BIOMEDICAL ENGINEERING: RESEARCH, M.S.

This is a named option within the Biomedical Engineering M.S. (http://guide.wisc.edu/graduate/biomedical-engineering/biomedical-engineering-ms/)

The Research named option in the Biomedical Engineering M.S. is designed for students who want to conduct research during their program. A thesis is required.

ADMISSIONS

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/).

<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>October 1</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>December 15</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Not 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 (<a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a>).</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>

Applicants should have a bachelor’s degree in engineering (biomedical, chemical, electrical, industrial, mechanical, etc.) or science (biology, biochemistry, chemistry, genetics, immunology, physics, etc.). Each application is judged on the basis of:

- Official academic transcripts
- Test of English as a Foreign Language (http://www.ets.org/toefl/) (TOEFL) examination for international students
- Three letters of recommendation
- Statement of purpose (https://grad.wisc.edu/apply/prepare/)
- Resume

All applicants must satisfy requirements that are set forth by the Graduate School (https://grad.wisc.edu/). Students admitted to the program may be required to make up deficiency course requirements.

To apply to the BME program, complete applications (https://grad.wisc.edu/apply/), including supportive materials, must be submitted as described below and received by the following deadline dates:

- Fall Semester—December 15
- Spring Semester—October 1
- Summer Session—December 15

Please note that summer admissions are generally limited to continuing BME students at UW–Madison or applicants who have research assistantships already arranged with UW faculty.

OFFICIAL ACADEMIC TRANSCRIPT

Electronically submit one copy of your transcript of all undergraduate and previous graduate work in your online application to the Graduate School. Unofficial copies of transcripts will be accepted for review. Official copies are required after an applicant is recommended for admission. Please do not send transcripts or any other application materials to the Graduate School or the BME department unless requested. If you have questions, please contact bmegradadmission@engr.wisc.edu.

TEST OF ENGLISH AS A FOREIGN LANGUAGE (TOEFL)

The TOEFL is required for international students unless a degree from a U.S. educational institution is held. Scores should be sent using institution code 1846.

An applicant whose TOEFL (iBT) score is below 92; TOEFL (PBT) score is below 580; or IELTS score is below 7 must take an English assessment test upon arrival. Depending on the result, an applicant may need to register for recommended English as a Second Language (ESL) courses in the first semester of enrollment.

Any international applicant who will hold a teaching assistantship (TA), and whose native language is not English must take the SPEAK test (https://esl.wisc.edu/ita-training/speak/) when arriving on campus.

THREE LETTERS OF RECOMMENDATION

These letters are required from people who can accurately judge the applicant’s academic or research performance. Letters of recommendation are submitted electronically to graduate programs through the online application. Applicants should not send any more than three letters (if more than three are sent, only the first three will be considered). See the Graduate School for FAQs (https://grad.wisc.edu/apply/) regarding letters of recommendation.

STATEMENT OF PURPOSE

In this document, applicants should explain why they want to pursue further education in BME and discuss which UW faculty members they would be interested in doing research with during their graduate study. See the Graduate School for more advice on how to structure a personal statement (https://grad.wisc.edu/apply/prepare/).

RESUME

Upload your resume in your application.

APPLICATION FEE

Submission must be accompanied by the one-time application fee. It is non-refundable and can be paid by credit card (Master Card or Visa).
or debit/ATM. This fee cannot be waived or deferred. Fee grants are available through the Graduate School under certain conditions.

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.

NAMED OPTION REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Requirements</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>16 credits</td>
</tr>
</tbody>
</table>

Minimum Graduate Coursework

15 credits must be graduate-level coursework. Details can be found in the Graduate School’s Minimum Graduate Coursework (50%) policy (https://policy.wisc.edu/library/UW-1244/).

Overall GPA

3.00 GPA required.

Graduate GPA Requirement

This program follows the Graduate School’s GPA Requirement policy (https://policy.wisc.edu/library/UW-1203/).

