SECONDARY EDUCATION: SCIENCE, BS

Degree Requirements

Requirements for Students Matriculating in or before Academic Year 2024-2025. Learn more about University Academic Regulation 3.1 (http://catalog.okstate.edu/university-academic-regulations/#matriculation).

Minimum Overall Grade Point Average: 2.50
Total Hours: 120

Code	Title	Hours
General Education Requirements		
English Composition		
See Academic Regulation 3.5 (http://catalog.okstate.edu/university-academic-regulations/#english-composition)		
ENGL 1113	Composition I [1]	3
or ENGL 1313	Critical Analysis and Writing I	
Select one of the following:		3
ENGL 1213	Composition II [1]	
ENGL 1413	Critical Analysis and Writing II [1]	
ENGL 3323	Technical Writing [1]	
American History & Government		
Select one of the following:		3
HIST 1103	Survey of American History	
HIST 1483	American History to 1865 (H)	
HIST 1493	American History Since 1865 (DH)	
POLS 1113	American Government	3
Analytical & Quantitative Thought (A)		
Select one course from the following:		3
MATH 1613	Trigonometry (A) (required for Biology emphasis)	
MATH 1813	Preparation for Calculus (A) (required for Chemistry, Earth Science and Physics emphasis)	
MATH 2144	Calculus I (A)	
Select one course from the following:		3
STAT 2013	Elementary Statistics (A)	
or STAT 4013	Statistical Methods I (A)	
STAT 4013	Statistical Methods I (A) (required for Physics emphasis)	
Humanities (H)		
Courses designated (H)		6
Natural Sciences (N)		
Must include one Laboratory Science (L) course		
CHEM 1314	Chemistry I (LN) [1, 2]	4
CHEM 1515	Chemistry II (LN)	5
Select one of the following options:		4
BIOL 1114	Introductory Biology (LN) [1, 2]	
BIOL 1113 & BIOL 1111	Introductory Biology (N) and Introductory Biology Laboratory (LN) [1,2]	
Social & Behavioral Sciences (S)		
Courses designated (S)		3
Hours Subtotal		**40**
Diversity (D) & International Dimension (I)		
May be completed in any part of the degree plan		
Select at least one Diversity (D) course		
Select at least one International Dimension (I) course		
College/Departmental Requirements		
Minimum grade of "C" or "P" in each course		
UNIV 1111	First Year Seminar (or other approved first year seminar course)	1
EDHS 1111	First Year Seminar Supplement	1
PHIL 3933	Creation and Evolution	3
Select 2-8 hours of electives to total 120 credit hours for degree		2-8
3 hours may need to be foreign language		
Hours Subtotal		**7-13**
Major Requirements		
Minimum GPA 2.50 with a minimum grade of "C" or "P" in each course in the emphasis area and those with a footnote of 1, 2.		
Select one area of emphasis: (p. 2)		35-41
Hours Subtotal		**35-41**
Professional Core Requirements		
Minimum GPA 2.50 with a minimum grade of "C' or "P" in each course		
SMED 1012	Inquiry Approaches to Teaching	2
SMED 3013	Knowing and Learning in Mathematics and Science	3
SMED 4023	Problem-Based Learning in Mathematics and Science [3]	3
SMED 4611	Authentic Research in the Science Classroom [3]	1
SMED 4613	Teaching the Nature of Science Through an Inquiry Approach [3]	3
SMED 4713	Teaching and Learning Science in the Secondary School [3]	3
SMED 4723	Senior Seminar in Secondary Mathematics and Science Education [3]	3
CIED 3313	Field Experience in the Secondary Schools	3
CIED 4133	Introduction to K-12 English Language Learners	3
CIED 4720	Internship in the Secondary Classroom [3]	6
SPED 3202	Educating Exceptional Learners (D)	2
Hours Subtotal		**32**
Total Hours		**120**

