

# Drexel University

## Catalog 2009/2010

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# Drexel University

## Catalog 2009/2010

### **The Goodwin College of Professional Studies School of Education**

The School of Education seeks to enrich knowledge and practice related to lifespan learning, based on the most current and appropriate research and practice. The goal of the school is to improve human understanding through programs and activities that emphasize creative uses of human effort, technology and problem solving.

The School of Education offers bachelor's, master's, and doctoral degrees in addition to a number of certification programs.

#### **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.

### The School of Education

#### About the Curriculum

Certification for classroom instruction is available in:

- Elementary education
  - Elementary: PK-4
  - Elementary: PK-4 and Special Education
  - Middle Level Math and English
  - Middle Level Science and English
  - Middle Level Science and Math
- Secondary education (grades 7-12)
  - Biology
  - Chemistry
  - Earth and Space Science
  - General Science
  - Mathematics
  - Physics
- Secondary education (grades K-12)
  - Environmental Education

Students may acquire certification in more than one subject area.

The program in 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 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 writing-intensive 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.

# Drexel University

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### **The Goodwin College of Professional Studies School of Education**

#### **Co-operative Education**

Drexel University has long been known for its co-operative education program, through which students combine periods of fulltime, career-related employment with their studies. Internship employment is a requirement for all teacher education majors.

The degree is completed in four years, and it includes one six-month internship period of full-time employment related to the student's initial area of teacher certification. The goal of the co-op program in teacher education is to provide real-world experiences for future teachers to use in their classrooms.

Students pursue varied positions geared directly to their area(s) of certification. For example, a student working toward certification in chemistry might seek employment in a corporate laboratory, just as a chemistry major would do. Some students, especially elementary certification majors, intern in liberal arts areas or such educationally oriented museums as Philadelphia's Please Touch Museum and the Franklin Institute Science Museum.

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### **The Goodwin College of Professional Studies School of Education**

#### **Facilities**

The Drexel Center for the Prevention of School-aged Violence is located within the School of Education at Drexel University, 3141 Chestnut Street, Philadelphia, PA 19104. The mission of the center is to provide a research venue for investigating applications of creativity and the power of creativity as a force in uncovering hidden talents of youth of diverse age groups, cultures, and economic backgrounds.

The Multicultural Collaborative is a School of Education center that serves as a hub where scholars and communities beyond the university work together to create projects that transform the lives of all students.

For more information about the School's centers, visit the The Centers of Goodwin College.

### BS in Elementary Education

#### About the Major

The BS in Elementary Education uses university-wide resources to prepare fully qualified teachers at the primary education levels. Primary teacher certification options include:

- Pre-Kindergarten - Grade 4
- Pre-Kindergarten - Grade 4 & Special Education
- Middle Level (grades 4-8) Mathematics and Science
- Middle Level (grades 4-8) Science and English
- Middle Level (grades 4-8) Mathematics and English

Students may acquire certification in more than one subject area.

The program requires that students have a B average (3.0 GPA) in content courses needed for teacher certification in addition to the grade of B or better in each EDUC course throughout their time in the program. These requirements must be satisfied in order for Drexel to recommend the student for teacher certification upon graduation and/or be considered to have completed the program.

A benchmark to assist students in meeting the GPA and B grade requirements is the formal review of each student's content and pedagogy coursework at the end of the sophomore year. Students who meet these requirements, as well as pass the *Pre-Professional Skills Test* (PPST Reading, PPST Writing, PPST Mathematics) of the *ETS Praxis Exams* according to Pennsylvania standards at that time, are officially accepted into Drexel's Teacher Preparation Program. Students who do not meet the requirements work with their academic advisor to develop a plan of action to work toward meeting the requirements, continue in the program to work toward the BS degree without being recommended for a teaching certificate, or explore another major.

Students participate in classroom observations and limited direct teaching experiences as a component of many of their pedagogy courses beginning in their freshman year. Students have the option of the following teacher certification/concentration tracks within their major which determines their individual program of study:

**Elementary Education, Pre-Kindergarten through Grade 4:** focused study to work with children in pre-kindergarten, kindergarten, and grades 1-4 across subject areas (ages 3-9). The competencies for this concentration include child development (birth through age 5), language development, early literacy and math foundations for preschool years, early intervention, integrating the arts for the developing child and family and community partnerships.

**Elementary Education, Pre-Kindergarten through Grade 4 and Special Education:** focused study to work with children in pre-kindergarten, kindergarten, and grades 1-4 across subject areas (ages 3-9) within the competencies listed previously as well as working with students with disabilities in pre-kindergarten, kindergarten and grades 1-8 (ages 3-14). The special education competencies emphasize the Response to Intervention process, working with students at risk for and with/without disabilities, progress monitoring techniques, research-based instructional practices and interventions.

**Elementary Education, Middle Level:** focused study to work with students in

grades 4-6 across subjects and with students in grades 7-8 in two core academic subject(s) the teacher education candidate chooses to pursue:

- Middle School Mathematics & English
- Middle School Science & English
- Middle School Science & Math

In the senior year, students who are officially accepted into the Teacher Preparation Program and maintain the GPA and grade requirements, enroll and complete the 12-week, full-time, student-teaching experience (EDUC 410 WI) in their primary area of certification. Students must receive a grade of at least B in EDUC 410 (and EDUC 414 if applicable) and in all pedagogy (EDUC) coursework, as well as maintain an overall 3.0 GPA to be recommended for teacher certification.

Students who were not officially accepted into the Teacher Preparation Program and/or do not maintain the GPA and grade requirements but who are working towards the BS degree without being recommended for teacher certification take other courses as assigned by the Teacher Education Program Director and/or academic advisor to fulfill needed credits for the degree in lieu of student teaching.

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.

Additional information is available at the [School of Education's web site](#).



# Drexel University

## Catalog 2009/2010

### BS in Elementary Education: PK-4

*Bachelor of Science Degree: 180.5 Credits*

Degree requirements (incoming students, 2009/2010)

This certification enables teachers to work with children in prekindergarten, kindergarten, and grades 1-4 across subject areas. Required competencies are covered in areas such as child development, language development, early literacy and math foundations for preschool years, early intervention, integrating the arts for the developing child, and family and community partnerships.

For a sample plan of study listing the sequence of how courses should be completed, see the BS in Elementary Education: PK-4 Sequence page.

<b>General education/Content requirements</b>		<b>65.0 Credits</b>
BIO 161	<b>General Biology I</b>	3.0
BIO 162	<b>General Biology I</b>	3.0
CHEM 111	<b>General Chemistry I</b>	4.0
COM 111	<b>Techniques of Speaking</b>	3.0
ECON 201	<b>Principles of Microeconomics</b>	4.0
ENGL 101	<b>Expository Writing and Reading</b>	3.0
ENGL 102	<b>Persuasive Writing and Reading</b>	3.0
ENGL 103	<b>Analytical Writing and Reading</b>	3.0
ENVS 260	<b>Environmental Science and Society</b>	3.0
HIST 298	<b>Special Studies in History: Pennsylvania/Philadelphia History</b>	3.0
MATH 181	<b>Mathematical Analysis I</b>	3.0
MATH 182	<b>Mathematical Analysis II</b>	3.0
MATH 183	<b>Mathematical Analysis III</b>	3.0
MUSC 130	<b>Introduction to Music</b>	4.0
PHYS 151	<b>Applied Physics</b>	3.0
PSY 101	<b>General Psychology</b>	3.0
PSY 320	<b>Educational Psychology</b>	3.0
PSY 330	<b>Cognitive Psychology</b>	3.0
SOC 335	<b>Sociology of Education</b>	3.0
UNIV 101	<b>The Drexel Experience</b>	2.0
	<b>English elective course between 200-329</b>	3.0
	<b>Nutrition elective*</b>	3.0
	<b>Free electives**</b>	24.0

\*NFS 101 is the recommended Nutrition elective.

\*\*Students wishing to receive PA Teacher Certification upon graduation in the area of Elementary Education should take EDUC 475 Conflict Resolution and Prevention School Violence as an elective.

<b>Pedagogy requirements</b>	<b>89.5 Credits</b>
<b>Foundations in Education I: A Historical and</b>	

EDUC 101	<b>Philosophical Perspective</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 120	<b>Child Development I: Typical Development</b>	3.0
EDUC 121	<b>Child Development II: Atypical Development</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Pedagogy Seminar</b>	1.0
EDUC 210	<b>Early Language Development</b>	3.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 217	<b>Math Methods and Content: Early Childhood</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 236	<b>Early Literacy I</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 265	<b>Instructing English Language Learners</b>	3.0
EDUC 305	<b>Junior Pedagogy Seminar</b>	1.0
EDUC 306	<b>Assessment of Young Children I</b>	3.0
EDUC 307	<b>Assessment of Young Children II</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 335	<b>Engaging the Learner</b>	3.0
EDUC 336	<b>Early Literacy II</b>	3.0
EDUC 338	<b>Expressive Arts for PreK-4</b>	3.0
EDUC 355	<b>Social Studies Teaching Methods</b>	3.0
EDUC 405	<b>Senior Pedagogy Seminar</b>	1.0
EDUC 411	<b>Family and Community Partnerships</b>	3.0
EDUC 355	<b>Social Studies Teaching Methods</b>	3.0

**Student teaching experience**

EDUC 410	<b>Student Teaching</b>	9.0
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*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 Elementary Education

4 YR UG Co-op Concentration /Elementary PK-4

		Credits
<b>Term 1</b>		
<a href="#">EDUC 101</a>	Foundations in Education I: A Historical and Philosophical Perspective	3.0
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 120</a>	Child Development I: Typical Development	3.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 181</a>	Mathematical Analysis I	3.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 2</b>		<b>Credits</b>
<a href="#">BIO 161</a>	General Biology I	3.0
<a href="#">COM 111</a>	Principles of Communication	3.0
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 121</a>	Child Development II: Atypical Development	3.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 182</a>	Mathematical Analysis II	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 3</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">MATH 183</a>	Mathematical Analysis III	3.0
<a href="#">NFS 101</a>	Introduction to Nutrition & Food	3.0
	<i>Term Credits</i>	<i>17.5</i>
<b>Term 4</b>		<b>Credits</b>
<a href="#">BIO 162</a>	General Biology II	3.0
<a href="#">EDUC 205</a>	Sophomore Pedagogy Seminar	1.0
<a href="#">EDUC 236</a>	Early Literacy I	3.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
	ENGL 200 through ENGL 399	3.0
	<i>Term Credits</i>	<i>14.5</i>
<b>Term 5</b>		<b>Credits</b>
<a href="#">EDUC 217</a>	Math Methods and Content: Early Childhood	3.0
<a href="#">EDUC 265</a>	Instructing English Language Learners	3.0
<a href="#">EDUC 326</a>	Language Arts Processes	3.0
<a href="#">HIST 298</a>	Special Studies in History: Pennsylvania and Philadelphia History	3.0
<a href="#">PHYS 151</a>	Applied Physics	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 6</b>		<b>Credits</b>
<a href="#">ECON 201</a>	Principles of Microeconomics	4.0
<a href="#">EDUC 210</a>	Early Language Development	3.0
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
	<i>Term Credits</i>	<i>14.5</i>

<b>Term 7</b>		<b>Credits</b>
<a href="#">CHEM 111</a>	General Chemistry I	4.0
<a href="#">EDUC 305</a>	Junior Pedagogy Seminar	1.0
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
<a href="#">SOC 335</a>	Sociology of Education I	3.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 218</a>	Math: Methods & Content	3.0
<a href="#">EDUC 306</a>	Assessment of Young Children I	3.0
<a href="#">EDUC 335</a>	Engaging the Learner	3.0
<a href="#">EDUC 355</a>	Social Studies Teaching Methods	3.0
<a href="#">ENVS 260</a>	Environmental Science and Society I	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 307</a>	Assessment of Young Children II	4.0
<a href="#">EDUC 336</a>	Early Literacy II	3.0
	Free electives	9.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 338</a>	Expressive Arts for PK-4	3.0
<a href="#">EDUC 405</a>	Senior Pedagogy Seminar	1.0
<a href="#">EDUC 411</a>	Family and Community Partnerships	3.0
<a href="#">MUSC 130</a>	Introduction to Music	3.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
	<i>Term Credits</i>	<b>13.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 410</a>	Student Teaching	9.0
	Free elective	3.0
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
	Free electives	12.0
	<i>Term Credits</i>	<b>12.0</b>
	<b>Total Credits (minimum)</b>	<b>180.5</b>

Last Updated: February 1, 04:43 pm

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# Drexel University

## Catalog 2009/2010

### **BS in Elementary Education: PK-4 and Special Education**

*Bachelor of Science Degree: 188.0 Credits*

Degree requirements (incoming students, 2009/2010)

This certification enables teachers to work with children in prekindergarten, kindergarten, and grades 1-4 across subject areas. Required competencies are covered in areas such as child development, language development, early literacy and math foundations for preschool years, early intervention, integrating the arts for the developing child, and family and community partnerships.

