

BIOPHYSICS, M.S.

Students are not admitted into the Biophysics Program for a terminal master's degree. However, a master's degree is officially offered. For more information, see the Biophysics Handbook (<http://www.biophysics.wisc.edu/handbook/>).

The doctor of philosophy degree with a major in biophysics is an interdepartmental offering under the supervision of the biophysics program committee. The biophysics degree is intended for those who wish to emphasize physical principles and methods in solving biological problems. By necessity, the interdisciplinary nature of biophysics generates interaction among, and expands the boundaries of, traditional areas of science. Persons with strong training in biophysics can be expected to be major innovators and contributors in research and applied technology. Biophysics graduates pursue careers in academic, industrial, and government research, and in teaching and administration.

The biophysics program consists of 44 faculty members from 14 departments that span four colleges within the university. State-of-the-art facilities are available within the biophysics program for research in x-ray crystallography, nuclear magnetic-resonance spectroscopy, electron resonance spectroscopy, fluorescence spectroscopy, microscopy and imaging, and computational chemistry. Graduate students in biophysics can choose from an expansive range of research topics including, but not limited to, biomolecular structure and function interactions, protein engineering and biotechnology, virus structure and function, enzyme catalysis and kinetics, membranes, neurochemistry, and electrophysiology.

The program is flexible in its formal course requirements and emphasizes excellence in research. The candidate is encouraged to begin research as quickly as possible, since it is research experience that brings focus and meaning to classroom studies, and research progress that empowers critical judgment and self-confidence for independent work. To enhance self-confidence, students are expected to participate in weekly seminars and to present a seminar.

Financial assistance is available to support qualified graduate students throughout their graduate studies. Types of graduate appointments that may be awarded include research assistantships, fellowships, and traineeships. The stipends awarded provide financial support to students during their graduate work, permitting them to devote their efforts to coursework and research. In recognition of the leadership provided by scientists and researchers at University of Wisconsin–Madison, the National Institutes of Health (NIH) have funded a predoctoral training grant in molecular biophysics for the past consecutive 20 years.

ADMISSIONS

This master's program is offered for work leading to the Ph.D. Students may not apply directly for the master's, and should instead see the admissions information for the Ph.D (<http://guide.wisc.edu/graduate/graduate-school-wide/biophysics-phd/>).

FUNDING

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 restrictions related to funding.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

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

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

| Face to Face | Evening/ Weekend | Online | Hybrid | Accelerated |
|--------------|---------------------|--------|--------|-------------|
| Yes | No | No | No | No |

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirements Detail

Minimum Credit Requirement 30 credits

Minimum Residence Credit Requirement 16 credits

Minimum Graduate Coursework Requirement 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 (<https://registrar.wisc.edu/course-guide> (<https://registrar.wisc.edu/course-guide/>)).

| | |
|----------------------------------|---|
| Overall Graduate GPA Requirement | 3.00 GPA required. |
| Other Grade Requirements | Any grade of BC or lower will not count toward the Biophysics core course requirement. If a student receives a BC or lower, the student must repeat the course in order to receive a higher grade. The student may also substitute to course for an alternate core course with approval from the Biophysics Steering Committee. |
| Assessments and Examinations | Students take two rounds of exams in order to achieve dissertator status. At the end of students' second year, they are required to take their written preliminary exam. Once this exam is passed, students must take their preliminary exam by the end of their third year. |
| Language Requirements | No language requirements. |

REQUIRED COURSES

Students must take the same courses as are required for the biophysics Ph.D.:

| Code | Title | Credits |
|---|---------------------------------------|---------|
| Required by the time oral prelim is taken: | | |
| BIOCHEM/ CHEM 665 | Biophysical Chemistry | 4 |
| CHEM 668 | Biophysical Spectroscopy ¹ | 2-3 |

Students must take at least 2 additional classes from different categories from the following list of classes (alternative classes may be substituted with approval from the Biophysics Program Steering Committee):

Structure

BIOCHEM 601 Protein and Enzyme Structure and Function

BIOCHEM 606

BIOCHEM 625 Mechanisms of Action of Vitamins and Minerals

Modeling

CHEM 661 Chemical and Statistical Thermodynamics

MATH/B M I/
BIOCHEM/
BMOLCHEM 609 Mathematical Methods for Systems Biology

Molecular Biology

BIOCHEM/
GENETICS/
MICROBIO 612 Prokaryotic Molecular Biology

BIOCHEM/
GENETICS/
MD GENET 620 Eukaryotic Molecular Biology

Neuroscience

NTP/
NEURODPT 610 Cellular and Molecular Neuroscience

Spectroscopy/Microscopy

B M E/MED PHYS/
PHMCOL-M/
PHYSICS/
RADIOL 619 Microscopy of Life

Additional Courses

| | | |
|--------------------------|--|-----|
| BIOCHEM 729 | Advanced Topics (Ethics) ² | 1-3 |
| CHEM/ BIOCHEM 872 | Selected Topics in Macromolecular and Biophysical Chemistry ³ | 1-3 |
| 990 Seminar ⁴ | | |

