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# The School of Education

#### About the School

The School of Education is the umbrella for:

- Teacher education and its undergraduate and graduate programs, which lead to B.S. and M.S. degrees and Pennsylvania State Teacher Certification for grades kindergarten through grade 12, and graduate Instructional Technology Specialist and school principal certification programs .
- The Drexel Center for the Prevention of School Violence, which is committed to reducing violence in schools by assisting schools in designing, implementing, and evaluating a creative school violence prevention model of pedagogy based on current research in creativity as opposed to the prevalent punitive focus on discipline.
- Ph.D. degree program in Educational Leadership Development and Learning Technologies, and School Superintendant certification.

#### **Title II Reporting**

In compliance with Title II, Section 207, of the Higher Education Act of 1998 and General Standards for the Institutional Preparation of Professional Educators (Chapter 354), pass rates on the Praxis Series Exam for students prepared as teachers by Drexel University are available at the School of Education.



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# The School of Education

#### About the Curriculum

Certification for classroom instruction is available in:

- <u>Elementary education</u> (emphasis on mathematics, science, and technology)
- Secondary education (grades 7-12)
  - о <u>Biology</u>
  - Chemistry
  - Earth and Space Science
  - o General Science
  - o <u>Mathematics</u>
  - o Physics
  - o Library Science
- Secondary education (grades K-12)
  - o Environmental Educaton

Students may acquire certification in more than one subject area.

Teacher education uses University-wide resources to prepare fully qualified mathematics and science teachers at both the elementary and secondary levels. It applies the microcomputer in teaching and learning, and it is the only such program in the country to incorporate a six-month paid internship in industry related to the student's area of certification (for example, a prospective chemistry teacher might co-op at a chemical company).

Because the program requires that students have a B average in content courses needed for certification, the student's content coursework is evaluated at the end of the sophomore year for formal admittance into the Teacher Preparation program. All students are expected to meet the B average requirement in content coursework before beginning pre-student field teaching experience. Students who fail to meet this requirement must take additional content coursework until the B average is met.

Students participate in two periods of direct teaching experience. The first period, in the junior year, consists of a ten-week field experience (EDUC 320 WI) through which students participate in limited teaching; on-campus coursework accompanies the field experience (EDUC 325 and EDUC 326 WI). In the senior year, students complete the 12-week student-teaching experience (EDUC 412 WI) required for certification. Students must receive a grade of at least B in student teaching and in all pedagogy coursework to be recommended for certification.

Students pursuing the appropriate majors in the College of Arts and Sciences may also complete the requirements for certification within their area of study. For more information, contact the Program Coordinator for the School of Education at 215-895-6770.

#### Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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# The School of Education

#### **Combination Certifications**

Combination certifications are available. Sample combinations include:

- Biology certification, with courses for additional certification in chemistry.
- Chemistry certification, with courses for additional certification in biology.
- Earth and space science certification, with courses for additional certification in chemistry.
- Earth and space science certification, with courses for additional certification in physics.
- Mathematics certification, with courses for additional certification in physics
- Physics certification, with courses for additional certification in mathematics.

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### **Elementary Education Certification**

Bachelor of Science Degree: 180.0 Credits

#### **Degree Requirements**

General educ	ation requirements	Credits
COM 111	Techniques of Speaking	3.0
SOC 335	Sociology of Education	3.0
ECON 201	Economics I	4.0
HIST 280	History of Science I	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
EDUC 475	Special Studies in Teacher Education: Analysis	3.0
PSY 101	General Psychology	3.0
PSY 320	Educational Psychology	3.0
UNIV 101	The Drexel Experience	2.0
	English elective course between 200-329	3.0
	Art or music elective	3.0
	Nutrition elective*	3.0
	Professional or free electives	36.0

\*NFS 101 is the recommended Nutrition elective.

One of the fo	ollowing courses	3.0
HIST 201	U.S. History to 1815	
HIST 202	U.S. History 1815 -1900	
<u>HIST 203</u>	The United States Since 1900	

Science requirements		Credits
BIO 102	Bioscience I	4.0
BIO 104	Bioscience II	4.0
CHEM 111	General Chemistry I	

<u>PHYS 103</u>	General Physics I	4.0
CHEM 112	General Chemistry II	
or		
<u>PHYS 104</u>	General Physics II	4.0
ENVR 260	Environmental Science and Society	3.0
PHYS 131 WI	Survey of the Universe	3.0
<u>NFS 101</u>	Introduction to Nutrition and Foods	3.0

Education requirements		Credits
EDUC 105	Freshman Seminar	3.0
EDUC 112	Integrative Instruction	3.0
EDUC 114	Science Teaching Methods	3.0
EDUC 205	Sophomore Seminar	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
EDUC 305	Junior Seminar	2.0
EDUC 310	Computer Applications in Teaching	3.0
EDUC 320 WI	Professional Studies in Instruction	9.0
EDUC 322	Evaluation of Instruction	4.0
EDUC 323 WI	Diagnostic Teaching	4.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 326 WI	Language Arts Processes	3.0
EDUC 327	Learning Disabilities	3.0
EDUC 405	Senior Seminar	2.0

### Student teaching experience

EDUC 412 WI	Student Teaching	12.0
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### Suggested Professional Electives

Bioscience		Credits
BIO 201	Human Physiology I	4.0
BIO 203	Human Physiology II	4.0
BIO 221	Microbiology	5.0
BIO 244	Genetics I	3.0
BIO 254	Invertebrate Morphology and Physiology	5.0
BIO 256	Vertebrate Morphology and Physiology	5.0
BIO 260	Plant Biology I: Evolution and Diversity	4.0
BIO 262	Plant Biology II: Morphology and Physiology	4.0
BIO 235	Terrestrial Ecology	5.0

Chemistry		Credits
CHEM 103	General Chemistry III	5.0
CHEM 230	Quantitative Analysis	3.0
CHEM 231 WI	Quantitative Analysis Laboratory	2.0
CHEM 241	Organic Chemistry I	4.0
<u>CHEM 242</u>	Organic Chemistry II	4.0

Nutrition and	foods	Credits
<u>NFS 200 WI</u>	Nutrition I: Principles of Nutrition	4.0

Physics		Credits
PHEV 145	Weather 1: Climate and Global Change	4.0
PHEV 146	Weather 2: Analysis and Forecasting	4.0
PHYS 106 WI	The Physics of High Fidelity	3.0

#### Writing-Intensive Course Requirements

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#### **Recommended Plan Of Study**

