M.A. DEGREE DETAILS

The master of arts degree is a purely academic degree, requiring 30 credits of graduate course work and passage of the qualifying examination at the master's level. It is designed to strengthen the student's physics background and enhance the opportunities for employment as a physicist or in physics education.

ADMISSIONS

GRADUATE SCHOOL ADMISSIONS

Graduate admissions is a two-step process between academic degree programs and the Graduate School. Applicants must meet requirements of both the program(s) and the Graduate School. Once you have researched the graduate program(s) you are interested in, apply online.

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>December 15</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>This program does not admit in the spring.</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>This program does not admit in the summer.</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Required.</td>
</tr>
<tr>
<td>English Proficiency Test</td>
<td>Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements.</td>
</tr>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
</tr>
<tr>
<td>Letters of Recommendation</td>
<td>3</td>
</tr>
</tbody>
</table>

Admission is competitive. All applicants are reviewed and evaluated on the basis of previous academic record, three letters of recommendation, statement of purpose for graduate studies, resume, and Graduate Record Exam (GRE) general and subject scores. The physics subject GRE exam is required. For applicants whose native language is not English, the department requires a minimum score of 580 (paper-based), 237 (computer-based), or 92 (internet-based) on the Test of English as a Foreign Language (TOEFL) exam, or 7 on the International English Language Testing System (IELTS) exam. All eligible applicants with complete files are considered for teaching or research assistantships and fellowships. To be considered for admission, students must submit all application materials (including test scores) via the Graduate School electronic application site (https://www.grad.wisc.edu/eapp/eapp.pl) by December 15.

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information is available from
the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

**PROGRAM RESOURCES**

**FINANCIAL SUPPORT FOR PHD STUDENTS IN PHYSICS**

All admitted Ph.D. students are provided with a guarantee of financial support. Typically, a graduate student is first appointed as a teaching assistant. Teaching assistantships assist faculty members in the introductory physics courses, generally by teaching discussion and laboratory sections. Later, as a research assistant, the student works with a major professor on a mutually agreed research program. Tuition is remitted for teaching assistant and research assistant appointments greater than one-third time or greater. However, all students must still pay the segregated fees, which are about $600 per semester for full-time students, and any additional university fees.

**Teaching Assistantships**

The typical first appointment for a beginning graduate student is a teaching assistantship (TA). A teaching assistantship is both a teaching position and a means of support for graduate study. It is normally advantageous for a graduate student to hold a TA position for at least a semester during graduate studies, since the teaching activity solidifies and deepens the teaching assistant’s undergraduate education in physics and also helps prepare for a possible career in teaching.

TA appointments are granted for a semester at a time. Based on a 50% appointment at the standard rate, a TA earns approximately $8,000 per semester.

**Research Assistantships**

Research assistantships are made available by individual professors to students who have decided on their field of research. Most departmental RA appointments are made for an annual (12 months) period. Applicants who wish to be considered for an RA appointment should contact the faculty (https://www.physics.wisc.edu/people/faculty) directly.

**Fellowships**

Fellowships, including University Fellowships and Advanced Opportunity Fellowships, are awarded by the Graduate School upon recommendation of the Department of Physics. In addition, the department may have additional fellowships—funded by endowments from physics department alumni—available for first-year graduate students. Information on these fellowships is available on the department website (https://www.physics.wisc.edu/academics/gradstudents/fellowships).

Information on nondepartmental fellowships can be found on the Graduate School funding page (http://grad.wisc.edu/studentfunding/types).

**FINANCIAL SUPPORT FOR MS STUDENTS IN PHYSICS-NAMED OPTION IN QUANTUM COMPUTING**

Students admitted to the MS degree in Physics named option in Quantum Computing are not provided with a guarantee of funding support as this is a one year accelerated master’s program. Students cannot accept research, teaching, or project assistantships or other university appointments that grant remission or waivers of tuition and fees.

**REQUIREMENTS**

**MINIMUM GRADUATE SCHOOL REQUIREMENTS**

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

**MAJOR REQUIREMENTS**

**MODE OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Mode of Instruction Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face to Face</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

**Curricular Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>). No 300-level courses will be counted toward the 30 credit minimum.</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required.</td>
</tr>
</tbody>
</table>
Other Grade Requirements: The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

Assessments and Examinations: All master of arts degree candidates must pass the qualifying examination at the master's level.

Language Requirements: Contact the program for information on any language requirements.

REQUIRED COURSES

All graduate degree candidates are required to take five core courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICS 711</td>
<td>Theoretical Physics-Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>PHYSICS 715</td>
<td>Statistical Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYSICS 721</td>
<td>Theoretical Physics-Electrodynamics</td>
<td>3</td>
</tr>
<tr>
<td>PHYSICS 731</td>
<td>Quantum Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>PHYSICS 732</td>
<td>Quantum Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

The remaining 15 credits may be earned through a combination of coursework, directed study, and research, to be determined by the advisor in consultation with the student.

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School’s Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

GRADUATE PROGRAM HANDBOOK

The Graduate Program Handbook (https://www.physics.wisc.edu/pmad) is the repository for all of the program’s policies and requirements.

PRIOR COURSEWORK

Graduate Work from Other Institutions: Prior coursework from other institutions may count toward any graduate degree in physics as allowed by the Graduate School policy on prior coursework.

UW–Madison Undergraduate: Up to 7 credits in courses numbered 500 or above may be used to satisfy minimum degree requirements.

