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

	Department(s) & Course #(s)	Completed/ Grade(s)	Needed

MASON CORE REQUIREMENTS (21)

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 – MATH 113)
d. Literature (3)
e. Arts (3)
f. Western Civilization (HIST 100, 125, or acceptable transfer course)
g. Social and Behavioral Science: **Choose one of the following: ECON 103 (3), PSYC 100 (3), or SOCI 101 (3)**
h. Natural Science (satisfied by completion of major requirements - PHYS 160/161 & 260/261; BIOL 213; CHEM 251)
i. Global Understanding (3)
j. Information Technology (satisfied by completion of major requirements – CS 112 & ENGR 107)
k. Synthesis (satisfied by completion of major requirements – BENG 492 & 493)

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

BIOENGINEERING Major Requirements (96 credit hours required, including concentration)

Bioengineering (29 credits)
a. BENG 101, BENG 220 (3,3)
b. BENG 301, BENG 302 (3,1)
c. BENG 304, BENG 320 (3,3)
d. BENG 380, BENG 381 (3,1)
e. BENG 420 (3)
f. BENG 491, BENG 492 (1,2)
g. BENG 493, BENG 495 (2,1)

Biology (7 credits)
h. BIOL 213 (Bioengineering Section) & BENG 313 (4,3)

Computer Science (7 credits) & Engineering (2 credits)
i. CS 112, ENGR 107 (4,2)
j CS 211 **OR** CS 222 (circle choice) (3)

Math and Statistics (20 credits)
k. MATH 113, MATH 114 **(B- and above)**(4,4)
l. MATH 213, MATH 214 **(B- and above)**(3,3)
m. **MATH 203 – Bioengineering Section Only** (3)
n. STAT 344 (3)

Physics (8 credits)
o. PHYS 160, PHYS 161 (3,1)
p. PHYS 260, PHYS 261 (3,1)

Biomedical Signals and Systems Concentration (23)

Chemistry/Physics (8 credits)
a. CHEM 271/272 or CHEM 211, 213 (4)
d. PHYS 262, PHYS 263 or CHEM 212, 214 (3,1)

Other Requirements (15 credits)
b. ECE 301 (3)
c. Twelve 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. (Students may choose to substitute one of the three credit technical electives with one of the following: BIOL 305/306, 311, 483 & CHEM 463, CHEM 313/315, CS 310, CS 444, CS 445, ECE 305, 350, 370, 410, 421, 450; ME 313; PSYC 372)

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.

MINIMUM 120 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 Biomedical Signals and Systems Concentration majors (BMSS)

First Semester	
MATH 113 Analytic Geom. and Calculus I	4
BENG 101 Intro to Bioengineering	3
ENGR 107 Intro to Engineering	2
Mason Core*	3
CHEM 211+213 **OR** CHEM 271+272 Gen.Chem/ Engr	4
Total	**16**

Second Semester	
MATH 114 Analytic Geom. And Calculus II	4
CS 112 Intro to Computer Programming	4
PHYS 160 University Physics I	3
PHYS 161 University Physics I Lab	1
Mason Core*	3
Total	**15**

Third Semester	
MATH 213 Analytic Geom. & Calculus III	3
MATH 203 Linear Algebra[1]	3
PHYS 260 University Physics II	3
PHYS 261 University Physics II Lab	1
BIOL 213 Cell Structure and Function[1]	4
Total	**14**

Fourth Semester	
MATH 214 Elem. Differential Equations	3
BENG 220 Physical Bases of Biomed Systems	3
BENG 313 Physiology for Engineers	3
PHYS 262 University Physics III[2]	3
PHYS 263 University Physics III Lab[2]	1
Mason Core*	3
Total	**16**

Fifth Semester	
BENG 320 Bioengineering Signals & Systems	3
BENG 380 Intro to Circuits and Electronics	3
BENG 381 Circuits and Electronics Lab	1
CS 222 Computer Programming for Engineers **OR** CS 211 Obj. Oriented Programming	3
Mason Core*	3
Mason Core*	3
Total	**16**

Sixth Semester	
STAT 344 Probability & Statistics for Engineers	3
BENG 301 Bioengineering Measurements	3
BENG 302 Bioengineering Measurements Lab	1
BENG 304 Modeling & Control of Physiol. Syst.	3
ECE 301 Digital Electronics	3
Mason Core (ENGH 302 Adv. Comp)***	3
Total	**16**

Seventh Semester	
BENG 491 Bioengineering Senior Seminar I	1
BENG 492 Senior Advanced Design Project I	2
BENG 420 Bioinformatics for Engineers	3
Technical Elective[3]	3
Technical Elective[3]	3
Mason Core*	3
Total	**15**

Eighth Semester	
BENG 495 Bioengineering Senior Seminar II	1
BENG 493 Senior Advanced Design Project II	2
Technical Elective[3]	3
Technical Elective[3]	3
Mason Core*	3
Total	**12**

Total: 120 credits

[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 may substitute CHEM 211 and CHEM 213 (or CHEM 211H + lab) and CHEM 212 and CHEM 214 (or CHEM 212H + lab) for PHYS 262, PHYS 263, and CHEM 271+272.

[3] Students choose from a list of approved technical electives, including one of the Technical Electives from an approved life science course.

* http://masoncore.gmu.edu Mason Core Categories: One course from each: Social and Behavioral Sciences (ECON103, PSYC100 OR SOCI 101), Oral Communication, Composition I, Arts, Global Understanding, Literature, Western Civilization/World History. ** Composition I and Mason Core-Literature must 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.