

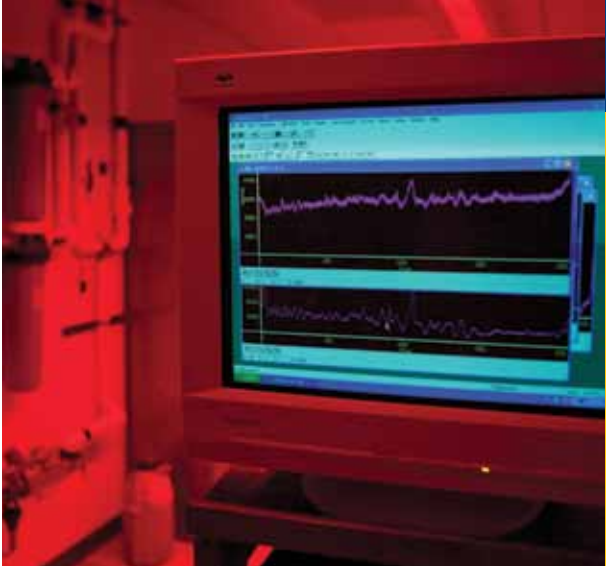


Graduate programs in  
**CHEMISTRY**



**MARQUETTE**  
UNIVERSITY

Be The Difference.



# Why graduate studies in Chemistry at Marquette?

Participate in cutting-edge research. Present at literature- and research-based seminars. Work with renowned faculty who are at the forefront of their fields. Hear top researchers speak at department-sponsored talks. Join a graduate organization and advance your leadership skills. Whether you're a chemist looking to advance your career or a high school science teacher wishing to enhance your scientific background, Marquette's graduate chemistry program will help you develop the skills you need to succeed.

**Be prepared.** You'll have opportunities to participate in world-class scientific experiments, submit articles to journals and present your work at scientific meetings.

**Be impressed.** You'll work in [newly renovated research labs](#) with state-of-the-art [instrumentation](#) and have access to the university's [parallel computer](#) cluster.

**Be independent.** We'll help you grow as an independent scientist by honing your research, oral communication and written communication skills.

**Be flexible.** A flexible curriculum allows you to tailor a program to fit your individual interests. And a flexible schedule, including many evening classes, allows you to complete the program on a part- or full-time basis.

**Be noticed.** Thanks to a ratio of one full-time faculty member for every four students, you're never just a face in a crowd. Far from it — the mentoring relationships you develop here will carry into your professional life.

**Be supported.** We offer financial aid to students every year in the form of research assistantships or teaching assistantships with tuition credits, a competitive stipend and health care benefits.

## Chemistry graduate programs:

Doctorate

Master of science

## ABOUT MARQUETTE

**Our programs.** Marquette offers 50 doctoral and master's degree and more than 30 graduate certificate programs, and a School of Dentistry and Law School. And we have a variety of specializations to help you tailor the curriculum to your needs — an opportunity not offered by all universities.

**Our students.** We enroll approximately 3,700 graduate and professional students from diverse cultural and educational backgrounds and 68 countries all over the world.

**Our faculty.** Marquette's almost 700 full-time faculty represent renowned scholars and industry experts. As a student, you'll also benefit from established collaborations within the local business and nonprofit communities, as well as other nationally renowned institutions within the region, including the Clinical and Translational Science Institute, Medical College of Wisconsin, Milwaukee School of Engineering, University of Wisconsin system, and others.

**Our research.** Graduate students can participate in important research alongside our renowned faculty members — making you a contributing member of our research team, not just a face in the crowd like at some other universities. Marquette's overall research award volume in fiscal year 2010 reached a record high, with faculty receiving more than \$28 million. Federal award dollars increased by 81 percent, and the average award size rose by 45 percent.

**Our commitment.** Class sizes are small and are usually taught by regular faculty members who are conducting cutting edge research. Your teaching will be informed by current research, and you will often have the opportunity to participate in research.

**Our network.** As a graduate of Marquette, you'll become part of our alumni family of 110,000 around the world — creating a professional network that spans from right next door to across the globe.

**Our values-based education.** As a Jesuit institution of higher education, Marquette continues a centuries-old tradition of academic excellence, development of the whole person and research that addresses societal needs.

