

Request for Graduate Addition, Deletion, or Change of Area of Emphasis-Page 1

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
 2. E-mail one PDF copy without signatures to the Graduate Council Chair. If attachments included, please merge into a single file.
 3. **The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.**

College: Science

Dept/Division: Biological Sciences

Contact Person: Anne Axel

Phone: 696-2426

Action Requested

Check action requested: Addition Deletion Change

Degree Program Biological Sciences

Area of Emphasis Organismal, Evolutionary, and Ecological Biology

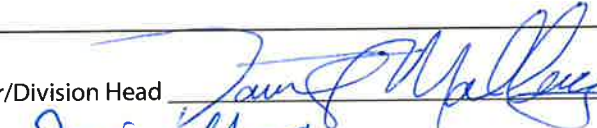



Effective Term/Year Fall 20 18 Spring 20 Summer 20

Notifications

Attach a copy of written notification regarding this curriculum request to the following:

1. Statement of Non-Duplication: If this area of emphasis will be similar in title or content to an existing area of emphasis, please send a memo to the affected department/division and include a copy with this packet as well as the response received from the affected department.
2. If your department/division requires additional faculty, equipment, or specialized materials, attach an estimate of cost and time required to secure these items.

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head 	Date <u>27 March 2018</u>
Registrar 	Date <u>3-27-18</u>
College Curriculum Chair 	Date <u>3-28-18</u>
College Dean 	Date <u>30 MARCH 2018</u>
Graduate Council Chair _____	Date _____
Provost/VP Academic Affairs _____	Date _____
President _____	Date _____

Request for Graduate Addition, Deletion, or Change of Area of Emphasis-Page 2

1. Please provide a rationale for addition, deletion, change:

The area of emphasis is redundant. It is so broad that it is essentially the same as the Biological Sciences major. The Area of Emphasis is not distinct from the major itself.

2. Please describe any changes in curriculum:

Course number, title, credit hours. Note whether each course is required or optional. Enter NONE if no change.

NONE

3. **Additional Resource Requirements:** If your program requires additional faculty, equipment or specialized materials to ADD or CHANGE this Area of Emphasis attach an estimate of the time and money required to secure these items. May attach separate page if needed

NOTE: approval of this form does not imply approval for additional resources. Enter NOT APPLICABLE if not applicable.

NOT APPLICABLE

4. **NON-DUPLICATION:**

If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the request and any response received from them.

Enter NONE if not applicable.

NONE

For catalog changes as a result of the above action, please fill in the following pages.

Request for Graduate Addition, Deletion, or Change of Area of Emphasis-Page 3

5. **Current Catalog Description**

Insert the *Current* Catalog Description and page number from the latest catalog for entries you would like to change.
(May attach separate page if needed)

Please see attached.

6. **Edits to the Current Description**

Attach a PDF copy of the current catalog description prepared in MS Word with strikethroughs to mark proposed deletions and use the highlight function to indicate proposed new text.

7. **New Catalog Description**

Insert a 'clean' copy of your proposed description, i.e., no strikethroughs or highlighting included. This should be what you are proposing for the new description. (May attach separate page if needed)

NONE

M.S. Degree Requirements

- Students must complete at least 32 hours of graduate coursework, including the thesis. The maximum amount of credit that may be earned for the thesis (BSC 681) is 12 hours.
- Candidates for the M.S. degree must register for and participate in six hours of Graduate Seminar (BSC 660 and 661 during their first year and BSC 662 in at least two subsequent semesters) during each of the semesters in which they are actively enrolled in the graduate program and complete at least 18 hours in graded BSC electives at the graduate level (which may include BSC 660, 661, 662, and 681).
- Not more than 6 hours of seminar (BSC 660, 661, 662) may be used to complete the 32-hour requirement.
- Not more than 4 semester hours credit in Independent Study (BSC 585-588) or Special Problems (BSC 650-652) may be used to complete the 32 hour requirement, and these may only be applied beyond the 18 hours in BSC graduate credits.
- Students may elect to take 6 hours of graduate work in a minor field.
- Successful completion of the program in Biological Sciences requires a GPA of 3.0 or higher, and no more than 6 credit hours of "C" grades may be applied to the total hours for graduation. Upon completion of course requirements and the thesis, M.S. candidates must pass a comprehensive oral examination.