In addition, this certification enables teachers to work with students with disabilities in prekindergarten, kindergarten, and grades 1-4. Students will learn how to work with students at risk for disabilities or with disabilities, progress monitoring techniques, research based instructional practices, and interventions.

For a sample plan of study listing the sequence of how courses should be completed, see the BS in Elementary Education: PK-4 and Special Education Sequence page.

<b>General education/Content requirements</b>		<b>65.0 Credits</b>
BIO 161	<b>General Biology I</b>	3.0
BIO 162	<b>General Biology I</b>	3.0
CHEM 111	<b>General Chemistry I</b>	4.0
COM 111	<b>Techniques of Speaking</b>	3.0
ECON 201	<b>Principles of Microeconomics</b>	4.0
ENGL 101	<b>Expository Writing and Reading</b>	3.0
ENGL 102	<b>Persuasive Writing and Reading</b>	3.0
ENGL 103	<b>Analytical Writing and Reading</b>	3.0
ENVS 260	<b>Environmental Science and Society</b>	3.0
HIST 298	<b>Special Studies in History: Pennsylvania/Philadelphia History</b>	3.0
MATH 181	<b>Mathematical Analysis I</b>	3.0
MATH 182	<b>Mathematical Analysis II</b>	3.0
MATH 183	<b>Mathematical Analysis III</b>	3.0
MUSC 130	<b>Introduction to Music</b>	4.0
PHYS 151	<b>Applied Physics</b>	3.0
PSY 101	<b>General Psychology</b>	3.0
PSY 320	<b>Educational Psychology</b>	3.0
PSY 330	<b>Cognitive Psychology</b>	3.0
SOC 335	<b>Sociology of Education</b>	3.0
UNIV 101	<b>The Drexel Experience</b>	2.0
	<b>English elective course between 200-329</b>	3.0
	<b>Nutrition elective*</b>	3.0

\*NFS 101 is the recommended Nutrition elective.

<b>Pedagogy requirements</b>		<b>90.0 Credits</b>
EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 120	<b>Child Development I: Typical Development</b>	3.0
EDUC 121	<b>Child Development II: Atypical Development</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Pedagogy Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 217	<b>Math Methods and Content: Early Childhood</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 236	<b>Early Literacy I</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 265	<b>Instructing English Language Learners</b>	3.0
EDUC 305	<b>Junior Pedagogy Seminar</b>	1.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 335	<b>Engaging the Learner</b>	3.0
EDUC 336	<b>Early Literacy II</b>	3.0
EDUC 338	<b>Expressive Arts for PreK-4</b>	3.0
EDUC 355	<b>Social Studies Teaching Methods</b>	3.0
EDUC 405	<b>Senior Pedagogy Seminar</b>	1.0
EDUC 411	<b>Family and Community Partnerships</b>	3.0
EDUC 355	<b>Social Studies Teaching Methods</b>	3.0
<b>Special Education Core Courses</b>		<b>31.5</b>
EDUC 347	<b>Special Education Processes</b>	4.5
EDUC 348	<b>Emotional &amp; Behavioral Support</b>	4.5
EDUC 349	<b>High Incident Disabilities</b>	4.5
EDUC 350	<b>Low Incident Disabilities</b>	4.5
EDUC 351	<b>Pervasive Developmental Disorders</b>	4.5
EDUC 352	<b>Integrating Technology for Learning &amp; Achievement</b>	4.5
EDUC 353	<b>Special Education: Methods &amp; Practices</b>	4.5
<b>Student teaching experience</b>		
EDUC 414	<b>Special Education: Field Placement Seminar</b>	9.0

#### *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 writing-intensive 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 Elementary Education

4 YR UG Co-op Concentration /Elementary PK-4 & Special Ed

Term 1	Credits
<a href="#">EDUC 101</a> Foundations in Education I: A Historical and Philosophical Perspective	3.0
<a href="#">EDUC 105</a> Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 120</a> Child Development I: Typical Development	3.0
<a href="#">ENGL 101</a> Expository Writing and Reading	3.0
<a href="#">MATH 181</a> Mathematical Analysis I	3.0
<a href="#">PSY 101</a> General Psychology I	3.0
<a href="#">UNIV 101</a> The Drexel Experience	1.0
<i>Term Credits</i>	<i>17.0</i>
Term 2	Credits
<a href="#">BIO 161</a> General Biology I	3.0
<a href="#">COM 111</a> Principles of Communication	3.0
<a href="#">EDUC 105</a> Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 121</a> Child Development II: Atypical Development	3.0
<a href="#">ENGL 102</a> Persuasive Writing and Reading	3.0
<a href="#">MATH 182</a> Mathematical Analysis II	3.0
<a href="#">UNIV 101</a> The Drexel Experience	1.0
<i>Term Credits</i>	<i>17.0</i>
Term 3	Credits
<a href="#">EDUC 105</a> Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 114</a> Science Teaching Methods	3.0
<a href="#">EDUC 142</a> Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a> Analytical Writing and Reading	3.0
<a href="#">MATH 183</a> Mathematical Analysis III	3.0
<a href="#">NFS 101</a> Introduction to Nutrition & Food	3.0
<i>Term Credits</i>	<i>17.5</i>
Term 4	Credits
<a href="#">BIO 162</a> General Biology II	3.0
<a href="#">EDUC 205</a> Sophomore Pedagogy Seminar	1.0
<a href="#">EDUC 236</a> Early Literacy I	3.0
<a href="#">EDUC 244</a> Inclusionary Practices for Exceptional Students	4.5
<i>Term Credits</i>	<i>11.5</i>
Term 5	Credits
<a href="#">EDUC 217</a> Math Methods and Content: Early Childhood	3.0
<a href="#">EDUC 265</a> Instructing English Language Learners	3.0
<a href="#">EDUC 326</a> Language Arts Processes	3.0
<a href="#">HIST 298</a> Special Studies in History: Pennsylvania and Philadelphia History	3.0
<a href="#">PHYS 151</a> Applied Physics	3.0
ENGL 200 through ENGL 399	3.0
<i>Term Credits</i>	<i>18.0</i>
Term 6	Credits
<a href="#">ECON 201</a> Principles of Microeconomics	4.0
<a href="#">EDUC 216</a> Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a> Literacy and Content Skill Development	4.5
<a href="#">EDUC 347</a> Special Education Processes	4.5
<i>Term Credits</i>	<i>16.0</i>

<b>Term 7</b>		<b>Credits</b>
<a href="#">CHEM 111</a>	General Chemistry I	4.0
<a href="#">EDUC 305</a>	Junior Pedagogy Seminar	1.0
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">EDUC 338</a>	Expressive Arts for PK-4	3.0
<a href="#">EDUC 353</a>	Special Education: Methods & Practices	4.5
<a href="#">PSY 320</a>	Educational Psychology	3.0
	<i>Term Credits</i>	<b>18.5</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 218</a>	Math: Methods & Content	3.0
<a href="#">EDUC 307</a>	Assessment of Young Children II	4.0
<a href="#">EDUC 335</a>	Engaging the Learner	3.0
<a href="#">EDUC 348</a>	Emotional & Behavioral Support	4.5
<a href="#">EDUC 355</a>	Social Studies Teaching Methods	3.0
<a href="#">ENVS 260</a>	Environmental Science and Society I	3.0
	<i>Term Credits</i>	<b>20.5</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 336</a>	Early Literacy II	3.0
<a href="#">EDUC 349</a>	High Incident Disabilities	4.5
<a href="#">EDUC 351</a>	Pervasive Developmental Disorders	4.5
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 405</a>	Senior Pedagogy Seminar	1.0
<a href="#">EDUC 410</a>	Student Teaching	9.0
<a href="#">EDUC 411</a>	Family and Community Partnerships	3.0
	<i>Term Credits</i>	<b>13.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 352</a>	Integrating Technology for Learning & Achievement	4.5
<a href="#">EDUC 414</a>	Special Education: Field Placement Seminar	9.0
	<i>Term Credits</i>	<b>13.5</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">EDUC 350</a>	Low Incident Disabilities	4.5
<a href="#">MUSC 130</a>	Introduction to Music	3.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
<a href="#">SOC 335</a>	Sociology of Education I	3.0
	<i>Term Credits</i>	<b>13.5</b>
	<b>Total Credits (minimum)</b>	<b>188.0</b>

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# Drexel University

## Catalog 2009/2010

### **BS in Elementary Education: Middle Level Math and English**

*Bachelor of Science Degree: 180.5 Credits*

Degree requirements (incoming students, 2009/2010)

This certification enables to teachers to work with students in grades 4-6 across subjects, and with students in grades 7-8 in the core academic subjects of mathematics and English. Additional information about the degree is available at the School of Education's web site.

For a sample plan of study listing the sequence of how courses should be completed, see the BS in Elementary Education: Middle Level Math and English Sequence page.

<b>General education/Content requirements</b>		<b>82.0 Credits</b>
ARTH 101	<b>History of Art</b>	3.0
BIO 161	<b>General Biology I</b>	3.0
BIO 162	<b>General Biology I</b>	3.0
CHEM 111	<b>General Chemistry I</b>	4.0
COM 111	<b>Techniques of Speaking</b>	3.0
ECON 201	<b>Principles of Microeconomics</b>	4.0
ENGL 101	<b>Expository Writing and Reading</b>	3.0
ENGL 102	<b>Persuasive Writing and Reading</b>	3.0
ENGL 103	<b>Analytical Writing and Reading</b>	3.0
ENGL 304	<b>Young Adult Fiction</b>	3.0
ENVS 260	<b>Environmental Science and Society</b>	3.0
HIST 298	<b>Special Studies in History: Pennsylvania/Philadelphia History</b>	3.0
LING 101	<b>Linguistic Analysis</b>	3.0
MATH 181	<b>Mathematical Analysis I</b>	3.0
MATH 182	<b>Mathematical Analysis II</b>	3.0
MATH 183	<b>Mathematical Analysis III</b>	3.0
MUSC 130	<b>Introduction to Music</b>	4.0
PHYS 151	<b>Applied Physics</b>	3.0
PSY 101	<b>General Psychology</b>	3.0
PSY 320	<b>Educational Psychology</b>	3.0
PSY 330	<b>Cognitive Psychology</b>	3.0
SOC 335	<b>Sociology of Education</b>	3.0
UNIV 101	<b>The Drexel Experience</b>	2.0
<b>One of the following American History courses:</b>		
HIST 201	<b>US History to 1815</b>	3.0
HIST 202	<b>US History, 1815-1900</b>	3.0
HIST 203	<b>US History since 1900</b>	3.0
	<b>Nutrition elective*</b>	3.0
	<b>Free electives**</b>	12.0

\*NFS 101 is the recommended Nutrition elective.