#### BS Education 4 YR UG Co-op Concentration /Elementary Education

Term 1		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 310	Computer Applications in Teaching	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 101	Introduction to Analysis I	4.0
PSY 101	General Psychology I	3.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 102	Introduction to Analysis II	4.0
<b>UNIV 101</b>	The Drexel Experience	1.0
HIST 201	US History to 1815	3.0
or		
HIST 202	US History, 1815-1900	3.0
or		
HIST 203	US History Since 1900	3.0
	Term Credits	15.0
_		•
Term 3		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 112	Integrative Instruction	3.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 475	Special Studies in Teacher Education: Analysis	3.0
ENGL 103	Analytical Writing and Reading	3.0
-	Art or music elective	3.0
	Term Credits	16.0
Term 4		Credits
BIO 102	Biology I: Cells and Tissues	4.0
EDUC 205	Sophomore Seminar	4.0
EDUC 326	Language Arts Processes	3.0
HIST 280	History of Science I	3.0
NFS 101	Introduction to Nutrition and Foods	3.0
	Free elective	
•		3.0
	Term Credits	17.0
Term 5		Credits
BIO 104	Biology II: Growth and Heredity	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
-	English (ENGL) course between 200-329	3.0
	Term Credits	14.0
		14.0
Term 6		Credits
COM 111	Principles of Communication	3.0
ECON 201	Economics I	4.0
EDUC 205	Sophomore Seminar	1.0
PSY 320	Educational Psychology	3.0
		5.0

	Term Credits	
		17.
Term 7		Credit
EDUC 305	Junior Seminar	1.
EDUC 327	Learning Disabilities	3.
PHYS 131	Survey of the Universe	3.
<u>CHEM 111</u> Or	General Chemistry I	4.
PHYS 103	General Physics I	4.
	Free elective	3.
	Term Credits	14.
Term 8		Credit
EDUC 305	Junior Seminar	1.
EDUC 322	Evaluation of Instruction	4.
ENVR 260	Environmental Science and Society I	3.
SOC 335	Sociology of Education I	3.
CHEM 112	General Chemistry II	4.
or		
PHYS 104	General Physics II	4.
	Term Credits	15.
Term 9		Credit
EDUC 114	Science Teaching Methods	3.
EDUC 320	Professional Studies in Instruction	9.
EDUC 325	Multimedia in Instructional Design	3.
	Term Credits	15.
Term 10		Credit
EDUC 323	Diagnostic Teaching	4.
EDUC 405	Senior Seminar	1.
	Free electives	9.
	Term Credits	14.
Term 11		Credit
EDUC 412	Student Teaching	12.
	Term Credits	12.
Term 12		Credit
EDUC 405	Senior Seminar	1.
	Free electives	15.
	Term Credits	16.
	Total Credits (minimum)	180.



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# **Biology Certification**

Bachelor of Science: 185.5 credits Certification is for grades 7 - 12

#### **Degree Requirements**

General educ	ation requirements	Credits
HIST 280	History of Science I	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology	3.0
PSY 320	Educational Psychology	3.0
UNIV 101	The Drexel Experience	2.0
	English elective course between 200-329	3.0

Science requirements		Credits
BIO 121	Physiology and Nutrition	4.5
BIO 122	Cells and Genetics	4.5
BIO 123	Organismal Diversity and Ecology	4.5
BIO 201	Human Psychology I	4.0
BIO 214	Principles of Cell Biology	3.0
BIO 215	Techniques of Cell Biology	2.5
BIO 218	Principles of Molecular Biology	3.0
BIO 219	Techniques of Molecular Biology	2.5
BIO 270	Developmental Biology	3.0
BIO 271	Developmental Biology Laboratory	2.0
BIO 404	Structure and Function of Biomolecules	4.0
BIO 306	Biochemistry Laboratory	2.0

<u>CHEM 101</u>	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 241	Organic Chemistry I	4.0
CHEM 242	Organic Chemistry II	4.0
CHEM 244	Organic Chemistry I Laboratory	3.0
CHEM 245	Organic Chemistry Laboratory II	3.0
ENVR 284 WI	Ecology I: Physiological and Population Ecology	5.0
ENVR 460	Evolution	3.0
PHYS 152	Physics for Life Sciences I	4.5
PHYS 153	Physics for Life Sciences II	4.5

Credits

#### Education requirements

#### **EDUC 105 Freshman Seminar** 3.0 EDUC 112 Integrative Instruction 3.0 EDUC 114 **Science Teaching Methods** 3.0 **EDUC 205** Sophomore Seminar 1.0 **EDUC 216 Diversity and Today's Teacher** 3.0 **EDUC 218** 3.0 Math: Methods and Content EDUC 301 Introduction to Personalized System of Instruction 3.0 **EDUC 305 Junior Seminar** 1.0 **EDUC 310 Computer Applications in Teaching** 3.0 EDUC 320 WI **Professional Studies in Instruction** 9.0 **EDUC 322 Evaluation of Instruction** 4.0 **EDUC 323 WI** 4.0 **Diagnostic Teaching** EDUC 324 **Current Research in Curriculum and Instruction** 3.0 EDUC 325 **Multimedia in Instructional Design** 3.0 **EDUC 326 WI** Language Arts Processes 3.0 EDUC 327 Learning Disabilities 3.0 **EDUC 405** Senior Seminar 1.0

#### Student teaching experience

#### Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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#### **Recommended Plan Of Study**

#### BS Education 4 YR UG Co-op Concentration /Biological Sciences

Term 1		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 310	Computer Applications in Teaching	
ENGL 101		3.0
MATH 121	Expository Writing and Reading	3.0
	Calculus I	4.0
PSY 101	General Psychology I	3.0
<u>UNIV 101</u>	The Drexel Experience	1.0
	Term Credits	15.0
Term 2		Credits
CHEM 101	General Chemistry I	3.5
EDUC 105	Freshman Seminar	1.0
EDUC 301	Introduction to Personalized Systems of Instruction	3.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 122	Calculus II	4.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	15.5
	Term Credits	15.5
Term 3		Credits
CHEM 102	General Chemistry II	4.5
EDUC 105	Freshman Seminar	1.0
EDUC 112	Integrative Instruction	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 123	Calculus III	4.0
	Term Credits	15.5
		10.0
Term 4		Credits
CHEM 241	Organic Chemistry I	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 326	Language Arts Processes	3.0
HIST 280	History of Science I	3.0
BIO 121	Physiology of Nutrition	4.5
	Term Credits	15.5
		10.0
Term 5		Credits
BIO 122	Cells and Genetics	4.5
CHEM 242	Organic Chemistry II	4.0
<b>CHEM 244</b>	Organic Chemistry Lab I	3.0
EDUC 205	Sophomore Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
	Term Credits	18.5
_		
Term 6 BIO 123	One of the Diversity & Feelense	Credits
_	Organismal Diversity & Ecology	4.5
CHEM 245	Organic Chemistry Lab II	3.0
EDUC 205	Sophomore Seminar	1.0
PHIL 251	Ethics	3.0
<u>PSY 320</u>	Educational Psychology	3.0
	Term Credits	14.5
Term 7		Credits
BIO 218	Principles of Molecular Biology	3.0
	r morpres or morecular biology	3.0

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Biology	4.0 3.0
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Biology	
	2.0
Studies in Instruction	9.0
	18.0
	Credits
Laboratory	2.0
d Function of Biomolecules	4.0
eaching	4.0
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## **Chemistry Certification**

Bachelor of Science: 186.5 credits (Certification is for grades 7 - 12)

#### **Degree Requirements**

General educ	ation requirements	Credits
HIST 280	History of Science I	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology	3.0
PSY 320	Educational Psychology	3.0
UNIV 101	The Drexel Experience	2.0
	English elective course between 200-329	3.0

