

Bioengineering Undergraduate Curriculum

Concentration in Prehealth (BMPH)

Bioengineering students who are seriously considering a career path as a health care professional in medicine, dentistry, veterinary medicine, optometry, podiatry, etc., should use the Health Professions Advising Office as a primary resource for coursework requirements and other advice to craft a desirable application. In addition to seeing their Bioengineering advisor, students need to consult the university's pre-health advisor (Dr. Jane Rockwood; <http://prehealth.gmu.edu>) to develop a fully integrated curriculum plan and timeline. The Medical College Admission Test (MCAT) lists general coursework requirements for examination:

Prerequisites	Minimum	GMU Course Equivalent
English/Writing	1 year	ENGL 101 + 302
Chemistry, Introductory	1 year with lab	CHEM 211/213 + 212/214
Chemistry, Organic	1 year with lab	CHEM 313/315 & 314/318
Physics	1 year with lab	PHYS 160/161 & 260/261
Biology, Introductory	1 year with lab	BIOL 213 & 311
Biochemistry	1 semester	BIOL 483
Psychology	1 semester	PSYC 100
Sociology	1 semester	SOCI 101

To fulfill the requirements for both a Bioengineering Bachelor of Science degree and the prehealth program, **additional credits beyond 120 hours are required**, assuming incoming students lack Advanced Placement credit. The following curriculum meets the requirements for the MCAT.

Semester 1

MATH 113 Analytic Geom & Calc I	4
CS 112 Intro to Computer Programming	4
Mason Core ¹	3
CHEM 211 General Chemistry I	3
CHEM 213 General Chemistry I Lab	1
	15

Semester 2

MATH 114 Analytic Geom. & Calc. II	4
PHYS 160 University Physics I	3
PHYS 161 University Physics I Lab	1
BENG 101 Intro to Bioengineering	3
CHEM 212 General Chemistry I	3
CHEM 214 General Chemistry I Lab	1
ENGR 107 Intro to Engineering	2
	17

Semester 3

MATH 213 Analytic Geom. & Calc. III	3
BIOL 213 Cell Structure and Function	4
PHYS 260 University Physics II	3
PHYS 261 University Physics II Lab	1
MATH 203 Linear Algebra ²	3
	14

Semester 4

MATH 214 Elem. Differential Equations	3
CS 211 OR CS 222	3
BENG 220 Phys. Bases of Biomed. Syst.	3
BENG 313 Physiology for Engineers	3
SOCI 101 Introductory Sociology	3
	15

Semester 5

CHEM 313 Organic Chemistry I Lecture	3
CHEM 315 Organic Chemistry I Lab	2
BENG 320 BS Signals and Systems	3
BENG 380 Intro to Circuits & Electronics	3
BENG 381 Circuits & Electronics Lab	1
Mason Core ¹	3
	15

Semester 6

CHEM 314 Organic Chemistry II Lecture	3
CHEM 318 Organic Chemistry I Lab	2
BENG 301 BE Measurements	3
BENG 302 BE Measurements Lab	1
BENG 304 Model Control of Physiol. Sys.	3
Mason Core ¹	3
	15

Semester 7

BENG 492 Sen. Adv. Design Project I	2
BENG 491 BE Senior Seminar I	1
ECE 301 Digital Electronics	3
STAT 344 Prob. & Statistics for Engr I	3
ENGH 302 Advanced Composition	3
PSYC 100	3
	15

Semester 8

BENG 493 Sen. Adv. Design Project II	2
BENG 495 BE Senior Seminar II	1
BIOL 483 General Biochemistry	4
BIOL Technical Elective ⁴	3-4
[optional: BIOL Technical Elective ⁴	3-4]
Mason Core ¹	3
	13-14

Semester 9

BENG 420 Bioinformatics for Engr.	3
Technical Elective ³	3
Technical Elective ³	3
Mason Core ¹	3
Mason Core ¹	3
	15

Total: 134-135 Credit Hours

¹ <http://masoncore.gmu.edu> Mason Core Categories: One course from each: Oral Communication, ENGH 101, ENGH 302, Arts, Global Understanding, Literature, Western Civilization/World History. ENGH101 and Mason Core Literature have to be completed before taking ENGH 302.

² All bioengineers will be required to register for a specific section of MATH 203 including a 1-hour recitation with MATLAB applications.

³ Students choose from sets of approved technical electives, including one of the Technical Electives from an approved life science course (See page 18 of the Bioengineering Student Guide for details).

⁴ Students seeking admission to highly selective medical schools are advised to take an additional Biology/Chemistry Elective. Biology/Chemistry Electives include but are not limited to:

- BIOL 305/306 Microbiology (4)
- BIOL 311 General Genetics (3)
- BIOL 322/323 Developmental Biology (4)
- BIOL 326 Animal Physiology (3)
- BIOL 382 Introduction to Virology (3)
- BIOL 430 Advanced Human Anatomy and Physiology I (4)

To ensure that they receive up to date and accurate advice, students interested in medical school must consult with the Pre-health Advisor:

Jane Rockwood
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 Academic Advising Center, SUB I, 2500
 4400 University Drive, MS 2E6
 Fairfax, Virginia 22030
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