\*\*Students wishing to receive PA Teacher Certification upon graduation in the area of Elementary Education should take EDUC 475 Conflict Resolution and Prevention School Violence as an elective.

<b>Pedagogy requirements</b>		<b>92.5 Credits</b>
EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 123	<b>Adolescent Development</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Pedagogy Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 223	<b>Teaching the Middle School Child</b>	3.0
EDUC 240	<b>Proportional Reasoning in Middle School</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 256	<b>Teaching Writing Grades 4-8</b>	3.0
EDUC 257	<b>Content Area Reading (Grades 4-8)</b>	3.0
EDUC 265	<b>Instructing English Language Learners</b>	3.0
EDUC 284	<b>Teaching Life Science in the Middle School</b>	3.0
EDUC 285	<b>Teaching Physical Science in the Middle School</b>	3.0
EDUC 286	<b>Teaching Earth &amp; Space Science for Middle School</b>	3.0
EDUC 292	<b>Science Methods for Middle School</b>	3.0
EDUC 305	<b>Junior Pedagogy Seminar</b>	1.0
EDUC 306	<b>Assessment of Young Children I</b>	3.0
EDUC 307	<b>Assessment of Young Children II</b>	4.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 328	<b>Language Arts Processes 4-8</b>	3.0
EDUC 355	<b>Social Studies Teaching Methods</b>	3.0
EDUC 405	<b>Senior Pedagogy Seminar</b>	1.0
<b>Student teaching experience</b>		
EDUC 410	<b>Student Teaching</b>	9.0

#### *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 writing-intensive 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 Elementary Education

4 YR UG Co-op Concentration /Middle Level Math & English

		Credits
<b>Term 1</b>		
<a href="#">BIO 161</a>	General Biology I	3.0
<a href="#">EDUC 101</a>	Foundations in Education I: A Historical and Philosophical Perspective	3.0
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 123</a>	Adolescent Development	3.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 181</a>	Mathematical Analysis I	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 2</b>		<b>Credits</b>
<a href="#">COM 111</a>	Principles of Communication	3.0
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 115</a>	Reasoning about Numbers/Quantity (4-8)	3.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 182</a>	Mathematical Analysis II	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	2.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 3</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">LING 101</a>	Introduction to Linguistics	3.0
<a href="#">MATH 183</a>	Mathematical Analysis III	3.0
	<i>Term Credits</i>	<b>17.5</b>
<b>Term 4</b>		<b>Credits</b>
<a href="#">BIO 162</a>	General Biology II	3.0
<a href="#">EDUC 205</a>	Sophomore Pedagogy Seminar	1.0
<a href="#">EDUC 223</a>	Teaching the Middle School Child	3.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
<a href="#">PSY 101</a>	General Psychology I	3.0
	<i>Term Credits</i>	<b>14.5</b>
<b>Term 5</b>		<b>Credits</b>
<a href="#">EDUC 240</a>	Proportional Reasoning in Middle School	3.0
<a href="#">EDUC 265</a>	Instructing English Language Learners	3.0
<a href="#">EDUC 328</a>	Language Arts Processes 4-8	3.0
<a href="#">HIST 298</a>	Special Studies in History: Pennsylvania/Philadelphia History	3.0
<a href="#">PHYS 151</a>	Applied Physics	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 6</b>		<b>Credits</b>
<a href="#">ECON 201</a>	Principles of Microeconomics	4.0
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
<a href="#">EDUC 257</a>	Content Area Reading (Grades 4-8)	3.0
<a href="#">ENGL 304</a>	Young Adult Fiction	3.0
	<i>Term Credits</i>	<b>17.5</b>
<b>Term 7</b>		<b>Credits</b>
<a href="#">CHEM 111</a>		

	General Chemistry I	4.0
<a href="#">EDUC 305</a>	Junior Pedagogy Seminar	1.0
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
<a href="#">SOC 335</a>	Sociology of Education I	3.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 218</a>	Math: Methods & Content	3.0
<a href="#">EDUC 256</a>	Teaching Writing Grades 4-8	3.0
<a href="#">EDUC 306</a>	Assessment of Young Children I	3.0
<a href="#">EDUC 355</a>	Social Studies Teaching Methods	3.0
<a href="#">ENVS 260</a>	Environmental Science and Society I	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 307</a>	Assessment of Young Children II	4.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">EDUC 326</a>	Language Arts Processes	3.0
<a href="#">EDUC 416</a>	Introduction to Math Teaching Methods (4-8)	3.0
<a href="#">EDUC 432</a>	Algebraic Reasoning	3.0
	<i>Term Credits</i>	<i>16.0</i>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 405</a>	Senior Pedagogy Seminar	1.0
<a href="#">EDUC 417</a>	Advanced Math Teaching Methods (4-8)	3.0
<a href="#">EDUC 433</a>	Functions in Middle School Math	3.0
<a href="#">MUSC 130</a>	Introduction to Music	3.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
	<i>Term Credits</i>	<i>13.0</i>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 410</a>	Student Teaching	9.0
	Free elective	3.0
	<i>Term Credits</i>	<i>12.0</i>
<b>Term 12</b>		<b>Credits</b>
<a href="#">ARTH 101</a>	History of Art I: Ancient to Medieval	3.0
<a href="#">NFS 101</a>	Introduction to Nutrition & Food	3.0
<a href="#">HIST 201</a>	US History to 1815	3.0
or		
<a href="#">HIST 203</a>	US History since 1900	3.0
or		
<a href="#">HIST 202</a>	US History, 1815-1900	3.0
	Free elective	3.0
	<i>Term Credits</i>	<i>12.0</i>
	<b>Total Credits (minimum)</b>	<b>180.5</b>

# Drexel University

## Catalog 2009/2010

### **BS in Elementary Education: Middle Level Science and Math**

*Bachelor of Science Degree: 180.5 Credits*

Degree requirements (incoming students, 2009/2010)

This certification enables to teachers to work with students in grades 4-6 across subjects, and with students in grades 7-8 in the core academic subjects of science and mathematics. Additional information about the degree is available at the School of Education's web site.

For a sample plan of study listing the sequence of how courses should be completed, see the BS in Elementary Education: Middle Level Science and Math Sequence page.

<b>General education/Content requirements</b>		<b>88.0 Credits</b>
ARTH 101	<b>History of Art</b>	3.0
BIO 161	<b>General Biology I</b>	3.0
BIO 162	<b>General Biology I</b>	3.0
CHEM 111	<b>General Chemistry I</b>	4.0
COM 111	<b>Techniques of Speaking</b>	3.0
ECON 201	<b>Principles of Microeconomics</b>	4.0
ENGL 101	<b>Expository Writing and Reading</b>	3.0
ENGL 102	<b>Persuasive Writing and Reading</b>	3.0
ENGL 103	<b>Analytical Writing and Reading</b>	3.0
ENVS 260	<b>Environmental Science and Society</b>	3.0
HIST 298	<b>Special Studies in History: Pennsylvania/Philadelphia History</b>	3.0
MATH 181	<b>Mathematical Analysis I</b>	3.0
MATH 182	<b>Mathematical Analysis II</b>	3.0
MATH 183	<b>Mathematical Analysis III</b>	3.0
MUSC 130	<b>Introduction to Music</b>	4.0
PHYS 151	<b>Applied Physics</b>	3.0
PSY 101	<b>General Psychology</b>	3.0
PSY 320	<b>Educational Psychology</b>	3.0
PSY 330	<b>Cognitive Psychology</b>	3.0
SOC 335	<b>Sociology of Education</b>	3.0
UNIV 101	<b>The Drexel Experience</b>	2.0
<b>One of the following American History courses:</b>		
HIST 201	<b>US History to 1815</b>	3.0
HIST 202	<b>US History, 1815-1900</b>	3.0
HIST 203	<b>US History since 1900</b>	3.0
	<b>Nutrition elective*</b>	3.0
	<b>Free electives**</b>	9.0

\*NFS 101 is the recommended Nutrition elective.

\*\*Students wishing to receive PA Teacher Certification upon graduation in the area

of Elementary Education should take EDUC 475 Conflict Resolution and Prevention School Violence as an elective.

<b>Pedagogy requirements</b>		<b>101.5 Credits</b>
EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 115	<b>Reasoning about Numbers/Quantity (4-8)</b>	3.0
EDUC 123	<b>Adolescent Development</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Pedagogy Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 223	<b>Teaching the Middle School Child</b>	3.0
EDUC 240	<b>Proportional Reasoning in Middle School</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 265	<b>Instructing English Language Learners</b>	3.0
EDUC 284	<b>Teaching Life Science in the Middle School</b>	3.0
EDUC 285	<b>Teaching Physical Science in the Middle School</b>	3.0
EDUC 286	<b>Teaching Earth &amp; Space Science for Middle School</b>	3.0
EDUC 292	<b>Science Methods for Middle School</b>	3.0
EDUC 305	<b>Junior Pedagogy Seminar</b>	1.0
EDUC 306	<b>Assessment of Young Children I</b>	3.0
EDUC 307	<b>Assessment of Young Children II</b>	4.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 355	<b>Social Studies Teaching Methods</b>	3.0
EDUC 405	<b>Senior Pedagogy Seminar</b>	1.0
EDUC 416	<b>Introduction to Math Teaching Methods (4-8)</b>	3.0
EDUC 417	<b>Advanced Math Teaching Methods (4-8)</b>	3.0
EDUC 432	<b>Algebraic Reasoning</b>	3.0
EDUC 433	<b>Functions in Middle School Math</b>	3.0
<b>Student teaching experience</b>		
EDUC 410	<b>Student Teaching</b>	9.0

#### *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 writing-intensive 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 Elementary Education

4 YR UG Co-op Concentration /Middle Level Science & Math

Term 1	Credits
<a href="#">BIO 161</a> General Biology I	3.0
<a href="#">EDUC 101</a> Foundations in Education I: A Historical and Philosophical Perspective	3.0
<a href="#">EDUC 105</a> Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 123</a> Adolescent Development	3.0
<a href="#">ENGL 101</a> Expository Writing and Reading	3.0
<a href="#">MATH 181</a> Mathematical Analysis I	3.0
<i>Term Credits</i>	<i>16.0</i>
Term 2	Credits
<a href="#">COM 111</a> Principles of Communication	3.0
<a href="#">EDUC 105</a> Freshman Pedagogy Seminar	1.0
<a href="#">ENGL 102</a> Persuasive Writing and Reading	3.0
<a href="#">MATH 182</a> Mathematical Analysis II	3.0
<a href="#">MUSC 130</a> Introduction to Music	3.0
<a href="#">UNIV 101</a> The Drexel Experience	2.0
<i>Term Credits</i>	<i>15.0</i>
Term 3	Credits
<a href="#">EDUC 105</a> Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 114</a> Science Teaching Methods	3.0
<a href="#">EDUC 115</a> Reasoning about Numbers/Quantity (4-8)	3.0
<a href="#">EDUC 142</a> Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a> Analytical Writing and Reading	3.0
<a href="#">MATH 183</a> Mathematical Analysis III	3.0
<i>Term Credits</i>	<i>17.5</i>
Term 4	Credits
<a href="#">BIO 162</a> General Biology II	3.0
<a href="#">EDUC 205</a> Sophomore Pedagogy Seminar	1.0
<a href="#">EDUC 223</a> Teaching the Middle School Child	3.0
<a href="#">EDUC 244</a> Inclusionary Practices for Exceptional Students	4.5
<a href="#">HIST 298</a> Special Studies in History: Pennsylvania/Philadelphia History	3.0
<i>Term Credits</i>	<i>14.5</i>
Term 5	Credits
<a href="#">EDUC 240</a> Proportional Reasoning in Middle School	3.0
<a href="#">EDUC 265</a> Instructing English Language Learners	3.0
<a href="#">EDUC 284</a> Teaching Life Science in the Middle School	3.0
<a href="#">EDUC 285</a> Teaching Physical Science in the Middle School	3.0
<a href="#">PHYS 151</a> Applied Physics	3.0
<i>Term Credits</i>	<i>15.0</i>
Term 6	Credits
<a href="#">ECON 201</a> Principles of Microeconomics	4.0
<a href="#">EDUC 216</a> Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a> Literacy and Content Skill Development	4.5
<a href="#">PSY 101</a> General Psychology I	3.0
Free elective	3.0
<i>Term Credits</i>	<i>17.5</i>
Term 7	Credits
<a href="#">CHEM 111</a>	

