

Master of Arts in Teaching (M.A.T.)

Science Education Teacher Education Program 5-12

Student Name:

UID:

This program of the University of Iowa College of Education is approved by the state of Iowa as preparation for two or more of the following endorsements and is a graduate program for the degree, Master of Arts in Teaching, available to students who have completed a bachelor's degree with a major in an area of science, or an equivalent or other closely-related course of study.

- 151 Biology 5-12
- 152 Chemistry 5-12
- 153 Earth Science 5-12
- 156 Physics 5-12
- 185 All Science 5-12
- 1541 Basic Science 5-12

Requirements

- [Admission to the Teacher Education Program](#) and [admission to the University of Iowa Graduate College](#).
- [U2G pathway for Science Education](#) is available for those earning a BA in a science.
- Comprehensive examinations and a minimum of 48 semester hours of graduate credit.
- Completion of the TEP Professional Education Course Requirements and field experiences.

Professional Education Course Requirements

Complete all the following courses (may be taken in the first semester of enrollment).

Course	Course Title	Credit	Session/Substitute
EDTL:3002	Teaching and Learning Technologies	2 s.h.	
EDTL:3091	Sec Ed Orientation & Classroom Management	3 s.h.	
EDTL:3095	Teaching Reading Secondary Content Areas	1 s.h.	

Complete all of the following (may be completed prior to TEP admission).

Course	Course Title	Credit	Session/Substitute
EPLS:3000	Foundations of Education	3 s.h.	
EDTL:4900	Foundations of Special Education	3 s.h.	
EPLS:4180	Human Relations for the Classroom Teacher	3 s.h.	

Complete one the following courses.

Course	Course Title	Credit	Session/Substitute
PSQF:1075	Educational Psychology and Measurement	2 s.h.	
PSQF:6200	Educational Psychology	3 s.h.	

Complete the following courses.

Course	Course Title	Credit	Session/Substitute
EDTL:4750	Assessment in STEM (Fall only)	2 s.h.	
EDTL:4751	Learning in the STEM Classroom (Fall only)	2 s.h.	
EDTL:4752	Secondary Science Methods II and Field Experience	3 s.h.	

Complete both of the following courses in the same Fall semester.

Course	Course Title	Credit	Session/Substitute
EDTL:4753	Secondary Science Methods III and Field Experience	3 s.h.	
EDTL:4779	Secondary School Science Practicum	2 s.h.	

Complete a course in college-level Mathematics.

Course	Course Title	Credit	Session/Substitute

Science Education

Complete the following.

Course	Course Title	Credit	Session/Substitute
SIED:4135	The Nature of Science (Fall only)	4 s.h.	

Complete two of the following five Societal and Educational Applications courses.

Course	Course Title	Credit	Session/Substitute
SIED:4102	Soc Ed App of Earth Science & Environ (Fall only)	4 s.h.	
SIED:4103	Soc Ed App of Biological Sciences (Fall only)	4 s.h.	
SIED:4105	Soc Ed App of Physical Sciences (Spring only)	4 s.h.	
SIED:4106	Soc Ed App of Chemical Concepts (Spring only)	4 s.h.	
SIED:4110	Environ Issues of Colorado Rockies (Summer only)	4 s.h.	

Student Teaching

Course	Course Title	Credit	Session/Substitute
EDTL:4087	Seminar Curriculum Student Teaching	3 s.h.	
EDTL:4091	Observation & Lab Prac in Secondary School	6 s.h.	
EDLT:4092	Observation & Lab Prac in Secondary School	6 s.h.	

Science Content Course Requirements

Complete the minimum 24 s.h. for an endorsement in one of the four science subjects: biology, chemistry, earth science, or physics, plus complete one of the following two options for additional science endorsement(s).

Option 1: Complete a minimum 15 s.h. for an additional endorsement in at least one of the other three science subjects, not the primary emphasis subject, chosen from selected courses or approved substitutions for endorsement. This completes the requirements for endorsement in at least two science content areas.

Option 2: Complete a minimum 9 s.h. in each of the other three science subjects, not the primary emphasis subject, chosen from selected courses or approved substitutions for endorsement. This completes the requirements for endorsements 185 All Science 5-12 and 1541 Basic Science 5-12.