## YOUR JOURNEY

Today's professional chemists are in high demand. According to the 2010-11 edition of the Bureau of Labor and Statistics' *Occupational Handbook*, a baccalaureate degree in chemistry is the "minimum educational requirement" for entry-level jobs. The handbook also says that individuals holding a master's or doctoral degree are in demand and enjoy greater access to career opportunities in larger pharmaceutical and biotechnology firms. Are you ready to reach your full potential?

### Doctoral degree

**Specializations:** analytical chemistry, bioanalytical chemistry, biophysical chemistry, chemical physics, inorganic chemistry, organic chemistry and physical chemistry

**Subspecialty areas within the department include:** photochemistry, molecular spectroscopy, organometallic, physical organic, bio-organic, polymer, theoretical chemistry and chemical dynamics

### Course work:

- Students must complete 36 post-baccalaureate credit hours (12 classes), including:
  - 24 credit hours (eight classes) of course work, of which six credit hours may be independent research — a 6000-level graduate chemistry course.
  - 12 doctoral dissertation credit hours.
- Course work is generally completed by the end of the second year and is followed by an intense program of laboratory instruction and research.
- Full-time students can expect to spend approximately 40 hours a week on course work and independent research.
- There are no foreign language requirements, unless deemed necessary as part of a student's research.
- Typical class size is 10 students.



“At Marquette, I learned chemistry from some of the best classroom teachers and research scientists. After graduation, I was able to land my dream job as an assistant professor of chemistry at the University of Wisconsin-Green Bay.

**Dr. Julie Lukesh, Grad '04**  
Assistant professor in the Department of Chemistry  
University of Wisconsin-Green Bay



Refine your teaching skills, participate in university committee work, present scholarly lectures and papers, and learn how to conduct a successful job search through our Preparing Future Faculty program. Marquette is one of only 17 U.S. universities to have received funding for this program. For more information, visit [marquette.edu/pff](http://marquette.edu/pff).

### Seminar requirements:

- Students are required to present a literature-based seminar during their second year.
- Students are required to present a research-based seminar during their third year.

### Comprehensive examination:

- Eight qualifying examinations are given per year.
- Students are expected to pass four exams by the end of the fifth semester of their doctoral study.

### Dissertation requirements:

- Twelve hours of dissertation credits are required.
- Students must author and successfully defend a dissertation representing an original research contribution under the supervision of a faculty research director.

For more program details, including requirements and course descriptions, see the *Graduate Bulletin* at [marquette.edu/grad](http://marquette.edu/grad).

## Master of science

**Specializations:** analytical chemistry, bioanalytical chemistry, biophysical chemistry, chemical physics, inorganic chemistry, organic chemistry and physical chemistry

**Subspecialty areas within the department include:** photochemistry, molecular spectroscopy, organometallic, physical organic, bio-organic, polymer, theoretical chemistry and chemical dynamics

### Course work:

Two tracks are offered:

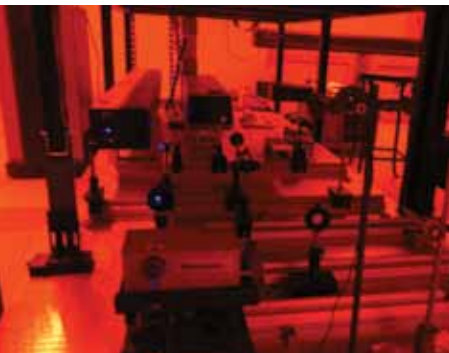
- Plan A is an option designed for individuals preparing for a career as a professional chemist. The focus of this track is research. All students are admitted under this track but may transfer to plan B.
  - Students must complete 36 post-baccalaureate credit hours (12 classes), including:
    - 24 credit hours (eight classes) of course work, of which six credit hours may be independent research — a 6000-level graduate chemistry course.
    - six master's thesis credits.
- Plan B is an option designed for high school science teachers wishing to enhance their scientific backgrounds. The focus of this track is enrichment and skill strengthening.
  - Students must complete 30 post-baccalaureate credit hours (10 classes), including:
    - 24 credit hours (eight classes) of course work, of which six credit hours may be independent research — a 6000-level graduate chemistry course.
    - an essay.
- Course work is generally completed by the end of the second year and is followed by an intense program of laboratory instruction and research.
- Full-time students can expect to spend approximately 40 hours a week on course work and independent research.
- There are no foreign language requirements, unless deemed necessary as part of a student's research.
- Typical class size is 10 students.