1 Minimum grade of "C"

2 Included in the Major Requirements when calculating Major GPA

3 Full admission to Professional Education required

Areas of Emphasis

Biology (40 Hours)

Code	Title	Hours
Biology Emphasis Requirements		
BIOL 1604	Animal Biology	4
BIOL 3023	General Genetics	3
BIOL 3034	General Ecology	4
BIOL 3204	Physiology	4
BIOL 4133	Evolution	3
CHEM 3013	Survey of Organic Chemistry	3
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
MICR 3033	Cell and Molecular Biology	3
PHYS 1114	College Physics I (LN)	4
or PHYS 2014	University Physics I (LN)	
PBIO 1404	Plant Biology (LN)	4
Select 3 hours of upper-division PBIO coursework		3

Chemistry (35 Hours)

Code	Title	Hours
Chemistry Emphasis Requirements		
CHEM 2113	Principles of Analytical Chemistry	3
CHEM 2122	Quantitative Analysis Laboratory	2
CHEM 3053	Organic Chemistry I	3
CHEM 3112	Organic Chemistry Laboratory	2
CHEM 3153	Organic Chemistry II	3
CHEM 3353	Descriptive Inorganic Chemistry	3
CHEM 3413	Physical Chemistry Applications	3
CHEM 4990	Special Problems in Chemistry	2
PHYS 1114	College Physics I (LN)	4
or PHYS 2014	University Physics I (LN)	
PHYS 1214	College Physics II (LN)	4
or PHYS 2114	University Physics II (LN)	
MATH 2153	Calculus II (A)	3
BIOC 3653	Survey of Biochemistry	3

Earth Science (39 Hours)

Code	Title	Hours
Earth Science Emphasis Requirements		
GEOL 1214	Introductory Geological Processes (LN)	4
GEOL 1224	Evolution of the Earth (LN)	4
GEOL 2464	Rocks and Minerals	4
GEOL 2773	Introduction to Planetary Geology (N)	3
GEOL 3014	Structural Geology	4
GEOL 3034	Principles of Stratigraphy and Sedimentology	4
GEOL 3503	Environmental Geology (N)	3
GEOL 4503	Introduction to Oceanography (N)	3
GEOG 3023	Climatology (N)	3
or GEOG 3033	Meteorology (N)	
ASTR 1023	Stars, Galaxies, Universe (N)	3
PHYS 1114	College Physics I (LN)	4
or PHYS 2014	University Physics I (LN)	

Physics (41 Hours)

Code	Title	Hours
Physics Emphasis Requirements		
PHYS 2014	University Physics I (LN)	4
PHYS 2114	University Physics II (LN)	4
PHYS 2203	University Physics III	3
PHYS 3013	Mechanics I	3
PHYS 3323	Modern Laboratory Methods I	3
PHYS 3513	Mathematical Physics	3
PHYS 3623	Modern Laboratory Methods II	3
PHYS 3713	Modern Physics	3
PHYS 4113	Electricity and Magnetism	3
MATH 2153	Calculus II (A)	3
MATH 2163	Calculus III	3
MATH 2233	Differential Equations	3
Select 3 hours of upper-division physics		3

Other Requirements

- 40 hours of upper-division coursework.
- Required for graduation and recommendation for Standard Certification:
  a. 2.50 Overall GPA;
  b. 2.50 GPA in Major Requirements and specified general education courses; and
  c. 2.50 GPA in Professional Core Requirements.
- The student must earn minimum grades of “C” or “P” in each course in the Major Requirements and Professional Core Requirements and must earn grades of “P” in all sections of observation courses and student teaching for recommendation for Certification.
- Students must demonstrate proficiency in a foreign language at the novice high level from among those languages identified by the Office of Educational Quality and Accountability. For clarification see OSU academic advisor. This proficiency can be demonstrated by presenting a high school transcript which demonstrates two years of study of a single foreign language with grades of “B” or better. Or, students may complete 3 hours college credit in a single language with no grade below C (or pass an advanced standing examination, College Level Examination Program (CLEP) exam, or Oral Proficiency Interview developed by the American Council on the Teaching of Foreign Languages, equivalent to 3 hours of college credit.) Students whose primary language is other than English may document proficiency in English as their second language with a score of 550 or more on the Test of English as a Foreign Language. Or, students may meet the requirement by transfer of documentation of meeting the foreign language competency from one of the teacher education programs in the State of Oklahoma approved by the Oklahoma State Regents for Higher Education.