**Complete a minimum of 24 s.h. in one primary area:
Biology, Chemistry, Earth Science, or Physics.**

Course	Course Title	Credit	Session/Substitute

Biology

Complete a minimum of 9 s.h. Both BIOL:1411 and BIOL:1412 are recommended.

Course	Course Title	Credit	Session/Substitute
BIOL:1411	Foundations of Biology	4 s.h.	
BIOL:1412	Diversity of Form and Function	4 s.h.	
BIOL:2512	Fundamental Genetics	4 s.h.	
BIOL:2673	Ecology	3 s.h.	
BIOL:2723	Cell Biology	3 s.h.	
BIOL:3172	Evolution	4 s.h.	
BIOL:3343	Animal Physiology	3 s.h.	
BMB:3110	Biochemistry	3 s.h.	
HHP:3500	Human Physiology	3 s.h.	
SIED:4103	Soc & Ed Applicatns of Biological Sciences	4 s.h.	
SIED:3164	Intro to Global Socioscientific Challenges	3 s.h.	

BMB:3110 Biochemistry can be used to satisfy requirements in either Biology or Chemistry, but not both.

Chemistry

Complete a minimum of 9 s.h. Both CHEM:1110 and CHEM:1120 are recommended.

Course	Course Title	Credit	Session/Substitute
CHEM:1110	Principles of Chemistry I	4 s.h.	
CHEM:1120	Principles of Chemistry II	4 s.h.	
CHEM:2021	Fundamentals of Chemical Measurements	3 s.h.	
CHEM:2210	Organic Chemistry I	3 s.h.	
CHEM:2220	Organic Chemistry II	3 s.h.	
CHEM:3250	Inorganic Chemistry	3 s.h.	
BMB:3110	Biochemistry	3 s.h.	
SIED:4106	Soc & Ed Applicatns of Chemical Concepts	4 s.h.	

BMB:3110 Biochemistry can be used to satisfy requirements in either Biology or Chemistry, but not both.

Earth Science

Complete a minimum of 9 s.h. Either SEES:1030 or SEES:1050 is recommended.

Course	Course Title	Credit	Session/Substitute
SEES:1030	Introduction to Earth Science	4 s.h.	
SEES:1040	Evolution and the History of Life	4 s.h.	
SEES:1050	Introduction to Geology	4 s.h.	
SEES:1080	Introduction to Environmental Science	4 s.h.	
SEES:1085	Fundamentals of Environmental Science	4 s.h.	
SEES:2050	Foundations of GIS	4 s.h.	
SEES:3070	Marine Ecosystems and Conservation	3 s.h.	
SEES:3080	Introduction to Oceanography	2 s.h.	
SEES:4010	Field Methods in Physical Geography	3 s.h.	
SIED:4102	Soc & Ed Applicatn of Earth Science & Envir Science	4 s.h.	
SIED:4110	Environmental Issues of the Colorado Rockies	4 s.h.	

Physics

Complete a minimum of 9 s.h. Both PHYS:1511 and PHYS:1512 are recommended.

Course	Course Title	Credit	Session/Substitute
PHYS:1200	Physics of Everyday Experience	3 s.h.	
PHYS:1511	College Physics I (Algebra-based)	4 s.h.	
PHYS:1512	College Physics II (Algebra-based)	4 s.h.	
PHYS:3811	Electricity and Magnetism I	3 s.h.	
ASTR:1070	Stars, Galaxies, and the Universe	3-4 s.h.	
ASTR:1085	Citizen Astronomy	4 s.h.	
ASTR:1771	Fundamental Astronomy I	4 s.h.	
SIED:4105	Soc & Ed Applicatns of Physical Sciences	4 s.h.	

Introductory Physics I and II (PHYS:1611 and PHYS:1612) or Physics I and II (PHYS:1701 and PHYS:1702) may be substitutes for College Physics I and II (PHYS:1511 and PHSY:1512).

Additional Information

This Program Guide is for planning and documentation of program completion. State requirements for licensure and endorsements are subject to change without notice; check with your advisor or the Office of Education Services for updated requirements. Course transfer and substitution may require syllabi or other documentation in addition to transcript. Revised 10/1/2025 version 4.3.

For additional information, admissions procedures, or advising referral, please contact Office of Student Services, College of Education, N201 Lindquist Center, Iowa City, IA 52242, 319-335-5359, ask-education@uiowa.edu, <https://education.uiowa.edu/>