### College of Basic and Applied Sciences
#### 2018-2019 Upper Division Form

**Student name**

**Major** Biology

**Concentration**

**Student #**

**Minor**

**E-mail**

**E-mail**

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**Instructions:** For students graduating in Fall 2017 or later. One (1) copy signed by major and minor advisors should be filed in the Graduation Coordinator’s Office (DSB 120) three semesters before anticipated graduation. An Intent to Graduate form should accompany this form.

### General Studies Area

- **COMMUNICATION** (9 hours)
  - ENGL 1010
  - ENGL 1020
  - COMM 2200

- **HISTORY** (6 hours)
  - Choose two: HIST 2010, HIST 2020, HIST 2030

- **HUMANITIES AND/OR FINE ARTS** (9 hours) Choose one: ENGL 2020, 2030, or HUM 2610. Choose two with different prefixes: ANTH 2210, ART 1030, 1920, DANC 1000, HIST 1010, 1020, 1110, 1120, MUS 1030, PHIL 1030, THEA 1030

- **MATHMATICS** (3 hours)
  - MATH 1910

- **NATURAL SCIENCES** (8 hours)
  - BIOL 1110 & 1111
  - CHEM 1110 & 1111

- **SOCIAL/BEHAVIORAL SCIENCES** (6 hours) Choose two (different prefixes): AAS 2100, ANTH 2100, ECON 2410, ECON 2420, GEOG 2000, GS 2100, HLTH 1530/1531, PS 1010, PSY 1410, RS 2100, SOC 1010, 2010, WGST 2100

### Hours Required

<table>
<thead>
<tr>
<th>General Studies Area</th>
<th>Course</th>
<th>Semester</th>
<th>Grade</th>
<th>Prerequisites/Notes</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMUNICATION</strong></td>
<td>ENGL 1010</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGL 1020</td>
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<td>ENGL 1010</td>
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<td></td>
<td>COMM 2200</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>HISTORY</strong></td>
<td></td>
<td></td>
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<td>3</td>
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<td>3</td>
</tr>
<tr>
<td><strong>HUMANITIES AND/OR FINE ARTS</strong></td>
<td></td>
<td></td>
<td></td>
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<td>3</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>MATHMATICS</strong></td>
<td>MATH 1910</td>
<td></td>
<td></td>
<td>MATH 1730 with a minimum grade of C or Math ACT score of 26.</td>
<td>3 of 4</td>
</tr>
<tr>
<td><strong>NATURAL SCIENCES</strong></td>
<td>BIOL 1110 &amp; 1111</td>
<td></td>
<td></td>
<td>Course is also considered part of the major, making a minimum of 42 credits of BIOL courses.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CHEM 1110 &amp; 1111</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>SOCIAL/BEHAVIORAL SCIENCES</strong></td>
<td></td>
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<td>3</td>
</tr>
</tbody>
</table>

**Hours Required:** 41

### Major Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester</th>
<th>Grade</th>
<th>Prerequisites/Notes</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction to the Biology Major</strong></td>
<td>BIOL 1000</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>General Biology 1110</strong> (credits counted above)</td>
<td>BIOL 1110/1111</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>General Biology</strong></td>
<td>BIOL 1120/1121</td>
<td></td>
<td>BIOL 1110/1111</td>
<td>4</td>
</tr>
<tr>
<td><strong>Microbiology</strong></td>
<td>BIOL 2230/2231</td>
<td></td>
<td>BIOL 1110 &amp; 1120</td>
<td>4</td>
</tr>
<tr>
<td><strong>Genetics</strong></td>
<td>BIOL 3250/3251</td>
<td></td>
<td>BIOL 1110 &amp; 1120</td>
<td>4</td>
</tr>
<tr>
<td><strong>General Ecology</strong></td>
<td>BIOL 3400/3401</td>
<td></td>
<td>BIOL 1110, 1120, and CHEM 1110</td>
<td>4</td>
</tr>
<tr>
<td><strong>Biology Concentration Courses (see listing)</strong></td>
<td></td>
<td></td>
<td>See Advisor</td>
<td>4</td>
</tr>
<tr>
<td><strong>Biology Concentration Courses (see listing)</strong></td>
<td></td>
<td></td>
<td>See Advisor</td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Biology Concentration Courses (see listing)</strong></td>
<td></td>
<td></td>
<td>See Advisor</td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Biology Upper Division Elective (3000/4000)- See Advisor</strong></td>
<td></td>
<td></td>
<td>See Advisor</td>
<td>1-3</td>
</tr>
<tr>
<td><strong>Physiology (select from BIOL 4110 &amp; 4111, or 4210 &amp; 4211, or 4500)</strong></td>
<td></td>
<td></td>
<td>See Advisor</td>
<td>4</td>
</tr>
<tr>
<td><strong>Evolution</strong></td>
<td>BIOL 3500</td>
<td></td>
<td>BIOL 3250</td>
<td>3</td>
</tr>
<tr>
<td><strong>Senior Seminar</strong></td>
<td>BIOL 4200</td>
<td></td>
<td>BIOL 2230, 3250, 3400, 3500</td>
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</tbody>
</table>

