Violation of the University Policy on Sexual Offenses – i.e., unwanted sexual conduct, including but not limited to a sexual offense and/or rape. A sexual offense may include, but is not limited to, any sexual act directed against another person forcibly and/or against that person's will, or where the victim is incapable of giving

consent.

20. Any unauthorized use of electronic or other devices to make an audio or video record of any person while on University property without his/her knowledge, video/photographing individuals in secured areas such as bathrooms, locker rooms, or other areas where there is a reasonable expectation of privacy, and/or taking video/photographs of an individual without his/her effective consent, and electronic transmission of video/photographs of any person without his/her express permission are strictly prohibited.
21. Violation of copyright rules, regulations, and laws.
22. Violation of local, state, and/or federal laws.

## **B. Misconduct Procedures:**

1. All cases of alleged student misconduct shall be referred in writing to the Vice Chancellor of Student Affairs. Any member of the University community may refer alleged student misconduct to the Vice Chancellor of Student Affairs or his/her designee. Any charges concerning alleged student misconduct must be referred in writing, along with any supporting documentation, statement, or evidence, to the Vice Chancellor of Student Affairs or his/her designee within thirty (30) days of the discovery of the incident. Charges should include a specific description of the alleged wrongful conduct, the date/time/locations of the incident, and identification of any witnesses. The Student Affairs Designee shall conduct a review of the charges and determine whether to resolve the matter informally or file formal charges.

2. If formal charges are filed, the following apply:

- a. Within ten (10) business days of the initial referral, the student will be notified, in writing, of the alleged misconduct and the charges. This notice will include a description of the complaint, the time and place if known, and the person who filed a report. The Student shall be provided a copy of the Code.
- b. Within ten (10) business days of informing the student accused of misconduct, the Student Affairs Designee shall commence an investigation of the accusation(s). The investigation may include interviews with the person(s) making the accusation, the student(s) accused of misconduct, and other identified relevant parties who may have knowledge concerning the allegations.
- c. Within ten (10) business days following the conclusion of the investigation, the Student Affairs Designee shall make a finding concerning the accusation and inform the student in writing of that finding. The Student Affairs Designee may issue a finding of:

**RESPONSIBLE:** In this case, the Student Affairs Designee may impose appropriate sanctions.

**NOT RESPONSIBLE:** In this case, no sanctions will be imposed and the individual charge(s) shall be dismissed.

3. Within (10) ten business days after the Student Affairs Designee's decision, a student may request an appeal in writing to the Vice Chancellor of Student Affairs. The Vice Chancellor shall convene an Appeal Panel from the standing membership of the Joint Discipline and Grievance Committee, consisting of 23 faculty members, 1 professional staff member, and 2 students, to review the case by convening a hearing. The Vice Chancellor for Student Affairs will appoint a member of the Panel to serve as the Chair. The hearing will be closed to all persons other than those invited by the Chair of the Appeal Panel. The hearing will be taped by the Chair of the Appeal Panel. The tape shall be kept by the Vice Chancellor of Student Affairs; all parties shall be informed in advance that the hearing will be taped. All information, both verbal and written, exchanged in the hearing shall be confidential, subject to applicable provisions of the Fair Information Practices Regulations of the University and applicable state and federal laws.

4. Within (10) ten business days after completion of its hearing and review, the Panel will make a report of its findings and recommendations to the Vice Chancellor for Student Affairs upholding, reversing, or modifying the Student Affairs Designee's decisions.. Within (10) ten business days of the receipt of this report, the Vice Chancellor for Student Affairs will accept or reject, in whole or in part, the Panel's findings. The decision of the Vice Chancellor for Student Affairs is the final University disposition of the matter and is not subject to further appeal, except in cases of expulsion. Expulsions may be appealed to the Chancellor within (10) ten business days of the decision to expel.

### **C. University/Misconduct Sanctions:**

Disciplinary Sanctions which may be imposed for misconduct shall include one or more of the following. Further infractions of University regulations will result in more severe disciplinary sanctions than those originally imposed.

