Biomedical Engineering Graduate Programs at WPI

Prof. Marsha Rolle
Graduate Program Committee
Department of Biomedical Engineering

Prof. Songbai Ji is interim Graduate Program Coordinator, AY 19-20
Frequently Asked Questions…

• Should I apply to graduate school?
• What programs does WPI offer?
• Which one is right for me?
• Does BME offer a BS/MS degree?
• Can I “double count” undergrad courses?
• Can I take grad courses as an undergrad?
• When should I apply?
• What is the application procedure?
• What are my chances of admission?
• Other???
Should I apply to Graduate School?

- What are your professional goals?
  - Industry?
  - Health care profession?
  - Research?
  - Management?
- Will an advanced degree help you achieve your professional goals?
  - Needed for some positions
  - Higher salary?
  - More responsibility
  - Management opportunities
- Work experience may help you decide…
Get Work Experience NOW!!!

- Summer internships
  - Industry, NSF REU, WPI SURF
- Work part-time during the academic year
  - Work study? Earn hours in a lab.
  - Research assistant positions (UMMS, local companies)
- Volunteer part-time (or full-time summer)
  - Shadow professionals over breaks
  - Volunteer as a research assistant
    - WPI, UMass Medical School, Tufts
Benefits of Work Experience

• “Preview” job types/roles
• Do I love (or hate) research?
• Small company v. large company?
• Engineering, or other?
  – Quality assurance
  – Management
  – Marketing

• What academic credentials do I need?
Benefits of Work Experience

• Informs your decision
  – Master’s? PhD? Professional program?
  – Thesis, project or course-only Master’s program?
  – Which schools/programs offer what I’m interested in?

• *Strengthens your application!*
WPI Graduate Degrees
BME Graduate Degree Programs

• Master of Science (M.S.) – Thesis OR **Project**!
  – 30 credits total
  – ~ 1-2+ years beyond B.S. degree
• Master of Engineering (M.E.)
  - 33 credits total
  - Usually 1 year beyond B.S. degree
• Ph.D.
  – 90 credits, 5+ years beyond B.S. degree
  – *Uncommon to admit WPI students, but we do - sometimes - with student / advisor agreement AND student meets admission criteria*
Course Requirements – Master’s

### MS (Thesis-based Master’s Degree)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>12</td>
</tr>
<tr>
<td>Electives</td>
<td>12</td>
</tr>
<tr>
<td>BME 599 (MS Thesis)</td>
<td>6</td>
</tr>
</tbody>
</table>

**TOTAL:** 30 credits

### MS (Project-based Master’s Degree)

<table>
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<tbody>
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<tr>
<td>BME 597 (MS Project)</td>
<td>6</td>
</tr>
</tbody>
</table>

**TOTAL:** 30 credits

*In addition, the following requirements must be met for both Master of Science Degree Programs:*

- **Technical Depth Requirements**
  - 15 credits

- **Seminar (must take BME 591) pass twice**

- **BME Core Competencies (5)**
  - Mathematics
  - Life science
  - Clinical needs analysis
  - Regulation and controls
  - Value creation, innovation, technology, commercialization
# Course Requirements – Master’s

- **ME (Course-based Master’s Degree)**

<table>
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<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>12</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Math</td>
<td>3</td>
</tr>
<tr>
<td>Life Sciences or Advanced Math</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>12</td>
</tr>
<tr>
<td>BME 591: Graduate Seminar (x 2)</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL:** 33 credits

**NOTE:** 1 grad credit = 1/6 unit undergrad; 2 grad credits = 1/3 unit undergrad
Which program is right for me?

• **M.S. Thesis**
  – Independent research could lead to publications, presentations, patents?
  – Expected to work full-time on thesis research (may not have funding)
  – Time to completion varies, can be > 2 years beyond B.S. degree (unless you start during B.S.)

• **M.E.**
  - Usually 1 year beyond B.S. degree, depending on course load
  - Can work full-time while completing degree (although this may take longer)
Which program is right for me?

**M.S. Project**
- Third option, since Fall 2018
- Can be combined with a co-op or internship!
- Completion based on number of credits (v. open-ended thesis research)
- Short-term independent project
  - Design project (Research in WPI faculty lab)
  - Academic/design project related to co-op or internship
  - Clinical project
  - Continuation of MQP?

- Usually 1 year beyond B.S. degree, depending on course load
- Can work full-time while completing degree (although this may take longer)
Does BME offer a BS/MS degree?

• Yes!
• Similarities to other WPI BS/MS programs:
  – Up to 30% of course credits can double count
  – WPI tuition incentives apply
  – Continuous enrollment from B.S. through Master’s
• Differences:
  – Apply during senior year, NOT junior year
  – MQP advisor should write a reference for you
• Discuss plans with your Academic Advisor
Does BME offer a BS/MS degree?

- Apply for either the M.E. or M.S. program
  - B.S. + M.E. can be completed in 5 years
  - B.S. + M.S. can take 6+ years
- If applying to M.S. program, do you have a thesis/project advisor in mind?
  - Not required, but encouraged!
  - Faculty you worked with for MQP, ISP (can give you a head start on thesis research or project)
  - Doesn’t have to be CORE BME faculty – can be BME Program Faculty
  - PROJECT – can be done with a co-op or internship!
Can I “double count” courses?

