Program Approval Form

For approval of new programs and deletions or modifications to an existing program.

Action Requested:

- [ ] Create New (SCHEV approval required except for minors)
- [ ] Inactivate Existing
- [X] Modify Existing (check **ALL** that apply)
  - [ ] Title (SCHEV approval required except for minors)
  - [X] **Concentration** (Choose one): [ ] *Add* [ ] *Delete* [X] *Modify*
  - [X] Degree Requirements
  - [ ] Admission Standards/ Application Requirements
  - [ ] Other Changes:

Type (Check one):

- [ ] B.A. [X] B.S. [ ] Minor
- [ ] Master's
- [ ] Ph.D.
- [ ] Undergraduate Certificate*
- [ ] Graduate Certificate*
- [ ] Bachelor's/Accelerated Master's
- [ ] Other:

College/School: Volgenau School of Engineering **Department:** Department of Bioengineering

Submitted by: Laurence Bray **Ext:** 2218 **Email:** Lbray2@gmu.edu

Effective Term: Fall 2018 **Please note:** For students to be admitted to a new degree, minor, certificate or concentration, the program must be fully approved, entered into Banner, and published in the University Catalog.

Justification: (attach separate document if necessary)

These changes are for the BMSS concentration under the BS degree in Bioengineering

	Existing	New/Modified
Program Title: (Required) Title must identify subject matter. Do not include name of college/school/dept.	Bioengineering, BS	
Concentration(s):	Biomedical Signals and Systems	
Admissions Standards / Application Requirements: (Required only if different from those listed in the University Catalog)		
Degree Requirements: Consult University Catalog for models, attach separate document if necessary using track changes for modifications	**Chemistry** Choose one of the following: 4 CHEM 251 General Chemistry for Engineers (Mason Core) CHEM 211 & CHEM 213 General Chemistry I (Mason Core) and General Chemistry Laboratory I (Mason Core) **Bioengineering Core** BENG 492 Senior Advanced Design Project I (Mason Core) 2 BENG 493 RS: Senior Advanced Design Project II (Mason Core) 2 **Biology** BIOL 213 Cell Structure and Function (Mason Core) 4 credits	**Chemistry** Choose one of the following: 3-4 CHEM 251 General Chemistry for Engineers (Mason Core) 4 CHEM 211 & CHEM 213 General Chemistry I (Mason Core) and General Chemistry Laboratory I (Mason Core) 4 BENG 201 Introduction to Bimolecular Engineering 3 **Bioengineering Core** BENG 492 Senior Advanced Design Project I (Mason Core) 3 BENG 493 RS: Senior Advanced Design Project II (Mason Core) 3 **Biology** BIOL 213 Cell Structure and Function (Mason Core) 4 credits OR BENG 213 Introduction to Biocellular Engineering 3 credits

Technical Electives

Select 12 credits from the following: 12

BENG 341 Introduction to Biomaterials 3

BENG 390 Engineering Design and Fabrication 3

BENG 392 Engineering Design Studio 1

BENG 395 RS: Mentored Research in Bioengineering 1-3

BENG 406 Introduction to Biomechanics 3

BENG 421 Introduction to Tissue Engineering 3

BENG 437 Medical Image Processing 3

BENG 441 Nanotechnology in Health 3

BENG 451 Translation and Entrepreneurship in Bioengineering 3

BENG 499 Special Topics in Bioengineering 4

BENG 525 Neural Engineering 3

BENG 538 Medical Imaging 3
BENG 541 Biomaterials 3

BENG 550 Advanced Biomechanics 3

ECE 305 Electromagnetic Theory 3

ECE 350 Embedded Systems and Hardware Interfaces 3

ECE 370 Robot Design 3

ECE 410 Applications of Discrete-Time Signal Processing 3

ECE 421 Classical Systems and Control Theory 3

ECE 450 Introduction to Robotics 3

ME 313 Material Science 3

Students may choose to substitute one of the technical electives with one of the following:

BIOL 305
& BIOL 306 Biology of Microorganisms and Biology of Microorganisms Laboratory 4

CHEM 313
& CHEM 315 Organic Chemistry I and Organic Chemistry Lab I 5

CS 310 Data Structures 3

CS 444 Introduction to Computational Biology 3

CS 445 Computational Methods for Genomics 3

Technical Electives

Select 12 credits from the following: 12

BENG 327 Cellular, Neurophysiological, and Pharmacological Neuroscience 3

BENG 341 Introduction to Biomaterials 3

BENG 390 Engineering Design and Fabrication 3

BENG 392 Engineering Design Studio 1

BENG 395 RS: Mentored Research in Bioengineering 1-3

BENG 406 Introduction to Biomechanics 3

BENG 417 Bioengineering World Health 3

BENG 421 Introduction to Tissue Engineering 3

BENG 429 Mason-Inova Applied Technologies 3

BENG 437 Medical Image Processing 3

BENG 441 Nanotechnology in Health 3

BENG 451 Translation and Entrepreneurship in Bioengineering 3

BENG 499 Special Topics in Bioengineering 4

BENG 525 Neural Engineering 3

BENG 538 Medical Imaging 3

BENG 541 Biomaterials 3

BENG 550 Advanced Biomechanics 3

Students may choose to substitute one of the technical electives with one of the following:

ECE 305 Electromagnetic Theory 3

ECE 350 Embedded Systems and Hardware Interfaces 3

ECE 370 Robot Design 3

ECE 410 Applications of Discrete-Time Signal Processing 3

ECE 421 Classical Systems and Control Theory 3
ECE 450 Introduction to Robotics 3

ME 313 Material Science 3

CS 310 Data Structures 3

CS 444 Introduction to Computational Biology 3

CS 445 Computational Methods for Genomics 3

Students must select one of the technical electives from the following:

BIOL 305
& BIOL 306 Biology of Microorganisms and Biology of Microorganisms Laboratory 4

BIOL 311 General Genetics 4

BIOL 483 or CHEM 463 General Biochemistry

	~~NEUR 327 Cellular, Neurophysiological, and Pharmacological Neuroscience 3~~ PSYC 372 Physiological Psychology 3	4 CHEM 313 & CHEM 315 Organic Chemistry I and Organic Chemistry Lab I 5 PSYC 372 Physiological Psychology 3
Courses offered via distance: (if applicable)		
TOTAL CREDITS REQUIRED:	120	120-122

***For Certificates Only:** Indicate whether students are able to pursue on a ☐ **Full-time basis** ☐ **Part-time basis**

Approval Signatures

Department 1/29/18 Date College/School 1/30/18 Date 1/30/18

If this program may impact another unit or is in collaboration with another unit at Mason, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Undergraduate Programs only

Undergraduate Council Member | Provost Office | Undergraduate Council Approval Date

For Graduate Programs Only

Graduate Council Member | Provost Office | Graduate Council Approval Date

For Registrar Office's Use Only: Received_____ Banner_____ Catalog_____