#### Science requirements

BIO 102	Bioscience I	4.0
BIO 104	Bioscience II	4.0
BIO 404	Structure and Function of Biomolecules	4.0
BIO 306	Biochemistry Laboratory	2.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
<u>CHEM 230</u>	Quantitative Analysis	3.0
<u>CHEM 231 WI</u>	Quantitative Analysis Laboratory	2.0
<u>CHEM 241</u>	Organic Chemistry	4.0
<u>CHEM 242</u>	Organic Chemistry II	4.0
<u>CHEM 243</u>	Organic Chemistry III	3.0
<u>CHEM 244</u>	Organic Chemistry Laboratory I	3.0
<u>CHEM 245</u>	Organic Chemistry Laboratory	3.0

<u>CHEM 251</u>	Physical Chemistry I	3.0
CHEC 352	Physical Chemistry and Applications II	4.0
CHEM 357	Physical Chemistry II Laboratory	2.5
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	4.0
ENVR 401	Chemistry of the Environmental	3.0
PHYS 111	Physics I	4.5
PHYS 112	Physics II	4.5
PHYS 131 WI	Survey of the Universe	3.0
or		
PHEV 145	Weather 1: Climate and Global Change	4.0

Education requirements		Credits
EDUC 105	Freshman Seminar	3.0
EDUC 112	Integrative Instruction	3.0
EDUC 114	Science Teaching Methods	3.0
EDUC 205	Sophomore Seminar	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
EDUC 305	Junior Seminar	2.0
EDUC 310	Computer Applications in Teaching	3.0
EDUC 320 WI	Professional Studies in Instruction	9.0
EDUC 322	Evaluation of Instruction	4.0
EDUC 323 WI	Diagnostic Teaching	4.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 326 WI	Language Arts Processes	3.0
EDUC 327	Learning Disabilities	3.0
EDUC 405	Senior Seminar	2.0

#### Student teaching experience

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EDUC 412 WI	Student Teaching	12.0

#### Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog indicates that this course can fulfill a writingintensive requirement. Departments will designate specific sections of such courses as writing-intensive. Sections of writing-intensive courses are not indicated in this catalog. Students should check the section comments in Banner when registering. Students scheduling their courses in Banner can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term. For more information on writing-intensive courses, see the Drexel University Writing Program's <u>Writing-Intensive Course</u> page.



#### **Recommended Plan Of Study**

#### BS Education 4 YR UG Co-op Concentration /Chemistry

EDUC 103         Freshman Seminar         1.0           EDUC 103         Computer Applications in Teaching         3.0           EDUC 310         Computer Applications in Teaching         3.0           EDUC 103         Expository Writing and Reading         3.0           MATH 121         Calculus I         3.0           MATH 121         Calculus I         3.0           MINT 101         The Drexel Experience         1.0           Term Credits         15.0           Term 2         Credits           EDUC 105         Freshman Seminar           1.0         Experience           1.0         Freshman Seminar           1.0         Freshman Seminar           1.0         Freshman Seminar           1.0         Freshman Seminar           1.0         Term Credits           Term 3         Credits           Term 6         Term Credits           Term 3         Credits           EDUC 103         Freshman Seminar           1.0         Experience           1.0         Term Credits           EDUC 102         Integrative Instruction           3.0         MATH 122           Calculus 11         4.0	Term 1		Credits
EDUC 310         Computer Applications in Teaching         3.0           ENGL 101         Expository Writing and Reading         3.0           ENGL 101         Expository Writing and Reading         3.0           DNIV 101         General Psychology I         3.0           UNIV 101         The Drexel Experience         1.6           Term Credits         15.0           Term Credits         15.0           Term Credits         3.5           EDUC 109         Freshman Seminar           ENGL 102         Persuasive Writing and Reading           S0.1         The Drexel Experience           111         Physics I         4.5           UNIV 101         The Drexel Experience         1.0           Term Credits         17.0           Term 3         Credits           Checitiz         11.0           EDUC 102         Freshma Seminar           EDUC 103         Freshma Seminar           EDUC 104         Freshma Seminar           EDUC 105         Freshma Seminar           EDUC 104         Freshma Seminar           EDUC 105         Freshma Seminar           EDUC 105         Freshma Seminar           EDUC 105         Freaclaculus III		Freshman Seminar	
ENGL 101         Expository Writing and Reading         3.0           MATH 121         Calculus I         4.0           MATH 121         General Psychology I         3.0           UNIV 101         The Drexel Experience         1.0           Term Credits         15.0           Term 2         Credits           EDUC 108         Freshman Seminar         1.0           NATH 122         Calculus II         4.0           PHY 5111         Physics I         4.0           PHY 5112         Persuasive Writing and Reading         3.0           MATH 122         Calculus II         4.0           PHY 5111         Physics I         4.0           PHY 5112         Physics I         7.0           Term 3         Credits         17.0           Term 3         Credits         17.0           ENGL 102         General Chemistry II         4.5           ENGL 103         Analytical Writing and Reading         3.0           Writing and Reading         3.0         3.0           ENGL 103         Analytical Writing and Reading         3.0           ENGL 104         4.0         1.0           HYS 112         Physics I         4.0	EDUC 310		-
MATH 121         Calculus i         4.0           PSY 101         General Psychology I         3.6           NNV 101         The Drexel Experience         1.0           Term Credits         15.0           Term 2         Credits           DDUC 105         Freshman Seminar         1.0           ENGL 102         Persuasive Writing and Reading         3.0           MATH 122         Calculus I         4.0           PNS 111         Physics I         4.5           NW 101         The Drexel Experience         1.0           Term 3         Credits         7.0           Term 3         Credits         1.0           EDUC 105         Freshman Seminar         1.0           EDUC 105         Analytical Writing and Reading         3.0           MATH 123         Calculus III         4.0           EDUC 105         Sphomore Seminar         1.0	ENGL 101		
SY 191         General Psychology I         3.0           UNIV 191         The Drexel Experience         1.0           Term Credits         15.0           Term Credits         15.0           EHEM 101         General Chemistry I         3.5           EDUC.105         Freeshman Seminar         1.0           NOL 102         Persuasive Writing and Reading         3.0           MATH 122         Calculus II         4.0           PHYS.111         Physics I         4.5           UNIV 101         The Drexel Experience         1.0           Term Credits         17.0           Term 3         Credits           EDUC.109         Freshman Seminar         1.0           EDUC.109         Freshman Seminar         1.0           EDUC.109         Analytical Writing and Reading         3.0           EDUC.109         Integrative Instruction         3.0           EDUC.109         Integrative Instruction         3.0           EDUC.1012         Integrative Instruction         3.0           EDUC.102         Integrative Instruction         3.0           EDUC.103         General Chemistry III         4.5           Term Credits         20.0         1.0 <t< td=""><td>MATH 121</td><td></td><td></td></t<>	MATH 121		
INIV 101         The Drexet Experience         1.0           Term Credits         15.0           Term 2         Credits           CHEM 101         General Chemistry I         3.5           EDUC 105         Freshman Seminar         1.0           ENGL 102         Persuasive Writing and Reading         3.0           MATH 122         Calculus II         4.0           PHYS 111         Physics I         4.5           UNIV 101         The Drexel Experience         1.0           Term Credits         17.0           Term 3         Credits           EDUC 105         Freshman Seminar         1.0           EDUC 105         Analytical Writing and Reading         3.0           MATH 123         Calculus III         4.5           Term Credits         20.0         Term 4           Education III         4.5         1.0           EDUC 202         Sophomore Seminar         1.0           EDUC 232         Langua	PSY 101		
Term Credits         15.0           Term 2         Credits           CHEM 101         General Chemistry I         3.5           EDUC 105         Freshman Seminar         1.0           EDUC 105         Freshman Seminar         1.0           Status         A4         4.0           PHYS 111         Physics I         4.5           UNV101         The Drexel Experience         1.0           Term 3         Credits         17.0           Term 3         Credits         1.0           EDUC 105         Freshman Seminar         1.0           EDUC 105         Freshman Seminar         1.0           EDUC 105         Freshman Seminar         1.0           EDUC 102         General Chemistry II         4.5           EDUC 103         Analytical Writing and Reading         3.0           ENGL 103         Analytical Writing and Reading         3.0           ENGL 103         Calculus III         4.0           PHYS 112         Physics I         4.5           Term Credits         20.0         1.0           EDUC 203         Sophomore Seminar         1.0           EDUC 204         General Chemistry III         5.0           EDU	<b>UNIV 101</b>		
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CHEM 101       General Chemistry I       3.5         EDUC.105       Freshman Seminar       1.0         EDUC.105       Freshman Seminar       3.0         MATH 122       Calculus II       4.0         PHYS 111       Physics I       4.5         JINIV 101       The Drexel Experience       1.0         Term Credits       77.0         Term 3       Credits         ChEM 102       General Chemistry II       4.5         EDUC.105       Freshman Seminar       1.0         EDUC.105       Freshman Seminar       1.0         EDUC.105       Freshman Seminar       3.0         EDUC.105       Freshman Seminar       3.0         EDUC.105       Freshman Seminar       1.0         EDUC.105       Freshman Seminar       1.0         EDUC.105       Freshman Seminar       1.0         EDUC.105       Freshman Seminar       1.0         EDUC.105       Analytical Writing and Reading       3.0         INAT 123       Calculus III       4.0         PHYS 112       Physics I       4.5         Term Credits       20.0       Credits         Bi0 102       Biology 1: Cells and Tissues       4.0	Torm 2		Credits
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MATH 200Multivariate Calculus4.0PHIL 251Ethics3.0PSY 320Educational Psychology3.0	EDUC 205		1.0
PSY 320 Educational Psychology 3.0	MATH 200		4.0
	PHIL 251	Ethics	3.0
Term Credits 20.0	PSY 320	Educational Psychology	3.0
		Term Credits	20.0

