## MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
### OFFICE OF EDUCATOR QUALITY – EDUCATOR PREPARATION

**BIOLOGY, GRADES 9-12 - MAT**

<table>
<thead>
<tr>
<th><strong>MISSOURI STATE UNIVERSITY</strong></th>
<th><strong>EDUCATOR PREPARATION PROGRAM NAME</strong></th>
<th><strong>EDUCATOR PREPARATION PROGRAM CODE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri State University</td>
<td>MO 500-3104 (03/15)</td>
<td>119119</td>
</tr>
</tbody>
</table>

### INSTRUCTIONS

Please complete Educator Preparation Program (EPP) Name & EPP Code above. The EPP Code may be located at [https://dese.mo.gov/sites/default/files/EPP-Code-Name.pdf](https://dese.mo.gov/sites/default/files/EPP-Code-Name.pdf)

Certification Requirements:
- Course Number – List the course number(s) for the course(s) or groups of competencies that align with the specific section of the requirements. It is possible to have more than one course or group listed.
- Course Title – List the course title(s) for the course(s) or groups of competencies that align with the specific section of the requirements. It is possible to have more than one course or group listed.
- Semester Hours – List the number of semester hours for each specific section. It is possible to use decimals (to the nearest tenth) to indicate partial use of a course to meet a requirement. The total number of semester hours must meet or exceed the minimum required number of semester hours.

Email the completed cover sheet, curriculum matrix, and advising/program information to [DESE.MoSPETransition@dese.mo.gov](mailto:DESE.MoSPETransition@dese.mo.gov) on or before the date established in the Transition Plan.

**QUESTIONS:** Contact Educator Preparation, 573/751-1668 or [DESE.MoSPETransition@dese.mo.gov](mailto:DESE.MoSPETransition@dese.mo.gov)

### A. Professional Requirements (Minimum of 26 semester hours)

#### 1. Content Planning and Delivery

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Curriculum and Instructional Planning</td>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td>2(9)</td>
</tr>
<tr>
<td>b. Instructional Strategies and Techniques in Content Area Specialty</td>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td>2(9)</td>
</tr>
<tr>
<td>c. Assessment, Student Data, and Data-Based Decision-Making</td>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td>2(9)</td>
</tr>
<tr>
<td>d. Strategies for Content Literacy</td>
<td>RDG710 Content Area Literacy</td>
<td>.25(3)</td>
</tr>
<tr>
<td>e. Critical Thinking and Problem Solving</td>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td>1(9)</td>
</tr>
<tr>
<td>f. English Language Learning</td>
<td>RDG710 RDG574 or RDG640 Advanced Studies in Teaching and Learning</td>
<td>0(3)/.5(3)</td>
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</tbody>
</table>

#### 2. Individual Student Needs

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Psychological Development of the Child and Adolescent</td>
<td>PSY710 Psychology of Education</td>
<td>1.25(3)</td>
</tr>
<tr>
<td>b. Psychology/Education of the Exceptional Child</td>
<td>SPE715 Foundations in Special Education</td>
<td>3</td>
</tr>
<tr>
<td>c. Differentiated Learning</td>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td>1(9)</td>
</tr>
<tr>
<td>RDG710 Content Area Literacy</td>
<td>RDG574 or RDG640 Advanced Studies and Correction of Difficulties in Literacy</td>
<td>.25(3)/0(3)</td>
</tr>
<tr>
<td>d. Classroom Management</td>
<td>SFR797 PSY710 Psychology of Education</td>
<td>.25(9)</td>
</tr>
<tr>
<td>SEC783 Internship in Teaching I</td>
<td></td>
<td>1(3)</td>
</tr>
<tr>
<td>e. Cultural Diversity</td>
<td>RDG560 or RDG660 Diversity Issues in Literacy and Content Area Instruction</td>
<td>2(3)</td>
</tr>
<tr>
<td>RDG665 Cultural Diversity in Literacy and Instruction: Classrooms and Community</td>
<td></td>
<td>2(3)</td>
</tr>
<tr>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td></td>
<td>.25(9)</td>
</tr>
<tr>
<td>f. Educational Psychology</td>
<td>PSY710 Psychology of Education</td>
<td>1.5(3)</td>
</tr>
</tbody>
</table>