**Hours Required:** 38 (42)

Revised 4.29.2019
## Supporting Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester</th>
<th>Grade</th>
<th>Prerequisites/Notes</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CHEM 1120 &amp; 1121</td>
<td></td>
<td></td>
<td>CHEM 1110/1111 with a C- or better</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 2030 &amp; 2031 or 3010 &amp; 3011</td>
<td></td>
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<td>CHEM 1110/1111 &amp; 1120/1121</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1920, or MATH 2050, or BIOL 4350 &amp; 4351</td>
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<td>See Advisor</td>
<td>3-4</td>
</tr>
<tr>
<td>Elective if MATH 2050 is chosen</td>
<td></td>
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<td>0-1</td>
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<tr>
<td>Math 1910 (remaining 1 credit from general education)</td>
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<td>1</td>
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</table>

| Hours Required       | 12-14    |

Note: Sufficient upper division electives (3000/4000 level) must be earned to meet the 42 required for graduation. At least 120 credit hours must be earned for graduation.

## Elective Courses

<table>
<thead>
<tr>
<th>Elective Courses</th>
<th>Semester</th>
<th>Grade</th>
<th>Notes</th>
<th>Credit Hours</th>
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Remaining credit hours needed to meet the minimum 120 hour requirement

## Optional Minor

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester</th>
<th>Grade</th>
<th>Notes</th>
<th>Credit Hours</th>
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</table>

| Hours Required       |          |

Signed: [Minor Advisor] Date

1. Degrees require a minimum of 120 semester hours (12 of the last 18 at MTSU) with a 2.0 GPA, a minimum of 42 upper-division hours (30 at MTSU) with a 2.0 GPA, and minimum of 60 senior college hours.
2. Learning Support courses do not count toward the 120-hour requirement or cumulative degree GPA.

Signed: [Major Advisor] Date

Revised 4.29.2019
# Instructions For Upper-Division Forms for Biology

1. This form should be filled out in consultation with your advisor three semesters prior to graduation.
2. An Intent to Graduate Form must accompany the Upper Division Form when submitted to the Graduation Analyst in Jones Hall, room 115.
3. In order to graduate, you must complete at least 120 semester hours of which at least 42 must be in upper division (3000/4000 numbered) courses. At least 60 semester hours must have been taken at a senior (4 year) college/university. A minimum 2.00 GPA in the major, overall, in at least 42 hrs of upper division (3000/4000 level) courses, and in most minors, is required for graduation. Course work awarded from a junior college will not count as upper-division credit even if it is credited on your transcript as a 3000 or 4000 level course. At least one minor is required; a natural science such as chemistry is recommended.
4. If the course prefix and number are not shown, be sure to write them in the “Course” column. In the “Grade” column, write the grade that you received if you have already completed the course, or the semester that you plan on taking the course (for example: F 16, Sp 17, Su 17, etc.). In the Notes column, write in the course you are taking instead of the course listed, or Advanced Placement credit for the course, or transfer credit for the course, (in which case you should list the original course name and number); otherwise, the Notes column should remain blank. See advisor and catalog for options to fulfill specific requirements. If a course previously taken is accepted as a substitution for a course listed, then a Substitution Form must be filled out and approved by Major Advisor and Department Chair and accompany the Upper Division and Intent to Graduate Forms.
5. See the specified MTSU Undergraduate Catalog and the Student Handbook for further details concerning degree requirements for graduation. You are responsible for understanding and fulfilling all degree requirements.