Term 7		Credits
CHEM 230	Quantitative Analysis	3.0
CHEM 231	Quantitative Analysis Lab	2.0
CHEM 241	Organic Chemistry I	4.0
EDUC 305	Junior Seminar	1.0
EDUC 327	Learning Disabilities	3.0
PHEV 145	Weather I: Climate and Global Change	4.0
O <b>r</b> PHYS 131	Survey of the Universe	3.0
	Term Credits	17.0
		Credite
Term 8 CHEM 242	Organia Chemistry II	Credits
CHEM 242	Organic Chemistry II	4.0
CHEM 356	Organic Chemistry Laboratory I	3.0
EDUC 305	Physical Chemistry Lab Junior Seminar	2.0
EDUC 305 EDUC 322	Evaluation of Instruction	1.0
2000 322	Term Credits	4.0 14.0
	Term Creans	14.0
Term 9		Credits
CHEC 352	Physical Chemistry II	4.0
CHEM 245	Organic Chemistry Lab II	3.0
EDUC 320	Professional Studies in Instruction	9.0
	Term Credits	16.0
Term 10		Credits
CHEM 421	Inorganic Chemistry I	3.0
CHEM 430	Analytical Chemistry I	3.0
EDUC 323	Diagnostic Teaching	4.0
EDUC 405	Senior Seminar	1.0
	English (ENGL) course between 200-329	3.0
	Term Credits	14.0
Term 11		Credits
EDUC 412	Student Teaching	12.0
	Term Credits	12.0
Ferm 12		Credits
CHEM 243	Organic Chemistry III	3.0
CHEM 357	Physical Chemistry Lab I	2.5
DUC 324	Current Research in Curriculum & Instruction	3.0
DUC 405	Senior Seminar	1.0
DUC 325	Multimedia in Instructional Design	3.0
	Term Credits	12.5
	Total Credits (minimum)	187.5

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# Earth and Space Science Certification

Bachelor of Science: 186.0 credits (Certification is for grades 7 - 12)

#### **Degree Requirements**

#### **General education requirements**

Ceneral education requirements		orcaits
ECON 201	Economics I	4.0
HIST 285	Technology in Historical Perspective	3.0
HIST 280	History of Science I	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
<u>MATH 121</u>	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	
PHIL 251	Ethics	3.0
PSY 101	General Psychology	3.0
PSY 320	Educational Psychology	3.0
<u>UNIV 101</u>	The Drexel Experience	2.0
	English elective course between 200-329	3.0
	Elective	3.0

Credits

Science requirements		Credits
BIO 102	Bioscience I	4.0
BIO 104	Bioscience II	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemisty II	4.5
ENVR 272	Physical Geology	4.0
ENVR 270	History of Life on Earth	4.0
ENVR 284 W	Ecology I: Physiological and Population Ecology	5.0
<u>ENVR 286</u> <u>WI</u>	Ecology II: Communities and Ecosystems	5.0
ENVR 260	Environmental Science and Society	3.0

ENVR 261	Environmental Science and Society Laboratory	1.0
ENVR 310	Environmental Data Analysis	3.0
ENVR 330	Aquatic Ecology	3.0
ENVR 390	Marine Ecology	3.0
PHEV 145	Weather 1: Climate and Global Change	4.0
PHEV 146	Weather 2: Analysis and Forecasting	4.0
PHEV 441	Issues in Global Change I: Seminar	2.0
<u>PHYS 111</u>	Physics I	4.5
PHYS 112	Physics II	4.5
PHYS 131 W	I Survey of the Universe	3.0

Credits

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# Education requirements EDUC 105 Freshman Seminar

EDUC 105	Freshman Seminar	3.0
EDUC 112	Integrative Instruction	3.0
EDUC 114	Science Teaching Methods	3.0
EDUC 205	Sophomore Seminar	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
EDUC 305	Junior Seminar	2.0
EDUC 310	Computer Applications in Teaching	3.0
<u>EDUC 320</u> <u>WI</u>	Professional Studies in Instruction	9.0
EDUC 322	Evaluation of Instruction	4.0
EDUC 323 V	<u>/I</u> Diagnostic Teaching	4.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 326 V	<u>/I</u> Language Arts Processes	3.0
EDUC 327	Learning Disabilities	3.0
EDUC 405	Senior Seminar	2.0

#### Student teaching experience

EDUC 412 WI Student Teaching	12.0

Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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#### **Recommended Plan Of Study**