1. Case Dismissed: An action which closes the case for any one of the following reasons:  
a "not responsible" finding is reached, or there is lack of sufficient information and/or evidence.
2. Verbal Warning: The lightest form of disciplinary action. This will be documented in the decision letter.
3. Written Reprimand: An official written notice to a student that his/her conduct is in violation of University rules or regulations and will not be tolerated.
4. Disciplinary Probation: A more severe sanction than a reprimand. For the duration of a stated probationary period, no less than one month, the student must demonstrate a willingness to comply with University rules or regulations or other stipulated conditions or requirements, which may include forfeiture of the privilege of participation in club or team activities or other University based extracurricular activities. While on Disciplinary Probation, a student may not represent the University in any context, run for or hold office in any student organizations or participate in intercollegiate athletic teams, intramural programs, or any student clubs or organizations.
5. Suspension from the University: Withdrawal from all divisions of the University and premises for a period no less than one semester or fifteen (15) weeks. The suspension period will be stated in writing at the time of its imposition.
6. Expulsion from the University: Permanent separation from the University. An expelled

- student may not be readmitted to any of the University's academic units, and a notation of expulsion may be placed on the student's official University transcript.
7. Restitution: The assessment of financial charges or other forms of recompense for any damage or loss incurred by the University or any members of the University community.
  8. Counseling/Training/Community Service: When appropriate, students may be required to seek counseling or training or to perform community service as a condition of readmission to or continued attendance at the University.
  9. Restrictions and Trespass: The student is subject to arrest if s/he enters University premises (either generally or specific areas as noted in the sanction) without seeking prior approval from the Vice Chancellor of Students Affairs or his/her designee, who in turn will notify Campus Police.
  10. Sanction Held in Abeyance: If there are sufficiently extenuating circumstances, the sanction is assessed but not imposed. The sanction may be imposed at a later time, however, if the student is subsequently found responsible for other violations of the Code. Local, State, and Federal Charges: In cases where criminal or civil charges may apply, a case may be referred to local, state, or federal authorities.

## **Policy on Satisfactory Academic Progress**

### **Graduate Student Standards**

At the end of the spring semester each year or upon your re-enrollment at the University, your academic performance is reviewed to determine if you are making satisfactory academic progress (SAP). The review is based on qualitative (grade point average) and quantitative measures (credits or credit equivalencies completed vs. attempted); it is also cumulative for all academic work attempted at UMass Boston.

UMass Boston observes the following Satisfactory Academic Progress guidelines for graduate students:

- Graduate students are eligible for financial aid based on the U.S. Department of Education standards, which are both qualitative and quantitative. The qualitative component requires that your grades and evaluation of work completed be measured against a norm. The quantitative component specifies that the maximum time frame for completion of your program is set at 150 percent of the published length of the program. For example, a two-year program must be completed in no more than three years.
- To continue to be eligible for financial aid, you must complete a percentage of your graduate program each year. If you are attending part-time, the percentage is pro-rated.
- You must maintain a minimum of a 3.00 cumulative grade point average to remain eligible.
- Your academic progress will be reviewed each academic year based upon academic statistics at the end of the spring semester (or most recent semester completed).
- If you have been notified that you are no longer eligible for financial aid, you may appeal this decision to the Financial Aid Appeal Committee. A written letter of appeal and documents supporting your request must be submitted to FAS within thirty (30) days of your financial aid denial letter. The Committee may waive these guidelines and consider cases of unusual hardship, personal injury, death of a relative or other special circumstances.

# APPENDIX A

## **Choosing a Research Advisor**

*MS Seeking Students: Semester 1*

*PhD Seeking Students: Semester 1*

Graduate students are required to talk to **at least five (5) members of the faculty** before selecting his or her research advisor. It is in the best interest of a full-time student to make this decision during their first semester in the program. Therefore, this form needs to be completed and handed in personally to the Graduate Program Director during an advising session by the end of the first semester of study.

**Timothy Dransfield**

Timothy.Dransfield@umb.edu

S-1-085

617-287-6143

\_\_\_\_\_  
(signature)

**Jason Evans**

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\_\_\_\_\_  
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**Michelle Foster**

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**Deyang Qu**

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**Bela Torok**

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\_\_\_\_\_  
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**Marianna Torok**

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\_\_\_\_\_  
(signature)

**Wei Zhang**

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S-1-127

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\_\_\_\_\_  
(signature)

## **APPENDIX B**

University of Massachusetts – Boston  
Department of Chemistry  
Graduate Program  
**Research Advisor Acceptance Form**  
*MS Seeking Students: Semester 1*  
*PhD Seeking Students: Semester 1*

Once a research advisor has been chosen, students are required to formally request to work in their research group. Upon completion of this form, the faculty member indicates his or her acceptance of the responsibility of acting as the research advisor for said graduate student.