Other Grade Requirements

Assessments and Examinations

There are no degree-specific assessments and examinations outside of those given in individual courses.

Language Requirements

n/a

REQUIRED COURSES

Specific course selection is very flexible and draws upon a variety of courses. The required coursework is designed to complement each student’s interests and background in biomedical engineering.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research (such as B M E 790)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Coursework</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Two semesters of B M E 701 Seminar in Biomedical Engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least 12 credits of College of Engineering courses, 400 level or above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least 15 credits, 400 level or above, in one area of specialization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least 3 credits of bioscience from the following list (or other bioscience course with advisor approval):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANAT&amp;PHY 335</td>
<td>Physiology</td>
<td></td>
</tr>
<tr>
<td>ANAT&amp;PHY 435</td>
<td>Fundamentals of Human Physiology</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 501</td>
<td>Introduction to Biochemistry</td>
<td></td>
</tr>
<tr>
<td>CRB 640</td>
<td>Fundamentals of Stem Cell and Regenerative Biology</td>
<td></td>
</tr>
<tr>
<td>CRB 650</td>
<td>Molecular and Cellular Organogenesis</td>
<td></td>
</tr>
<tr>
<td>CRB/B M E 670</td>
<td>Biology of Heart Disease and Regeneration</td>
<td></td>
</tr>
<tr>
<td>NTP/NEURODPT 610</td>
<td>Cellular and Molecular Neuroscience</td>
<td></td>
</tr>
<tr>
<td>ZOOLOGY/BIOCHEM/PHMCOL-M 630</td>
<td>Cellular Signal Transduction Mechanisms</td>
<td></td>
</tr>
<tr>
<td>ZOOLOGY/PSYCH 523</td>
<td>Neurobiology</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM/GENETICS/MICROBIO 612</td>
<td>Prokaryotic Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM/GENETICS/MD GENET 620</td>
<td>Eukaryotic Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>ONCOLOGY 401</td>
<td>Introduction to Experimental Oncology</td>
<td></td>
</tr>
</tbody>
</table>
Areas of specialization are defined by the student and faculty advisor in relation to each student's research. Please keep written communication (emails are acceptable) of approvals from your faculty advisor.

**Policies**

**Graduate School Policies**
The Graduate School's Academic Policies and Procedures (https://grad.wisc.edu/acadapolicy/) 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.

**Named Option-Specific Policies**

**Prior Coursework**
Graduate Work from Other Institutions
This program follows the Graduate School's policy for Satisfying Requirements with Prior Graduate Coursework from Other Institutions. (https://policy.wisc.edu/library/UW-1216/)
Reach out to the BME Graduate Coordinator for more information.

**UW-Madison Undergraduate**
A student who has completed their bachelor's degree at UW-Madison may transfer 6 credits of coursework with program approval. These courses must be coursework numbered 400 level or above. Coursework earned five or more years prior to admission to a M.S. degree is not allowed to satisfy requirements. These courses may not be used toward the Graduate School's Minimum Graduate Residence Credit.

**UW-Madison University Special**
This program follows the Graduate School's policy for Transfer from UW-Madison University Special Student Career at UW-Madison. (https://policy.wisc.edu/library/UW-1216/)

**Probation**
This program follows the Graduate School's Probation policy. (https://policy.wisc.edu/library/UW-1217/)

**Advisor / Committee**
Every BME graduate student must have a faculty advisor. A faculty advisor provides the student with academic guidance in their course program and research oversight. The advisor must be a primary BME faculty or a BME affiliate; if the advisor is a BME affiliate, the student must identify a primary BME faculty to serve as co-advisor. Graduate students should always seek advice from their advisor prior to enrolling for courses.

**Credits per Term Allowed**
15 credits

**Time Limits**
Full-time students take approximately 18-24 months to complete the M.S. Research.

**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://facstaffprovost.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)

**BME Grievance Procedures**
If a student feels unfairly treated or aggrieved by faculty, staff, or another student, the University offers several avenues to resolve the grievance.