### Seminar requirements:

- Students are required to present a literature-based seminar during their second year.

### Required examination:

- Public defense of the thesis or essay constitutes a comprehensive exam.



Dr. Kincaid's group, funded by the National Science Foundation and the National Institutes of Health, studies functionally diverse heme proteins and model compounds. The application of various biophysical tools, including the structure-sensitive resonance Raman spectroscopy, greatly enhances our understanding of the molecular details of enzymatic reaction mechanisms. The group's current research efforts are focused on improvement of the resonance Raman methodology as it applies to heme proteins, with particular emphasis now being focused on human enzymes involved in drug metabolism and steroid biosynthesis, efforts which naturally carry important implications for the fields of pharmacology and drug development.

### Research requirement:

- Plan A — Students must author and successfully defend a master's thesis representing independent research carried out under the supervision of a faculty research director.
- Plan B — Students must submit an essay review of the literature of some area of chemistry and a proposal about how knowledge in that area might be extended by research.

For more program details, including requirements and course descriptions, see the *Graduate Bulletin* at [marquette.edu/grad](http://marquette.edu/grad).

## YOUR FACULTY MENTORS



**Dr. Dmitri A. Babikov**, associate professor  
*Theoretical chemistry*

**Dr. William A. Donaldson**, professor  
*Synthesis of natural products*

**Dr. Adam T. Fiedler**, assistant professor  
*Inorganic chemistry*

**Dr. James R. Gardinier**, associate professor  
*Inorganic and coordination chemistry*

**Dr. Jeanne M. Hossenlopp**, professor, vice provost for research and dean of the Graduate School  
*Laser studies of chemical reaction dynamics*

**Dr. James R. Kincaid**, director of graduate studies and professor  
*Raman and time-resolved Raman spectroscopy*

**Dr. Rajendra Rathore**, professor  
*Organic supramolecular chemistry*

**Dr. Scott A. Reid**, Wehr Professor of Chemistry and chair  
*Laser spectroscopy (detection of transient molecular species)*

**Dr. Michael D. Ryan**, professor  
*Electrochemistry of nitrate/sulfite reductases and model complexes*

**Dr. David M. Schrader**, research professor  
*Physical and theoretical chemistry*

**Dr. Evgeni Kovrigin**, assistant professor  
*Biophysical NMR and biochemistry*

**Dr. Mark G. Steinmetz**, professor  
*Organic photochemistry*

**Dr. Qadir Timerghazin**, assistant professor  
*Theoretical physical chemistry*

**Dr. Chieu D. Tran**, Habermann Professor of Chemistry  
*Analytical laser spectroscopy*

**Dr. Chae S. Yi**, associate professor  
*Organotransition metal chemistry*

For more information about the department's faculty members and their research, visit [marquette.edu/chem/faculty](http://marquette.edu/chem/faculty).

## FACULTY GRANTS

### Dr. Dmitri A. Babikov

Air Force Office of Scientific Research — non-born-oppenheimer spectroscopy of energetic triatomics

### Dr. William A. Donaldson

National Science Foundation — natural product synthesis via organoiron methodology

### Dr. Jeanne M. Hossenlopp

National Science Foundation — kinetics of anion exchange in nanodimensional layered metal hydroxides

### Dr. James R. Kincaid

National Institutes of Health — modulation of soluble guanylyl cyclase by endogenous and exogenous elements

National Science Foundation — structural characterization of highly reactive heme enzyme intermediates

### Dr. Scott A Reid

National Science Foundation — the spectroscopy and photochemistry of key reactive intermediates: carbenes and carbocations

Petroleum Research Fund — experimental probes of key organometallic intermediates: metal carbenes

### Dr. Daniel S. Sem

National Institutes of Health — implications of binding synergy for fragment assembly: a dynamics perspective

### Dr. Chieu D. Tran

Prevent Cancer Foundation — ultrasound-enhanced near-infrared imaging for detection of breast cancer

## FACULTY RESEARCH

Marquette's Chemistry Department consists of 15 faculty members who are actively engaged in cutting-edge research, publication, teaching and service. Committed to the teacher-scholar model, most of our faculty members regularly teach courses at all levels in addition to conducting their own research.