### **Student Information**

Student Name: \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Advisor Information**

Research Advisor: \_\_\_\_\_

**\*By signing in the space below, I agree to serve as the research advisor for the above named student.**

Signature \_\_\_\_\_ Date \_\_\_\_\_

## APPENDIX C

University of Massachusetts – Boston  
Department of Chemistry  
Graduate Program  
**Thesis Committee**  
*MS Seeking Students: Semester 1*

Masters students are required to choose three members of the chemistry faculty, one of whom is to be your advising Professor to serve on their Thesis committee, within the first semester of attendance.

The responsibilities of a Thesis Committee member consist of participating in the review of a student's literature seminar presentation and public thesis defense as well as the review of a finished version of the student's thesis.

### **Student Information**

Name \_\_\_\_\_

Advising Professor \_\_\_\_\_

Anticipated semester of thesis defense \_\_\_\_\_

### **Chosen Committee Members**

1. Name (print) \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_

2. Name (print) \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_

3. Name (print) \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_

## APPENDIX D

University of Massachusetts – Boston  
Department of Chemistry  
Graduate Program  
**Dissertation Committee**  
*PhD Seeking Students: Semester 1*

Doctoral students are required to choose three members of the chemistry faculty and one faculty member from outside the chemistry department to serve on their Dissertation committee. Three members from the chemistry faculty must be chosen within the student's first year of attendance. The fourth member, from outside the chemistry department, may be chosen at a later date.

The responsibilities of a Dissertation Committee member consist of participating in the literature seminar and oral qualifying exam of the student and in the oral defense of the dissertation. The oral qualifying exam requires the committee member to review a 15-page research proposal written by the doctoral student regarding a series of experiments similar to but not identical to their chosen doctoral research project or research being conducted within the chemistry department. Next the committee member must participate in the public presentation and private defense of this research proposal by the graduate student. The oral defense of the dissertation is very similar to the oral qualifying exam, except the document the committee member must review is the final draft of the students' dissertation. The dissertation defense is similar to the oral qualifying exam in that the committee member is expected to be present at the public presentation of the doctoral research and then to participate in the oral defense of this work.

### Student Information

_____	_____
Name	Advising Professor
_____	_____
Anticipated semester of oral qualifying exam	Anticipated semester of dissertation defense

### Chosen Committee Members

_____	_____
Name (please print)	Name (please print)
_____	_____
nature	nature
Date	Date
2. _____	4. _____
Name (please print)	External Committee Member Name and Dept
_____	_____

Signature

Date

Signature

Date

## APPENDIX E

### CHEMISTRY GRADUATE COURSE DESCRIPTIONS

#### **CHEM 601**

*Thermodynamics and Kinetics* Advanced physical chemistry with an emphasis on thermodynamics, chemical kinetics, and statistical mechanics with applications to problems in chemistry.

*Prerequisite: Enrollment in the Graduate Chemistry Program or permission of instructor*  
4 Credits

#### **CHEM 602**

*Quantum Mechanics and Spectroscopy*: Advanced physical chemistry with an emphasis on modern theories of the structure of matter, including the principles of quantum mechanics, the electronic structure of atoms and molecules, chemical bonding, and atomic and molecular spectra.

*Prerequisite: Enrollment in the Graduate Chemistry Program or permission of instructor*  
4 Credits

#### **CHEM 611**

*Inorganic Chemistry: Synthesis and Analysis*: Study of the determination of chemical structures by various methods such as UV-Vis, infrared and nuclear magnetic resonance spectroscopy, and X-ray diffraction.

*Prerequisite: Enrollment in the Graduate Chemistry Program or permission of instructor*  
4 Credits

#### **CHEM 612**

*Inorganic Chemistry: Structure and Reactivity*: Study of structural aspects of modern chemistry based bond and molecular orbital theories. Group theoretical principles are used to understand structural and spectroscopic properties of molecules. Topics include: Walsh diagrams, projection operators, ligand field theory, angular overlap model, and symmetry controlled reactions. Examples are taken from representative and transition metal compounds.