M.A. Degree Requirements

- Students who select the M.A. option must complete a minimum of 36 hours of graduate coursework.
- M.A. candidates do not conduct thesis research. The Graduate Seminar, BSC electives, Independent Study/Special Problems, GPA, "C" grades, and comprehensive oral exam requirements are as stated for the M.S. degree.

Area of Emphasis in Organismal, Evolutionary, and Ecological Biology

Organismal, Evolutionary, and Ecological Biology as an area of emphasis in Biological Sciences will provide participating students with a broad background in biology at the level of the individual organism and above. The anatomy, structure, and function of individual species are stressed, as is the comparative natural history and evolutionary relationships of groups of related organisms. Lastly, the roles of organisms in a broader context is studied via the analysis of ecological relationships. The intent of this area of emphasis is to serve students engaged in natural history studies, students engaged in the assessment of environmental impacts on species and communities, and those focusing on the detailed anatomy, structure, and function of individual organisms both recent and fossil. Students choosing this major will be well-prepared to pursue careers or further education in the environmental sciences, environmental mitigation, resource management, and ecological impact assessment. Others choosing this area of emphasis will be prepared for the study of evolutionary biology, biomechanics, and the natural history of groups of organisms ranging from today's plants to fossil reptiles and mammals.

Degree Requirements for Area of Emphasis

BSC 660	Introductory Graduate Seminar
BSC 661	Seminar I
BSC 662	Seminar II
BSC 681	Thesis, up to 12 hrs.

(If only 9 hours of thesis are taken, select an additional course(s) from the list below.)

Additional Courses from which to select (at least 14 hours for M.S. and 18 hours for M.A.)

BSC 501	Ichthyology
BSC 505	Economic Botany
BSC 506	Herpetology
BSC 508	Ornithology
BSC 509	Mammalogy
BSC 513	Principles of Organic Evolution
BSC 516	Plant Taxonomy
BSC 517	Biostatistics
BSC 524	Animal Parasitology
BSC 525	Biosystematics
BSC 526	Medical Entomology
BSC 530	Plant Ecology
BSC 560	Conservation Forest Soil Wildlife
BSC 610	Advanced Vertebrate Morphology
BSC 620	Taxonomy of Vascular Plants

Additional electives not listed above may be included in a student's program of study if determined by the advisor to be appropriate to this area of emphasis.

Area of Emphasis in Watershed Resource Science

Watershed Resource Science as an area of emphasis in Biological Sciences will provide participating students with a systematic and integrated approach to the study of water resources as well as the analysis and implementation of the most effective way to assess their quality and manage their use and conservation. In this program, the integration of course offerings in assessment, informatics, and management into traditional and integrated science curricula provides students with the knowledge base necessary to effectively and innovatively assess and manage water resources.

Admissions Requirements for Watershed Resource Science Area of Emphasis

- Must be admitted to the BSC master's degree program;
- Must have a bachelor's degree which includes a minimum of 6 courses from the following disciplines: two courses in mathematics (must include 1 semester of calculus and one semester of statistics); two courses in physical science (physics, chemistry, geology, etc.); and two courses in life science (biology, agronomy, microbiology, etc.).

Degree Requirements for Watershed Resource Science Area of Emphasis

- The curriculum of this program is made up of a research component, a core of required courses, and specialization in either environmental assessment, environmental management, or environmental informatics.
- Students choosing the M.S. option must complete 32 hours of coursework including up to six hours of thesis.
- Students choosing a non-thesis option will receive an M.A. degree and must complete 36 hours of credit.
- The M.A. degree also requires completion of a minimum of three hours of independent study credit.
- A minimum of sixteen hours for M.S. and eighteen hours for M.A. degrees must be completed in coursework at the 600 level.
- A successful graduate must complete the research core, which may be a thesis (M.S.) or independent study (M.A.) project, the core of required courses, and courses in a specialization chosen in collaboration with a faculty advisor.

Graduate Certificate Program in Bioinformatics

The Marshall University bioinformatics certificate is designed to develop a working understanding of a variety of techniques and methods for analyzing vast amounts of biological data. The source of information may be associated with recent genomic research, but may also include data sets related to other complex biological problems involving such topics as structure modeling, database mining, and visualization.