#### BS Education 4 YR UG Co-op Concentration /Earth & Space Science

Term 1		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 310	Computer Applications in Teaching	3.0
<b>ENGL 101</b>	Expository Writing and Reading	3.0
MATH 121	Calculus I	4.0
PSY 101	General Psychology I	3.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	15.0
-		
Term 2 CHEM 101		Credits
EDUC 105	General Chemistry I	3.5
EDUC 105 EDUC 301	Freshman Seminar	1.0
EDGC 301 ENGL 102	Introduction to Personalized Systems of Instruction	3.0 3.0
MATH 122	Persuasive Writing and Reading Calculus II	
UNIV 101		4.0 1.0
	The Drexel Experience	
	Term Credits	15.5
Term 3		Credits
CHEM 102	General Chemistry II	4.5
EDUC 105	Freshman Seminar	1.0
EDUC 112	Integrative Instruction	3.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 123	Calculus III	4.0
	Term Credits	18.5
Term 4		Credits
BIO 102	Biology I: Cells and Tissues	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 326	Language Arts Processes	3.0
HIST 280	History of Science I	3.0
PHYS 111	Physics I	4.5
	Term Credits	15.5
Term 5		Credits
BIO 104	Biology II: Growth and Heredit	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 218	Math: Methods and Content	3.0
ENVR 260	Environmental Science & Society I	3.0
ENVR 261	Environmental Science & Society I Lab	1.0
PHYS 112	Physics II	4.5
	Term Credits	16.5
Term 6		Credits
ECON 201	Economics I	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
PSY 320	Educational Psychology	3.0
•	English (ENGL) course between 200-329	3.0
	Term Credits	14.0

EDUC 305	Junior Seminar	1.0
EDUC 327	Learning Disabilities	3.0
ENVR 284	Ecology I: Physiological and Population Ecology	5.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHIL 251	Ethics	3.0
PHYS 131	Survey of the Universe	3.0
	Term Credits	19.0
Term 8		Credits
EDUC 305	Junior Seminar	1.0
EDUC 322	Evaluation of Instruction	4.0
ENVR 272	Physical Geology	4.0
ENVR 286	Ecology II: Communities and Ecosystems	5.0
PHEV 146	Weather II: Analysis and Forecasting	4.0
	Term Credits	18.0
Term 9		Credits
EDUC 114	Science Teaching Methods	3.0
EDUC 320	Professional Studies in Instruction	9.0
EDUC 325	Multimedia in Instructional Design	3.0
	Term Credits	15.0
Term 10		Credits
EDUC 323	Diagnostic Teaching	4.0
EDUC 405	Senior Seminar	1.0
ENVR 310	Environmental Data Analysis	3.0
ENVR 330	Aquatic Ecology	3.0
PHEV 441	Issues in Global Change I: Seminar	2.0
	Term Credits	13.0
Term 11		Credits
EDUC 412	Student Teaching	12.0
	Term Credits	12.0
Term 12		Credits
EDUC 405	Senior Seminar	1.0
ENVR 270	History of Life on Earth	4.0
ENVR 390	Marine Ecology	3.0
HIST 285	Technology in Historical Perspective	3.0
	Free elective	3.0
-	Term Credits	14.0
	Total Credits (minimum)	186.0
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### **General Science Certification**

Bachelor of Science: 188.0 credits (Certification is for grades 7 - 12)

#### **Degree Requirements**

General edu	ication requirements	Credits
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
<u>MATH 121</u>	Calculus I	4.0
<u>MATH 122</u>	Calculus II	4.0
MATH 123	Calculus III	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology	3.0
PSY 320	Educational Psychology	3.0
UNIV 101	The Drexel Experience	2.0
HIST 280	History of Science I	3.0
	English elective course between 200-329	3.0
	Science, Technology, Human Affairs electives *	6.0
	Electives	18.0

#### **Science requirements**

<u>BIO 102</u>	Bioscience I	4.0
BIO 104	Bioscience II	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
ENVR 272	Physical Geology	4.0
ENVR 270	History of Life on Earth	4.0
ENVR 284 V	VI Ecology I: Physiological and Population Ecology	5.0
<u>ENVR 286</u> <u>WI</u>	Ecology II: Communities and Ecosystems	5.0
ENVR 390	Marine Ecology	3.0

PHEV 145	Weather 1: Climate and Global Change	4.0
PHYS 111	Physics I	4.5
PHYS 112	Physics II	4.5
PHYS 131 W	Survey of the Universe	3.0

#### **Education requirements**

Lauvation	equienents	
EDUC 105	Freshman Seminar	3.0
EDUC 112	Integrative Instruction	3.0
EDUC 114	Science Teaching Methods	3.0
EDUC 205	Sophomore Seminar	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
EDUC 305	Junior Seminar	2.0
EDUC 310	Computer Applications in Teaching	3.0
EDUC 320 WI_	Professional Studies in Instruction	9.0
EDUC 322	Evaluation of Instruction	4.0
EDUC 323 V	VI Diagnostic Teaching	4.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 326 V	VI Language Arts Processes	3.0
EDUC 327	Learning Disabilities	3.0
EDUC 405	Senior Seminar	2.0

#### Student teaching experience

EDUC 412 WI Student Teaching

12.0

#### Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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#### **Recommended Plan Of Study**

#### BS Education 4 YR UG Co-op Concentration /General Science

Term 1		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 310	Computer Applications in Teaching	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 121	Calculus I	4.0
PSY 101		3.0
UNIV 101	General Psychology I The Drexel Experience	<u> </u>
	Term Credits	
	Term Creans	15.0
Term 2		Credits
CHEM 101	General Chemistry I	3.5
EDUC 105	Freshman Seminar	1.0
EDUC 301	Introduction to Personalized Systems of Instruction	3.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 122	Calculus II	4.0
<u>UNIV 101</u>	The Drexel Experience	1.0
	Term Credits	15.5
Term 3		Credits
CHEM 102	General Chemistry II	4.5
EDUC 105	Freshman Seminar	1.0
EDUC 112	Integrative Instruction	3.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 123	Calculus III	4.0
	Term Credits	18.5
Term 4		Credits
BIO 102	Biology I: Cells and Tissues	4.0
EDUC 205	Sophomore Seminar	4.0
EDUC 326	Language Arts Processes	3.0
HIST 280	History of Science I	3.0
PHYS 111	Physics I	4.5
	Term Credits	4.5
		10.0
Term 5		Credits
BIO 104	Biology II: Growth and Heredity	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
PHYS 112	Physics II	4.5
	Term Credits	15.5
Term 6		Credits
CHEM 103	General Chemistry III	5.0
EDUC 205	Sophomore Seminar	1.0
	English (ENGL) course between 200-329	3.0
•	Free elective	3.0
•	Science, Technology and Human Affairs elective	3.0
	Term Credits	15.0
Term 7		Credits