*Prerequisite: Enrollment in the Graduate Chemistry Program or permission of instructor*  
4 Credits

#### **CHEM 621**

*Organic Synthesis and Mechanisms*: Discussion of the mechanisms of fundamental reactions used in organic synthesis. Critical analysis of the tactics and strategy of the use of these reactions for the construction of organic compounds.

*Prerequisite: Enrollment in the Graduate Chemistry Program or permission of instructor*  
4 Credits

### **CHEM 622**

*Physical Organic Chemistry:* Modern theories of organic reaction mechanisms, particularly the use of physical-chemical principles to predict the effect of changing reaction variables, especially reactant structures, on reactivity. The structure, stability, and reactivity of carbanions and carbocations, as well as SN1 and SN2 reactions, are discussed. Molecular orbital theory and symmetry as applied to organic reactions is also a focus.

*Prerequisite: Enrollment in the Graduate Chemistry Program or permission of instructor*  
4 Credits

### **CHEM 651**

*Spectrometric Identification of Organic Compounds:* A survey of spectral methods for organic structure determination. This course will introduce the major spectroscopic techniques with an emphasis on the application to structural analysis. The basic theory and methodology of each type of spectroscopy will be presented. Topics covered include IR, UV-vis, NMR, and mass spectrometry.

*Prerequisite: Enrollment in the Graduate Chemistry Program or permission of instructor*  
4 Credits

### **CHEM 653**

*Polymer Chemistry:* An introductory survey of polymer chemistry including polymer structure and stereochemistry, characterization of polymers, categories of polymers, synthesis of monomers, and polymerization reactions and their mechanisms. Why and how polymers are tailor-made is exemplified. Emphasis is given to polymer chemistry as an interdisciplinary field and as a unique area of chemical science

*Prerequisite: CHEM 254 or permission of instructor*  
*Hrs by arrangement, 3 Credits*

### **CHEM 658**

*Medicinal Chemistry:* This graduate and upper-level professional course presents the principles of medicinal chemistry.

Organized along pharmacological lines, the course considers the development and design of drugs, those a) acting on the central and peripheral nervous system; b) acting on the cardiovascular, hematopoietic and renal systems; c) acting as chemotherapeutic agents, vitamins, and hormones. Special emphasis is given to drugs used in emergencies and to drugs described in the United States Pharmacopoeia and the National Formulary. Syntheses of important compounds in the various categories are presented.

*Prerequisite: CHEM 254 or equivalent*  
3 Credits

### **CHEM 666**

*Electrochemistry:* This course provides an advanced study in the fascinating field of electrochemistry. Electrochemistry will include an overview of the theories of ionics, electrostatics and charge transfer. These theories will be applied to the understanding to a variety of electroanalytical techniques and electrochemical applications such as contemporary batteries and

fuel cells. Electroanalytical techniques to be discussed include static and dynamic methods for application of controlled voltage (potentiometric) and controlled current (coulometric) as well as ion detection, electro-separation and conductometric methods. Specific topics emphasized will include electrochemical instrumentation, reference electrodes, cyclic voltametry, microelectrochemistry and contemporary ion selective electrode analysis.

*Prerequisite: CHEM 312*

*Hrs by arrangement, 4 Credits*

### **CHEM 671**

*Introduction to Green Chemistry:* This course, taught at a graduate level, probes aspects of chemistry which are designed to benefit society and which search for pathways to minimize environmental impact. This course studies a specific environmental problem in-depth, then probes the pragmatic implications of discoveries in the field, and finally provides an array of representative Green Chemistry examples.

*Prerequisite: CHEM 254 and preferred CHEM 312*

*4 Credits*

### **CHEM 680L (BIOL 680L)**

*Physical Biochemistry:* This course serves as an introduction to analytical methods and instrumentation available to the interdisciplinary scientist. While no course can be comprehensive in this field, this course will examine a broad base of analytical methods through introductory theory and will highlight applications and recent developments in these methods through current primary literature.