Additional State/OSU Requirements

- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.

- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2030.

Example Plan of Study

Finish in Four Plan of Study

The plan below is an **example** of how students can successfully complete degree requirements in four years. This suggested class schedule plan may be used as a guide and can be adjusted based on individual needs. Students are required to meet with an academic advisor prior to enrollment each semester to plan their class schedule, and students are ultimately responsible for completing all degree requirements.

Biology

Course	Title	Hours
Freshman		
Fall		
UNIV 1111	First Year Seminar	1
ENGL 1113 or ENGL 1313	Composition I or Critical Analysis and Writing I	3
SMED 1012	Inquiry Approaches to Teaching	2
BIOL 1113 & BIOL 1111 or BIOL 1114	Introductory Biology (N) or Introductory Biology (LN)	4
MATH 1813	Preparation for Calculus (A)	3
HIST 1103 or HIST 1483 or HIST 1493	Survey of American History or American History to 1865 (H) or American History Since 1865 (DH)	3
	Hours	**16**
Spring		
EDHS 1111 or ENGL 1413 or ENGL 3323	First Year Seminar Supplement or Critical Analysis and Writing II or Technical Writing	1
ENGL 1213 or ENGL 1413 or ENGL 3323	Composition II or Critical Analysis and Writing II or Technical Writing	3
CHEM 1314	Chemistry I (LN)	4
BIOL 1604	Animal Biology	4
POLS 1113	American Government	3
	Hours	**15**
Sophomore		
Fall		
CHEM 1515	Chemistry II (LN)	5
PBIO 1404	Plant Biology (LN)	4
SPED 3202	Educating Exceptional Learners	2
PHIL 3933	Creation and Evolution	3
3 Hour General Education Humanities (H)		3
	Hours	**17**
Spring		
PHYS 1114 or PHYS 2014	College Physics I (LN) or University Physics I (LN)	4
MICR 2123	Introduction to Microbiology	3
MICR 2132	Introduction to Microbiology Laboratory	2
SMED 3013	Knowing and Learning in Mathematics and Science	3
3 Hours General Education (S)		3
	Hours	**15**
Junior		
Fall		
BIOL 3204	Physiology	4
MICR 3033	Cell and Molecular Biology	3
CIED 3313	Field Experience in the Secondary Schools	3
3 Hours Upper-Division PBIO		3
3 Hours General Education		3
	Hours	**16**
Spring		
BIOL 3023	General Genetics	3
BIOL 4133	Evolution	3
CHEM 3013	Survey of Organic Chemistry	3
SMED 4611	Authentic Research in the Science Classroom	1
SMED 4613	Teaching the Nature of Science Through an Inquiry Approach	3
CIED 4133	Introduction to K-12 English Language Learners	3
	Hours	**16**
Senior		
Fall		
BIOL 3034	General Ecology	4
STAT 4013 or STAT 2013	Statistical Methods I (A) or Elementary Statistics (A)	3
SMED 4023	Problem-Based Learning in Mathematics and Science	3
SMED 4713	Teaching and Learning Science in the Secondary School	3
3 Hours General Education		3
	Hours	**16**
Spring		
CIED 4720	Internship in the Secondary Classroom	6
SMED 4723	Senior Seminar in Secondary Mathematics and Science Education	3
	Hours	**9**
	Total Hours	**120**

