

BME Non-Thesis MS Requirements: Semester Version

Approved, revised by faculty Winter 2012; updated Spring 2012; SP2015

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 (required if student has not previously taken a physiology course)	PhysioCB 6101 or 6102	3
OR		or
Graduate Anatomy (if student has taken at least 1qtr/sem physiology course)	ANAT 6220	5

Total **10-13 credit hours**

BME Graduate Course Requirement

1. Students are required to take **4 fundamental BME graduate courses** (12 semester credit hours) from the following list, or subject to BMEGSC approval, *students must take at least 2 OSU BME fundamental courses and may take up to 2 non-BME, BME-type OSU courses, and no more than 1 non-OSU BME course, by petition.* Students must work with their faculty academic/research advisor to determine the best courses that will prepare them for their goals. More importantly, *the faculty academic/research advisor must approve courses used to satisfy this requirement. If the faculty academic/research advisor does not approve, he/she will not sign the student's program of study.*

Biolmaging: 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
& BioTransport: BME 5210 Advanced Biological Transport
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

2. Students must take at least two additional “**graduate elective**” courses (6 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 faculty academic/research advisor as indicated by the advisor’s signature on the student’s program of study.*
3. Students must take at least one “**free elective**” courses (2 or 3 semester credits) to meet the 30 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 faculty academic/research advisor as indicated by the advisor’s signature on the student’s program of study.*
4. Elective Restrictions:
 - a. 3 of the 9 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.
 - b. 3 of the 9 credits used to satisfy requirements #2 and #3 (i.e. graduate and free electives) must be in the Engineering Sciences. Courses that **do not** count towards this Engineering Science requirement are noted by asterisks (*) in Appendix A. In addition, all courses listed in the Life Science section do not count towards Engineering Sciences. If the course is not listed in Appendix A, the student must petition the Graduate Studies Committee to consider the course as Engineering Sciences.

Total 19-20 cr hrs

Program Approval

A GSC-reviewed Program of Study must be on file with the Graduate Studies Office before the end of Spring term (or the student's second term of enrollment).

MS Committee Approval

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

Culminating Experience

In addition to the completion of the course work, a non-thesis Master's student will be required to arrange and complete a 12-hour culminating experience involving the application of biomedical engineering. This could involve an internship or practicum in an industrial setting, a mentored patient-contact experience, a community service experience, or some similar experience. The objective of this experience should be to experience BME "in situ."

Following the completion of this culminating experience, a written Master's Exam consisting of a 1000-1500 word written document explaining the experience and its relevance to the field must be submitted. An oral presentation discussing the experience may also be included. *This experience, written project, and Master's Exam must be coordinated and completed by the student in accordance with published Graduate School Master's Exam deadlines!*

Total Program Requirements

Total course requirement: **30 semester credit course hours**

Minimum Graduation Requirements

- Completion of ≥ 30 course hours as described above with a minimum GPA of 3.00
- Successful completion of the non-thesis final project and MS Exam Form signed off by the faculty advisor and one additional approved MS committee member, submitted to Graduate School by published university deadlines.

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 <http://www.gradsch.osu.edu/7.13-graduation-requirements.html>. 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 Non-Thesis Masters Program – SAMPLE program

YEAR	FALL	SPRING	MAY / SUMMER
1	Intro to BME 1____ Research Ethics 2____ BME Seminar 0____ Physiology/Anatomy.....3-5____ BME Fundamental #1..... 3____ Research Design..... 3____ TOTAL = 12-14	BME Fundamental #23____ BME Fundamental #3.....3____ Grad Elective #13____ BME Seminar 1____ BME Fundamental #4.....3____ TOTAL =13	Grad Elective #2 3____ Free Elective 3____ TOTAL = 6
2	<i>Option of doing May/Summer courses here instead</i>		

Total Hours = 30 [at least 30 course hours]