

BIOCHEMISTRY, M.S.

Biochemistry is the study of biological molecules, their roles in the cell, and the chemistry of their reactions in living systems. The Integrated Program in Biochemistry (IPIB) is the merged graduate program between the Department of Biochemistry (in the College of Agricultural and Life Sciences) and the Department of Biomolecular Chemistry (in the School of Medicine and Public Health). The program trains the next generation of biochemists and prepares them for 21st century challenges in science. IPIB offers a Ph.D. degree with a major in biochemistry. Although an M.S. degree is officially offered, students are not admitted for a terminal master's degree.

From atoms and cells to plants and animals, biochemistry research in IPIB is at the forefront of modern science. We are home to around 100 graduate students and 57 world-class faculty pursuing cutting-edge research in all areas of biochemistry, including: cell and developmental biology, chemical biology, endocrinology, enzymology, immunology, metabolism, molecular genetics, molecular medicine, physical biochemistry and biophysics, quantitative biology, structural biology, systems and synthetic biology, and virology. The program teaches critical thinking skills, applicable to a wide range of professional fields that students pursue after graduation.

The size and breadth of IPIB provide unique opportunities for graduate students who want to pursue a degree in one of the top biochemistry graduate programs in the nation. Our modern facilities are filled with labs carrying out groundbreaking research in a collaborative, friendly, and inspirational atmosphere. Welcome to IPIB and we hope that you can share our enthusiasm for the biochemical sciences!

DUAL DEGREES

The program participates with the School of Medicine and Public Health in offering a dual degree program for students wishing to complete both the M.D. and Ph.D. degrees. For the prerequisites and degree requirements for the M.D. degree, as well as the online application form, see Medical Scientist Training Program (<http://mstp.med.wisc.edu/>).

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/biochemistry/biochemistry-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.

PROGRAM RESOURCES

IPIB students receive a full stipend (<https://ipib.wisc.edu/education/financial-support/>) as well as tuition remission and comprehensive health insurance. The stipends take the form of traineeships, research

assistantships, or fellowships, and are guaranteed for all IPIB Ph.D. candidates in good academic standing and making satisfactory research progress. IPIB also assists its graduate students with outstanding academic records in competing for University or national awards.

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 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	48 credits
Minimum Residence Credit Requirement	42 credits
Minimum Graduate Coursework Requirement	All coursework 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 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 Upon completion of the Graduate School's and IPIB's minimum requirements for a master's degree, whether to confer the degree is up to the student's thesis advisor.

Language Requirements n/a

REQUIRED COURSES

Code	Title	Credits
Required Core		
BIOCHEM 719	From Atoms to Molecules	3
BIOCHEM/ BMOLCHEM 701	Professional Responsibility	1
BMOLCHEM 720	Experimental Design and Paradigms in Cellular Biochemistry and Molecular Biology	3
BIOCHEM 721	Biochemical Communication	2
BIOCHEM 990 or BMOLCHEM 990	Research ¹ Advanced Biomolecular Chemistry and Research	Varies

Seminars

M.S. candidates must have successfully completed at least one semester in one of the following advanced seminars per year of graduate study.

Any 900-level BIOCHEM or BMOLCHEM Seminar

BIOCHEM 729 Advanced Topics (IPIB Seminar, Practicum in Undergraduate Teaching, or Responsible Conduct of Research)

BIOCHEM/
CHEM 872 Selected Topics in Macromolecular and Biophysical Chemistry

BMOLCHEM 675 Advanced or Special Topics in Biomolecular Chemistry

B M E 780 Methods in Quantitative Biology

BOTANY 950 Seminar-Plant Ecology

LSC 875 Special Topics

NEURODPT 675 Selected Topics in Physiology (Ion Channels Seminar)

NUTR SCI 931 Seminar-Nutrition

PL PATH/
BOTANY 930 Seminar-Mycology

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

For well-prepared advanced students, the Program may accept up to 6 credits of prior graduate coursework from other institutions towards the minimum graduate degree credit and minimum graduate coursework (50%) requirement. The minimum graduate residence credit requirement can be satisfied only with courses taken as a graduate student at UW-Madison.

UW-Madison Undergraduate

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

UW-Madison University Special

No credits taken as a University Special student are allowed to count toward the graduate degree.