*Prerequisite: BIOCHM 384*

*4 Credits*

### **CHEM 687**

*Topics in Chemistry:* Graduate level readings in various areas of chemistry under the supervision of a faculty member

*Prerequisite: Permission of instructor*

*Hrs by arrangement, 1-10 Credits*

### **CHEM 688**

*Topics in Physical Chemistry:* Topical discussions, each based on elementary principles of physical chemistry and progressing toward recent developments in the field. Open to graduates and advanced undergraduates

*Prerequisite: CHEM 312, and 369, or equivalent*

*Hrs by arrangement, 3 Credits*

### **CHEM 689**

*Topics in Organic Chemistry:* Discussions of selected topics of current interest in organic chemistry. Open to graduates and advanced undergraduates.

*Prerequisite: CHEM 254 or equivalent*

*Hrs by arrangement, 3 Credits*

### **CHEM 690**

*Topics in Inorganic Chemistry:* Discussions of selected topics of current interest in inorganic chemistry. Open to graduates and advanced undergraduates.

*Prerequisite: CHEM 370 or equivalent*  
*Hrs by arrangement, 3 Credits*

**CHEM 691**

*Seminar I: Students take CHEM 691 or 692 during every semester they are enrolled in the program.*

*Prerequisite: Enrollment in the Graduate Chemistry Program, or permission of instructor.*

*Hrs by arrangement, 1 Credit*

**CHEM 692**

*Seminar II: Students take CHEM 691 or 692 during every semester they are enrolled in the program.*

*Prerequisite: Enrollment in the Graduate Chemistry Program, or permission of instructor.*

*Hrs by arrangement, 1 Credit*

**CHEM 696**

*Independent Study: Study of a particular area of chemistry under the supervision of a faculty member.*

*Prerequisite: Permission of instructor.*

*Hrs by arrangement, 1-10 Credits*

**CHEM 699**

*Master's Thesis: Open to degree candidates.*

*Hrs by arrangement, 1-10 Credits*

## APPENDIX F

Chemistry Graduate Program  
University of Massachusetts Boston  
**Annual Graduate Student Report**

For the period of January 1, 20XX to December 31, 20XX  
(For graduate students enrolled in the program during any or all of this period)  
Hand in to Research Advisor by January 30, 20XX

**Notes on Procedure:** The graduate student completes Sections 1, 2, 3, 4, and 5; the research advisor and the GPD then fills out Sections 6 and 7 respectively (all copies). Use additional sheets as necessary.

### **Section 1**

Name:

Date:

Program (MS or PhD):

Status in Program (full time or part time):

Research Advisor:

Semester you began the program:

Semester you achieved candidacy:

### **Section 2: Degree Progress in 2008**

- A. Courses Completed
- B. Literature Seminar
- C. Thesis Defense (MS only)
- D. Written Qualifying Exam (PhD only)
- E. Oral Qualifying Exam (PhD only)
- F. Dissertation Defense (PhD only)

### **Section 3: Teaching**

#### **A. Courses Taught**

##### **Spring 2008**

Courses taught:

Did you serve as a TA1 or a TA2

How many students were enrolled in each section you taught?

**Summer 2008**

Courses taught:

Did you serve as a TA1 or a TA2

How many students were enrolled in each section you taught?

**Fall 2008**

Courses taught:

Did you serve as a TA1 or a TA2

How many students were enrolled in each section you taught?

**B. Describe any major changes in your teaching approach or responsibilities.**

**C. (i) List separately any students who worked under your supervision last year.**

<b>Section 4: Research Activity</b>
-------------------------------------

**A. Publications** (please give the full citation of any and all articles you are listed as an author on in 2008)

1. Completed (in print or accepted for publication)
2. Completed (submitted to a journal)
3. In Progress (paper being written)

**B. Presentations**

1. Seminars you gave.
2. Posters you created.
3. Presentations of your research given by someone else (Tell me who gave the presentation and whether it was a poster or a talk.)

**C. Research Projects** (please give a brief summary of all the research projects you have worked on in the past calendar year along with a progress report of those projects)

**D. Other Research, Creative, or Professional Activities not adequately covered in any of the previous sections. Format: include sufficient information to identify the activity in a complete manner.**

<b>SECTION 5: Service</b>
---------------------------

**A. Service to Research Group**

**B. Service to Chemistry Department**

**C. Service to Profession**

**D. Other service activities or accomplishments not adequately covered in any of the previous sections.**

<b>SECTION 6: Activities and accomplishments not adequately covered in any of the previous sections</b>
---

**NEXT STEP:** After completing Sections 2 through 5, the graduate student forwards all copies to their Research Advisor.