- ¹ Because CHEM 668 Biophysical Spectroscopy is only offered every other year, students will be advised upon joining the program in which semester they must complete the course.
- ² Students are also required to take an ethics course that covers all of the items considered necessary by the NIH for ethical and professional scientific training. It is strongly recommended that students take the ethics course during their first year. The recommended ethics course is: BIOCHEM 729 Advanced Topics. The Biophysics Program also conducts a mandatory ethics refresher seminar for all students that is held at the end of every spring semester.
- ³ Additionally, students are required to participate in seminar courses for the duration of their studies. Initially, all students are required to enroll in CHEM/BIOCHEM 872 Selected Topics in Macromolecular and Biophysical Chemistry for both fall and spring semesters. Once a student has successfully achieved dissertator status, they are eligible to enroll in alternative seminars with permission from the program.
- ⁴ Finally, all students are expected to register for 990 research credits every semester. These are the courses in which students will be conducting their independent research. First semester students will register for 990 research credits in the department of the Biophysics Program Chair, Meyer Jackson. Once a thesis lab is chosen, these credits will be conducted in the thesis advisor's home department.

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

PRIOR COURSEWORK

Graduate Work from Other Institutions

With program approval, students are allowed to count no more than 9 credits of graduate coursework from other institutions. Coursework earned more than two years prior to admission to the doctoral degree is not allowed to satisfy requirements. No admissions are made into the master's program.

UW–Madison Undergraduate

No credits from a UW–Madison undergraduate degree are allowed to count toward the degree.

UW–Madison University Special

With program approval, students are allowed to count no more than 9 credits of coursework numbered 300 or above taken as a UW–Madison Special student. Coursework earned more than two years prior to

admission to the doctoral degree is not allowed to satisfy requirements. No admissions are made into the master's program.

PROBATION

If students fall below the 3.00 GPA program requirement or have incomplete grades, the biophysics program follows the Graduate School's policy of satisfactory/unsatisfactory progress. This could result in academic probation or suspension.

ADVISOR / COMMITTEE

All students are required to have an advisor by the end of their first semester in the program. Thesis committees must be formed prior to their preliminary exam. The committee consists of at least four other faculty members and the student's advisor. After gaining dissertator status, students are required to hold yearly progress report meetings with their committee until graduation.

CREDITS PER TERM ALLOWED

15 credits

TIME CONSTRAINTS

Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
 - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Dean of Students Office (<https://doso.students.wisc.edu/>) (for all students to seek grievance assistance and support)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (<https://employeedisabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)

- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

Students should contact the department chair or program director with questions about grievances.

OTHER

Fall semester enrollment only. First semester, program-sponsored lab rotations lead to thesis lab selection and research assistantship through the thesis advisor.

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (<https://grad.wisc.edu/pd/>) to build skills, thrive academically, and launch your career.

LEARNING OUTCOMES

1. Articulates, critiques, or elaborates the theories, research methods, and approaches to inquiry or schools of practice in the field of study.
2. Identifies sources and assembles evidence pertaining to questions or challenges in the field of study.
3. Understands the primary field of study in a historical, social or global context.
4. Selects and/or utilizes the most appropriate methodologies and practices.
5. Evaluates or synthesizes information pertaining to questions or challenges in the field of study.
6. Communicates clearly in ways appropriate to the field of study.
7. Recognizes and applies principles of ethical conduct.

PEOPLE

FACULTY

Chair: Dr. Alessandro Senes (Biochemistry) Website (<https://biochem.wisc.edu/faculty/senes/>)

Paul Ahlquist (Oncology) Website (<https://mcardle.wisc.edu/who-we-are/mcardle-faculty/paul-g-ahlquist-phd/>)

Tom Brunold (Chemistry) Website (<http://brunold.chem.wisc.edu/>)

Andrew Buller (Chemistry) Website (<https://www.chem.wisc.edu/users/abuller/>)

Mark Burkard (Medicine) Website (https://www.medicine.wisc.edu/people-search/people/staff/703/Burkard_Mark/)

Judith Burstyn (Chemistry) Website (<http://burstyn.chem.wisc.edu/>)

Briana Burton (Bacteriology) Website (<https://burtonlab.bact.wisc.edu/>)

Sam Butcher (Biochemistry) Website (<https://biochem.wisc.edu/faculty/butcher/>)

Silvia Cavagnero (Chemistry) Website (<http://cavagnero.chem.wisc.edu/>)

Baron Chanda (Neuroscience) Website (<http://bclab.neuro.wisc.edu/>)

