BIOPHYSICS, PHD

Biophysics is an inter-disciplinary PhD program in the biosciences. It brings together students from diverse backgrounds (from biology to biochemistry, chemistry, physics, bioengineering, computational biology, neuroscience, cell biology, and so on) who are interested in research at the cross-section between these disciplines.

Our broad inter-departmental program consists of approximately 60 faculty trainers (https://biophysics.wisc.edu/labs/) from departments that belong to five different schools/colleges (College of Letters & Science, College of Agricultural & Life Sciences, College of Engineering, School of Medicine and Public Health and School of Pharmacy). This highly collaborative environment offers a spectrum of opportunities that include, for example, protein structure/function and engineering, nucleic acid and membrane biophysics, neuroscience, virology, as well as synthetic and system biology applied to both bacterial and eukaryotic organisms. These areas of research share the common goal of understanding biological systems in physical and mechanistic terms, the use of cutting-edge quantitative instrumental methods, and, frequently, the integration of computation and machine learning. Please find an overview of our research areas (https://biophysics.wisc.edu/research/) on our website.

UW-Madison is a center of excellence in structural biology, with major instrumentation facilities such as the National Magnetic Resonance Facility, the CryoEM Research Center, and the Midwest Center for Cryo-Electron Tomography. Trainers who participate in these centers offer outstanding research opportunities to students who want to become experts in the application and/or development of structural biology.

In addition, many other accessible facilities and instrumentation in our trainers' laboratories provide advanced training in spectroscopy, microscopy and single-molecule imaging, high-throughput methods, and the integration of experimental and computational methods applied to the analysis and modeling of macromolecules and biological systems.

Biophysics is an inclusive and collaborative community whose goal is to prepare students of diverse backgrounds with rigorous interdisciplinary and quantitative training for a future in research and teaching in academia, industry, and alternative careers. The program is flexible in its formal course requirements, emphasizing excellence in research. For this reason, the coursework can be tailored to the specific research interests and the diverse backgrounds of each student.

For more information, please visit the Biophysics Graduate Program website (https://biophysics.wisc.edu/).

ADMISSIONS

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Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two-step process between academic programs and the Graduate School. ***Applicants must meet* the minimum requirements *(https://grad.wisc.edu/apply/requirements/) of the Graduate School as well as the program(s).*** Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/apply/).

Requirements	Detail
Fall Deadline	December 1
Spring Deadline	The program does not admit in the spring.
Summer Deadline	The program does not admit in the summer.
GRE (Graduate Record Examinations)	Not required but may be considered if available.
English Proficiency Test	Refer to the Graduate School: Minimum Requirements for Admission policy: https://policy.wisc.edu/library/UW-1241 (https://policy.wisc.edu/library/UW-1241/).
Other Test(s) (e.g., GMAT, MCAT)	n/a
Letters of Recommendation Required	3

EVALUATION PHILOSOPHY

The Biophysics Admissions Committee will carefully evaluate the potential of candidates to be successful in the Biophysics program by taking all components of the application into consideration. Applications will be reviewed holistically, and all aspects of training will be taken into account, including research experience, letters of recommendation, personal statement and academic transcripts.

APPLICANT CONSIDERATIONS

To qualify for admission to the program, an applicant must complete a bachelor's degree at a recognized, accredited college or university, or a comparable degree from an international institution. Biophysics is a broadly interdisciplinary program. We encourage applications from students from a wide variety of undergraduate training experiences in biology, biochemistry, chemistry, physics, computer science, computational biology, bioengineering, cell and molecular biology, neuroscience, or other biological or medical sciences. A successful candidate will have substantial prior research experience. Some level of experience in one or more of the biological disciplines through coursework or prior research is also highly beneficial.

Biophysics at the University of Wisconsin Madison is committed to building a diverse and inclusive community and strongly encourages candidates from underrepresented groups to apply. Applicants are encouraged to include in their statements information about how their background and life experiences shaped their interests in pursuing a research-oriented career and will make them successful in this program.