### Analytical and bioanalytical chemistry

Drs. James R. Kincaid, Michael D. Ryan and Chieu D. Tran

### Biochemically related sciences

Drs. William A. Donaldson, Kincaid, Evgeni Kovrigin, Ryan, Tran and Chae S. Yi

### Chemical physics

Drs. Dmitri Babikov, Jeanne M. Hossenlopp and Qadir Timerghazin, Scott A. Reid

### Inorganic chemistry

Drs. Adam T. Fiedler, James R. Gardinier and Yi

### Laser spectroscopy

Drs. Kincaid and Tran

### Materials

Drs. Hossenlopp, Rajendra Rathore, Reid and Mark G. Steinmetz

### Organic chemistry and polymer science

Drs. Donaldson, Rathore and Steinmetz

### Physical chemistry

Drs. Babikov, Hossenlopp, Reid and Timerghazin

### Synthesis and catalysis

Drs. Donaldson, Kincaid, Rathore, Steinmetz, Charles Wilkie and Yi

For more information about the department's faculty members and their research, visit [marquette.edu/chem/faculty](http://marquette.edu/chem/faculty).



## YOUR RESOURCES

As a graduate student in chemistry, you'll have access to:

- 29 newly renovated graduate research laboratories.
- modern instrumentation, including:
  - three high-field NMRs (up to 600 MHz).
  - powder and single-crystal X-ray diffractometers.
  - MALDI mass spectrometer
  - laser spectroscopic facilities.
- the university's parallel computer cluster.

Our graduate programs also provide excellent resources beyond the classrooms. Thanks to our location in downtown Milwaukee and community-connected faculty, you'll enjoy an urban setting with access to a vibrant arts scene, professional sports, restaurants and nightlife.

### Marquette University

- Access to networking, career counseling, and job searching counselors and seminars through our free [Career Services Center](#)
- More than 20 [academic centers and institutes](#) that foster research in end-of-life care, ethics, neuroscience, rehabilitation engineering, transnational justice, water quality, sports law and others
- Access to more than 1.7 million volumes of books and bound journals, 22,000 journals and other serials in digital format, laptops for checkout, and extensive special collections ([Raynor Memorial Libraries](#) are open evenings and weekends)
- Access to a secure high-speed wireless network (54Mbps) for laptops and other devices
- Remote computer access to campus-only resources through our VPN
- [Student Health Service](#), [Counseling Center](#) and [Campus Ministry](#)
- [Sports recreation](#) and fitness facilities
- [Big East Conference sports](#), including men's basketball, which has 27 NCAA appearances, 14 Sweet Sixteen appearances, three Final Four appearances and one NCAA championship (1977) and plays in front of 18,000 fans at the Bradley Center

### Milwaukee

- The Milwaukee metropolitan area has approximately 1.7 million people, ranking among the top cities in the United States by population
- Home to nine Fortune 500 company headquarters, including Harley-Davidson, Johnson Controls, Northwestern Mutual and Rockwell Automation
- Milwaukee offers many art and cultural opportunities, including a [repertory theatre](#), a [symphony orchestra](#), two opera companies, a [ballet company](#), diverse art galleries, a public museum, the [Milwaukee County Zoo](#) and the [Milwaukee Art Museum](#)
- Professional sports include baseball ([Brewers](#)), basketball ([Bucks](#)), hockey ([Admirals](#)), soccer (Wave) and skating exhibitions at the [Pettit National Ice Center](#) (an Olympic training facility)
- Known as the city of festivals, Milwaukee has abundant celebrations throughout the year honoring the city's diverse heritage, including [Summerfest](#) — the world's largest outdoor music festival
- More than 10 miles of lakefront, 1,500 restaurants and 15,000 acres of parks



## YOUR INVESTMENT

Furthering your education is an investment you can count on. Financial aid — in several forms — can help meet the costs of your graduate education at Marquette.

### Tuition\*

#### For full-time students:

Nine credit hours per semester at \$945 per credit = \$8,505 per semester

#### For part-time students:

Three credits per semester at \$945 per credit = \$2,835 per semester

A minimum of 34 credit hours beyond a bachelor's degree is required to complete the doctoral degree program.

A minimum of 34 credit hours beyond a bachelor's degree is required to complete the master's professional-track degree program.

A minimum of 30 credit hours beyond a bachelor's degree is required to complete the master's background-track degree program.

\* Figures provided are based on average credit hours taken per semester and exclude service fees and/or continuous enrollment/continuation course fees. Per-credit cost valid until May 2012.