Term 7		Credits
EDUC 305	Junior Seminar	1.0

EDUC 327	Learning Disabilities	3.0
<u>ENVR 284</u>	Ecology I: Physiological and Population Ecology	5.0
PHIL 251	Ethics	3.0
<u>PHYS 131</u>	Survey of the Universe	3.0
	Science, Technology and Human Affairs elective	3.0
	Term Credits	18.0
Term 8		Credits
EDUC 305	Junior Seminar	1.0
EDUC 322	Evaluation of Instruction	4.0
ENVR 272	Physical Geology	4.0
ENVR 286	Ecology II: Communities and Ecosystems	5.0
•	Free elective	3.0
	Term Credits	17.0
Term 9		Credits
EDUC 114	Science Teaching Methods	3.0
EDUC 320	Professional Studies in Instruction	9.0
EDUC 325	Multimedia in Instructional Design	3.0
	Term Credits	15.0
Term 10		Credits
EDUC 323	Diagnostic Teaching	4.0
EDUC 405	Senior Seminar	4.0
PHEV 145	Weather I: Climate and Global Change	4.0
PSY 320	Educational Psychology	3.0
	Free electives	<u> </u>
	Term Credits	18.0
Term 11		Credits
EDUC 412	Student Teaching	12.0
	Term Credits	12.0
Term 12		Credits
EDUC 405	Senior Seminar	1.0
ENVR 270	History of Life on Earth	4.0
ENVR 390	Marine Ecology	3.0
	Free electives	5.0
•	Term Credits	13.0
	Total Credits (minimum)	188.0
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### **Mathematics Certification**

Bachelor of Science: 183.0 credits (Certification is for grades 7 - 12)

#### **Degree Requirements**

General education requirements		46.0 Credits
ECON 201	Principles of Economics I	4.0
HIST 280	History of Science I	3.0
INFO 108	Foundations of Software	4.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology I	3.0
PSY 320	Educational Psychology	3.0
UNIV 101	The Drexel Experience	2.0
	English elective course between 200-329	3.0
	Electives	12.0

Mathematics requirements		40.0 Credits
EDUC 428	Cultural and Historical Significance of Math	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
<u>MATH 210</u>	Differential Equations	4.0
MATH 220	Introduction to Mathematical Reasoning	3.0
MATH 221	Discrete Mathematics	3.0
MATH 311	Probability and Statistics I	4.0

<u>BIO 102</u>	Bioscience I	4.0
<u>BIO 104</u>	Bioscience II	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENVR 260	Environmental Science and Society	3.0
PHYS 111	Physics I	4.5
PHYS 112	Physics II	4.5

Education requirements		69.0 Credits
EDUC 105	Freshman Seminar	3.0
EDUC 112	Integrative Instruction	3.0
EDUC 114	Science Teaching Methods	3.0
EDUC 205	Sophomore Seminar	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
EDUC 305	Junior Seminar	2.0
EDUC 310	Computer Applications in Teaching	3.0
EDUC 320 WI	Professional Studies in Instruction	9.0
EDUC 322	Evaluation of Instruction	4.0
EDUC 323 V	<u>VI</u> Diagnostic Teaching	4.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 326 V	VI Language Arts Processes	3.0
EDUC 327	Learning Disabilities	3.0
EDUC 405	Senior Seminar	2.0
Student tea	ching experience	
EDUC 412 V	<u>VI</u> Student Teaching	12.0

# Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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#### **Recommended Plan Of Study**

#### BS Education 4 YR UG Co-op Concentration /Mathematics

Term 1		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 310	Computer Applications in Teaching	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 121	Calculus I	4.0
PSY 101	General Psychology I	3.0
UNIV 101	The Drexel Experience	1.0
	Term Credits	15.0
_		
Term 2		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
ENGL 102	Persuasive Writing and Reading	3.0
INFO 108	Foundations of Software	4.0
MATH 122	Calculus II	4.0
<u>UNIV 101</u>	The Drexel Experience	1.0
	Term Credits	16.0
Term 3		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 112	Integrative Instruction	3.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 123	Calculus III	4.0
	Term Credits	14.0
Term 4		Credits
BIO 102	Biology I: Cells and Tissues	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 326	Language Arts Processes	3.0
HIST 280	History of Science I	3.0
<u>MATH 200</u>	Multivariate Calculus	4.0
	Term Credits	15.0
<b>TF</b>		One all te
Term 5 BIO 104	Dialogy II. Crowth and Haradity	Credits
EDUC 205	Biology II: Growth and Heredity	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 218	Diversity and Today's Teacher Math: Methods and Content	<u>3.0</u> 3.0
MATH 201	Linear Algebra	4.0
	Term Credits	4.0
	Term Credits	15.0
Term 6		Credits
ECON 201	Economics I	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 428	Cultural and Historical Significance of Mathematics	3.0
PSY 320	Educational Psychology	3.0
•	English (ENGL) course between 200-329	3.0
	Term Credits	14.0
Term 7		Credits
<u>CHEM 101</u>	General Chemistry I	3.5
EDUC 305	Junior Seminar	1.0
-		

EDUC 327	Learning Disabilities	3.0
MATH 220	Introduction to Mathematical Reasoning	3.0
PHYS 111	Physics I	4.5
	Term Credits	15.0
Term 8		Credits
CHEM 102	General Chemistry II	4.5
EDUC 305	Junior Seminar	1.0
EDUC 322	Evaluation of Instruction	4.0
MATH 210	Differential Equations	4.0
PHYS 112	Physics II	4.5
	Term Credits	18.0
Term 9		Credits
EDUC 114	Science Teaching Methods	3.0
EDUC 320	Professional Studies in Instruction	9.0
EDUC 325	Multimedia in Instructional Design	3.0
<b>MATH 221</b>	Discrete Mathematics	3.0
	Term Credits	18.0
Term 10		Credits
Term 10 EDUC 323	Diagnostic Teaching	Credits 4.0
	Diagnostic Teaching Senior Seminar	
EDUC 323		4.0
EDUC 323 EDUC 405	Senior Seminar	4.0 1.0
EDUC 323 EDUC 405 ENVR 260	Senior Seminar Environmental Science and Society I	4.0 1.0 3.0
EDUC 323 EDUC 405 ENVR 260 MATH 311	Senior Seminar Environmental Science and Society I Probability and Statistics I	4.0 1.0 3.0 4.0
EDUC 323 EDUC 405 ENVR 260 MATH 311	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics	4.0 1.0 3.0 4.0 3.0
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics Term Credits	4.0 1.0 3.0 4.0 3.0 15.0 Credits
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics	4.0 1.0 3.0 4.0 3.0 15.0
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251 Term 11 EDUC 412	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics <i>Term Credits</i> Student Teaching	4.0 1.0 3.0 4.0 3.0 15.0 Credits 12.0 12.0
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251 Term 11 EDUC 412 Term 12	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics <i>Term Credits</i> Student Teaching <i>Term Credits</i>	4.0 1.0 3.0 4.0 3.0 15.0 Credits 12.0 12.0 Credits
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251 Term 11 EDUC 412	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics <i>Term Credits</i> Student Teaching <i>Term Credits</i> Senior Seminar	4.0 1.0 3.0 4.0 3.0 15.0 Credits 12.0 12.0 Credits 12.0 12.0 12.0
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251 Term 11 EDUC 412 Term 12	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics <i>Term Credits</i> Student Teaching <i>Term Credits</i> Senior Seminar Free electives	4.0 1.0 3.0 4.0 3.0 4.0 3.0 15.0 Credits 12.0 12.0 Credits 12.0 12.0 12.0 12.0 12.0
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251 Term 11 EDUC 412 Term 12	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics <i>Term Credits</i> Student Teaching <i>Term Credits</i> Senior Seminar	4.0 1.0 3.0 4.0 3.0 15.0 Credits 12.0 12.0 Credits 12.0 12.0 12.0
EDUC 323 EDUC 405 ENVR 260 MATH 311 PHIL 251 Term 11 EDUC 412 Term 12	Senior Seminar Environmental Science and Society I Probability and Statistics I Ethics <i>Term Credits</i> Student Teaching <i>Term Credits</i> Senior Seminar Free electives	4.0 1.0 3.0 4.0 3.0 4.0 3.0 15.0 Credits 12.0 12.0 Credits 12.0 12.0 12.0 12.0 12.0