Chemistry

Course	Title	Hours
Freshman		
Fall		
UNIV 1111	First Year Seminar	1
ENGL 1113 or ENGL 1313	Composition I or Critical Analysis and Writing I	3
SMED 1012	Inquiry Approaches to Teaching	2
CHEM 1314	Chemistry I (LN)	4
MATH 2144	Calculus I (A)	4
HIST 1103 or HIST 1483 or HIST 1493	Survey of American History or American History to 1865 (H) or American History Since 1865 (DH)	3
	Hours	**17**
Spring		
EDHS 1111	First Year Seminar Supplement	1
ENGL 1213 or ENGL 1413 or ENGL 3323	Composition II or Critical Analysis and Writing II or Technical Writing	3
CHEM 1515	Chemistry II (LN)	5
BIOL 1113 & BIOL 1111 or BIOL 1114	Introductory Biology (N) or Introductory Biology (LN)	4
MATH 2153	Calculus II (A)	3
	Hours	**16**

Sophomore		
Fall		
CHEM 3053	Organic Chemistry I	3
PHYS 1114 or PHYS 2014	College Physics I (LN) or University Physics I (LN)	4
SPED 3202	Educating Exceptional Learners	2
POLS 1113	American Government	3
3 Hours Course Designated (H, DH, or HI)		3
	Hours	**15**
Spring		
PHYS 1214 or PHYS 2114	College Physics II (LN) or University Physics II (LN)	4
CHEM 3153	Organic Chemistry II	3
SMED 3013	Knowing and Learning in Mathematics and Science	3
CHEM 3112	Organic Chemistry Laboratory	2
3 Hours General Education (S)		3
	Hours	**15**
Junior		
Fall		
CHEM 2113	Principles of Analytical Chemistry	3
CHEM 2122	Quantitative Analysis Laboratory	2
CHEM 4990	Special Problems in Chemistry	1
PHIL 3933	Creation and Evolution	3
CIED 3313	Field Experience in the Secondary Schools	3
3 Hours General Education		3
	Hours	**15**
Spring		
CHEM 3353 or CHEM 3363	Descriptive Inorganic Chemistry or Bioinorganic Chemistry	3
CHEM 3413	Physical Chemistry Applications	3
CHEM 4990	Special Problems in Chemistry	1
SMED 4611	Authentic Research in the Science Classroom	1
SMED 4613	Teaching the Nature of Science Through an Inquiry Approach	3
CIED 4133	Introduction to K-12 English Language Learners	3
3 Hours Elective		3
	Hours	**17**
Senior		
Fall		
BIOC 3653	Survey of Biochemistry	3
STAT 4013 or STAT 2013	Statistical Methods I (A) or Elementary Statistics (A)	3
SMED 4023	Problem-Based Learning in Mathematics and Science	3
SMED 4713	Teaching and Learning Science in the Secondary School	3
3 Hours General Education		3
1 Hour Elective		1
	Hours	**16**
Spring		
CIED 4720	Internship in the Secondary Classroom	6
SMED 4723	Senior Seminar in Secondary Mathematics and Science Education	3
	Hours	**9**
	Total Hours	**120**