APPLICATION MATERIALS

A complete application (https://grad.wisc.edu/apply/) (Graduate School website) includes:

- A resume or CV.
- Reasons for graduate study (address, in narrative essay form, your research experiences, reasons and goals for graduate study, and how earning a PhD will help you achieve your goals).
- Transcripts must be submitted from each institution that you have attended and listed on your graduate school application (undergraduate and graduate). Records from international institutions

must be in the original language with an official English translation. Copies of transcripts must be uploaded to the online application.

- Three letters of recommendation:
  - Qualified references include faculty and/or supervisors, who have familiarity with your intellectual, academic, and research-oriented capabilities, accomplishments, and personality. Recommendations are included as part of your online application.
- A $75 non-refundable application fee. The application fee covers an application to three different graduate programs at UW-Madison. We encourage you to apply for the programs that best encompass your research interests, but you need to keep in mind that you will need to submit all application materials by the first program deadline. The UW Graduate School offers a limited number of application fee grants (https://grad.wisc.edu/apply/fee-grant/) to eligible students.
- Graduate Record Exam (GRE) scores are NOT required as part of the application submitted to the Biophysics Program. You can choose to include scores if you wish, but a lack of scores will not impact consideration of your application.

Candidates must meet the general requirements of the UW–Madison Graduate School, including an undergraduate GPA of 3.0 out of 4.0 in the last 60 semester hours. For more information, please visit the Prospective Students (https://biophysics.wisc.edu/prospective-students/) page on the Biophysics program's website.

FUNDING

FUNDING

GRADUATE SCHOOL RESOURCES

The Bursar's Office provides information about tuition and fees associated with being a graduate student. 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 restrictions related to funding.

PROGRAM RESOURCES

The Biophysics Graduate Degree Program offers a yearly stipend in the form of traineeships or research assistantships to all PhD candidates and assists those with outstanding records in competing for university and national awards (fellowships). The program guarantees a full stipend for all its PhD candidates who remain in good standing. In addition to the stipend, all students receive tuition remission and are eligible for comprehensive health insurance.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (https://guide.wisc.edu/graduate/#requirementstext) and policies (https://guide.wisc.edu/graduate/#policiestext), 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 typically take enough credits aimed at completing the program in a year or two.

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

Requirement	Detail
Minimum Credit Requirement	51 credits
Minimum Residence Credit Requirement	32 credits
Minimum Graduate Coursework Requirement	26 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/).
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/).
Other Grade Requirements	Degree requirements are not satisfied from courses in which a grade of BC or below is obtained for the Biophysics core courses. In the event of an unsatisfactory grade, the student must repeat the course and obtain a grade of B or better if they want to count the class towards their degree course requirements.
Assessments and Examinations	Students are required to complete an oral preliminary exam. The oral exam should be completed no later than the end of the student's third fall semester in the program. This exam consists of an oral defense of a written research proposal. The format of the research proposal is based on the format for an NIH F31 predoctoral grant application. If the student feels they need more time to complete the oral exam, they must request an extension from the Biophysics Office.

Language Requirements	No language requirements.
Graduate School Breadth Requirement	No doctoral minor or graduate/professional certificate required.