	General Chemistry I	4.0
<a href="#">EDUC 305</a>	Junior Pedagogy Seminar	1.0
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
<a href="#">SOC 335</a>	Sociology of Education I	3.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 218</a>	Math: Methods & Content	3.0
<a href="#">EDUC 306</a>	Assessment of Young Children I	3.0
<a href="#">EDUC 327</a>	Learning Disabilities	3.0
<a href="#">EDUC 355</a>	Social Studies Teaching Methods	3.0
<a href="#">ENVS 260</a>	Environmental Science and Society I	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 286</a>	Teaching Earth & Space Science for Middle School	3.0
<a href="#">EDUC 307</a>	Assessment of Young Children II	4.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">EDUC 416</a>	Introduction to Math Teaching Methods (4-8)	3.0
<a href="#">EDUC 432</a>	Algebraic Reasoning	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 292</a>	Science Methods for Middle School	3.0
<a href="#">EDUC 405</a>	Senior Pedagogy Seminar	1.0
<a href="#">EDUC 417</a>	Advanced Math Teaching Methods (4-8)	3.0
<a href="#">EDUC 433</a>	Functions in Middle School Math	3.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
	<i>Term Credits</i>	<b>13.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 410</a>	Student Teaching	9.0
	Free elective	3.0
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">ARTH 101</a>	History of Art I: Ancient to Medieval	3.0
<a href="#">NFS 101</a>	Introduction to Nutrition & Food	3.0
<a href="#">HIST 201</a>	US History to 1815	3.0
or		
<a href="#">HIST 203</a>	US History since 1900	3.0
or		
<a href="#">HIST 202</a>	US History, 1815-1900	3.0
	Free elective	3.0
	<i>Term Credits</i>	<b>12.0</b>
	<b>Total Credits (minimum)</b>	<b>180.5</b>



# Drexel University

## Catalog 2009/2010

### **BS in Elementary Education: Middle Level Science and English**

*Bachelor of Science Degree: 180.5 Credits*

Degree requirements (incoming students, 2009/2010)

This certification enables to teachers to work with students in grades 4-6 across subjects, and with students in grades 7-8 in the core academic subjects of science and English. Additional information about the degree is available at the School of Education's web site.

For a sample plan of study listing the sequence of how courses should be completed, see the BS in Elementary Education: Middle Level Science and English Sequence page.

<b>General education/Content requirements</b>		<b>88.0 Credits</b>
ARTH 101	<b>History of Art</b>	3.0
BIO 161	<b>General Biology I</b>	3.0
BIO 162	<b>General Biology I</b>	3.0
CHEM 111	<b>General Chemistry I</b>	4.0
COM 111	<b>Techniques of Speaking</b>	3.0
ECON 201	<b>Principles of Microeconomics</b>	4.0
ENGL 101	<b>Expository Writing and Reading</b>	3.0
ENGL 102	<b>Persuasive Writing and Reading</b>	3.0
ENGL 103	<b>Analytical Writing and Reading</b>	3.0
ENGL 304	<b>Young Adult Fiction</b>	3.0
ENVS 260	<b>Environmental Science and Society</b>	3.0
HIST 298	<b>Special Studies in History: Pennsylvania/Philadelphia History</b>	3.0
LING 101	<b>Linguistic Analysis</b>	3.0
MATH 181	<b>Mathematical Analysis I</b>	3.0
MATH 182	<b>Mathematical Analysis II</b>	3.0
MATH 183	<b>Mathematical Analysis III</b>	3.0
MUSC 130	<b>Introduction to Music</b>	4.0
PHYS 151	<b>Applied Physics</b>	3.0
PSY 101	<b>General Psychology</b>	3.0
PSY 320	<b>Educational Psychology</b>	3.0
PSY 330	<b>Cognitive Psychology</b>	3.0
SOC 335	<b>Sociology of Education</b>	3.0
UNIV 101	<b>The Drexel Experience</b>	2.0
<b>One of the following American History courses:</b>		
HIST 201	<b>US History to 1815</b>	3.0
HIST 202	<b>US History, 1815-1900</b>	3.0
HIST 203	<b>US History since 1900</b>	3.0
	<b>Nutrition elective*</b>	3.0
	<b>Free electives**</b>	9.0

\*NFS 101 is the recommended Nutrition elective.

\*\*Students wishing to receive PA Teacher Certification upon graduation in the area of Elementary Education should take EDUC 475 Conflict Resolution and Prevention School Violence as an elective.

<b>Pedagogy requirements</b>		<b>92.5 Credits</b>
EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 115	<b>Reasoning about Numbers/Quantity (4-8)</b>	3.0
EDUC 123	<b>Adolescent Development</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Pedagogy Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 223	<b>Teaching the Middle School Child</b>	3.0
EDUC 240	<b>Proportional Reasoning in Middle School</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 265	<b>Instructing English Language Learners</b>	3.0
EDUC 305	<b>Junior Pedagogy Seminar</b>	1.0
EDUC 306	<b>Assessment of Young Children I</b>	3.0
EDUC 307	<b>Assessment of Young Children II</b>	4.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 328	<b>Language Arts Processes 4-8</b>	3.0
EDUC 355	<b>Social Studies Teaching Methods</b>	3.0
EDUC 405	<b>Senior Pedagogy Seminar</b>	1.0
EDUC 416	<b>Introduction to Math Teaching Methods (4-8)</b>	3.0
EDUC 417	<b>Advanced Math Teaching Methods (4-8)</b>	3.0
EDUC 432	<b>Algebraic Reasoning</b>	3.0
EDUC 433	<b>Functions in Middle School Math</b>	3.0
<b>Student teaching experience</b>		
EDUC 410	<b>Student Teaching</b>	9.0

#### *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 writing-intensive 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 Elementary Education

4 YR UG Co-op Concentration /Middle Level Science & English

<b>Term 1</b>		<b>Credits</b>
<a href="#">BIO 161</a>	General Biology I	3.0
<a href="#">EDUC 101</a>	Foundations in Education I: A Historical and Philosophical Perspective	3.0
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 123</a>	Adolescent Development	3.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 181</a>	Mathematical Analysis I	3.0
	<i>Term Credits</i>	<i>16.0</i>
<b>Term 2</b>		<b>Credits</b>
<a href="#">COM 111</a>	Principles of Communication	3.0
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 182</a>	Mathematical Analysis II	3.0
<a href="#">MUSC 130</a>	Introduction to Music	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	2.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 3</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Pedagogy Seminar	1.0
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">LING 101</a>	Introduction to Linguistics	3.0
<a href="#">MATH 183</a>	Mathematical Analysis III	3.0
	<i>Term Credits</i>	<i>17.5</i>
<b>Term 4</b>		<b>Credits</b>
<a href="#">BIO 162</a>	General Biology II	3.0
<a href="#">EDUC 205</a>	Sophomore Pedagogy Seminar	1.0
<a href="#">EDUC 223</a>	Teaching the Middle School Child	3.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
<a href="#">HIST 298</a>	Special Studies in History: Pennsylvania/Philadelphia History	3.0
<a href="#">PSY 101</a>	General Psychology I	3.0
	<i>Term Credits</i>	<i>17.5</i>
<b>Term 5</b>		<b>Credits</b>
<a href="#">EDUC 265</a>	Instructing English Lang. Learners	3.0
<a href="#">EDUC 284</a>	Teaching Life Science in the Middle School	3.0
<a href="#">EDUC 285</a>	Teaching Physical Science in the MS	3.0
<a href="#">EDUC 328</a>	Language Arts Processes 4-8	3.0
<a href="#">PHYS 151</a>	Applied Physics	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 6</b>		<b>Credits</b>
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
<a href="#">EDUC 257</a>	Content Area Reading (Grades 4-8)	3.0
<a href="#">ENGL 304</a>	Young Adult Fiction	3.0
	<i>Term Credits</i>	<i>13.5</i>
<b>Term 7</b>		<b>Credits</b>
<a href="#">CHEM 111</a>		

	General Chemistry I	4.0
<a href="#">EDUC 305</a>	Junior Pedagogy Seminar	1.0
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
<a href="#">SOC 335</a>	Sociology of Education I	3.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 218</a>	Math: Methods & Content	3.0
<a href="#">EDUC 256</a>	Teaching Writing Grades 4-8	3.0
<a href="#">EDUC 306</a>	Assessment of Young Children I	3.0
<a href="#">EDUC 355</a>	Social Studies Teaching Methods	3.0
<a href="#">ENVS 260</a>	Environmental Science and Society I	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 286</a>	Teaching Earth & Space Science for Middle School	3.0
<a href="#">EDUC 307</a>	Assessment of Young Children II	4.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">EDUC 328</a>	Language Arts Processes 4-8	3.0
	Free elective	3.0
	<i>Term Credits</i>	<i>16.0</i>
<b>Term 10</b>		<b>Credits</b>
<a href="#">ECON 201</a>	Principles of Microeconomics	4.0
<a href="#">EDUC 292</a>	Science Methods for Middle School	3.0
<a href="#">EDUC 405</a>	Senior Pedagogy Seminar	1.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
	Free elective	3.0
	<i>Term Credits</i>	<i>14.0</i>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 410</a>	Student Teaching	9.0
	Free elective	3.0
	<i>Term Credits</i>	<i>12.0</i>
<b>Term 12</b>		<b>Credits</b>
<a href="#">ARTH 101</a>	History of Art I: Ancient to Medieval	3.0
<a href="#">NFS 101</a>	Introduction to Nutrition & Food	3.0
<a href="#">HIST 201</a>	US History to 1815	3.0
or		
<a href="#">HIST 203</a>	US History since 1900	3.0
or		
<a href="#">HIST 202</a>	US History, 1815-1900	3.0
	Free elective	3.0
	<i>Term Credits</i>	<i>12.0</i>
	<b>Total Credits (minimum)</b>	<b>180.5</b>

### BS in Teacher Education

#### About the Major

The BS in Teacher Education, is focused on secondary education, and provides graduates with the background to work with students in grades 7-12\* in a specific subject area. Students may work with their academic advisor to satisfy teacher certification requirements for multiple areas if desired. Available certification areas include:

- Biology
- Chemistry
- Earth & Space Science
- Environmental Education\*
- English
- General Science
- Mathematics
- Physics

\*Environmental Education is a grades K-12 certification area.

The program requires that students have a B average (3.0 GPA) in content courses needed for teacher certification in addition to the grade of B or better in each EDUC course throughout their time in the program. These requirements must be satisfied in order for Drexel to recommend the student for teacher certification upon graduation and/or be considered to have completed the program.

A benchmark to assist students in meeting the GPA and B grade requirements is the formal review of each student's content and pedagogy coursework at the end of the sophomore year. Students who meet these requirements, as well as pass the *Pre-Professional Skills Test* (PPST Reading, PPST Writing, PPST Mathematics) of the *ETS Praxis Exams* according to Pennsylvania standards at that time, are officially accepted into Drexel's Teacher Preparation Program. Students who do not meet the requirements work with their academic advisor to develop a plan of action to work toward meeting the requirements, continue in the program to work toward the BS degree without being recommended for a teaching certificate, or explore another major.

Students participate in classroom observations and limited direct teaching experiences as a component of many of their pedagogy courses beginning in their freshman year.