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## **Physics Certification**

Bachelor of Science: 181.5 credits (Certification is for grades 7 - 12)

#### **Degree Requirements**

General education requirements		Credits
HIST 280	History of Science I	3.0
ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 200	Multivariate Calculus	4.0
MATH 201	Linear Algebra	4.0
MATH 210	Differential Equations	4.0
PHIL 251	Ethics	3.0
PSY 101	General Psychology	3.0
PSY 320	Educational Psychology	3.0
<u>UNIV 101</u>	The Drexel Experience	2.0
	English elective course between 200-329	3.0

#### Science requirements

BIO 102	Bioscience I	4.0
BIO 104	Bioscience II	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENVR 260	Environmental Science and Society	3.0
PHEV 145	Weather 1: Climate and Global Change	4.0
PHYS 111	Physics I	4.5
PHYS 112	Physics II	4.5
PHYS 131 WI	Survey of the Universe	3.0
PHYS 211	Physics III	4.5

<u>PHYS 222</u>	Modern Physics	4.0
<u>PHYS 311</u>	Classical Mechanics I	4.0
PHYS 312	Classical Mechanics II	4.0
<u>PHYS 316</u>	Thermodynamics	4.0
PHYS 321	Electromagnetic Fields I	4.0
<u>PHYS 326</u>	Quantum Mechanics I	4.0

#### **Education requirements**

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EDUC 112	Integrative Instruction	3.0
EDUC 114	Science Teaching Methods	3.0
EDUC 205	Sophomore Seminar	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
EDUC 305	Junior Seminar	2.0
EDUC 310	Computer Applications in Teaching	3.0
EDUC 320 WI	Professional Studies in Instruction	9.0
EDUC 322	Evaluation of Instruction	4.0
EDUC 323 WI	Diagnostic Teaching	4.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 326 WI	Language Arts Processes	3.0
EDUC 327	Learning Disabilities	3.0
EDUC 405	Senior Seminar	2.0

#### Student teaching experience

	Otradaut Taasking	10.0
<u>EDUC 412 WI</u>	Student Teaching	12.0

#### Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

A "WI" next to a course in this catalog indicates that this course can fulfill a writingintensive requirement. Departments will designate specific sections of such courses as writing-intensive. Sections of writing-intensive courses are not indicated in this catalog. Students should check the section comments in Banner when registering. Students scheduling their courses in Banner can also conduct a search for courses with the attribute "WI" to bring up a list of all writing-intensive courses available that term. For more information on writing-intensive courses, see the Drexel University Writing Program's Writing-Intensive Course page.



#### **Recommended Plan Of Study**

BS Education 4 YR UG Co-op Concentration /Physics

Term 1		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 310	Computer Applications in Teaching	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 121	Calculus I	4.0
PSY 101	General Psychology I	3.0
UNIV 101	The Drexel Experience	1.0
-	Term Credits	15.0
Term 2		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 301	Introduction to Personalized Systems of Instruction	3.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 122	Calculus II	4.0
PHYS 111	Physics I	4.5
<u>UNIV 101</u>	The Drexel Experience	1.0
	Term Credits	16.5
Term 3		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 112	Integrative Instruction	3.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 123	Calculus III	4.0
PHYS 112	Physics II	4.5
-	Term Credits	18.5
Term 4		Credits
BIO 102	Biology I: Cells and Tissues	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 326	Language Arts Processes	3.0
HIST 280	History of Science I	3.0
MATH 200	Multivariate Calculus	4.0
PHEV 145	Weather I: Climate and Global Change	4.0
	Term Credits	19.0
		• •
Term 5		Credits
BIO 104	Biology II: Growth and Heredity	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
MATH 201	Linear Algebra	4.0
<u>PHYS 211</u>	Physics III	4.5
	Term Credits	19.5
Term 6		Credits
EDUC 205	Sophomore Seminar	1.0
MATH 210	Differential Equations	4.0
PHIL 251	Ethics	3.0
PHYS 222	Modern Physics	4.0
PSY 330	Cognitive Psychology	3.0
	Term Credits	15.0

Term 7		Credits
CHEM 101	General Chemistry I	3.5
EDUC 305	Junior Seminar	1.0
EDUC 327	Learning Disabilities	3.0
PHYS 131	Survey of the Universe	3.0
•	English (ENGL) course between 200-329	3.0
	Term Credits	13.5
Term 8		Credits
CHEM 102	General Chemistry II	4.5
EDUC 305	Junior Seminar	1.0
EDUC 322	Evaluation of Instruction	4.0
<b>PHYS 311</b>	Classical Mechanics	4.0
	Term Credits	13.5
Term 9		Credits
EDUC 320	Professional Studies in Instruction	9.0
EDUC 325	Multimedia in Instructional Design	3.0
PHYS 312	Classical Mechanics II	4.0
	Term Credits	16.0
Term 10		Credits
EDUC 323	Diagnostic Teaching	4.0
EDUC 405	Senior Seminar	1.0
ENVR 260	Environmental Science and Society I	3.0
PHYS 217	Thermodynamics	4.0
	Term Credits	12.0
Term 11		Credits
EDUC 412	Student Teaching	12.0
	Term Credits	12.0
Term 12		Credits
EDUC 114	Science Teaching Methods	3.0
EDUC 405	Senior Seminar	1.0
PHYS 321	Electromagnetic Fields I	4.0
<u>PHYS 326</u>	Quantum Mechanics I	4.0
	Term Credits	12.0
	Total Credits (minimum)	182.5

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# **Environmental Education Certification**

Bachelor of Science: 186.0 credits (Certification is for grades K - 12)

#### **Degree Requirements**

#### **General education requirements** Credits **ECON 201 Economics I** 4.0 **HIST 285 Technology in Historical Perspective** 3.0 **HIST 280 History of Science I** 3.0 **ENGL 101 Expository Writing and Reading** 3.0 **ENGL 102 Persuasive Writing and Reading** 3.0 **ENGL 103** Analytical Writing and Reading 3.0 **MATH 121** Calculus I 4.0 **MATH 122** Calculus II 4.0 **MATH 123** Calculus III **PHIL 251** Ethics 3.0 **PSY 101 General Psychology** 3.0 **PSY 320 Educational Psychology** 3.0 **UNIV 101** The Drexel Experience 2.0 English elective course between 200-329 3.0 Elective 3.0

