



**School of Education, Indiana University, Bloomington**  
**SCIENCE ADDITIONS FOR CERTIFICATION/LICENSING**

For an individual who has or is earning a license in one secondary science certification area (i.e., Chemistry, Earth-Space Science, Life Science, or Physics), gaining an additional science license requires extra coursework in the area of the second license. The lists below identify the specific courses required for each certification area. In addition to these courses in the specific area, persons who are at the initial licensure stage must meet the Secondary Science Education Core courses. Persons who already hold a license in a science area will have already met the science education core requirements that were in effect for their initial license and do not have to meet the current science education core or the history/philosophy of science course requirement.

For an individual who has or is earning a license in a non-science certification area (i.e., mathematics, social studies, etc.), gaining an additional science license requires the science content courses identified below, completion of the secondary science education core courses plus Q506-Methods of Teaching SH/JH/MS Science (3 credits) and the associated field experience M501 (2 credits).

**Some of the courses in each area below may be earned (and needed) within the science core**  
**A 2.5 GPA in each area with a C (2.0) in each course is required.**

**Science Core courses** (for non-science teachers)

|  |     |
|--|-----|
| BIOL L111 Introduction to Biology: Evolution & Diversity | 3   |
| BIOL L112 Introduction to Biology: Biological Mechanisms | 3   |
| CHEM C117 Principles of Chemistry & Biochemistry I       | 5   |
| CHEM C118 Principles of Chemistry & Biochem II (5cr)     | 3-5 |
| CHEM R340 Survey of Organic (3cr) or                     |     |
| CHEM N330 (chemistry majors) Intermediate Inorganic (5)  |     |
| GEOG G107 Physical Systems of the Environment            | 3   |
| GEOL G104 Evolution of the Earth                         | 3   |
| PHYS P201 General Physics I AND                          | 5   |
| PHYS P202 General Physics II, OR                         | 5   |
| PHYS P221 Physics I (5cr) AND                            |     |
| PHYS P222 Physics II (5cr)                               |     |

**CORE may be waived by meeting qualifying score 137 on the middle school science test: 10439**

**History and Philosophy of Science** (for non-science teachers)

|  |
|--|
| HPSC X100 Human Perspective on Science, 3cr                |
| HPSC X102 Revolutions in Science, 3cr                      |
| HPSC X200 Scientific Reasoning, 3cr                        |
| HPSC X222 Big Science in the 20 <sup>th</sup> Century, 3cr |
| (Graduate equivalent may be substituted.)                  |

**Science Education (methods):** (for non-science teachers)

|   |     |
|---|-----|
| EDUC Q506 Methods for Teaching SH/JH/MS Science | 3cr |
| EDUC M501 Field Experience                      | 2cr |

**See next page for requirements for science content areas being added.**

## CONTENT AREAS

### Chemistry (14 additional credits to Core)

|   |   |
|---|---|
| CHEM C117 Principles of Chemistry & Biochemistry I (Core)                               | 5 |
| CHEM C341 Organic Chemistry I (P: C117)   | 3 |
| CHEM C342 Organic Chemistry II (P: C341)  | 3 |
| CHEM N330 Intermediate Inorganic Chemistry (P: C/S342, R340)                            | 5 |
| CHEM C360 Intro to Physical Chemistry (P: C117, M119, P201<br>Highly Recommended, N330) | 3 |

### Earth-Space Science (16 additional credits to Core)

|   |     |
|---|-----|
| GEOG G103 Earth Science: Materials and Processes <b>OR</b>                |     |
| G111 Physical Geology   | 3   |
| GEOL G104 Evolution of the Earth (Core) <b>OR</b>                         |     |
| G112 Historical Geology   | 3   |
| AST A100 The Solar System <b>OR</b> A221 General Astronomy I (4cr)        | 3-4 |
| AST A105 Stars and Galaxies <b>OR</b> AST A202 General Astronomy II (4cr) | 3-4 |
| GEOL G225 Earth Materials   | 4   |
| GEOG G304 Physical Meteorology & Climatology                              | 3   |

### Life Science (12 additional credits to Core)

|   |   |
|---|---|
| BIOL L112 Introduction to Biology: Biological Mechanisms (Core) | 3 |
| BIOL L111 Introduction to Biology: Evolution & Diversity (Core) | 3 |
| BIOL L113 Biology Lab (P or C: L112 & L111)                     | 3 |
| BIOL L211 Molecular Biology (P: L112)                           | 3 |
| BIOL L311 Genetics (P: L211)                                    | 3 |
| BIOL L318 Evolution (P: L311)                                   | 3 |

### Physics (8 additional credits to Core)

|  |   |
|--|---|
| PHYS P201 General Physics I <b>AND</b>                     | 5 |
| PHYS P202 General Physics II (Core)                        | 5 |
| <b>OR</b> PHYS P221 Physics I (5cr) <b>AND</b>             |   |
| PHYS P222 Physics II (5cr)                                 |   |
| PHYS P301 Physics III (P: P202 or P222) <b>OR</b>          | 3 |
| PHYS P300 General Physics III (P: P202 or P222)            |   |
| PHYS P309 Modern Physics Lab (PorC: P301)                  | 2 |
| PHYS P310 Environmental Physics (P: P201 & M211) <b>OR</b> | 3 |
| Any other 3 credit course above the level of P301          |   |