

Bachelor of Arts in Education

**GENERAL SCIENCE – SECONDARY 5-12**

**Endorsement Options in Chemistry, Biology, Earth Science, and Physics**

\*Major must be accompanied by the professional preparation program in secondary education through Woodring College of Education

Student Name: \_\_\_\_\_  
 Student Number: W \_\_\_\_\_  
 Intended Quarter/Year of Graduation: \_\_\_\_\_/\_\_\_\_\_

SMATE ADVISING  
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<b>General Science – Secondary 5-12 Major Requirements</b>					XA01 (90-101 Credits)
✓	Course	Title	Cr	Prerequisites	Grade
	PHYS 114, <i>and</i> PHYS 115, <i>and</i> PHYS 116 <i>--OR--</i> PHYS 121, <i>and</i> PHYS 131, <i>and</i> PHYS 122, <i>and</i> PHYS 132, <i>and</i> PHYS 123, <i>and</i> PHYS 133	Principles of Physics I  Principles of Physics II  Principles of Physics III  Physics w/ Calculus I  Physics w/ Calculus I Lab  Physics w/ Calculus II  Physics w/ Calculus II Lab  Electricity and Magnetism  Electricity and Magnetism Lab	5  5  5  4  1  4  1  4  1	- Math 115  - Phys 114  - Phys 115  - Math 124 (or concurrent), Must be taken with Phys 131  - Phys 121; Math 124; Math 125 (or concurrent); Must be taken with Phys 132  - Phys 122; Math 125; Math 224 (or concurrent); Must be taken with Phys 133	
	CHEM 121, <i>and</i> CHEM 122, <i>and</i> CHEM 251	General Chemistry I  General Chemistry II  Elementary Organic Chemistry	5  5  5	- Math 114 or equiv. on Intermed. Algebra placement. - Chem 121  - Chem 115 or 121	
	BIOL 204, <i>and</i> BIOL 205, <i>and</i> BIOL 206	Intro to Evolution, Ecology, and Biodiversity  Intro to Cellular and Molecular Biology  Intro to Organismal Biology	4  5  5	- Chem 121 (or concurrent)  - Biol 204; Chem 121; Chem 122 (or concurrent) - Biol 205, Chem 122; Chem 123 (or concurrent)	
	GEOL 211, <i>and</i> GEOL 212	Physical Geology  Historical Geology	5  4	- Math 114 or higher and HS or college Chemistry - Geol 211	
	ASTR 103, <i>or</i> GEOL 252, <i>or</i>	Astronomy for the Liberal Arts  The Earth and Its Weather	4  4	- Math 102  - Geol 101, Chem101, or Phys101	

EGEO 331, <i>or</i> GEOL 340	Climatology  Geological Oceanography	4  3	- Egeo 203; Phys 101 or 114 recommended - Geol 211, Chem 121, 122 or equiv.
SCED 370	Science and Society	3	
SCED 491,  <i>and</i>  SCED 492	Methods in Secondary Education for Science Teachers  Teaching Science for the Secondary School	5  4	- Admission to the secondary teaching program and a major or concentration in natural sciences; SEC 431, 532 - Sced 491

\*\* 22-32 Credits of additional electives are required in a single scientific discipline to meet state endorsement standards for that discipline.

**Endorsement options in Chemistry, Biology, Earth Science, and Physics are listed below.**

Total Credits Remaining for Major \_\_\_\_\_

## ENDORSEMENT OPTIONS

\*Endorsement plans to accompany the General Science – Secondary 5-12 Major

<b>Biology</b> (28 credits minimum)					
✓	Course	Title	Cr	Prerequisites	Grade
	BIOL 321	Genetics	4	- Biol 204, 205, 206	
	BIOL 319 <i>or</i> BIOL 323	Cell Biology  Cell and Molecular Biology	3  3	- Biol 204, 205, 206 or perm.; Chem 251 or 351 - Biol 204, 205, 206; Chem 251 or Chem 351 and Chem 352	
	BIOL 322 <i>or</i> BIOL 324	Genetics Lab  Methods in Molecular Biology	2  3	- Biol 321 (or concurrent) - Biol 319 or 323 (or concurrent)	
	BIOL 325 <i>and</i> BIOL 326	Ecology  Ecology Lab	3  2	- Biol 204, 205, 206 - Concurrent with Biol 325	
	BIOL 432	Principles of Organic Evolution	4	- Biol 321	
	BIOL 450 <i>-or-</i> BIOL 451 <i>and</i> BIOL 453 <i>-or-</i> BIOL 452 <i>-or-</i> BIOL 479	Plant Anatomy  Plant Growth and Development  Investigations in Plant Dev.  Systematic Biology  Plant Physiology	5  3  3  5  5	- Biol 206 - Biol 206 - Biol 206; Co-Req. Biol 451 - Biol 206 - Biol 206; Chem 251 or Chem 351 and Chem 352	