Physics

Course	Title	Hours
Freshman		
Fall		
UNIV 1111	First Year Seminar	1
ENGL 1113 or ENGL 1313	Composition I or Critical Analysis and Writing I	3
SMED 1012	Inquiry Approaches to Teaching	2
CHEM 1314	Chemistry I (LN)	4
MATH 2144	Calculus I (A)	4
HIST 1103 or HIST 1483 or HIST 1493	Survey of American History or American History to 1865 (H) or American History Since 1865 (DH)	3
	Hours	**17**
Spring		
EDHS 1111	First Year Seminar Supplement	1
ENGL 1213 or ENGL 1413 or ENGL 3323	Composition II or Critical Analysis and Writing II or Technical Writing	3
PHYS 2014	University Physics I (LN)	4
CHEM 1515	Chemistry II (LN)	5
MATH 2153	Calculus II (A)	3
	Hours	**16**
Sophomore		
Fall		
PHYS 2114	University Physics II (LN)	4
BIOL 1113 & BIOL 1111 or BIOL 1114	Introductory Biology (N) or Introductory Biology (LN)	4
MATH 2163	Calculus III	3
SPED 3202	Educating Exceptional Learners	2
POLS 1113	American Government	3
	Hours	**16**
Spring		
PHYS 2203	University Physics III	3
PHYS 3513	Mathematical Physics	3
MATH 2233	Differential Equations	3
SMED 3013	Knowing and Learning in Mathematics and Science	3
3 Hours Course Designated (H, DH, or HI)		3
	Hours	**15**
Junior		
Fall		
PHYS 3013	Mechanics I	3
PHYS 3323	Modern Laboratory Methods I	3
PHYS 3713	Modern Physics	3
PHIL 3933	Creation and Evolution	3
CIED 3313	Field Experience in the Secondary Schools	3
	Hours	**15**
Spring		
PHYS 3623	Modern Laboratory Methods II	3
STAT 4013	Statistical Methods I (A)	3
SMED 4611	Authentic Research in the Science Classroom	1
SMED 4613	Teaching the Nature of Science Through an Inquiry Approach	3
CIED 4133	Introduction to K-12 English Language Learners	3
3 Hours General Education (S)		3
	Hours	**16**
Senior		
Fall		
PHYS 4113	Electricity and Magnetism	3
SMED 4023	Problem-Based Learning in Mathematics and Science	3
SMED 4713	Teaching and Learning Science in the Secondary School	3
3 Hours Upper-Division PHYS		3
4 Hours Electives		4
	Hours	**16**
Spring		
CIED 4720	Internship in the Secondary Classroom	6

SMED 4723	Senior Seminar in Secondary Mathematics and Science Education	3
	Hours	**9**
	Total Hours	**120**

Earth Science

Course	Title	Hours
Freshman		
Fall		
UNIV 1111	First Year Seminar	1
SMED 1012	Inquiry Approaches to Teaching	2
BIOL 1113 & BIOL 1111 or BIOL 1114	Introductory Biology (N) or Introductory Biology (LN)	4
GEOL 1214 or GEOL 1114	Introductory Geological Processes (LN) or Physical Geology (LN)	4
MATH 2144	Calculus I (A)	4
	Hours	**15**
Spring		
EDHS 1111	First Year Seminar Supplement	1
ENGL 1113 or ENGL 1313	Composition I or Critical Analysis and Writing I	3
CHEM 1314	Chemistry I (LN)	4
GEOL 1224	Evolution of the Earth (LN)	4
ASTR 1023	Stars, Galaxies, Universe (N)	3
SPED 3202	Educating Exceptional Learners	2
	Hours	**17**
Sophomore		
Fall		
ENGL 1213 or ENGL 1413 or ENGL 3323	Composition II or Critical Analysis and Writing II or Technical Writing	3
CHEM 1515	Chemistry II (LN)	5
GEOL 2464	Rocks and Minerals	4
HIST 1103 or HIST 1483 or HIST 1493	Survey of American History or American History to 1865 (H) or American History Since 1865 (DH)	3
	Hours	**15**
Spring		
PHYS 1114 or PHYS 2014	College Physics I (LN) or University Physics I (LN)	4
GEOG 3023 or GEOG 3033	Climatology (N) or Meteorology (N)	3
GEOL 3503	Environmental Geology (N)	3
SMED 3013	Knowing and Learning in Mathematics and Science	3
POLS 1113	American Government	3
	Hours	**16**
Junior		
Fall		
GEOL 3014	Structural Geology	4
GEOL 2773	Introduction to Planetary Geology (N)	3
PHIL 3933	Creation and Evolution	3
CIED 3313	Field Experience in the Secondary Schools	3
3 Hours Course Designated (H, DH, or HI)		3
	Hours	**16**
Spring		
GEOL 3034	Principles of Stratigraphy and Sedimentology	4
STAT 4013 or STAT 2013	Statistical Methods I (A) or Elementary Statistics (A)	3
SMED 4611	Authentic Research in the Science Classroom	1
SMED 4613	Teaching the Nature of Science Through an Inquiry Approach	3
CIED 4133	Introduction to K-12 English Language Learners	3
3 Hours General Education (S)		3
	Hours	**17**
Senior		
Fall		
GEOL 4503	Introduction to Oceanography (N)	3
SMED 4023	Problem-Based Learning in Mathematics and Science	3
SMED 4713	Teaching and Learning Science in the Secondary School	3
3 Hours Elective		3
3 Hours Elective		3
	Hours	**15**
Spring		
CIED 4720	Internship in the Secondary Classroom	6
SMED 4723	Senior Seminar in Secondary Mathematics and Science Education	3
	Hours	**9**
	Total Hours	**120**