## Biology Concentration Lists*

### Organismal Biology and Ecology*

**Choose at least 10 hours from the following list:**
- 3020 (4) Comp. Anat. Vert. (Fall)
- 3040 (4) Entomology (Fall, odd)
- 3050 (3) Parasitology (Spring)
- 4090 (3) Forest Ecology (Fall, odd)
- 4080 (4) Mycology (Fall, even)
- 4140 (4) Invert. Zool. (Spring, even)
- 4180 (4) Vert. Zool. (Fall)
- 4220 (4) Ichthyology (Fall, even)
- 4390 (4) Ethology (Spring, odd years)
- 4520 (4) Plant Anatomy
- 4570 (3) Principles of Toxicology (Spring, odd)
- 4580 (4) Marine Biology (Spring, odd)
- 4590 (4) Principles of Environmental Toxicology (Spring, even)

**Students may choose to follow one of the track options described to the right instead of choosing from the list above**

### Optional Organismal Biology & Ecology tracks:

- **Botany Track:** (10 hours)
  - Choose from BIOL 4080, 4090, 4520 and one course from among the column to the left. Students in this track should take BIOL 4500 (Plant Physiology) as their required Physiology course.

- **Zoology Track:** (10 hours)
  - Choose from BIOL 3020, 3040, 3050, 4140, 4180, 4220, 4390. Students in this track should take BIOL 4500 (Plant Physiology) as their required Physiology course.

- **Ecology Track:** (10 hours)
  - Take BIOL 4580 and choose two courses from among the column to the left.

- **General Biology Track:** (10 hours)
  - Choose one of the following courses: BIOL 3020 or 4180
  - Choose one of the following courses: BIOL 3040, 3050, or 4140
  - Choose one of the following courses: BIOL 4080, 4090 or 4420

**The General Biology Track satisfies Teacher Education Requirements**

### Genetics & Biotechnology*

**Required:**
- 4550 (3) Biotechnology (Fall & Spring)
**Pick one of the following:**
- 4450 (4) Molecular Genetics (Fall & Spring)
- 4460 (3) Human Genetics (Spring)
**Pick one of the following:**
- 4270 (4) Trans. Elec. Microscopy (Spring)
- 4290 (4) Scan. Elec. Microscopy (Fall)
- 4300 (4) Immunology (Fall & Spring)
- 4450 (4) Molecular Genetics (Fall & Spring)
- 4460 (3) Human Genetics (Spring)
- 4510 (4) Food/Industrial Micro. (Fall)
- 4570 (3) Prin. Toxicology (Spring, odd)
- 4720 (4) Animal Development (Spring)
- 4750 (4) Plant Biotechnology

### Optional Organismal Biology & Ecology tracks:

- **Botany Track:** (10 hours)
  - Choose from BIOL 4080, 4090, 4520 and one course from among the column to the left. Students in this track should take BIOL 4500 (Plant Physiology) as their required Physiology course.

- **Zoology Track:** (10 hours)
  - Choose from BIOL 3020, 3040, 3050, 4140, 4180, 4220, 4390. Students in this track should take BIOL 4500 (Plant Physiology) as their required Physiology course.

- **Ecology Track:** (10 hours)
  - Take BIOL 4580 and choose two courses from among the column to the left.

- **General Biology Track:** (10 hours)
  - Choose one of the following courses: BIOL 3020 or 4180
  - Choose one of the following courses: BIOL 3040, 3050, or 4140
  - Choose one of the following courses: BIOL 4080, 4090 or 4420

**The General Biology Track satisfies Teacher Education Requirements**

### Physiology*

**Choose 10 hrs. from the following list:**
- 3010 (4) Embryology (Fall)
- 3020 (4) Comp. Anat. Vert. (Fall)
- 4110 (4) Gen. Physiology (Fall & Spring+)
- 4130 (4) Histology (Spring)
- 4170 (3) Endocrinology (Spring)
- 4210 (4) Cell & Molec. (Fall & Spring+)
- 4300 (4) Immunology (Fall & Spring)
- 4310 (3) Cardio-Renal Physiology (Fall, even)
- 4440 (4) Gen. Virology (Fall)
- 4500 (4) Plant Physiology (Spring+)
- 4520 (4) Plant Anatomy
- 4560 (4) Neurobiology (Fall)
- 4570 (3) Prin. Toxicology (Spring, odd)

*only if not used for core requirement

### Microbiology*

**Choose 10 hrs. from the following list:**
- 3050 (3) Parasitology (Spring)
- 3210 (3) Environ. Micro. (Spring)
- 4080 (4) Mycology (Fall, even)
- 4300 (4) Immunology (Fall & Spring)
- 4430 (4) Diagnostic Micro. (Fall & Spring)
- 4440 (4) Gen. Virology (Fall)
- 4450 (4) Molec. Genet. (Fall & Spring)
- 4510 (4) Food/Industrial Micro. (Fall)
- 4550 (3) Biotechnology (Fall & Spring)
- 4730 (4) Microbial Phys. & Biochem. (Spring, even)

* See advisor or chair for additional options; other Upper Division Biology courses may be substituted.

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Revised 4.29.2019