PROBATION

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

ADVISOR / COMMITTEE

Every graduate student must have an IPIB faculty thesis advisor. The thesis advisor advises the student about coursework, supervises the student's research, and acts as a mentor to the student through the student's graduate career. The thesis advisor must approve the student's coursework before registration for a given semester and must also approve any subsequent changes to it.

A Ph.D. thesis committee is composed of at least four graduate university faculty members, including the thesis advisor. The thesis committee is empowered by the program to advise the student about certification, administer the preliminary examination, oversee annual progress reports, approve thesis composition, and conduct the final Ph.D. examination.

CREDITS PER TERM ALLOWED

12 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://employee disabilities.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)

College of Agricultural and Life Sciences: Grievance Policy

In the College of Agricultural and Life Sciences (CALs), any student who feels unfairly treated by a member of the CALs faculty or staff has the right to complain about the treatment and to receive a prompt hearing. Some complaints may arise from misunderstandings or communication breakdowns and be easily resolved; others may require formal action. Complaints may concern any matter of perceived unfairness.

To ensure a prompt and fair hearing of any complaint, and to protect the rights of both the person complaining and the person at whom the complaint is directed, the following procedures are used in the College of Agricultural and Life Sciences. Any student, undergraduate or graduate, may use these procedures, except employees whose complaints are covered under other campus policies.

1. The student should first talk with the person at whom the complaint is directed. Most issues can be settled at this level. Others may be resolved by established departmental procedures.
2. If the student is unsatisfied, and the complaint involves any unit outside CALs, the student should seek the advice of the dean or director of that unit to determine how to proceed.
 - a. If the complaint involves an academic department in CALs the student should proceed in accordance with item 3 below.
 - b. If the grievance involves a unit in CALs that is not an academic department, the student should proceed in accordance with item 4 below.
3. The student should contact the department's grievance advisor within 120 calendar days of the alleged unfair treatment. The departmental administrator can provide this person's name. The grievance advisor will attempt to resolve the problem informally within 10 working days of receiving the complaint, in discussions with the student and the person at whom the complaint is directed.
 - a. If informal mediation fails, the student can submit the grievance in writing to the grievance advisor within 10 working days of the date the student is informed of the failure of the mediation attempt by the grievance advisor. The grievance advisor will provide a copy to the person at whom the grievance is directed.
4. If the alleged unfair treatment occurs in a CALs unit that is not an academic department, the student should, within 120 calendar days of the alleged incident, take his/her grievance directly to the Associate Dean of Academic Affairs. The dean will attempt to resolve the problem informally within 10 working days of receiving the complaint. If this mediation attempt does not succeed the student may file a written complaint with the dean who will refer it to the CALs Equity and Diversity Committee. The committee will seek a written response from the person at whom the complaint is directed, subsequently following other steps delineated in item 3d above.

OTHER

Students may matriculate only in the fall semester, and a master's degree is not offered as a terminal degree.

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. Gain a broad understanding of the biochemical principles that underlie all biological processes.
2. Become aware of the current limitations of the state of understanding of this discipline and the strategies that are required to advance the field.

3. Formulate and design new approaches that extend and apply biochemical principles beyond their current boundaries.
4. Explore career development opportunities in industry, government and academia to realize professional goals and paths.
5. Develop teaching and mentoring skills in both lecture and laboratory settings.
6. Foster professional and ethical conduct in the sciences, including but not limited to: exposition of the scientific method; ethical design of experimental protocols; reproducibility in science; professional behavior in industrial, government, and academic settings; documentation of scientific results; communication to other scientists and the public; peer review; and confidentiality.

PEOPLE

Faculty: Professors B. Fox (Chair, Department of Biochemistry), Kiley (Chair, Department of Biomolecular Chemistry), Amasino, Attie, Audhya, Bednarek, Brow, Buller, Butcher, Campbell, Cantor, Cavagnero, Chaudhari, Coon, Cox, Coyle, Craciun, Craig, Denu, Engin, Fan, C. Fox, Friesen, Galmozzi, Gellman, Grant, Harrison, Henzler-Wildman, Hess, Holden, Hoskins, Hull, Keck, Kimble, Kirchdoerfer, Landick, Lewis, Lim, Merrins, Mosher, Neugebauer, Ntambi, Putnam, Ralph, Raman, Rayment, Rienstra, Romero, Senes, Sheets, Simcox, Sussman, Venturelli, Wang, Weeks, Wright