Science require	ements	Credits
BIO 102	Bioscience I	4.0
BIO 104	Bioscience II	4.0
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemisty II	4.5
ENVR 272	Physical Geology	4.0
ENVR 270	History of Life on Earth	4.0
ENVR 284 WI	Ecology I: Physiological and Population Ecology	5.0
ENVR 286 WI	Ecology II: Communities and Ecosystems	5.0
ENVR 260	Environmental Science and Society	3.0
ENVR 261	Environmental Science and Society Laboratory	1.0

ENVR 310	Environmental Data Analysis	3.0
ENVR 330	Aquatic Ecology	3.0
ENVR 390	Marine Ecology	3.0
PHEV 145	Weather 1: Climate and Global Change	4.0
PHEV 146	Weather 2: Analysis and Forecasting	4.0
PHEV 441	Issues in Global Change I: Seminar	2.0
PHYS 111	Physics I	4.5
PHYS 112	Physics II	4.5
PHYS 131 WI	Survey of the Universe	3.0

Education requ	lirements	Credits
EDUC 105	Freshman Seminar	3.0
EDUC 112	Integrative Instruction	3.0
EDUC 114	Science Teaching Methods	3.0
EDUC 205	Sophomore Seminar	3.0
EDUC 216	Diversity and Today's Teacher	3.0
EDUC 218	Math: Methods and Content	3.0
EDUC 301	Introduction to Personalized System of Instruction	3.0
EDUC 305	Junior Seminar	2.0
EDUC 310	Computer Applications in Teaching	3.0
EDUC 320 WI	Professional Studies in Instruction	9.0
EDUC 322	Evaluation of Instruction	4.0
EDUC 323 WI	Diagnostic Teaching	4.0
EDUC 324	Current Research in Curriculum and Instruction	3.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 326 WI	Language Arts Processes	3.0
EDUC 327	Learning Disabilities	3.0
EDUC 405	Senior Seminar	2.0

#### Student teaching experience

<u>EDUC 412 WI</u>	Student Teaching	12.0
	•	

Writing-Intensive Course Requirements

In order to graduate, all students beginning with the entering class of 2002/01 (fall, 2002) must pass three writing-intensive courses after their freshman year. Two writing-intensive courses must be in a student's major. The third can be in any discipline. Students are advised to take one writing-intensive class each year, beginning with the sophomore year, and to avoid "clustering" these courses near the end of their matriculation. Transfer students need to meet with an academic advisor to review the number of writing-intensive courses required to graduate.

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#### **Recommended Plan Of Study**

BS Education 4 YR UG Co-op Concentration /Environmental Education

Term 1		Credits
EDUC 105	Freshman Seminar	1.0
EDUC 310	Computer Applications in Teaching	3.0
ENGL 101	Expository Writing and Reading	3.0
MATH 121	Calculus I	4.0
PSY 101	General Psychology I	3.0
UNIV 101	The Drexel Experience	1.0
-	Term Credits	15.0
Term 2		Credits
CHEM 101	General Chemistry I	3.5
EDUC 105	Freshman Seminar	1.0
EDUC 301	Introduction to Personalized Systems of Instruction	3.0
ENGL 102	Persuasive Writing and Reading	3.0
MATH 122	Calculus II	4.0
<u>UNIV 101</u>	The Drexel Experience	1.0
	Term Credits	15.5
_		
Term 3		Credits
CHEM 102	General Chemistry II	4.5
EDUC 105	Freshman Seminar	1.0
EDUC 112	Integrative Instruction	3.0
EDUC 324	Current Research in Curriculum	3.0
ENGL 103	Analytical Writing and Reading	3.0
MATH 123	Calculus III	4.0
	Term Credits	18.5
Term 4		Credits
BIO 102	Biology I: Cells and Tissues	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 326	Language Arts Processes	3.0
HIST 280	History of Science I	3.0
PHYS 111	Physics I	4.5
	Term Credits	15.5
Term 5		Credits
BIO 104	Biology II: Growth and Heredity	4.0
EDUC 205	Sophomore Seminar	1.0
EDUC 218	Math: Methods and Content	3.0
ENVR 260	Environmental Science & Society I	3.0
ENVR 261	Environmental Science & Society I Lab	1.0
<u>PHYS 112</u>	Physics II	4.5
	Term Credits	16.5
Tarma		Oredite
Term 6 ECON 201	Feenemies	Credits
_	Economics I	4.0
EDUC 205 EDUC 216	Sophomore Seminar	1.0
PSY 320	Diversity and Today's Teacher	3.0
<u>- 31 320</u>	Educational Psychology	3.0
-	English (ENGL) course between 200-329 Term Credits	3.0
		14.0

EDUC 327	Junior Seminar Learning Disabilities	1.( 3.(
ENVR 284	Ecology I: Physiological and Population Ecology	5.0
PHEV 145	Weather I: Climate and Global Change	4.0
PHIL 251	Ethics	3.
PHYS 131	Survey of the Universe	3.
	Term Credits	19.
Term 8		Credit
EDUC 305	Junior Seminar	1.0
EDUC 322	Evaluation of Instruction	4.0
ENVR 272	Physical Geology	4.0
ENVR 286	Ecology II: Communities and Ecosystems	5.0
PHEV 146	Weather II: Analysis and Forecasting	4.0
	Term Credits	18.0
Term 9		Credits
EDUC 320	Professional Studies in Instruction	9.0
EDUC 325	Multimedia in Instructional Design	3.0
EDUC 114	Science Teaching Methods	3.0
	Term Credits	15.
Term 10		Credit
EDUC 323	Diagnostic Teaching	4.0
EDUC 405	Senior Seminar	1.0
ENVR 310	Environmental Data Analysis	3.0
ENVR 330	Aquatic Ecology	3.0
<u>PHEV 441</u>	Issues in Global Change I: Seminar	2.0
	Term Credits	13.
Term 11		Credits
EDUC 412	Student Teaching	12.0
	Term Credits	12.
Term 12		Credits
EDUC 405	Senior Seminar	1.0
ENVR 270	History of Life on Earth	4.0
ENVR 390	Marine Ecology	3.
HIST 285	Technology in Historical Perspective	3.
	Free elective	3.
	Term Credits	14.
	Total Credits (minimum)	186.0



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## **Minor in Education**

The minor in Education provides a structured academic opportunity for students who wish to add a fundamental understanding of the field of education as well as practical knowledge in the art and science of teaching and learning to their undergraduate experience.

Designed for students with a strong interest in education and training, the minor will not necessarily lead to the student being recommended for a state teaching certificate. However, should a student decide to also pursue a teaching certificate as a component of his or her major—or in post-baccalaureate work— the courses required for the minor are applicable to Pennsylvania State certification.

The minor in is comprised of eight required courses totaling 26.0 credits.

urses	Credits
Diversity and Today's Teacher	3.0
Introduction to Personalized System of Instruction	3.0
Professional Studies in Instruction (Non-Field Experience)	3.0
Evaluation of Instruction	4.0
<u>/I</u> Diagnostic Teaching	4.0
Current Research in Curriculum and Instruction	3.0
Multimedia in Instructional Design	3.0
Learning Disabilities	3.0
	Introduction to Personalized System of Instruction Professional Studies in Instruction (Non-Field Experience) Evaluation of Instruction U Diagnostic Teaching Current Research in Curriculum and Instruction Multimedia in Instructional Design