Zoology

Course	Title	Hours
Freshman		
Fall		
UNIV 1111	First Year Seminar	1
ENGL 1113 or ENGL 1313	Composition I or Critical Analysis and Writing I	3
SMED 1012	Inquiry Approaches to Teaching	2
BIOL 1113 & BIOL 1111 or BIOL 1114	Introductory Biology (N) or Introductory Biology (LN)	4
MATH 1813	Preparation for Calculus (A)	3
HIST 1103 or HIST 1483 or HIST 1493	Survey of American History or American History to 1865 (H) or American History Since 1865 (DH)	3
	Hours	**16**
Spring		
EDHS 1111	First Year Seminar Supplement	1
ENGL 1213 or ENGL 1413 or ENGL 3323	Composition II or Critical Analysis and Writing II or Technical Writing	3
CHEM 1314	Chemistry I (LN)	4
BIOL 1604	Animal Biology	4
POLS 1113	American Government	3
	Hours	**15**
Sophomore		
Fall		
CHEM 1515	Chemistry II (LN)	5
PBIO 1404	Plant Biology (LN)	4
SPED 3202	Educating Exceptional Learners	2
PHIL 3933	Creation and Evolution	3
3 Hours Course Designated (H, DH, or HI)		3
	Hours	**17**
Spring		
PHYS 1114 or PHYS 2014	College Physics I (LN) or University Physics I (LN)	4
BIOL 3104	Invertebrate Zoology	4
SMED 3013	Knowing and Learning in Mathematics and Science	3
3 Hours General Education (S)		3
	Hours	**14**
Junior		
Fall		
BIOL 3023	General Genetics	3
MICR 3033	Cell and Molecular Biology	3
BIOL 3114	Vertebrate Zoology	4

CIED 3313	Field Experience in the Secondary Schools	3
3 Hours General Education (A, H, N, or S)		3
	Hours	**16**
Spring		
BIOL 3204	Physiology	4
BIOL 4133	Evolution	3
CHEM 3013	Survey of Organic Chemistry	3
SMED 4611	Authentic Research in the Science Classroom	1
SMED 4613	Teaching the Nature of Science Through an Inquiry Approach	3
CIED 4133	Introduction to K-12 English Language Learners	3
	Hours	**17**
Senior		
Fall		
BIOL 3034	General Ecology	4
STAT 4013 or STAT 2013	Statistical Methods I (A) or Elementary Statistics (A)	3
SMED 4023	Problem-Based Learning in Mathematics and Science	3
SMED 4713	Teaching and Learning Science in the Secondary School	3
3 Hours Elective		3
	Hours	**16**
Spring		
CIED 4720	Internship in the Secondary Classroom	6
SMED 4723	Senior Seminar in Secondary Mathematics and Science Education	3
	Hours	**9**
	Total Hours	**120**