In the senior year, students who are officially accepted into the Teacher Preparation Program and maintain the GPA and grade requirements, enroll and complete the 12-week, full-time, student-teaching experience (EDUC 410 WI) in their primary area of certification. Students must receive a grade of at least B in EDUC 410 (and EDUC 414 if applicable) and in all pedagogy (EDUC) coursework, as well as maintain an overall 3.0 GPA to be recommended for teacher certification.

Students who were not officially accepted into the Teacher Preparation Program and/or do not maintain the GPA and grade requirements but who are working towards the BS degree without being recommended for teacher certification take other courses as assigned by the Teacher Education Program Director and/or academic advisor to fulfill needed credits for the degree in lieu of student teaching.

# Drexel University

## Catalog 2009/2010

### **B.S. in Teacher Education Biology Certification**

*Bachelor of Science: 190.0 credits*

*Certification is for grades 7 - 12*

Degree requirements (incoming students, 2009/2010)

The certification area emphasizes coursework in the biological sciences, including genetics, morphology and physiology, biochemistry, microbiology, and ecology. Students may also choose to pursue a second certification in chemistry and/or environmental education.

#### **General education requirements**

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

#### **Science requirements**

		<b>Credits</b>
BIO 121	<b>Physiology and Nutrition</b>	4.5
BIO 122	<b>Cells and Genetics</b>	4.5
BIO 123	<b>Organismal Diversity and Ecology</b>	4.5
BIO 201	<b>Human Psychology I</b>	4.0
BIO 214	<b>Principles of Cell Biology</b>	3.0
BIO 215	<b>Techniques of Cell Biology</b>	2.5
BIO 218	<b>Principles of Molecular Biology</b>	3.0
BIO 219	<b>Techniques of Molecular Biology</b>	2.5
BIO 270	<b>Developmental Biology</b>	3.0
BIO 271	<b>Developmental Biology Laboratory</b>	2.0
BIO 306	<b>Biochemistry Laboratory</b>	2.0
BIO 404	<b>Structure and Function of Biomolecules</b>	4.0
BIO 460	<b>Evolution</b>	3.0
CHEM 101	<b>General Chemistry I</b>	3.5
CHEM 102	<b>General Chemistry II</b>	4.5
CHEM 241	<b>Organic Chemistry I</b>	4.0
CHEM 242	<b>Organic Chemistry II</b>	4.0
CHEM 244	<b>Organic Chemistry I Laboratory</b>	3.0
CHEM 245	<b>Organic Chemistry Laboratory II</b>	3.0

ENVS 230	<b>General Ecology</b>	3.0
ENVS 284 WI	<b>Physiological and Population Ecology</b>	3.0
ENVS 285	<b>Population Ecology Laboratory</b>	2.0
PHYS 152	<b>Introductory Physics I</b>	4.0
PHYS 153	<b>Introductory Physics II</b>	4.0

<b>Pedagogy requirements</b>		<b>68.5 Credits</b>
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EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 102	<b>Foundations in Education II: Contemporary Issues</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 112	<b>Integrative Instruction</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 305	<b>Junior Seminar</b>	1.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 320 WI	<b>Professional Studies in Instruction</b>	6.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 405	<b>Senior Seminar</b>	1.0

<b>Student teaching experience</b>		
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EDUC 412 WI	<b>Student Teaching</b>	12.0
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*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 writing-intensive 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 /Biological Sciences

		Credits
<b>Term 1</b>		
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 121</a>	Calculus I	4.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 2</b>		<b>Credits</b>
<a href="#">CHEM 101</a>	General Chemistry I	3.5
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 301</a>	Introduction to Personalized Systems of Instruction	3.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 122</a>	Calculus II	4.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<b>15.5</b>
<b>Term 3</b>		<b>Credits</b>
<a href="#">CHEM 102</a>	General Chemistry II	4.5
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 112</a>	Integrative Instruction	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">MATH 123</a>	Calculus III	4.0
	<i>Term Credits</i>	<b>20.0</b>
<b>Term 4</b>		<b>Credits</b>
<a href="#">CHEM 241</a>	Organic Chemistry I	4.0
<a href="#">EDUC 205</a>	Sophomore Seminar	1.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
<a href="#">EDUC 326</a>	Language Arts Processes	3.0
<a href="#">HIST 280</a>	History of Science I	3.0
<a href="#">BIO 121</a>	Physiology of Nutrition	4.5
	<i>Term Credits</i>	<b>20.0</b>
<b>Term 5</b>		<b>Credits</b>
<a href="#">BIO 122</a>	Cells and Genetics	4.5
<a href="#">CHEM 242</a>	Organic Chemistry II	4.0
<a href="#">CHEM 244</a>	Organic Chemistry Lab I	3.0
<a href="#">COOP 101</a>	Career Management/Professional Development	0.0
<a href="#">EDUC 205</a>	Sophomore Seminar	1.0
<a href="#">EDUC 218</a>	Math: Methods and Content	3.0
	<i>Term Credits</i>	<b>15.5</b>
<b>Term 6</b>		<b>Credits</b>
<a href="#">BIO 123</a>	Organismal Diversity & Ecology	4.5
<a href="#">CHEM 245</a>	Organic Chemistry Lab II	3.0
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
<a href="#">PHIL 251</a>	Ethics	3.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
	<i>Term Credits</i>	<b>21.0</b>



<b>Term 7</b>		<b>Credits</b>
<a href="#">BIO 218</a>	Principles of Molecular Biology	3.0
<a href="#">BIO 219</a>	Techniques in Molecular Biology	2.5
<a href="#">EDUC 305</a>	Junior Seminar	1.0
<a href="#">PHYS 152</a>	Introductory Physics I	4.0
	English (ENGL) course between 200-329	3.0
	<i>Term Credits</i>	<b>13.5</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">BIO 214</a>	Principles of Cell Biology	3.0
<a href="#">BIO 215</a>	Techniques in Cell Biology	2.5
<a href="#">EDUC 305</a>	Junior Seminar	1.0
<a href="#">EDUC 322</a>	Evaluation of Instruction	4.0
<a href="#">PHYS 153</a>	Introductory Physics II	4.0
	<i>Term Credits</i>	<b>14.5</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">BIO 201</a>	Human Physiology I	4.0
<a href="#">BIO 270</a>	Development Biology	3.0
<a href="#">BIO 271</a>	Developmental Biology Laboratory	2.0
<a href="#">EDUC 320</a>	Professional Studies in Instruction	6.0
<a href="#">HIST 280</a>	History of Science I	3.0
	<i>Term Credits</i>	<b>18.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">BIO 306</a>	Biochemistry Laboratory	2.0
<a href="#">BIO 404</a>	Structure and Function of Biomolecules	4.0
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">EDUC 405</a>	Senior Seminar	1.0
<a href="#">ENVS 230</a>	General Ecology	3.0
	<i>Term Credits</i>	<b>13.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 412</a>	Student Teaching	12.0
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">BIO 460</a>	Evolution	3.0
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
<a href="#">ENVS 284</a>	Physiological and Population Ecology	3.0
<a href="#">ENVS 285</a>	Population Ecology Lab	2.0
	<i>Term Credits</i>	<b>14.0</b>
	<b>Total Credits (minimum)</b>	<b>192.0</b>

# Drexel University

## Catalog 2009/2010

### Chemistry Certification

*Bachelor of Science: 195.5 credits*

*(Certification is for grades 7 - 12)*

Degree requirements (incoming students, 2009/2010)

The certification area emphasizes coursework in such areas as organic chemistry, physical chemistry, biochemistry, analytical chemistry, and inorganic chemistry. Students may also choose to pursue a second certification in biology.

General education requirements		<b>38.0</b>
		<b>Credits</b>
HIST 280	<b>History of Science I</b>	3.0
ENGL 101	<b>Expository Writing and Reading</b>	3.0
ENGL 102	<b>Persuasive Writing and Reading</b>	3.0
ENGL 103	<b>Analytical Writing and Reading</b>	3.0
MATH 121	<b>Calculus I</b>	4.0
MATH 122	<b>Calculus II</b>	4.0
MATH 123	<b>Calculus III</b>	4.0
PHIL 251	<b>Ethics</b>	3.0
PSY 101	<b>General Psychology</b>	3.0
PSY 320	<b>Educational Psychology</b>	3.0
UNIV 101	<b>The Drexel Experience</b>	2.0
	<b>English elective course between 200-329</b>	3.0

Science requirements		<b>89.0</b>
		<b>Credits</b>
BIO 102	<b>Biology I: Cells and Tissues</b>	4.0
BIO 104	<b>Biology II: Growth and Heredity</b>	4.0
BIO 306	<b>Biochemistry Laboratory</b>	2.0
CHEC 352	<b>Physical Chemistry and Applications</b>	4.0
CHEM 101	<b>General Chemistry I</b>	3.5
CHEM 102	<b>General Chemistry II</b>	4.5
CHEM 103	<b>General Chemistry III</b>	5.0
CHEM 110	<b>Environmental Chemistry</b>	2.0
CHEM 230	<b>Quantitative Analysis</b>	3.0
CHEM 231 WI	<b>Quantitative Analysis Laboratory</b>	2.0
CHEM 241	<b>Organic Chemistry</b>	4.0
CHEM 242	<b>Organic Chemistry II</b>	4.0
CHEM 243	<b>Organic Chemistry III</b>	3.0
CHEM 244	<b>Organic Chemistry Laboratory I</b>	3.0
CHEM 245	<b>Organic Chemistry Laboratory II</b>	3.0
CHEM 252	<b>Physical Chemistry I</b>	3.0
CHEM 357	<b>Physical Chemistry I Laboratory</b>	2.5
CHEM 358	<b>Physical Chemistry II Laboratory</b>	2.5
CHEM 420	<b>Molecular Symmetry and Group Theory Chemistry</b>	3.0
CHEM 421	<b>Inorganic Chemistry I</b>	3.0
CHEM 430	<b>Analytical Chemistry I</b>	3.0

ENVS 401	<b>Chemistry of the Environment</b>	3.0
PHEV 145	<b>Weather 1: Climate and Global Change</b>	4.0
PHYS 101	<b>Fundamentals of Physics I</b>	4.0
PHYS 102	<b>Fundamentals of Physics II</b>	4.0
PHYS 201	<b>Fundamentals of Physics III</b>	4.0

**Pedagogy requirements** **72.0 Credits**

EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 102	<b>Foundations in Education II: Contemporary Issues</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 112	<b>Integrative Instruction</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 305	<b>Junior Seminar</b>	1.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 320 WI	<b>Professional Studies in Instruction</b>	6.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 405	<b>Senior Seminar</b>	1.0

**Student teaching experience**

EDUC 412 WI	<b>Student Teaching</b>	12.0
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*Writing-Intensive Course Requirements*

In order to graduate all students 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 writing-intensive 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 /Chemistry