The certificate is designed to complement existing degrees and to suit the needs of students and professionals who want to specialize in the fast-expanding field of bioinformatics. The certificate curriculum is interdisciplinary and includes courses from the College of Science, the College of Information Technology and Engineering, and the Joan C. Edwards School of Medicine. Through completion of the certificate, student will have acquired the necessary skills to analyze and interpret the large data sets using various bioinformatics tools.

Students who should apply for the certificate program would be biology, mathematics, chemistry, physics, and medical/biomedical students or medical doctors who desire to acquire skills required to understand bioinformatics methods and technology; computer science students who wish to understand biological concepts that can be analyzed using their programming skills; or health care professionals (medical, pharmaceutical, and agricultural industries) who desire to acquire bioinformatics knowledge relevant to their fields of expertise.

Students will earn the certificate by completing 15 credit hours, including 9 credit hours from 3 core courses, 3 credit hours from a first elective course, and another 3 credit hours from a second elective.

Admissions Requirements

1. Both senior-level undergraduate students with overall GPAs of at least 2.75 and graduate students may enroll in the certificate program.
2. Both undergraduate and graduate students must satisfy the following prerequisite requirement: Successful completion (grade of C or better) of MTH 140 or MTH 229, and one of MTH 225, MTH 326, or MTH 345.

Curriculum

Required courses:

CS	505	Computing for Bioinformatics
BSC	550	Molecular Biology
CS	645	Advanced Topics in Bioinformatics

(continued)

Area of Emphasis in Organismal, Evolutionary, and Ecological Biology

Organismal, Evolutionary, and Ecological Biology as an area of emphasis in Biological Sciences will provide participating students with a broad background in biology at the level of the individual organism and above. The anatomy, structure, and function of individual species are stressed, as is the comparative natural history and evolutionary relationships of groups of related organisms. Lastly, the roles of organisms in a broader context is studied via the analysis of ecological relationships.

The intent of this area of emphasis is to serve students engaged in natural history studies, students engaged in the assessment of environmental impacts on species and communities, and those focusing on the detailed anatomy, structure, and function of individual organisms both recent and fossil. Students choosing this major will be well-prepared to pursue careers or further education in the environmental sciences, environmental mitigation, resource management, and ecological impact assessment. Others choosing this area of emphasis will be prepared for the study of evolutionary biology, biomechanics, and the natural history of groups of organisms ranging from today's plants to fossil reptiles and mammals.

Degree Requirements for Area of Emphasis

BSC-660 Introductory Graduate Seminar

BSC-661 Seminar I

BSC-662 Seminar II

BSC-681 Thesis, up to 12 hrs.

(If only 9 hours of thesis are taken, select an additional course(s) from the list below.

Additional Courses from which to select (at least 14 hours for M.S. and 18 hours for M.A.)

BSC-501 Ichthyology

BSC-505 Economic Botany

BSC-506 Herpetology

BSC-508 Ornithology

BSC-509 Mammalogy

BSC-513 Principles of Organic Evolution

BSC-516 Plant Taxonomy

BSC-517 Biostatistics

BSC-524 Animal Parasitology

BSC-525 Biosystematics

BSC-526 Medical Entomology

BSC-530 Plant Ecology

BSC-560 Conservation Forest Soil Wildlife

BSC-610 Advanced Vertebrate Morphology

BSC-620 Taxonomy of Vascular Plants

Additional electives not listed above may be included in a student's program of study if determined by the advisor to be appropriate to this area of emphasis.

Request for Graduate Addition, Deletion, or Change of Area of Emphasis-Page 4

Please insert in the text box below your Area of Emphasis change information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:

Area of Emphasis Title:

Credit Hours:

Type of Change Requested: (*addition, deletion, change*)

Term to Take Effect: (*Fall, Spring, Summer/Year*)

Rationale:

Department: Biological Sciences

Area of Emphasis Title: Organismal, Evolutionary, and Ecological Biology

Credit Hours: M.S.: 36 hours; M.A.: 32 hours (no credit hours to be changed)

Type of Change Requested: (addition, deletion, change): deletion

Term to Take Effect: (Fall, Spring, Summer/Year): Fall 2018

Rationale: The area of emphasis is redundant. It is so broad that it is essentially the same as the Biological Sciences major. The Area of Emphasis is not distinct from the major itself.