**Step 1**
The student is encouraged to speak first with the person toward whom the grievance is directed to see if a situation can be resolved at this level. Students are also encouraged to talk with their faculty advisors regarding concerns or difficulties, or reach out to the Graduate Student Services Coordinator or Associate Chair of BME Graduate Advising for additional assistance. These activities do not rise to the level of a formal grievance; however, the student is encouraged to keep documentation of these interactions as they may be useful if a formal grievance is pursued.

**Step 2**
Should a satisfactory resolution not be achieved, a formal grievance can be filed with the BME Grievance Committee. To do so, the student contacts the Department Administrator, who will provide the student with the name of the current chair of the Grievance Committee. The student will then contact the Chair of the Grievance Committee, who will reply within seven calendar days. If the grievance is with the current Chair of the Grievance Committee, please let the Department Administrator know and they will identify an alternate committee member to contact. It is advised that grievances are filed within 60 calendar days of the alleged unfair treatment to enable a thorough investigation.

Step 3
If the student does not feel comfortable working through the departmental process, they are encouraged to seek out other campus resources including:

- The Assistant Dean for Graduate Affairs in the College of Engineering
- The Graduate School
- UW Division of Diversity, Equity & Educational Achievement (DDEEA)
- McBurney Disability Resource Center
- Employee Assistance Office
- Ombuds Office
- University Health Services

Step 4
At this point, if either party (the student or the person toward whom the grievance is directed) is unsatisfied with the decision of the faculty committee, the party may file a written appeal. Either party has ten working days to file a written appeal to the School/College. For more information, students should consult the College of Engineering Academic Advising Policies and Procedures.

Step 5
Documentation of the grievance will be stored for at least seven years. Significant grievances that set a precedent will be stored indefinitely. The Graduate School has procedures for students wishing to appeal a grievance decision made at the school/college level. These policies are described in the Graduate School's Academic Policies and Procedures.

OTHER
n/a

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.

PROGRAM RESOURCES

THE INDIVIDUAL DEVELOPMENT PLAN (IDP)
An Individual Development Plan (IDP) (https://grad.wisc.edu/pd/idp/) helps graduate students and postdoctoral researchers:

- assess current skills, interests, and strengths;
- make a plan for developing skills to meet academic and professional goals; and
- communicate with supervisors, advisors, and mentors about evolving goals and related skills.

The IDP is a document to be revisited again and again, to update and refine as goals change and/or come into focus, and to record progress and accomplishments.

The university recommends IDPs for all postdoctoral researchers and graduate students, and requires IDPs for all postdoctoral researchers and graduate students supported by National Institutes of Health (NIH) funding. See the Graduate School for more information and IDP resources (https://grad.wisc.edu/pd/idp/).

ENGINEERING CAREER SERVICES
The Engineering Career Services (https://ecs.wisc.edu/) staff offers assistance to students searching or preparing for internships, co-ops, and jobs with well-recognized organizations.

THE WRITING CENTER
The Writing Center (https://writing.wisc.edu/) is a campus-wide organization that provides free of charge, face-to-face and online consultations for students writing papers, reports, resumes, and applications.

PEOPLE

FACULTY
Paul Campagnola (Chair)
Randolph Ashton
David Beebe
Walter Block
Christopher Brace
Kevin Eliceiri
Shaoqin ’Sarah’ Gong
Aviad Hai
Melissa Kinney
Pamela Kreeger
Wan-ju Li
Kip Ludwig
Kristyn Masters
Megan McClean
Beth Meyerand
William Murphy
Krishanu Saha
Melissa Skala
Darryl Thelen
Justin Williams
Colleen Witzenburg
Filiz Yesilkoy

INSTRUCTIONAL STAFF AND TEACHING FACULTY
Amit Nimunkar
John Puccinelli
Tracy Jane Puccinelli
Dailis Suarez-Gonzalez
Aaron Suminski

See also Biomedical Engineering Faculty Directory (http://directory.engr.wisc.edu/bme/).