Term 1	Credits
<a href="#">EDUC 101</a> Foundations in Education I: A Historical and Philosophical Perspective	3.0
<a href="#">EDUC 105</a> Freshman Seminar	1.0
<a href="#">ENGL 101</a> Expository Writing and Reading	3.0
<a href="#">MATH 121</a> Calculus I	4.0
<a href="#">PSY 101</a> General Psychology I	3.0
<a href="#">UNIV 101</a> The Drexel Experience	1.0
<i>Term Credits</i>	<i>15.0</i>
Term 2	Credits
<a href="#">CHEM 101</a> General Chemistry I	3.5
<a href="#">EDUC 102</a> Foundations in Education II: Contemporary Issues	3.0
<a href="#">EDUC 105</a> Freshman Seminar	1.0
<a href="#">ENGL 102</a> Persuasive Writing and Reading	3.0
<a href="#">MATH 122</a> Calculus II	4.0
<a href="#">PHYS 101</a> Fundamentals of Physics I	4.0
<a href="#">UNIV 101</a> The Drexel Experience	1.0
<i>Term Credits</i>	<i>19.5</i>
Term 3	Credits
<a href="#">CHEM 102</a> General Chemistry II	4.5
<a href="#">EDUC 105</a> Freshman Seminar	1.0
<a href="#">EDUC 112</a> Integrative Instruction	3.0
<a href="#">ENGL 103</a> Analytical Writing and Reading	3.0
<a href="#">MATH 123</a> Calculus III	4.0
<a href="#">PHYS 102</a> Fundamentals of Physics II	4.0
<i>Term Credits</i>	<i>19.5</i>
Term 4	Credits
<a href="#">BIO 102</a> Biology I: Cells and Tissues	4.0
<a href="#">CHEM 103</a> General Chemistry III	5.0
<a href="#">EDUC 142</a> Special Education Foundations: Referral and Assessment	4.5
<a href="#">EDUC 205</a> Sophomore Seminar	1.0
<a href="#">PHYS 201</a> Fundamentals of Physics III	4.0
<i>Term Credits</i>	<i>18.5</i>
Term 5	Credits
<a href="#">BIO 104</a> Biology II: Growth and HereditY	4.0
<a href="#">COOP 101</a> Career Management/Professional Development	0.0
<a href="#">EDUC 216</a> Diversity and Today's Teacher	3.0
<a href="#">EDUC 218</a> Math: Methods and Content	3.0
<a href="#">EDUC 244</a> Inclusionary Practices for Exceptional Students	4.5
<a href="#">EDUC 301</a> Introduction to Personalized Systems of Instruction	3.0
<a href="#">EDUC 310</a> Computer Applications in Teaching	3.0
<i>Term Credits</i>	<i>20.5</i>
Term 6	Credits
<a href="#">BIO 306</a> Biochemistry Laboratory	2.0
<a href="#">EDUC 114</a> Science Teaching Methods	3.0
<a href="#">EDUC 246</a> Literacy and Content Skill Development	4.5
<a href="#">EDUC 326</a> Language Arts Processes	3.0
<a href="#">MATH 200</a> Multivariate Calculus	4.0

	<i>Term Credits</i>	<b>16.5</b>
<b>Term 7</b>		<b>Credits</b>
<a href="#">CHEM 110</a>	Environmental Chemistry	2.0
<a href="#">CHEM 230</a>	Quantitative Analysis	3.0
<a href="#">CHEM 231</a>	Quantitative Analysis Lab	2.0
<a href="#">CHEM 241</a>	Organic Chemistry I	4.0
<a href="#">EDUC 305</a>	Junior Seminar	1.0
<a href="#">HIST 280</a>	History of Science I	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">CHEM 242</a>	Organic Chemistry II	4.0
<a href="#">CHEM 244</a>	Organic Chemistry Laboratory I	3.0
<a href="#">CHEM 356</a>	Physical Chemistry Lab	2.0
<a href="#">EDUC 322</a>	Evaluation of Instruction	4.0
<a href="#">ENVS 401</a>	Chemistry of the Environment	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">CHEC 352</a>	Physical Chemistry II	4.0
<a href="#">CHEM 245</a>	Organic Chemistry Lab II	3.0
<a href="#">EDUC 320</a>	Professional Studies in Instruction	6.0
<a href="#">PHIL 251</a>	Ethics	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">CHEM 421</a>	Inorganic Chemistry I	3.0
<a href="#">CHEM 430</a>	Analytical Chemistry I	3.0
<a href="#">EDUC 405</a>	Senior Seminar	1.0
<a href="#">PHEV 145</a>	Weather I: Climate and Global Change	4.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
	English (ENGL) course between 200-329	3.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 412</a>	Student Teaching	12.0
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">CHEM 243</a>	Organic Chemistry III	3.0
<a href="#">CHEM 357</a>	Physical Chemistry Lab I	2.5
<a href="#">CHEM 420</a>	Molecular Symmetry and Group Theory-Chemistry	3.0
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
	<i>Term Credits</i>	<b>14.5</b>
	<b>Total Credits (minimum)</b>	<b>200.0</b>

# Drexel University

## Catalog 2009/2010

### Earth and Space Science Certification

*Bachelor of Science: 195.5.0 credits*

*(Certification is for grades 7 - 12)*

Degree requirements (incoming students, 2009/2010)

The certification area emphasizes interdisciplinary study, involving coursework in biology, chemistry, geology, physics and atmospheric science. Students may also choose to pursue a second certification in chemistry or physics.

#### General education requirements

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

#### Science requirements

		<b>Credits</b>
BIO 121	<b>Physiology and Nutrition</b>	4.5
BIO 122	<b>Cells and Genetics</b>	4.5
BIO 123	<b>Organismal Diversity and Ecology</b>	4.5
CHEM 101	<b>General Chemistry I</b>	3.5
CHEM 102	<b>General Chemistry II</b>	4.5
ENVS 272	<b>Physical Geology</b>	4.0
ENVS 270	<b>History of Life on Earth</b>	4.0
ENVS 284 WI	<b>Physiological and Population Ecology</b>	3.0
ENVS 285	<b>Population Ecology Laboratory</b>	2.0
ENVS 286 WI	<b>Community and Ecosystem Ecology</b>	3.0
ENVS 287	<b>Community and Ecosystem Ecology Laboratory</b>	2.0
ENVS 260	<b>Environmental Science and Society</b>	3.0
ENVS 330	<b>Aquatic Ecology</b>	3.0
ENVS 370	<b>Practice of Environmental Economics</b>	3.0
ENVS 390	<b>Marine Ecology</b>	3.0
PHEV 145	<b>Weather 1: Climate and Global Change</b>	4.0
PHEV 146	<b>Weather 2: Analysis and Forecasting</b>	4.0

PHYS 101	<b>Fundamentals of Physics I</b>	4.0
PHYS 102	<b>Fundamentals of Physics II</b>	4.0
PHYS 131 WI	<b>Survey of the Universe</b>	3.0

<b>Pedagogy requirements</b>	<b>71.5 Credits</b>
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EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 102	<b>Foundations in Education II: Contemporary Issues</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 112	<b>Integrative Instruction</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 305	<b>Junior Seminar</b>	1.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 320 WI	<b>Professional Studies in Instruction</b>	6.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 405	<b>Senior Seminar</b>	1.0

<b>Student teaching experience</b>	
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EDUC 412 WI	<b>Student Teaching</b>	12.0
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*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 writing-intensive 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 /Earth & Space Science

		Credits
<b>Term 1</b>		
<a href="#">EDUC 101</a>	Foundations in Education I: A Historical and Philosophical Perspective	3.0
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">ENVS 169</a>	Environmental Science	3.0
<a href="#">MATH 121</a>	Calculus I	4.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<b>18.0</b>
<b>Term 2</b>		<b>Credits</b>
<a href="#">CHEM 101</a>	General Chemistry I	3.5
<a href="#">EDUC 102</a>	Foundations in Education II: Contemporary Issues	3.0
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 122</a>	Calculus II	4.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<b>15.5</b>
<b>Term 3</b>		<b>Credits</b>
<a href="#">CHEM 102</a>	General Chemistry II	4.5
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 112</a>	Integrative Instruction	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">MATH 123</a>	Calculus III	4.0
	<i>Term Credits</i>	<b>20.0</b>
<b>Term 4</b>		<b>Credits</b>
<a href="#">BIO 121</a>	Physiology and Nutrition	4.5
<a href="#">EDUC 205</a>	Sophomore Seminar	1.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
<a href="#">EDUC 326</a>	Language Arts Processes	3.0
<a href="#">PHYS 101</a>	Fundamentals of Physics I	4.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 5</b>		<b>Credits</b>
<a href="#">BIO 122</a>	Cells and Genetics	4.5
<a href="#">EDUC 218</a>	Mathematics: Methods and Content	3.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">ENVS 230</a>	General Ecology	3.0
<a href="#">ENVS 260</a>	Environmental Science and Society I	3.0
<a href="#">PHYS 102</a>	Fundamentals of Physics II	4.0
	<i>Term Credits</i>	<b>20.5</b>
<b>Term 6</b>		<b>Credits</b>
<a href="#">BIO 123</a>	Organismal Diversity & Ecology	4.5
<a href="#">ECON 201</a>	Economics I	4.0
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
<a href="#">PSY 320</a>	Educational Psychology	3.0
	<i>Term Credits</i>	<b>19.0</b>



<b>Term 7</b>		<b>Credits</b>
<a href="#">EDUC 305</a>	Junior Seminar	1.0
<a href="#">ENVS 284</a>	Physiological and Population Ecology	3.0
<a href="#">ENVS 285</a>	Population Ecology Lab	2.0
<a href="#">HIST 280</a>	History of Science I	3.0
<a href="#">PHIL 251</a>	Ethics	3.0
<a href="#">PHYS 131</a>	Survey of the Universe	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 322</a>	Evaluation of Instruction	4.0
<a href="#">ENVS 272</a>	Physical Geology	4.0
<a href="#">ENVS 286</a>	Community and Ecosystem Ecology	3.0
<a href="#">ENVS 287</a>	Community Ecology Lab	2.0
<a href="#">PHEV 146</a>	Weather II: Analysis and Forecasting	4.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 320</a>	Professional Studies in Instruction	6.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
	<i>Term Credits</i>	<i>12.0</i>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 405</a>	Senior Seminar	1.0
<a href="#">ENVS 330</a>	Aquatic Ecology	3.0
<a href="#">ENVS 390</a>	Marine Ecology	3.0
	Free elective	3.0
	English (ENGL) course between 200-329	3.0
	<i>Term Credits</i>	<i>13.0</i>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 412</a>	Student Teaching	12.0
	<i>Term Credits</i>	<i>12.0</i>
<b>Term 12</b>		<b>Credits</b>
<a href="#">EDUC 324</a>	Current Research in Curriculum and Instruction	3.0
<a href="#">ENVS 270</a>	History of Life on Earth	4.0
<a href="#">ENVS 390</a>	Marine Ecology	3.0
<a href="#">HIST 285</a>	Technology in Historical Perspective	3.0
	<i>Term Credits</i>	<i>13.0</i>
	<b>Total Credits (minimum)</b>	<b>192.0</b>

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# Drexel University

## Catalog 2009/2010

### General Science Certification

*Bachelor of Science: 180.5 credits*

*(Certification is for grades 7 - 12)*

Degree requirements (incoming students, 2009/2010)

The certification area is a well-rounded program incorporating biology, chemistry, mathematics, and physics. Students may also choose to pursue a second certification in any of the other certification areas.

#### General education requirements

ENGL 101	<b>Expository Writing and Reading</b>	3.0
ENGL 102	<b>Persuasive Writing and Reading</b>	3.0
ENGL 103	<b>Analytical Writing and Reading</b>	3.0
MATH 121	<b>Calculus I</b>	4.0
MATH 122	<b>Calculus II</b>	4.0
MATH 123	<b>Calculus III</b>	4.0
PHIL 251	<b>Ethics</b>	3.0
PSY 101	<b>General Psychology</b>	3.0
PSY 320	<b>Educational Psychology</b>	3.0
UNIV 101	<b>The Drexel Experience</b>	2.0
HIST 280	<b>History of Science I</b>	3.0
	<b>English elective course between 200-329</b>	3.0
	<b>Science, Technology, Human Affairs electives *</b>	6.0
	<b>Electives</b>	9.0

\*Any History (HIST) course from 281-294.

