

GEORGE MASON UNIVERSITY
VOLGENAU SCHOOL OF ENGINEERING
B.S. DEGREE IN BIOENGINEERING (BIOENGINEERING PREHEALTH CONCENTRATION)
(3100 Peterson Hall, 703-993-4190)
<http://bioengineering.gmu.edu/>
2018 - 2019 CATALOG

	<u>Department(s) & Course #(s)</u>	<u>Completed/ Grade(s)</u>	<u>Needed</u>
<u>MASON CORE REQUIREMENTS (21)</u>			
a. Written Communication: ENGH 101 (100), ENGH 302 Natural Science or Multi Sections Only (C or better) (3,3)			
b. Oral Communication: COMM 100 or 101 (3)		—	—
c. Quantitative Reasoning (satisfied by completion of major requirements)			
d. Literature (3)	_____	_____	_____
e. Arts (3)	_____	_____	_____
f. Western Civilization (HIST 100, 125, or acceptable transfer course)		_____	_____
g. Social & Behavioral Science: (satisfied by completion of major requirements)			
h. Natural Science (satisfied by completion of major requirements)			
i. Global Understanding (3)	_____	_____	_____
j. Information Technology (satisfied by completion of major requirements)			
k. Synthesis (satisfied by completion of major requirements)			

Go to: <http://catalog.gmu.edu/mason-core/> to link to information on Mason Core requirements.

BIOENGINEERING Major Requirements (114 credit hours, including concentration requirements)

Bioengineering (29 credits)

a. BENG 101, BENG 220 (3,3)	a. _____	_____	_____
b. BENG 301, BENG 302 (3,1)	b. _____	_____	_____
c. BENG 304, BENG 320 (3,3)	c. _____	_____	_____
d. BENG 380, BENG 381 (3,1)	d. _____	_____	_____
e. BENG 420 (3)	e. _____	_____	_____
f. BENG 491, BENG 492 (1,2)	f. _____	_____	_____
g. BENG 493, BENG 495 (2,1)	g. _____	_____	_____

Biology (7 credits)

h. BIOL 213 (Bioengineering Section) & BENG 313 (4,3)	h. _____	_____	_____
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Computer Science (7 credits) & Engineering (2 credits)

i. CS 112, CS 211 or 222 (circle one) (3,3) ENGR 107 (4,2)	i. _____	_____	_____
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Math and Statistics (20 credits)

j. MATH 113, MATH 114 (B- or above)(4,4)	j. _____	_____	_____
k. MATH 213, MATH 214 (B- or above) (3,3)	k. _____	_____	_____
l. MATH 203 Bioengineering section only (3)	l. _____	_____	_____
m. STAT 344 (3)	m. _____	_____	_____

Physics (8 credits)

n. PHYS 160, PHYS 161 (3,1)	n. _____	_____	_____
o. PHYS 260, PHYS 261 (3,1)	o. _____	_____	_____

Bioengineering Prehealth Concentration (40-41)

Biology (7 - 8 credits)

a. BIOL 483 (4) and one of the following (3-4): BIOL 305/306 (3/1), BIOL 311 (4), BIOL 322/323 (3/1), BIOL 326 (3), BIOL 382 (3), BIOL 430 (4) (circle choice)	a. _____	_____	_____
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Chemistry (18 credits)

b. CHEM 211/213, CHEM 212/214 (3/1,3/1)	b. _____	_____	_____
c. CHEM 313/315, CHEM 314/318 (3/2, 3/2)	c. _____	_____	_____

Other Requirements (15 credits)

d. ECE 301 (3)	d. _____	_____	_____
e. PSYC 100, SOCI 101 (3,3)	e. _____	_____	_____
f. Six credits of Technical Electives chosen from the following (circle choices): BENG 327, 341, 390, 395, 406, 417, 421, 429, 437, 441, 451, 499, 525, 538, 541, 550	f. _____	_____	_____

Students must complete each BENG, BIOL, ECE and ENGR course presented as part of the required credits for the degree with a grade of C or better.

134-135 HOURS (including Minimum 45 UPPER DIVISION HOURS) to GRADUATE

This planning form is intended to be used in consultation with your academic advisor and reflects the requirements for the 2018 - 2019 Catalog; the University Catalog is the official reference for program requirements.

2018-2019 Sample Schedule For Undergraduate Bioengineering Concentration in Prehealth Majors (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
BENG 101 Intro to Bioengineering	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
Mason Core*	3
CHEM 212 General Chemistry II	3
CHEM 214 General Chemistry II Lab	1
ENGR 107 Intro to Engineering	2
	17

Semester 3

MATH 213 Analytic Geom. & Calc. III	3
BIOL 213 Cell Structure and Function ¹	4
PHYS 260 University Physics II	3
PHYS 261 University Physics II Lab	1
MATH 203 Linear Algebra ¹	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*	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*	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 Adv Comp (Nat Sci sec) **	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 ³	3-4
Mason Core*	3
	13-14

Semester 9

BENG 420 Bioinformatics for Engr.	3
Technical Elective ²	3
Technical Elective ²	3
Mason Core*	3
Mason Core*	3
	15

Total: 134-135 Credit Hours

* <http://catalog.gmu.edu/mason-core/> Mason Core Categories: One course from each: Oral Communication, ENGH 101, ENGH 302, Arts, Global Understanding, Literature, Western Civilization/World History. ENGH 101 and Mason Core Literature have to be completed before taking ENGH 302. ENGH 302 needs to be completed before Senior Design Projects. BIOE allows for ENG 302 natural science section or multidisciplinary section.

¹ All bioengineers will be required to register for a specific section of MATH 203 including a 1-hour recitation with practical applications and for a specific section of BIOL 213.

² Students choose from sets of approved technical electives, including one of the [Technical Electives](#) from an approved life science course (See page 19 of the Bioengineering Student Guide for details).

³ 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
Health Professions Advising Office
Academic Advising Center, SUB I, 2500
4400 University Drive, MS 2E6
Fairfax, Virginia 22030
Jrockwo1@gmu.edu