#### 3. Schools and the Teaching Profession

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Consultation and Collaboration</td>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td>.25(9)</td>
</tr>
<tr>
<td>RDG710 Content Area Literacy</td>
<td></td>
<td>0(3)</td>
</tr>
<tr>
<td>SEC784 Internship in Teaching II</td>
<td></td>
<td>1(10)</td>
</tr>
<tr>
<td>b. Legal/Ethical Aspects of Teaching</td>
<td>SFR797 Advanced Studies in Teaching and Learning</td>
<td>.25(9)</td>
</tr>
</tbody>
</table>
### 4. Secondary Literacy (Minimum of six semester hours)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. RDG710</td>
<td>Reading and Writing in the Content Area</td>
<td></td>
</tr>
<tr>
<td>RDG560 or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDG660 or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDG665</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDG560 or</td>
<td>Content Area Literacy</td>
<td>2.5(3)</td>
</tr>
<tr>
<td>RDG660 or</td>
<td>Diversity Issues in Literacy and Content Area Instruction</td>
<td>.5(3)</td>
</tr>
<tr>
<td>RDG665</td>
<td>Cultural Diversity in Literacy and Instruction: Classrooms and Community</td>
<td>.5(3)</td>
</tr>
<tr>
<td>b. RDG574 or</td>
<td>Instructional Interventions for Students with Reading Deficits</td>
<td></td>
</tr>
<tr>
<td>RDG640</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDG560 or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDG660 or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDG665</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDG560 or</td>
<td>Analysis and Correction of Difficulties in Literacy</td>
<td>2.5(3)</td>
</tr>
<tr>
<td>RDG660 or</td>
<td>Diversity Issues in Literacy and Content Area Instruction</td>
<td>.5(3)</td>
</tr>
<tr>
<td>RDG665</td>
<td>Cultural Diversity in Literacy and Instruction: Classrooms and Community</td>
<td>.5(3)</td>
</tr>
</tbody>
</table>

### B. Field and Clinical Experiences (Minimum of ten semester hours)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. SEC783</td>
<td>Early Field Experiences (Minimum of one semester hour with a minimum of 30 clock hours)</td>
<td>1(3)</td>
</tr>
<tr>
<td>b. SEC783</td>
<td>Mid-Level Field Experiences (Minimum of one semester hour with a minimum of 45 clock hours)</td>
<td>1(3)</td>
</tr>
<tr>
<td>c. SEC784</td>
<td>Culminating Clinical Experiences (Minimum of eight semester hours with a minimum of 12 weeks in one placement)</td>
<td>9(10)</td>
</tr>
</tbody>
</table>

### C. Biology Content Knowledge Area (Minimum of 35 semester hours)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI505</td>
<td>History/Philosophy of Science and Technology (Minimum of three semester hours)</td>
<td>3</td>
</tr>
<tr>
<td>a. BIO121</td>
<td>Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO210</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>BIO310</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>b. BIO122</td>
<td>Plant Form and Function</td>
<td>4</td>
</tr>
<tr>
<td>BIO215</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>c. BIO361</td>
<td>Animal Form and Function</td>
<td>4</td>
</tr>
<tr>
<td>or BMS307</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or BMS308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. BIO235</td>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>or BMS230 and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMS232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or BMS231</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. BIOS15</td>
<td>Evolution</td>
<td>3</td>
</tr>
</tbody>
</table>

Professional Requirements - Total Semester Hours 26

Field and Clinical Experiences - Total Semester Hours 11
### f. Biology Electives