<b>SECTION 7: Comments of the Research Advisor (Please include the basis for evaluation.)</b>
---

\_\_\_\_\_  
Signature of the Research Advisor

**SECTION 7: Comments of the Graduate Program Director (Please include the basis for evaluation.)**

\_\_\_\_\_  
Signature of the GPD

**NEXT STEP:** After Sections 6 and 7 have been completed, the GPD returns all copies to the faculty member.

**SECTION 8: I certify the accuracy of Sections 1 through 5. In addition, I have read the comments in Sections 6 and 7. (An additional statement, with appropriate copies, may be appended.)**

\_\_\_\_\_  
Signature of the Graduate Student

\_\_\_\_\_  
Date

**NEXT STEP:** After completing Section 8, the graduate student should make a copy of this document for their personal records but send the original copy to the office of the graduate program director.

**The Masters Program in Chemistry**  
**Academic Requirements Checklist**

- \_\_\_ **A. Choose a Research Advisor (within first semester of matriculation)**
  - \_\_\_ 1. Complete "Choosing a Research Advisor" Form
  - \_\_\_ 2. Complete "Research Advisor Acceptance" Form
  
- \_\_\_ **B. Form a Thesis Committee (3 members)**
  - \_\_\_ 1. Complete "Thesis Committee" Form
  
- \_\_\_ **C. 33 Credits from the following:** (Must maintain a B or better in each class)
  - \_\_\_ 1. 1 course in Physical Chemistry
  - \_\_\_ 2. 1 course in Inorganic Chemistry
  - \_\_\_ 3. 1 course in Organic Chemistry
  - \_\_\_ 4. Approved Elective 1 of 3
  - \_\_\_ 5. Approved Elective 2 of 3
  - \_\_\_ 6. Approved Elective 3 of 3
  - \_\_\_ 7. Thesis Research
  - \_\_\_ 8. Chem 691 or Chem 692 (Research Seminar) *during every semester*
  
- \_\_\_ **D. Literature Seminar Presentation (within 2 years of matriculation)**
  
- \_\_\_ **E. One semester of teaching or work experience (with approval from the GPD)**
  
- \_\_\_ **F. Successful Thesis Defense (before committee)**

**The PhD Program in Chemistry**  
**Academic Requirements Checklist**

- \_\_\_ **A. Choose a Research Advisor (within first semester of matriculation)**
- \_\_\_ 1. Complete "Choosing a Research Advisor" Form
  - \_\_\_ 2. Complete "Research Advisor Acceptance" Form
- \_\_\_ **B. Form a Dissertation Committee (3 members)**
- \_\_\_ 1. Complete "Dissertation Committee" Form
- \_\_\_ **C. 60 Credits from the following:** (Must maintain a B or better in each class)
- \_\_\_ 1. 1 course in Physical Chemistry
  - \_\_\_ 2. 1 course in Inorganic Chemistry
  - \_\_\_ 3. 1 course in Organic Chemistry
  - \_\_\_ 4. Chem 671 Introduction to Green Chemistry
  - \_\_\_ 5. Chem 687 Chemical Toxicology
  - \_\_\_ 6. Approved Elective 1 of 1
  - \_\_\_ 7. Dissertation Research
  - \_\_\_ 8. Chem 691 or Chem 692 (Research Seminar) *during every semester*
- \_\_\_ **D. Literature Seminar Presentation (within 2 years of matriculation)**
- \_\_\_ **E. Candidacy**
- \_\_\_ 1. Written Qualifying Exam
    - Eligible after completion of 5 of the 6 required courses
    - Administered every January and June
  - \_\_\_ 2. Oral Qualifying Exam
    - Eligible after WQE is passed and coursework is complete (all 6 courses)
    - If passed, an Oral Presentation is required every 9-12 months on dissertation progress
  - \_\_\_ 3. Meetings with the Dissertation Committee
- \_\_\_ **F. One semester of teaching or work experience (with approval from the GPD)**
- \_\_\_ **G. Successful Dissertation Defense (before committee)**