REQUIRED COURSES

Code	Title	Credits
Required by the time oral prelim is taken		
CHEM 665	Biophysical Chemistry	3
CHEM 668	Biophysical Spectroscopy	3
Biophysics Advanced Electives		
Students must take at least 6 credits of advanced electives from at least two different categories using the following list of classes (alternative classes may be substituted with approval from the Biophysics Program Curriculum Committee):		6
Structure		
BIOCHEM 601	Protein and Enzyme Structure and Function	
BIOCHEM 625	Mechanisms of Action of Vitamins and Minerals	
CHEM 622	Organic Analysis	
CHEM 675	Introductory Quantum Chemistry	
MICROBIO/ BMOLCHEM 668	Microbiology at Atomic Resolution	
ONCOLOGY 673	Purification and Characterization of Protein and Protein Complexes	
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	
B M E 751	Biomedical Optics and Biophotonics	
CHEM 636	Topics in Chemical Instrumentation: Introduction to NMR	
CHEM 860	Selected Topics in Physical Chemistry (Topic: Spectroscopy of Individual Molecules and Particles)	
BIOCHEM 729	Advanced Topics (Topic: Advanced Topics in NMR)	
Bioinformatics and Computational Biology		
B M I/ COMP SCI 776	Advanced Bioinformatics	
ONCOLOGY 778	Bioinformatics for Biologists	
Ethics Course		
BIOCHEM 729	Advanced Topics (Resp Conduct of Research)	1-3
Seminar Courses		**5-9**
1st and 2nd year students are required to take CHEM/ BIOCHEM 872 (Topic: Macromolecular and Biophysical Chemistry) each semester during the first two years in the program. 3rd year students are required to take CHEM/ BIOCHEM 872 for one semester (either Fall or Spring) and a different seminar course in the other semester. 4th year and beyond are required to attend four (4) more seminar classes before graduation. These are typically 900-level one-credit courses based on the presentation and discussion of journal articles or individual research.		
CHEM/ BIOCHEM 872	Selected Topics in Macromolecular and Biophysical Chemistry	
Additional Coursework		**33-36**
Specialty Courses		
Students can take specialty courses. It is recommended to take courses in areas such as biotechnology, computer science, electrical and computer engineering, molecular biology, or physics. Students should consult with their Thesis Advisor and thesis committee members about appropriate specialty courses to take pertaining to individual training goals.		
Research Credits		
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 Director. Once a thesis lab is chosen, these credits will be conducted in the thesis advisor's home department.		
Total Credits		**51**

Advanced Electives Requirement

To meet the 6-credit minimum, all elective courses must be at least 2 credits. That means that students can, for example, take two 3-credit courses, three 2-credit courses, or one 2-credit and one 4-credit course to satisfy this requirement. The above list of courses were approved as elective course options by the Biophysics Steering Committee. If you are interested in a different course to count as an elective course towards your Biophysics graduate degree, the course needs to be approved by the Curriculum Committee. To request a course approval, please use this form (https://biophysics.wisc.edu/advanced-elective-approval-form/) (you will need a syllabus from the course and a short paragraph detailing why the class is relevant to your research).

Ethics Requirement

Students are 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 (Responsible Conduct of Research). The Biophysics Program also conducts a mandatory ethics refresher seminar for all students that is held at the end of every spring semester.

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy/) serve as the official document of record for Graduate School academic and administrative policies and procedures and are updated continuously. Note some policies redirect to entries in the official UW-Madison Policy Library (https://policy.wisc.edu/). Programs may set more stringent policies than the Graduate School. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Credits Earned at Other Institutions

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

Undergraduate Credits Earned at Other Institutions or UW-Madison

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

Credits Earned as a Professional Student at UW-Madison (Law, Medicine, Pharmacy, and Veterinary careers)

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

Credits Earned as a University Special Student at UW–Madison

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

PROBATION

Refer to the Graduate School: Probation (https://policy.wisc.edu/library/UW-1217/) policy.

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 at the end of a student's first year in the program. The committee consists of at least four other faculty members and the student's advisor and faculty must represent at least two different departments on campus. After gaining dissertator status, students are required to hold yearly progress report meetings with their committee until graduation.

CREDITS PER TERM ALLOWED

15 credit maximum. Refer to the Graduate School: Maximum Credit Loads and Overload Requests (https://policy.wisc.edu/library/UW-1228/) policy.

TIME LIMITS

Refer to the Graduate School: Time Limits (https://policy.wisc.edu/library/UW-1221/) policy.

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/)
- 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 Student Assistance and Support (OSAS) (https://osas.wisc.edu/) (for all students to seek grievance assistance and support)
- 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

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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

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1. Articulates challenges, frontiers and limits with respect to theory, knowledge or practice within the field of study.

2. Formulates ideas, concepts, designs, and/or techniques beyond the current boundaries of knowledge within the field of study.
3. Creates research, scholarship or performance that makes a substantive contribution.
4. Demonstrates breadth within their learning experiences.
5. Communicates complex or ambiguous ideas in a clear and understandable manner.
6. Evaluates the implications of the discipline to broader social concerns.
7. Fosters ethical conduct and professional guidelines.