### Merit-based aid

- Teaching assistantships are available for incoming students and typically include a stipend, tuition credits and health care benefits.
- Fellowships and research assistantships are available for current students.
- Contact the department for more information.

### Need-based aid

Enroll as a half- or full-time student in a degree program (at least four credit hours, usually two or more classes a semester), and you may be eligible for loans distributed through the [Office of Student Financial Aid](#). Most student loans have competitive interest rates and do not require repayment until after you complete your course of study.

To apply, file the Free Application for Federal Student Aid each year between January 1 and mid-February. It's available from the [Office of Student Financial Aid](#) or at [fafsa.ed.gov](http://fafsa.ed.gov). Once you have been admitted to your program and completed your financial aid paperwork, we will determine your eligibility and send you a notice explaining what financial aid you are eligible to receive from the university.

### Additional resources

- Marquette offers a convenient payment plan that divides tuition costs into monthly installments. For more information, visit [marquette.edu/mucentral](http://marquette.edu/mucentral) or contact Marquette Central at (414) 288-4000.
- Employment assistance is available.
- Private lenders feature special educational loans.
- Your employer may offer a tuition-remission plan.
- Some private foundations offer financial aid for graduate study.
- Tax credits can be claimed for work-related educational expenses.



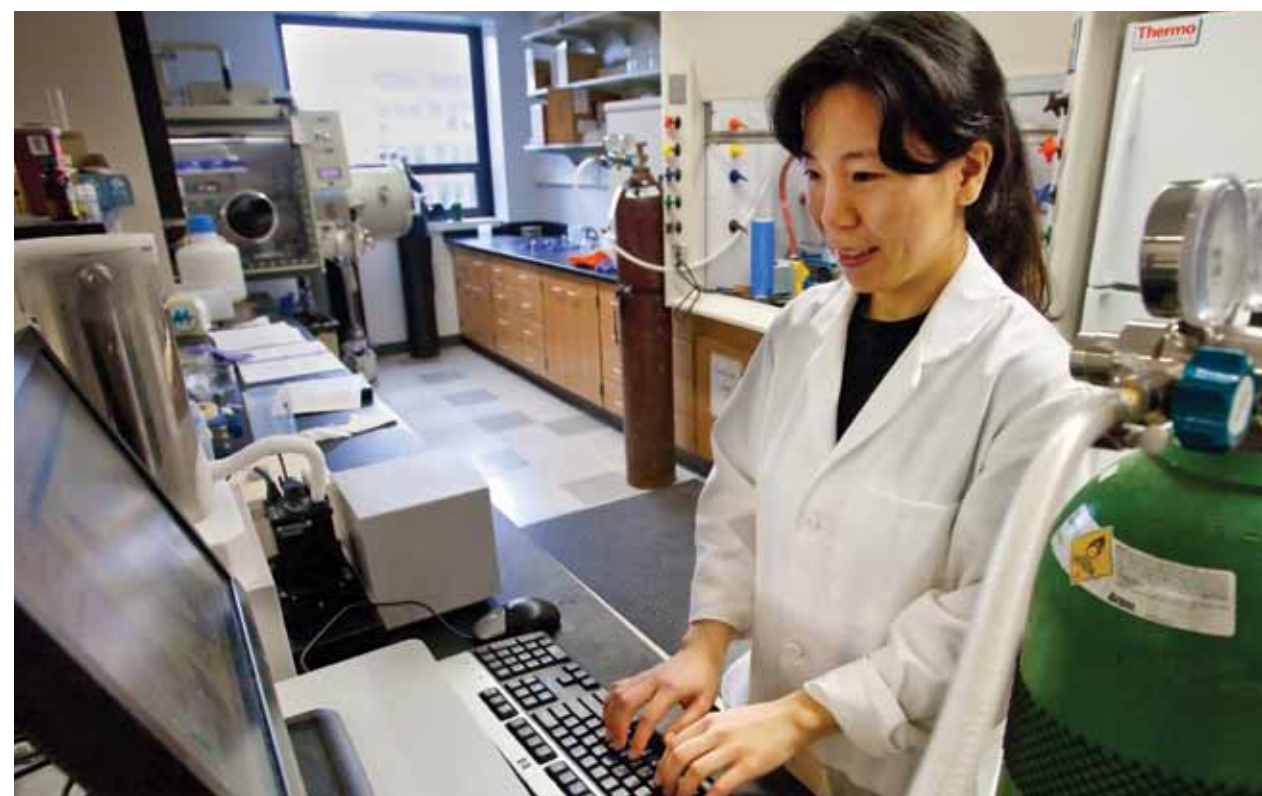
Marquette graduate Dr. Julie Lukesh has been a great addition to the chemistry program at the University of Wisconsin–Green Bay. Her time spent at Marquette gave her the skills to excel at teaching and research. She consistently has an impressive group of undergraduate students working in her organic synthesis lab, and this valuable research experience is preparing these students for their own careers.”