Ed Chapman (Neuroscience) Website (<https://chapman.neuro.wisc.edu/>)

Josh Coon (Chemistry) Website (<https://www.chem.wisc.edu/users/jcoon/>)

Gheorghe Craciun (Mathematics) Website (<http://www.math.wisc.edu/~craciun/>)

Cindy Czajkowski (Neuroscience) Website (<https://neuro.wisc.edu/staff/czajkowski-cynthia/>)

Katrina Forest (Bacteriology) Website (https://bact.wisc.edu/people_profile.php?t=rf&p=kforres1)

Brian Fox (Biochemistry) Website (<https://biochem.wisc.edu/faculty/fox/default.aspx>)

Sam Gellman (Chemistry) Website (<http://gellman.chem.wisc.edu/>)

Pupa Gilbert (Physics) Website (<https://home.physics.wisc.edu/gilbert/>)

Randy Goldsmith (Chemistry) Website (<https://goldsmith.chem.wisc.edu/>)

Jeff Hardin (Zoology) Website (<http://worms.zoology.wisc.edu/>)

Katie Henzler-Wildman (Biochemistry) Website (<https://biochem.wisc.edu/faculty/henzler-wildman/>)

Hazel Holden (Biochemistry) Website (<https://biochem.wisc.edu/faculty/holden/default.aspx>)

Aaron Hoskins (Biochemistry) Website (<https://biochem.wisc.edu/faculty/hoskins/default.aspx>)

Meyer Jackson (Neuroscience Department) Website (<https://neuro.wisc.edu/staff/jackson-meyer/>)

Mathew Jones (Neuroscience) Website (<https://neuro.wisc.edu/staff/jones-mathew-2/>)

Jim Keck (Biomolecular Chemistry) Website (<https://bmolchem.wisc.edu/staff/keck-james/>)

Bob Landick (Biochemistry) Website (<https://landick.wisc.edu/>)

John Markley (Biochemistry) Website (<https://biochem.wisc.edu/faculty/markley/>)

Megan McClean (Biomedical Engineering) Website (<http://mccleanlab.bme.wisc.edu/>)

Matthew Merrins (Biomolecular Chemistry) Website (<https://bmolchem.wisc.edu/staff/merrins-matthew/>)

Julie Mitchell (Mathematics) Website (<https://biochem.wisc.edu/faculty/mitchell/default.aspx>)

Regina Murphy (Chemical and Biological Engineering) Website (<http://murphygroup.che.wisc.edu/>)

Jacob Notbohm (Engineering Physics) Website (<http://notbohm.ep.wisc.edu/>)

Vatsan Raman (Biochemistry) Website (<https://biochem.wisc.edu/faculty/raman/>)

Ivan Rayment (Biochemistry) Website (<https://biochem.wisc.edu/faculty/rayment/default.aspx>)

Tom Record (Biochemistry) Website (<https://biochem.wisc.edu/faculty/record/>)

Gail Robertson (Neuroscience) Website (<https://neuro.wisc.edu/staff/robertson-gail/>)

Phil Romero (Biochemistry) Website (<https://biochem.wisc.edu/faculty/romero/>)

Subhojit Roy (Pathology and Laboratory Medicine) Website (<https://pathology.wisc.edu/staff/roy-subhojit/>)

Kris Saha (Biomedical Engineering) Website (<http://sahalab.bme.wisc.edu/>)

David Schwartz (Chemistry) Website (<https://www.chem.wisc.edu/users/schwartz/>)

Nate Sherer (Oncology) Website (<https://mcardle.wisc.edu/who-we-are/faculty/nathan-m-sherer-phd/>)

Raunak Sinha (Neuroscience) Website (<https://neuro.wisc.edu/staff/sinha-raunak/>)

Melissa Skala (Biomedical Engineering) Website (<https://morgridge.org/research/medical-engineering/multiscale-imaging/>)

Lloyd Smith (Chemistry) Website (<https://www.chem.wisc.edu/users/smith/>)

Aussie Suzuki (Oncology) Website (<https://cancerbiology.wisc.edu/staff/suzuki-phd-aussie/>)

Reid Van Lehn (Chemical and Biological Engineering) Website (<http://vanlehngroup.che.wisc.edu/>)

Ophelia Venturelli (Biochemistry) Website (<https://biochem.wisc.edu/faculty/venturelli/>)

Doug Weibel (Biochemistry) Website (<https://biochem.wisc.edu/faculty/weibel/default.aspx>)

Yongna Xing (Oncology): Website (<https://mcardle.wisc.edu/who-we-are/mcardle-faculty/yongna-xing-phd/>)

John Yin (Chemical and Biological Engineering) Website (<https://yin.discovery.wisc.edu/>)

Martin Zanni (Chemistry) Website (<https://zanni.chem.wisc.edu/>)