	BIOL 460 <i>-or-</i> BIOL 465 <i>-or-</i> BIOL 467 <i>and</i> BIOL 468 <i>-or-</i> BIOL 469 <i>-or-</i> BIOL 482 <i>and</i> BIOL 484	Invertebrate Zoology  Vertebrate Zoology  Comparative Vertebrate Physiology Comparative Vertebrate Physiology Lab Comparative Vertebrate Anatomy & Embryology Developmental Biology of Animals Developmental Biology Lab	5  5  3  3  5  3  3	- Biol 204, 205, 206  - Biol 206, 325, or perm.  - Biol 206  - Biol 206, Biol 467 (or concurrent)  - Biol 206  - Biol 321; Biol 319 or 323 or 471  - Biol 482 (or concurrent)	
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Total Credits Remaining for Biology Endorsement \_\_\_\_\_

<b>Chemistry</b> (28 credits minimum)					
✓	Course	Title	Cr	Prerequisites	Grade
	CHEM 123	General Chemistry III	4	- Chem 122	
	CHEM 351 <i>and</i> CHEM 352 <i>and</i> CHEM 353	Organic Chemistry I  Organic Chemistry II  Organic Chemistry III	4  4  3	- Chem 123 (or concurrent)  - Chem 351  - Chem 352	
	CHEM 354 <i>or</i> CHEM 355	Organic Chemistry Lab I  Organic Chemistry Lab II	2  2	- Chem 352 (or concurrent)  - Chem 353 (or concurrent), and Chem 354	
	CHEM 333	Analytical Chemistry	5	- Chem 123	
	CHEM 375 <i>or</i> CHEM 471	Elements of Biochemistry  Biochemistry (*same as Biol 471)	4  3	- Chem 251, or Chem 351, 352, and 353  - Chem 123; 353 (or concurrent); Biol 205; Chem 333 recommend.	
	CHEM 461	Physical Chemistry I	4	- Math 124, 125, or 128; Math 224; 1 year college physics; 1 year general chemistry	

Total Credits Remaining for Chemistry Endorsement \_\_\_\_\_

<b>Earth Science</b> (29 credits minimum)					
✓	Course	Title	Cr	Prerequisites	Grade
	GEOL 214	Environmental Geology	3	- Geol 101 or 211	
	GEOL 311 <i>-or-</i> GEOL 306 <i>and</i> GEOL 406	Earth Materials  Mineralogy  Petrology	4  4  4	- Geol 211; Chem 121  - Geol 211; Chem 121, 122  - Geol 306	
	GEOL 310	Geomorphology	5	- Geol 211; Math 114 or higher	

	GEOL 340	Geological Oceanography	3	- Geol 211; Chem 121, 122	
	EGEO 331 <i>or</i> GEOL 252	Climatology  The Earth and Its Weather	4  4	- Egeo 203; Phys 101 or 114 recommended - Geol 101, Chem 101, Phys 101	
	ASTR 103 <i>or</i> ASTR 315	Astronomy for the Liberal Arts  General Astron.: Solar System	4  4	- Math 102 - Phys 114 or equiv.	
	Electives –	(choose two):			
	GEOL 309	Volcanology	3	- Geol 311	
	GEOL 314	Engineering Geology	3	- Geol 211, Phys 121	
	GEOL 315	Minerals, Energy, and Society	4	- Geol 101 or 211	
	GEOL 316	Research in Marine Paleontology	4	- Geol 212	
	GEOL 318	Structural Geology	5	- Geol 211, 212; Phys 114 or 121	
	GEOL 352	Intro to Geophysics	4	- Geol 318; Phys 121	
	GEOL 400	Independent Study	1-15		
	GEOL 407	Advanced Petrography	3	- Geol 406	
	GEOL 410a	Field Methods and Theory	6	- Geol 211, 212, 318, 407	
	GEOL 410b	Geological Mapping	6	- Take concurrently or immediately following Geol 410a	
	GEOL 414	Geology of Washington	3-5	- Geol 101 or 211	
	GEOL 415	Stratigraphy and Sedimentation	4	- Geol 212, 306, 310	
	GEOL 430	Image Interpretation	3	- Geol 310; Geol 318 recommend.	
	GEOL 440	Glacial Geology	4	- Geol 310	

Total Credits Remaining for Earth Science Endorsement\_\_\_\_\_

<b>Physics</b> (22 credits minimum)					
✓	Course	Title	Cr	Prerequisites	Grade
	PHYS 223	Waves and Optics	3	- Phys 123; Math 224	
	PHYS 233	Waves and Optics Laboratory	1	- Concurrent with Phys 223	
	PHYS 224	Modern Physics I	4	- Phys 223	
	PHYS 225	Modern Physics II	3	- Phys 224	
	PHYS 322	Fundamentals of Electronics	4	- Phys 123, Co-req. Phys 325	
	PHYS 323	Analog and Digital Electronics	4	- Phys 322	
	PHYS 491	Senior Project in Experimental Physics	3	- Phys 323, 392; senior status; permission of instructor	

Total Credits Remaining for Physics Endorsement\_\_\_\_\_