#### Science requirements

BIO 102	<b>Bioscience I</b>	4.0
BIO 104	<b>Bioscience II</b>	4.0
CHEM 101	<b>General Chemistry I</b>	3.5
CHEM 102	<b>General Chemistry II</b>	4.5
CHEM 103	<b>General Chemistry III</b>	5.0
ENVS 270	<b>History of Life on Earth</b>	4.0
ENVS 272	<b>Physical Geology</b>	4.0
ENVS 284 WI	<b>Physiological and Population Ecology</b>	3.0
ENVS 285	<b>Population Ecology Laboratory</b>	2.0
ENVS 286 WI	<b>Community and Ecosystem Ecology</b>	3.0
ENVS 287	<b>Community and Ecosystem Ecology Laboratory</b>	2.0
ENVS 390	<b>Marine Ecology</b>	3.0
PHEV 145	<b>Weather 1: Climate and Global Change</b>	4.0
PHYS 101	<b>Fundamentals of Physics I</b>	4.0
PHYS 102	<b>Fundamentals of Physics II</b>	4.0
PHYS 131 WI	<b>Survey of the Universe</b>	3.0

<b>Pedagogy requirements</b>		<b>71.5 Credits</b>
EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 102	<b>Foundations in Education II: Contemporary Issues</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 112	<b>Integrative Instruction</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
DUC 305	<b>Junior Seminar</b>	1.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 320 WI	<b>Professional Studies in Instruction</b>	6.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 405	<b>Senior Seminar</b>	1.0
<b>Student teaching experience</b>		
EDUC 412 WI	<b>Student Teaching</b>	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 writing-intensive 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 /General Science

<b>Term 1</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 121</a>	Calculus I	4.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 2</b>		<b>Credits</b>
<a href="#">CHEM 101</a>	General Chemistry I	3.5
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 301</a>	Introduction to Personalized Systems of Instruction	3.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 122</a>	Calculus II	4.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>15.5</i>
<b>Term 3</b>		<b>Credits</b>
<a href="#">CHEM 102</a>	General Chemistry II	4.5
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 112</a>	Integrative Instruction	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">MATH 123</a>	Calculus III	4.0
	<i>Term Credits</i>	<i>20.0</i>
<b>Term 4</b>		<b>Credits</b>
<a href="#">BIO 102</a>	Biology I: Cells and Tissues	4.0
<a href="#">EDUC 205</a>	Sophomore Seminar	1.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
<a href="#">EDUC 326</a>	Language Arts Processes	3.0
<a href="#">PHYS 101</a>	Fundamentals of Physics I	4.0
	<i>Term Credits</i>	<i>16.5</i>
<b>Term 5</b>		<b>Credits</b>
<a href="#">BIO 104</a>	Biology II: Growth and Heredity	4.0
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 218</a>	Math: Methods and Content	3.0
<a href="#">PHYS 102</a>	Fundamentals of Physics II	4.0
	<i>Term Credits</i>	<i>14.0</i>
<b>Term 6</b>		<b>Credits</b>
<a href="#">CHEM 103</a>	General Chemistry III	5.0
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
	English (ENGL) course between 200-329	3.0
	Free elective	3.0
	Science, Technology and Human Affairs elective (Any HIST course 281-294)	3.0
	<i>Term Credits</i>	<i>18.5</i>
<b>Term 7</b>		<b>Credits</b>
<a href="#">EDUC 305</a>	Junior Seminar	1.0
<a href="#">ENVS 284</a>		

<a href="#">ENVS 285</a>	Physiological and Population Ecology	3.0
<a href="#">HIST 280</a>	Population Ecology Lab	2.0
<a href="#">PHIL 251</a>	History of Science I	3.0
<a href="#">PHYS 131</a>	Ethics	3.0
	Survey of the Universe	3.0
	Science, Technology and Human Affairs elective (Any HIST course 281-294)	3.0
	<b>Term Credits</b>	<b>18.0</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 322</a>	Evaluation of Instruction	4.0
<a href="#">ENVS 272</a>	Physical Geology	4.0
<a href="#">ENVS 286</a>	Community and Ecosystem Ecology	3.0
<a href="#">ENVS 287</a>	Community Ecology Lab	2.0
	Free elective	3.0
	<b>Term Credits</b>	<b>16.0</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 320</a>	Professional Studies in Instruction	3.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
	Free elective	3.0
	<b>Term Credits</b>	<b>12.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 405</a>	Senior Seminar	1.0
<a href="#">PHEV 145</a>	Weather I: Climate and Global Change	4.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
	Free elective	5.0
	<b>Term Credits</b>	<b>13.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 412</a>	Student Teaching	12.0
	<b>Term Credits</b>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">EDUC 324</a>	Current Research in Curriculum & Instruction	3.0
<a href="#">ENVS 270</a>	History of Life on Earth	4.0
<a href="#">ENVS 390</a>	Marine Ecology	3.0
	Free elective	3.0
	<b>Term Credits</b>	<b>13.0</b>
	<b>Total Credits (minimum)</b>	<b>183.5</b>

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# Drexel University

## Catalog 2009/2010

### Mathematics Certification

*Bachelor of Science: 182.5 credits*

*(Certification is for grades 7 - 12)*

Degree requirements (incoming students, 2009/2010)

The certification area emphasizes coursework in such areas of mathematics as calculus, linear algebra, differential equations, probability and statistics, techniques of mathematical proof, and discrete mathematics. Students may also choose to pursue a second certification in physics or one of the other sciences.

General education requirements		36.0 Credits
ECON 201	Principles of Economics	4.0
HIST 280	History of Science I	3.0
INFO 108	Foundations of Software	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
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
	Elective	3.0

Mathematics requirements		48.0 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
MATH 205	Survey of Geometry	3.0
MATH 210	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
MATH 312	Probability and Statistics II	4.0
MATH 331	Abstract Algebra I	4.0

Science requirements		27.0 Credits
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

ENVS 260	<b>Environmental Science and Society</b>	3.0
PHYS 101	<b>Fundamentals of Physics I</b>	4.0
PHYS 102	<b>Fundamentals of Physics II</b>	4.0

<b>Pedagogy requirements</b>	<b>72.0 Credits</b>
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EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 102	<b>Foundations in Education II: Contemporary Issues</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 112	<b>Integrative Instruction</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 305	<b>Junior Seminar</b>	1.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 320 WI	<b>Professional Studies in Instruction</b>	6.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 405	<b>Senior Seminar</b>	1.0

<b>Student teaching experience</b>
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EDUC 412 WI	<b>Student Teaching</b>	12.0
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*Writing-Intensive Course Requirements*

In order to graduate all students 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 writing-intensive 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 /Mathematics

<b>Term 1</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 121</a>	Calculus I	4.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>12.0</i>
<b>Term 2</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 301</a>	Introduction to Personalized System of Instruction	3.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">INFO 108</a>	Foundations of Software	3.0
<a href="#">MATH 122</a>	Calculus II	4.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>18.0</i>
<b>Term 3</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 112</a>	Integrative Instruction	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">MATH 123</a>	Calculus III	4.0
	<i>Term Credits</i>	<i>15.5</i>
<b>Term 4</b>		<b>Credits</b>
<a href="#">BIO 102</a>	Biology I: Cells and Tissues	4.0
<a href="#">EDUC 205</a>	Sophomore Seminar	1.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
<a href="#">EDUC 326</a>	Language Arts Processes	3.0
<a href="#">HIST 280</a>	History of Science I	3.0
<a href="#">MATH 200</a>	Multivariate Calculus	4.0
	<i>Term Credits</i>	<i>19.5</i>
<b>Term 5</b>		<b>Credits</b>
<a href="#">BIO 104</a>	Biology II: Growth and Heredity	4.0
<a href="#">COOP 101</a>	Career Management/Professional Development	0.0
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 218</a>	Math: Methods and Content	3.0
<a href="#">MATH 201</a>	Linear Algebra	4.0
	<i>Term Credits</i>	<i>14.0</i>
<b>Term 6</b>		<b>Credits</b>
<a href="#">ECON 201</a>	Economics I	4.0
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
<a href="#">EDUC 428</a>	Cultural and Historical Significance of Mathematics	3.0
<a href="#">PSY 320</a>	Educational Psychology	3.0
	<i>Term Credits</i>	<i>14.5</i>
<b>Term 7</b>		<b>Credits</b>
<a href="#">CHEM 101</a>	General Chemistry I	3.5
<a href="#">EDUC 305</a>	Junior Seminar	1.0
<a href="#">HIST 280</a>		



	History of Science I	3.0
<a href="#">MATH 205</a>	Survey of Geometry	3.0
<a href="#">MATH 220</a>	Introduction to Mathematical Reasoning	3.0
<a href="#">PHYS 101</a>	Fundamentals of Physics I	4.0
	<i>Term Credits</i>	<b>17.5</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">CHEM 102</a>	General Chemistry II	4.5
<a href="#">EDUC 322</a>	Evaluation of Instruction	4.0
<a href="#">MATH 210</a>	Differential Equations	4.0
<a href="#">PHYS 102</a>	Fundamentals of Physics II	4.0
	<i>Term Credits</i>	<b>16.5</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 320</a>	Professional Studies in Instruction	6.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
<a href="#">MATH 221</a>	Discrete Mathematics	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 405</a>	Senior Seminar	1.0
<a href="#">ENVS 260</a>	Environmental Science and Society I	3.0
<a href="#">MATH 311</a>	Probability and Statistics I	4.0
<a href="#">PHIL 251</a>	Ethics	3.0
	<i>Term Credits</i>	<b>11.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 412</a>	Student Teaching	12.0
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">EDUC 324</a>	Current Research in Curriculum and Instruction	3.0
<a href="#">MATH 312</a>	Probability and Statistics II	4.0
<a href="#">MATH 331</a>	Abstract Algebra I	4.0
	English (ENGL) course between 200-329	3.0
	Free elective	3.0
	<i>Term Credits</i>	<b>17.0</b>
	<b>Total Credits (minimum)</b>	<b>182.5</b>

# Drexel University

## Catalog 2009/2010

### Physics Certification

*Bachelor of Science: 186.0 credits*

*(Certification is for grades 7 - 12)*

Degree requirements (incoming students, 2009/2010)

The certification area emphasizes coursework in physics and atmospheric science, including such topics as classical mechanics, electromagnetic fields, quantum mechanics, and physics of high fidelity, and survey of the universe. Students may also choose to pursue a second certification in mathematics.

#### General education requirements

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

#### Science requirements

BIO 102	<b>Bioscience I</b>	4.0
BIO 104	<b>Bioscience II</b>	4.0
CHEM 101	<b>General Chemistry I</b>	3.5
CHEM 102	<b>General Chemistry II</b>	4.5
ENVS 260	<b>Environmental Science and Society</b>	3.0
PHEV 141	<b>Atmospheric Science I: Climate and Global Change</b>	3.0
PHYS 113	<b>Contemporary Physics I</b>	5.0
PHYS 114	<b>Contemporary Physics II</b>	5.0
PHYS 115	<b>Contemporary Physics III</b>	5.0
PHYS 131 WI	<b>Survey of the Universe</b>	3.0
PHYS 201	<b>Fundamentals of Physics III</b>	4.0
PHYS 217	<b>Thermodynamics</b>	4.0
PHYS 311	<b>Classical Mechanics I</b>	4.0
PHYS 312	<b>Classical Mechanics II</b>	4.0
PHYS 321	<b>Electromagnetic Fields I</b>	4.0
PHYS 326	<b>Quantum Mechanics I</b>	4.0

<b>Pedagogy requirements</b>		<b>71.5 Credits</b>
EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 102	<b>Foundations in Education II: Contemporary Issues</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 112	<b>Integrative Instruction</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 305	<b>Junior Seminar</b>	1.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 320 WI	<b>Professional Studies in Instruction</b>	6.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 405	<b>Senior Seminar</b>	1.0
<b>Student teaching experience</b>		
EDUC 412 WI	<b>Student Teaching</b>	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 writing-intensive 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