#### Dr. Michael Zorn

Associate professor and chair of chemistry  
Department of Natural and Applied Sciences  
University of Wisconsin–Green Bay

## YOUR OPPORTUNITIES

Where could a graduate degree in chemistry lead you? You'll find many of our recent graduates excelling in academia and industry, including at nationally recognized companies such as Abbott Labs in Chicago; Nalco in Naperville, Ill.; Owens Corning in Toledo, Ohio; and Sigma-Aldrich in Milwaukee; to name just a few.



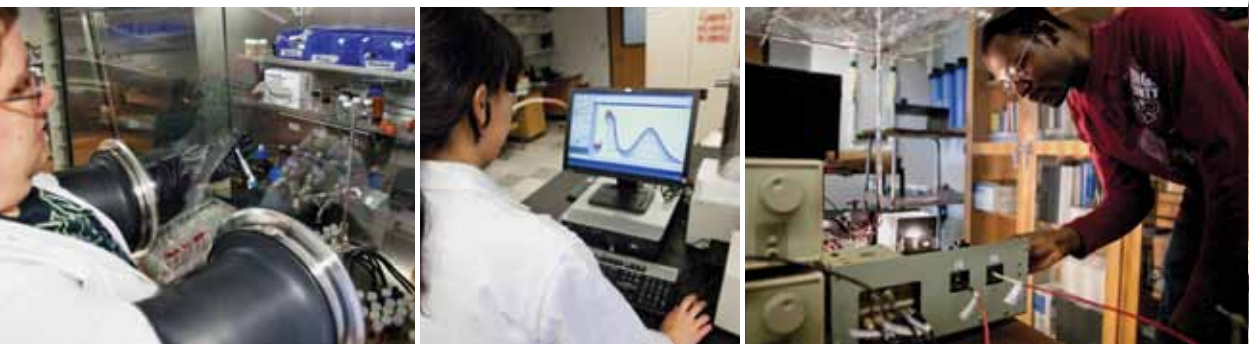
## YOUR FIRST STEP

**We invite you to apply.**

### Application requirement checklist

- Online application at [marquette.edu/grad/apply](http://marquette.edu/grad/apply) (must be submitted before any additional admission materials)
- Official transcripts from all current and previous colleges/universities except Marquette
- Three letters of recommendation from individuals familiar with applicant's academic work
- GRE scores (optional, but the subject test for chemistry is strongly recommended)
- (International applicants only) TOEFEL score or other acceptable proof of English proficiency
- If necessary, submit any additional hard-copy materials in one envelope to:

Marquette University Department of Chemistry  
Chair, Graduate Recruiting Committee  
P.O. Box 1881  
Milwaukee, WI 53201-1881



**We invite you to speak with a faculty member.**

#### **Dr. Mark G. Steinmetz**

Chair of the Graduate Recruiting Committee and professor

#### **Dr. Scott A. Reid**

Professor and chair

P.O. Box 1881

Milwaukee, WI 53201-1881

Phone: (414) 288-3536

Fax: (414) 288-7066

E-mail: [mark.steinmetz@marquette.edu](mailto:mark.steinmetz@marquette.edu), [scott.reid@marquette.edu](mailto:scott.reid@marquette.edu)





**MARQUETTE**  
UNIVERSITY

---

**Be The Difference.**

**Marquette University Graduate School**

Phone: (414) 288-7137 or (800) 793-6450, ext. 7

E-mail: [mugs@marquette.edu](mailto:mugs@marquette.edu)

1324 West Wisconsin Avenue | Holthusen Hall, Room 305 | P.O. Box 1881

Milwaukee, Wisconsin 53201-1881

[marquette.edu/grad](http://marquette.edu/grad)