Choose from the following 300 Level or above to reach a minimum of 32 hours of Biology coursework (3-5 hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO334</td>
<td>Plant Taxonomy</td>
<td>3</td>
</tr>
<tr>
<td>BIO339</td>
<td>Identification of Woody Plants</td>
<td>2</td>
</tr>
<tr>
<td>BIO355</td>
<td>Developmental Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO369</td>
<td>General Ecology</td>
<td>4</td>
</tr>
<tr>
<td>BIO370</td>
<td>Invertebrate Zoology</td>
<td>4</td>
</tr>
<tr>
<td>BIO371</td>
<td>Introduction to Entomology</td>
<td>3</td>
</tr>
<tr>
<td>BIO373</td>
<td>Principles of Wildlife Management</td>
<td>3</td>
</tr>
<tr>
<td>BIO380</td>
<td>Comparative Vertebrate Anatomy</td>
<td>5</td>
</tr>
<tr>
<td>BIO485</td>
<td>Marine Conservation</td>
<td>1-3</td>
</tr>
<tr>
<td>BIO499</td>
<td>Special Topics in Biology</td>
<td>1-3</td>
</tr>
<tr>
<td>BIO501</td>
<td>Natural History Museum Techniques</td>
<td>2</td>
</tr>
<tr>
<td>BIO505</td>
<td>Human Nature</td>
<td>3</td>
</tr>
<tr>
<td>BIO508</td>
<td>Environmental Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO511</td>
<td>Immunology</td>
<td>4</td>
</tr>
<tr>
<td>BIO512</td>
<td>Industrial Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO520</td>
<td>Pathogenic Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO521</td>
<td>Marine Science for Teachers I</td>
<td>2</td>
</tr>
<tr>
<td>BIO522</td>
<td>Marine Science for Teachers Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIO527</td>
<td>Field Biology</td>
<td>1-4</td>
</tr>
<tr>
<td>BIO550</td>
<td>Statistical Methods for Biologists</td>
<td>3</td>
</tr>
<tr>
<td>BIO560</td>
<td>Population Genetics and Evolutionary Mech.</td>
<td>3</td>
</tr>
<tr>
<td>BIO561</td>
<td>Environ. Issues Education and Interpretation</td>
<td>2</td>
</tr>
<tr>
<td>BIO564</td>
<td>Ozarks Natural Communities</td>
<td>2</td>
</tr>
<tr>
<td>BIO571</td>
<td>Comparative Animal Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BIO573</td>
<td>Ornithology</td>
<td>3</td>
</tr>
<tr>
<td>BIO575</td>
<td>Ichthyology</td>
<td>3</td>
</tr>
<tr>
<td>BIO576</td>
<td>Herpetology</td>
<td>3</td>
</tr>
<tr>
<td>BIO577</td>
<td>Mammalogy</td>
<td>3</td>
</tr>
<tr>
<td>BIO597</td>
<td>Topics in Biology</td>
<td>1-4</td>
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</table>

3. Additional Science Coursework – Minimum of 12 semester hours which must include:

a. Chemistry

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM116/117</td>
<td>Fundamentals of Chemistry/Lab</td>
<td>5</td>
</tr>
<tr>
<td>or CHM160/161 and CHM170/171</td>
<td>General Chemistry I/Lab and General Chemistry II/Lab</td>
<td>9</td>
</tr>
</tbody>
</table>

b. Physics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY100</td>
<td>Survey of Physics with Lab</td>
<td>4</td>
</tr>
<tr>
<td>or PHY123 and PHY124</td>
<td>Introduction to Physics I and Introduction to Physics II</td>
<td>8</td>
</tr>
</tbody>
</table>

c. Earth Science

Choose one

- GLG110
- GRY135
- GLG171

Choose one (1)

- Principles of Geology or Principles of Weather and Climate or Environmental Geology

3. Environmental Science

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO369</td>
<td>General Ecology</td>
<td>4</td>
</tr>
</tbody>
</table>

Content Knowledge Area - Total Semester Hours $MAT=48-57$

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