• Yes!
  – Up to 6 credits at 4000-level (~ 3 courses)
  – AND one 500-level course (~ 3 credits)
  \[= 9 \text{ credits “double-counted”}\]

• BME 4300 does not count for graduate credit

• Other 4000-level courses not needed for B.S. requirements can also count (up to 8 credits total at 4000-level can be used for BME graduate degrees – this total includes double counted classes above)

• To “double-count” courses:
  – Fill out the “Course Designation Form” (download from the Registrar’s website)
  – Obtain signatures from each course instructor
  – Submit the form to the Registrar

• Additional grad courses (500-level) not needed for B.S. requirements count directly for graduate degree.
Can I take grad courses as an undergrad?

- Yes! BUT…

- B.S. degree requirements should be met first!!!
  - Some graduate courses DO NOT COUNT toward B.S. degree (e.g., BME 560, BME 562, BME 564)
  - Best to take graduate courses senior year

- Talk to your Academic Advisor!
  - Is it appropriate for me to take graduate courses?
  - How will it affect my schedule / time to graduation?
  - Only one graduate course (500-level) can count toward BME B.S. degree
How do I register for graduate courses?

- Graduate course registration is (initially) restricted to graduate students.
- Undergraduate students ON TRACK to fulfill B.S. requirements can register for graduate courses with Add/Drop form and advisor signature.
- BME 562 – Laboratory Animal Surgery
  - Must contact Ina Gjencaj (igjencaj@wpi.edu)
  - Email your name, student number and class year.
- Course descriptions in WPI Graduate Catalog.
Application and Admissions
When should I apply?

• Applications due January 1, 2020
• Apply fall of your senior year
  – i.e., apply now if you wish to enroll Fall 2020
• Applications are reviewed ~ Jan 15 - May 15
• No new applications will be accepted after May 1
• BME does not admit students for Spring
  – Fall admissions only
• Other WPI departments may have slightly different deadlines and policies…
What is the application procedure?

• Apply online through WPI Graduate Admissions
  – [http://www.wpi.edu/admissions/graduate.html](http://www.wpi.edu/admissions/graduate.html)
  – “Apply Now”
• Required materials:
  – Transcript
  – Personal statement
  – Three letters of recommendation
• Optional:
  – Employment/experience
  – Publications, presentations, etc.
• GRE scores not required for WPI students/alumni
• Application fee waived for WPI students/alumni
Personal Statement

• Why are you applying to graduate school?
• Do you have any independent research or project experience? Tell us about it!
• Is there a specific faculty member you plan to work with for your M.S. thesis?
• What are your career goals/plans beyond graduate school?
• Separate statement about “why WPI”?
Recommendation Letters

- WPI faculty, MQP advisor, internship supervisors
  - People who can tell us about your aptitude for independent research and advanced study
  - People who know you well
- WAIVE your right to access the review
  - I require it, other faculty members might, too
  - Review is likely to be more helpful, possibly more honest
- Give plenty of notice (at least two weeks, if not more)
  - Letter writer may want to meet with you or request a resume, other information
- Send a gentle reminder (if needed) before the due date
Recommendation Letters (general)

• Ask faculty who have written letters for you before – they are likely to one have ready and just need to update it
• If applying to other schools / programs (not WPI), provide application deadlines and information about how to submit
  – Online? Email? Paper?
  – If paper, provide an addressed, stamped envelope
  – Help us help you!
What are my chances of admission?

- Admitted M.S. and M.E. students typically have:
  - Strong letters of recommendation
  - Strong performance on MQP (grades, letter from MQP advisor)
  - Overall GPA ≥ 3.2
  - ≥ “B” grades in advanced BME courses
  - At least one BME internship or research experience (internal or external)
  - Solid personal statement
Grades aren’t everything, but…

- Grades in advanced courses and MQP are indicators of your potential to succeed in graduate school.
- Only courses with “B” grades or higher can “double count.”
- We do not admit students with GPA <3.0.
What can I do to improve my chances?

- Work / internship experience
- Take graduate courses as a non-matriculated student
  - Shows you can succeed in graduate courses
  - Can take up to three graduate courses (9 credits) without being enrolled
  - Courses count toward degree if/when admitted
  - Must get “B” grade or higher to transfer
  - ADMISSION TO DEGREE PROGRAM NOT GUARANTEED!!!
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PhD Programs

• Goal: conduct and direct independent research
  – Industry or academia
• MUST LOVE RESEARCH!
  – Usually requires 60+ hours/week for at least 5 years (and postdoc beyond!!!)
  – Talk to PhD students and postdocs in your lab
• Dissertation research is central!
  – Choose school with strong research focus and resources in area of interest – start with literature search
  – Multiple faculty members in this research area
• Special focus or center of excellence?
• Apply for fellowships! Can apply for some senior year.
  – NSF Graduate Research Fellowship Program
• Did I mention emphasis on independent research?
Internship Resources

- Resume
  - Create one, keep it updated, get feedback from CDC and others
- Career Development Center (CDC)
  - Career Fairs (Spring - biotech/biomed)
  - JobFinder – resume database
- Mass. Life Sciences Internship Challenge
- Search companies; visit their websites
- Independent research
  - NSF REU (Research Experience for Undergraduates)
    - Search by research topic or geographic area
    - WPI SURF, UMass Med School
      - may need faculty sponsor to apply
BME Undergraduate Advising Canvas Site

- Graduate Program Information (left tab)
  - Slides of this presentation
  - FAQs re: BME BS/MS Program Application
  - Or, visit: wp.wpi.edu/bme/grad
Questions?

BMEGradProgram@wpi.edu

Ina Gjencaj
Graduate Program Administrative Assistant
igjencaj@wpi.edu