### 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/](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. This program takes approximately two years to complete and 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/](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/](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>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>The MCAT may be accepted as an alternate to the GRE.</td>
</tr>
<tr>
<td>Letters of Recommendation Required</td>
<td>3</td>
</tr>
</tbody>
</table>

* Three letters of recommendation
* Statement of purpose ([https://grad.wisc.edu/apply/prepare/](https://grad.wisc.edu/apply/prepare/))

All applicants must satisfy requirements that are set forth by the Graduate School ([https://grad.wisc.edu/apply/](https://grad.wisc.edu/apply/)). 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/](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 (MS and Ph.D.)
- Spring Semester—October 1 (MS and Ph.D.)
- Summer Session¹—December 15 (MS and Ph.D.)

¹Please 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 along with your online application to the Graduate School. Unofficial copies of transcripts will be accepted for review, but official copies are required for admitted students. 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.

### GRADUATE RECORD EXAMINATION (GRE)

Applicants should request ETS to send their official GRE scores by using institution code 1846.

MCAT scores may be substituted for GRE. Domestic applicants who choose to substitute MCAT scores for the GRE should send their MCAT score report to 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 (paper-based) test score is below 580; TOEFL computer-based test (CBT) score below 237; (TOEFL internet-based iBT) test score below 92; IELTS score below 7; or MELAB below 82 must take an English assessment test upon arrival. Depending on your score, you may need to register for any recommended English as a Second Language (ESL) courses in the first semester you are enrolled.

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/](https://esl.wisc.edu/ita-training/speak/)) when arriving on campus.

### THREE LETTERS OF RECOMMENDATIONS

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/](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/)).

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. By state law, this fee can only be waived or deferred through the conditions outlined here by the Graduate School (https://grad.wisc.edu/apply/fee-grant/).

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/#policiesandrequirementstext), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS
MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Mode of Instruction Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.</td>
</tr>
<tr>
<td>Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

CURRICULAR REQUIREMENTS
Requirements Detail

<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>16 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>).</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required.</td>
</tr>
<tr>
<td>Other Grade Requirements</td>
<td>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.</td>
</tr>
</tbody>
</table>

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>Two semesters of B M E 701 Seminar in Biomedical Engineering</td>
<td>Research (such as B M E 790)</td>
<td>6</td>
</tr>
<tr>
<td>Coursework</td>
<td></td>
<td>24</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 Physiology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANAT&amp;PHY 435 Fundamentals of Human Physiology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOCHEM 501 Introduction to Biochemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B M E 601 Special Topics in Biomedical Engineering (Topic in Physiology for Biomedical Engineering Students)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRB 640 Fundamentals of Stem Cell and Regenerative Biology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRB 650 Molecular and Cellular Organogenesis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRB 670</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15 credits numbered 700 or above. Coursework earned five or more years prior to admission to a M.S. degree is not allowed to satisfy requirements.

PROBATION
The Graduate School regularly reviews the record of any student who earned grades of BC, D, 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.

1. Good standing (progressing according to standards; any funding guarantee remains in place).
2. Probation (not progressing according to standards but permitted to enroll; loss of funding guarantee; specific plan with dates and deadlines in place in regard to removal of probationary status).
3. Unsatisfactory progress (not progressing according to standards; not permitted to enroll, dismissal, leave of absence or change of advisor or program).

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 CONSTRAINTS
Full-time students usually complete an M.S. in BME in one or two years.

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)

### 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.

### NAMED OPTION-SPECIFIC POLICIES

**PRIOR COURSEWORK**

**Graduate Work from Other Institutions**
A student may transfer graduate coursework from other institutions with program approval. These courses may not be used toward the Graduate School's Minimum Graduate Residence Credit. Coursework earned five years or more prior to admission to the master’s program is not allowed to satisfy requirements. 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**
A maximum of 15 credits from the UW-Madison University Special student career may count toward program requirements. Minimum graduate resident credits requirement and minimum graduate degree credit requirement: allowed up to 15 credits numbered 300 or above. Minimum graduate coursework (50%) requirement: allowed up to 15 credits numbered 700 or above. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>KINES 350</td>
<td>Introduction to Exercise Psychology</td>
</tr>
<tr>
<td>KINES 531</td>
<td>Neural Control of Movement</td>
</tr>
<tr>
<td>KINES 773</td>
<td>Cardiorespiratory Adaptations to Environment and Exercise</td>
</tr>
<tr>
<td>NTP/NEURODPT 610</td>
<td>Cellular and Molecular Neuroscience</td>
</tr>
<tr>
<td>NTP/NEURODPT/PSYCH 611</td>
<td>Systems Neuroscience</td>
</tr>
<tr>
<td>ZOOLOGY/BIOCHEM/PHMCOL-M 630</td>
<td>Cellular Signal Transduction Mechanisms</td>
</tr>
<tr>
<td>ZOOLOGY 470</td>
<td>Introduction to Animal Development</td>
</tr>
<tr>
<td>ZOOLOGY/PSYCH 523</td>
<td>Neurobiology</td>
</tr>
<tr>
<td>ZOOLOGY 570</td>
<td>Cell Biology</td>
</tr>
</tbody>
</table>

Total Credits 30

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 advisor.

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**POLICIES**

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**CREDITS PER TERM ALLOWED**

15 credits

**TIME CONSTRAINTS**

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**GRIEVANCES AND APPEALS**

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- 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 Elliclir
Shaoqin 'Sarah' Gong
Aviad Hai
Melissa Kinney
Pamela Kreeger
Wan-ju Li
Kip Ludwig
Kristyn Masters
Megan McClean
Beth Meyerand
William Murphy
Jeremy Rogers
Krishanu Saha
Melissa Skala
Darryl Thelen
Justin Williams
Colleen Witzenburg
Filiz Yesilkoy

INSTRUCTIONAL STAFF AND FACULTY ASSOCIATES
Amit Nimunkar
John Puccinelli
Tracy Jane Puccinelli
Darilis Suarez-Gonzalez
Aaron Suminski

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

PROFESSORS
• David Beebe
• Walter Block
• Paul Campagnola
• Naomi Chesler
• Kevin Eliceiri
• Shaoqin (Sarah) Gong
• Kristyn Masters
• Beth Meyerand
• William Murphy
• Darryl Thelen
• Justin Williams

ASSOCIATE PROFESSORS
• Randolph Ashton
• Christopher Brace
• Pamela Kreeger
• Wan-ju Li
• Kip Ludwig
• Krishanu Saha
• Melissa Skala

ASSISTANT PROFESSORS
• Aviad Hai
• Melissa Kinney
• Megan McClean
• Jeremy Rogers
• Colleen Witzenburg
• Filiz Yesilkoy

FACULTY ASSOCIATES
• Amit Nimunkar
• John Puccinelli
• Tracy Jane Puccinelli
• Darilis Suarez-Gonzalez
• Aaron Suminski

EMERITUS
• Ed Bersu
• Willis Tompkins
• John Webster