**BME Thesis-MS Requirements: Semesters**

Approved, revised by faculty Winter 2012; updated Spring 2012; Spring 2015; SP2017; AU18

Core Courses - Required of all students Credits

Scientific Methods in BME BME 6000 1

BME Seminar (2 semesters) BME 8810-8811 1

Graduate Research Design ChBE 5779 or Statistics 6410 3 or 4

Graduate Research Ethics BME 6983 2

Graduate Physiology PhysioCB 6101 or 6102 3

Total **10-11 credit hours**

BME Graduate Course Requirement

1. Students are required to take 3 **fundamental BME graduate courses** (9 semester credit hours) from the following list, or subject to BMEGSC approval, s*tudents must take at least 2 OSU BME fundamental courses and may take 1 non-BME, BME-type OSU courses, and no more than 1 non-OSU BME course, by petition.* Students must work with their faculty MS research advisor to determine the best courses that will prepare them for their MS research. More importantly, *the MS research advisor must approve courses used to satisfy this requirement. If the MS research advisor does not approve, he/she will not sign the student’s program of study.*

BioImaging: BME 5110 Biomedical Microscopic Imaging

BME 5120 Biomedical Optics

BME 5177 Biomedical AFM

BME 5186 Biomedical Ultrasound

BME 6113 Magnetic Res Spectro & Imaging I

BioMaterials: BME 5310 Advanced Biomaterials

BME 5353 Hard-Tissue Biomaterials

BioMechanics BME 5210 Advanced Biological Transport

& BioTransport: BME 5421 Tissue Mechanics

BME 5430 Finite Element Applications in BME

BME 5470 Cellular Mechanics

BME 5475 Biofluid Dynamics of Phys Systems

M,C, & T Eng: BME 5510 Advanced Tissue Engineering

BME 5520 Cell Engineering

BME 5420 Mechanobiology

BME 5580 Excitable Cell Engineering

Micro / Nano: BME 5610 Biomedical Microdevices

BME 5635 Cellular Nanotechnology

BME 5661 Biomedical Nanotechnology I

BME 5662 Advanced Biomed Nanotechnology II

BME 5663 Intro to Microfluidics and Nanofluidics

BME 5667 BioMEMS Microfabrication

BME 5668 Biomedical Microtransducers

Devices: BME 5639 Medical Device Design

BME 5771 Bioinstrumentation

Other BME courses:

BME 5001 Cardiovascular Bioengineering

BME 7114 Magnetic Res Spectro & Imaging II

1. Students must take at least one additional “**graduate elective**” courses (3 semester credit hours) from Appendix A. Note that any course used to satisfy requirement #1 cannot be used to satisfy the “graduate elective” course requirement. All graduate electives must be letter graded. In addition, *all graduate electives must be approved by the student’s MS research advisor as indicated by the MS advisor’s signature on the student’s program of study.*
2. Students must take at least one “**free elective**” courses (2 or 3 semester credits) to meet the 24 semester credit hour total. Free electives can be in Engineering Sciences, Life Sciences or Business/Technology Commercialization. No more than 1 free elective can be S/U graded. *All free electives must be approved by the student’s MS research advisor as indicated by the MS advisor’s signature on the student’s program of study.*
3. Elective Restrictions:
   1. 3 of the 6 credits used to satisfy requirements #2 and #3 (i.e. graduate and free electives) must be an advanced math course (Math 5000 or above). Students may petition the Graduate Studies Committee to have a non-Math course satisfy this requirement.

**Total 14-15 cr hrs**

**Program & MS Thesis Committee Approval**

The MS Thesis Committee will consist of at least 2 faculty members, with M or P graduate faculty status (at least one being a departmental BME core faculty member). A GSC-reviewed MS Program of Study and Thesis Committee must be on file with the Graduate Studies Office before the end of Spring term (or the student’s second term of enrollment). The Program cannot be reviewed by GSC without a proposed MS Committee.

**Total Program Requirements**

Total course requirement: **24 semester credit course hours**

Research hour (BME 6999) requirement: **≥6 semester research hours**

**Thesis Requirements**

Thesis Research: The thesis research project should be an original research project that makes a new contribution to the field. Proposals and protocols should be approved by the student’s adviser(s) prior to beginning the research. all research credits should be in BME unless primary research advisor’s appointment is in another engineering department. If the latter is true then at least ½ of the research credits must be in BME.

Committee Composition: Thesis examination committee will consist of at least 2 faculty members with graduate faculty status (M or P) in BME, at least one being a departmental core faculty member.

**Minimum Graduation Requirements**

* Completion of ≥24 course hours as described above with a minimum GPA of 3.00
* Completion of ≥6 research hours of thesis research (must be BME 6999)
* Successful completion of the Thesis Defense per Graduate School rules
* Submission of one (1) manuscript for publication in recognized scientific journals (e.g. indexed by ISI) OR presentation of at least one (1) oral or poster presentation at a regional, national, or international meeting

**Administration**

* Students & advisors may jointly petition GSC for waivers of any of the above requirements.

- These petitions will be considered at convened GSC meetings which will occur at least every other month.  *Last minute petitions may not be reviewed.*

- Changes to an approved Program or Committee must be reviewed by the GSC at least **one full semester** before an Application to Graduate is filed.

- Applications to Graduate will not be approved unless the student’s final GSC-approved Program and Committees are on file in the Graduate Office and most other graduation requirements are met. Exam and Graduation procedures can be reviewed at <https://gradsch.osu.edu/completing-your-degree>. All forms should be submitted via gradforms.osu.edu at least **one full week** in advance of the Graduate School deadline. No forms will be signed by the Chair of the Graduate Studies Committee until a graduation audit has been completed.

**BME Thesis Masters Program – SAMPLE of possible program sequence**

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| --- | --- | --- | --- |
| **YEAR** | **FALL** | **SPRING** | **MAY / SUMMER** |
| 1 | Intro to BME 1\_\_\_\_  Research Ethics 2\_\_\_\_  BME Seminar 0\_\_\_\_  Physiology/Anatomy 3-5\_\_\_\_  Research Design 3\_\_\_\_  TOTAL = 9-11 | BME Fundamental #1 3\_\_\_\_  BME Fundamental #2 3\_\_\_\_  Grad Elective #1 3\_\_\_\_  BME Seminar ­1\_\_\_\_  Free Elective 3\_\_\_\_  TOTAL =13 | Research 3\_\_\_\_  TOTAL = 3 |
| 2 | BME Fundamental #3 3\_\_\_\_  Research 3\_\_\_\_  Thesis Defense  TOTAL = 6 |  |  |

Total Hours = 30 [24 course hours; 6 research hours]