Program Approval Form

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

Registrar.

Action Requested:

- [ ] Create New (SCHEV approval required except for concentration, minors, and certificates)
- [ ] Delete Existing
- [x] Modify Existing (check all that apply)
  - [ ] Title (SCHEV approval required except for concentration, minors, certificates)
  - [x] Degree Requirements
  - [ ] Admission Standards
  - [ ] Application Requirements
  - [ ] Other Changes:

Type (Check one):

- [ ] B.A. [x] B.S. [ ] Minor
- [ ] Undergraduate Certificate
- [ ] M.A. [ ] M.S. [ ] M.Ed.
- [ ] Ph.D. [ ] Graduate Certificate
- [x] Concentration
- [ ] Other:

College/School:	College of Science	**Department:**	Biology Program		
Submitted by:	Larry Rockwood	**Ext:**	3-1031	**Email:**	lrockwoo@gmu.edu

Effective Term: Fall 2011

Please note: For students to start 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)

This combines two previous concentrations into one concentration and reflects the new core requirements for the BS degree in Biology

	Existing	New/Modified
Program Title: (Required) Use title to identify subject matter. Do not include name of college/school or department.	BS in Biology	BS in Biology
Concentration Title(s):	Biotechnology Molecular Biology	**Concentration in Biotechnology and Molecular Biology (BT)**
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	See attached	See attched
Courses offered via Distance: (if applicable)		
TOTAL CREDITS REQUIRED:		

Approval Signatures

Department	Date	College/School	Date	Provost's Office	Date
				Required for Undergraduate Programs Only	

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 Graduate Programs Only

Graduate Council Member	Provost Office	Graduate Council Approval Date

▲ Concentration in Biotechnology and Molecular Biology (BT)

The biotechnology concentration consists of a selection of courses that provide essential skills to students who seek employment in the field or wish to include an applied component in their undergraduate training in biology.

Students must fulfill all requirements for bachelor's degrees including university general education requirements . In addition, students majoring in biology with a concentration in biotechnology must complete the following. Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.

22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Introduction to Biostatistics Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

11 credits in biotechnology, including:

- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Lab Credit: 1
- BIOL 385 - Biotechnology and Genetic Engineering Credits: 3
- BIOL 483 - General Biochemistry Credits: 4

11 credits chosen from:
Note: Laboratories associated with these courses are required. At least one of these electives must include a laboratory.

- BIOL 402 - Applied and Industrial Microbiology
- BIOL 403 - Techniques in Applied and Industrial Microbiology
- BIOL 405 - Microbial Genetics
- BIOL 406 - Microbial Physiology and Metabolism
- BIOL 411 - Advanced General Genetics
- BIOL 417 - Selected Topics in Molecular and Cellular Biology*
- BIOL 418 - Current Topics in Microbiology*
- BIOL 420 - Vaccines
- BIOL 421 - Genetics of Human Diseases
- BIOL 422 - Stem Cell Biology and Regenerative Medicine
- BIOL 452 - Immunology
- BIOL 453 - Immunology Laboratory

- BIOL 482 - Introduction to Molecular Genetics
- BIOL 484 - Eukaryotic Cell Biology
- BIOL 486 - Molecular Biology and Biotechnology Laboratory
- BIOL 497 - Special Problems in Biology*
  *Topic must be approved by Biotechnology Coordinator

18 credits in chemistry, including;

- CHEM 211 - General Chemistry
- CHEM 212 - General Chemistry
- CHEM 313 - Organic Chemistry
- CHEM 314 - Organic Chemistry
- CHEM 315 - Organic Chemistry Lab I
- CHEM 318 - Organic Chemistry Lab II

8 credits of physics:

- PHYS 243 - College Physics
- PHYS 244 - College Physics Lab
- PHYS 245 - College Physics
- PHYS 246 - College Physics Lab

At least 3 credits from the following:

- MATH 108 - Introductory Calculus with Business Applications: 3 (transfer students only)
- MATH 111 - Linear Mathematical Modeling: 3 credits
- MATH 113 - Analytic Geometry and Calculus I: 4 credits
- MATH 114 - Analytic Geometry and Calculus II: 4 credits

3 credits of computer science chosen from one of the following:

- CDS 130 – Computing for Scientists Credits: 3
- IT 103 - Introduction to Computing Credits: 3