<b>Term 1</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 310</a>	Computer Applications in Teaching	3.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 121</a>	Calculus I	4.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 2</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 301</a>	Introduction to Personalized Systems of Instruction	3.0
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 122</a>	Calculus II	4.0
<a href="#">PHYS 113</a>	Contemporary Physics I	5.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 3</b>		<b>Credits</b>
<a href="#">EDUC 105</a>	Freshman Seminar	1.0
<a href="#">EDUC 112</a>	Integrative Instruction	3.0
<a href="#">EDUC 142</a>	Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">PHYS 114</a>	Contemporary Physics II	5.0
	<i>Term Credits</i>	<i>16.5</i>
<b>Term 4</b>		<b>Credits</b>
<a href="#">BIO 102</a>	Biology I: Cells and Tissues	4.0
<a href="#">EDUC 205</a>	Sophomore Seminar	1.0
<a href="#">EDUC 244</a>	Inclusionary Practices for Exceptional Students	4.5
<a href="#">EDUC 326</a>	Language Arts Processes	3.0
<a href="#">MATH 123</a>	Calculus III	4.0
<a href="#">PHYS 115</a>	Contemporary Physics III	5.0
	<i>Term Credits</i>	<i>21.5</i>
<b>Term 5</b>		<b>Credits</b>
<a href="#">BIO 104</a>	Biology II: Growth and Heredity	4.0
<a href="#">COOP 101</a>	Career Management/Professional Development	0.0
<a href="#">EDUC 205</a>	Sophomore Seminar	1.0
<a href="#">EDUC 216</a>	Diversity and Today's Teacher	3.0
<a href="#">EDUC 218</a>	Math: Methods and Content	3.0
<a href="#">MATH 200</a>	Multivariate Calculus	4.0
<a href="#">PHYS 201</a>	Fundamentals of Physics III	4.0
	<i>Term Credits</i>	<i>19.0</i>
<b>Term 6</b>		<b>Credits</b>
<a href="#">EDUC 246</a>	Literacy and Content Skill Development	4.5
<a href="#">MATH 201</a>	Linear Algebra	4.0
<a href="#">MATH 210</a>	Differential Equations	4.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
	<i>Term Credits</i>	<i>15.5</i>
<b>Term 7</b>		<b>Credits</b>
<a href="#">CHEM 101</a>		

	<b>General Chemistry I</b>	<b>3.5</b>
<a href="#">EDUC 305</a>	<b>Junior Seminar</b>	<b>1.0</b>
<a href="#">PHIL 251</a>	<b>Ethics</b>	<b>3.0</b>
<a href="#">PHYS 131</a>	<b>Survey of the Universe</b>	<b>3.0</b>
	<b><i>Term Credits</i></b>	<b>10.5</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">CHEM 102</a>	<b>General Chemistry II</b>	<b>4.5</b>
<a href="#">EDUC 322</a>	<b>Evaluation of Instruction</b>	<b>4.0</b>
<a href="#">PHYS 311</a>	<b>Classical Mechanics I</b>	<b>4.0</b>
	<b><i>Term Credits</i></b>	<b>12.5</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 320</a>	<b>Professional Studies in Instruction</b>	<b>6.0</b>
<a href="#">EDUC 325</a>	<b>Multimedia in Instructional Design</b>	<b>3.0</b>
<a href="#">HIST 280</a>	<b>History of Science I</b>	<b>3.0</b>
<a href="#">PHYS 312</a>	<b>Classical Mechanics II</b>	<b>4.0</b>
	<b><i>Term Credits</i></b>	<b>16.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 405</a>	<b>Senior Seminar</b>	<b>1.0</b>
<a href="#">ENVS 260</a>	<b>Environmental Science and Society I</b>	<b>3.0</b>
<a href="#">PHEV 141</a>	<b>Atmospheric Science I: Climate and Global Change</b>	<b>3.0</b>
<a href="#">PHYS 217</a>	<b>Thermodynamics</b>	<b>4.0</b>
	<b>English (ENGL) course between 200-329</b>	<b>3.0</b>
	<b><i>Term Credits</i></b>	<b>14.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 412</a>	<b>Student Teaching</b>	<b>12.0</b>
	<b><i>Term Credits</i></b>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">EDUC 114</a>	<b>Science Teaching Methods</b>	<b>3.0</b>
<a href="#">EDUC 324</a>	<b>Current Research in Curriculum and Instruction</b>	<b>3.0</b>
<a href="#">PHYS 321</a>	<b>Electromagnetic Fields I</b>	<b>4.0</b>
<a href="#">PHYS 326</a>	<b>Quantum Mechanics I</b>	<b>4.0</b>
	<b><i>Term Credits</i></b>	<b>14.0</b>
	<b>Total Credits (minimum)</b>	<b>183.5</b>

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# Drexel University

## Catalog 2009/2010

### Environmental Education Certification

*Bachelor of Science: 186.0 credits*

*(Certification is for grades K - 12)*

Degree requirements (incoming students, 2009/2010)

The certification area emphasizes coursework in such areas of environmental issues as biology and chemistry. Students may also choose to pursue a second certification in biology.

General education requirements		s
ECON 201	Principles of Microeconomics	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	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
	Elective	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
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
ENVS 272	Physical Geology	4.0
ENVS 270	History of Life on Earth	4.0
ENVS 284 WI	Physiological and Population Ecology	3.0
ENVS 286 WI	Communities and Ecosystem Ecology	3.0
ENVS 260	Environmental Science and Society	3.0
ENVS 330	Aquatic Ecology	3.0
ENVS 370	Practice of Environmental Economics	3.0
ENVS 390	Marine Ecology	3.0
PHEV 145	Weather 1: Climate and Global Change	4.0
PHEV 146	Weather 2: Analysis and Forecasting	4.0
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0

<b>Pedagogy requirements</b>		<b>68.5 Credits</b>
EDUC 101	<b>Foundations in Education I: A Historical and Philosophical Perspective</b>	3.0
EDUC 102	<b>Foundations in Education II: Contemporary Issues</b>	3.0
EDUC 105	<b>Freshman Seminar</b>	3.0
EDUC 112	<b>Integrative Instruction</b>	3.0
EDUC 114	<b>Science Teaching Methods</b>	3.0
EDUC 142	<b>Special Education Foundations</b>	4.5
EDUC 205	<b>Sophomore Seminar</b>	1.0
EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 218	<b>Math: Methods and Content</b>	3.0
EDUC 244	<b>Inclusionary Practices for Exceptional Students</b>	4.5
EDUC 246	<b>Literacy Development</b>	4.5
EDUC 305	<b>Junior Seminar</b>	1.0
EDUC 310	<b>Computer Applications in Teaching</b>	3.0
EDUC 320 WI	<b>Professional Studies in Instruction</b>	6.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 326 WI	<b>Language Arts Processes</b>	3.0
EDUC 405	<b>Senior Seminar</b>	1.0

**Student teaching experience**

EDUC 412 WI	<b>Student Teaching</b>	12.0
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*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 writing-intensive 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 /Environmental Education

Term 1	Credits
<a href="#">EDUC 105</a> Freshman Seminar	1.0
<a href="#">EDUC 310</a> Computer Applications in Teaching	3.0
<a href="#">ENGL 101</a> Expository Writing and Reading	3.0
<a href="#">ENVR 169</a> Environmental Science	3.0
<a href="#">MATH 121</a> Calculus I	4.0
<a href="#">PSY 101</a> General Psychology I	3.0
<a href="#">UNIV 101</a> The Drexel Experience	1.0
<i>Term Credits</i>	<i>18.0</i>
Term 2	Credits
<a href="#">CHEM 101</a> General Chemistry I	3.5
<a href="#">EDUC 105</a> Freshman Seminar	1.0
<a href="#">EDUC 301</a> Introduction to Personalized Systems of Instruction	3.0
<a href="#">ENGL 102</a> Persuasive Writing and Reading	3.0
<a href="#">MATH 122</a> Calculus II	4.0
<a href="#">UNIV 101</a> The Drexel Experience	1.0
<i>Term Credits</i>	<i>15.5</i>
Term 3	Credits
<a href="#">CHEM 102</a> General Chemistry II	4.5
<a href="#">EDUC 105</a> Freshman Seminar	1.0
<a href="#">EDUC 112</a> Integrative Instruction	3.0
<a href="#">EDUC 142</a> Special Education Foundations: Referral and Assessment	4.5
<a href="#">ENGL 103</a> Analytical Writing and Reading	3.0
<a href="#">MATH 123</a> Calculus III	4.0
<i>Term Credits</i>	<i>20.0</i>
Term 4	Credits
<a href="#">BIO 121</a> Physiology and Nutrition	4.5
<a href="#">EDUC 205</a> Sophomore Seminar	1.0
<a href="#">EDUC 244</a> Inclusionary Practices for Exceptional Students	4.5
<a href="#">EDUC 326</a> Language Arts Processes	3.0
<a href="#">PHYS 101</a> Fundamentals of Physics I	4.0
<i>Term Credits</i>	<i>17.0</i>
Term 5	Credits
<a href="#">BIO 122</a> Cells and Genetics	4.5
<a href="#">EDUC 218</a> Math: Methods and Content	3.0
<a href="#">ENVS 230</a> General Ecology	3.0
<a href="#">ENVS 260</a> Environmental Science and Society I	3.0
<a href="#">PHYS 102</a> Fundamentals of Physics II	4.0
<i>Term Credits</i>	<i>17.5</i>
Term 6	Credits
<a href="#">BIO 123</a> Organismal Diversity & Ecology	4.5
<a href="#">ECON 201</a> Economics I	4.0
<a href="#">EDUC 216</a> Diversity and Today's Teacher	3.0
<a href="#">EDUC 246</a> Literacy and Content Skill Development	4.5
<a href="#">PSY 320</a> Educational Psychology	3.0
<i>Term Credits</i>	<i>19.0</i>
Term 7	Credits
<a href="#">EDUC 305</a>	



	Junior Seminar	1.0
<a href="#">ENVS 284</a>	Physiological and Population Ecology	3.0
<a href="#">ENVS 285</a>	Population Ecology Lab	2.0
<a href="#">HIST 280</a>	History of Science I	3.0
<a href="#">PHIL 251</a>	Ethics	3.0
<a href="#">PHYS 131</a>	Survey of the Universe	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">EDUC 322</a>	Evaluation of Instruction	4.0
<a href="#">ENVS 272</a>	Physical Geology	4.0
<a href="#">ENVS 286</a>	Community and Ecosystem Ecology	3.0
<a href="#">ENVS 287</a>	Community Ecology Lab	2.0
<a href="#">PHEV 146</a>	Weather II: Analysis and Forecasting	4.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">EDUC 114</a>	Science Teaching Methods	3.0
<a href="#">EDUC 320</a>	Professional Studies in Instruction	6.0
<a href="#">EDUC 325</a>	Multimedia in Instructional Design	3.0
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">EDUC 405</a>	Senior Seminar	1.0
<a href="#">ENVS 330</a>	Aquatic Ecology	3.0
<a href="#">ENVS 370</a>	Practice of Environmental Economics	3.0
	English (ENGL) course between 200-329	3.0
	Free elective	3.0
	<i>Term Credits</i>	<b>13.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">EDUC 412</a>	Student Teaching	12.0
	<i>Term Credits</i>	<b>12.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">EDUC 324</a>	Current Research in Curriculum	3.0
<a href="#">ENVS 270</a>	History of Life on Earth	4.0
<a href="#">ENVS 390</a>	Marine Ecology	3.0
<a href="#">HIST 285</a>	Technology in Historical Perspective	3.0
	<i>Term Credits</i>	<b>13.0</b>
	<b>Total Credits (minimum)</b>	<b>189.0</b>

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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.

#### Required courses

EDUC 216	<b>Diversity and Today's Teacher</b>	3.0
EDUC 301	<b>Introduction to Personalized System of Instruction</b>	3.0
EDUC 321	<b>Professional Studies in Instruction</b>	3.0
EDUC 322	<b>Evaluation of Instruction</b>	4.0
EDUC 323 WI	<b>Diagnostic Teaching</b>	4.0
EDUC 324	<b>Current Research in Curriculum and Instruction</b>	3.0
EDUC 325	<b>Multimedia in Instructional Design</b>	3.0
EDUC 327	<b>Learning Disabilities</b>	3.0