UW–Madison University Special: With program approval and payment of difference in tuition (between Special and graduate tuition), students are allowed to count no more than 15 credits of coursework numbered 500 or above taken as a UW–Madison University Special student.

Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

PROBATION

Grade of B or better in all coursework and a minimum cumulative graduate GPA of 3.0 are required.

ADVISOR / COMMITTEE

The director of graduate studies (DGS) serves as the academic advisor to all master of arts degree candidates. The DGS will meet regularly with the Master’s candidate to monitor progress toward the degree.

CREDITS PER TERM ALLOWED

15 credits

TIME CONSTRAINTS

n/a

OTHER

n/a

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding) is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

PROGRAM RESOURCES

PROFESSIONAL DEVELOPMENT OPPORTUNITIES FOR PHYSICS GRADUATE STUDENTS

Our students have multiple opportunities for professional development throughout their graduate careers. As an integral part of research experience, students regularly work at CERN, national laboratories (Argonne, FermiLab), IceCube Neutrino Observatory at the South Pole etc.

Students are encouraged to travel to relevant conferences across the U.S. and the globe. Our students regularly attend the annual American Physical Society (APS) March Meeting and are encouraged to attend APS meetings in their sub-field throughout the year. We also encourage students to attend summer schools at various host institutions to expand their knowledge and to interact with fellow scientists in their field.

All incoming Ph.D. graduate students who will be Teaching Assistants (TA) receive extensive TA training during a week long, comprehensive program designed and implemented by our Director Undergraduate Studies. Students are also encouraged to join the DELTA program on campus which provides excellent training and mentorship for those interested in teaching. Each spring the course PHYSICS 603 Workshop in College Physics Teaching is offered. This gives our students the opportunity to learn effective teaching methods, do research into new teaching practices, and provides a forum for students and the instructor to openly discuss challenges and rewards of teaching.

Students are also encouraged to attend Graduate School sponsored Professional Development events and participate in Graduate School
Professional Development resources, such as the Individual Development Plan (IDP).

**LEARNING OUTCOMES**

1. Mastery of the core physical concepts (classical mechanics, electricity and magnetism, quantum mechanics, and statistical mechanics).
2. Articulates, critiques, or elaborates the theories, research methods, and approaches to inquiry or schools of practice in physics.
3. Evaluates or synthesizes information pertaining to questions or challenges in physics.
4. Gains rudimentary awareness of physics research execution.
5. Communicates clearly in ways appropriate to the field of physics.

**PEOPLE**

**FACULTY**

More detail about each faculty member (https://www.physics.wisc.edu/people/faculty) and the research areas (https://www.physics.wisc.edu/research/areas) can be found on the Physics website.

- Yang Bai, Associate Professor
- Baha Balantekin, Eugene P. Wigner Professor
- Vernon Barger, Vilas Professor and Van Vleck Professor
- Keith Bechtol, Assistant Professor
- Kevin Black, Professor
- Stanislav Boldyrev, Professor
- Tulika Bose, Professor
- Victor Brar, Assistant Professor
- Duncan Carlsmith, Professor
- Daniel Chung, Professor
- Susan Coppersmith, Robert E. Fassnacht Professor and Vilas Professor
- Sridhara Dasu, Department Chair & Professor
- Jan Egedal, Professor
- Mark Eriksson, Vilas Distinguished Achievement Professor
- Lisa Everett, Professor
- Cary Forest, Prager Professor of Experimental Physics
- Pupa Gilbert, Vilas Distinguished Achievement Professor
- Francis Halzen, Gregory Breit Professor and Hilldale Professor
- Kael Hanson, Professor, WIPAC Director
- Aki Hashimoto, Professor
- Matthew Herndon, Professor
- Lev Ioffe, Professor
- Robert Joynt, Professor
- Albrecht Karle, Professor, IceCube Associate Director, Science & Instrumentation
- Shimon Kolkowitz, Assistant Professor
- James Lawler, Arthur and Aurelia Schawlow Professor
- Alex Levchenko, Associate Professor
- Dan McCammon, Professor
- Robert McDermott, Professor
- Marshall Onellion, Professor
- Kimberly Palladino, Assistant Professor
- Yibin Pan, Associate Professor
- Brian Rebel, Visiting Associate Professor
- Mark Rzchowski, Associate Chair and Professor
- Mark Saffman, Professor
- John Sarff, Professor
- Gary Shiu, Professor
- Paul Terry, Professor
- Peter Timbie, Professor
- Justin Vandenbroucke, Assistant Professor
- Maxim Vavilov, Professor
- Thad Walker, Professor
- Sau Lan Wu, Enrico Fermi Professor and Vilas Professor
- Deniz Yavuz, Professor
- Ellen Zweibel, William L Kraushaar Professor of Astronomy & Physics

**AFFILIATED FACULTY**

- David Anderson, Professor, Electrical & Computer Engineering
- Chang-Beom Eom, Professor, Materials Science & Engineering
- Chris Hegna, Professor, Engineering Physics
- Sebastian Heinz, Professor, Astronomy
- Mikhail Kats, Assistant Professor, Electrical & Computer Engineering
- Irena Knezevic, Professor, Electrical & Computer Engineering
- Max Lagally, Professor Emeritus, Materials Science & Engineering
- Alexandre Lazarian, Professor, Astronomy
- Carl Sovinec, Professor, Engineering Physics
- Kalin Vetsigian, Assistant Professor, Bacteriology