



## Table of Contents

### The College of Information Science and Technology

**About The College of Information Science and Technology ..... 2**

#### *Undergraduate Programs*

**BS in Information Systems ..... 3**  
Degree Requirements ..... 5  
Sample Plan of Study ..... 8

**BS in Information Technology ..... 10**  
Degree Requirements ..... 12  
Sample Plan of Study ..... 15

**BS in Software Engineering ..... 17**  
Degree Requirements ..... 18  
Sample Plan of Study ..... 21

#### **Minors**

Informatics ..... 23  
Information Systems ..... 24  
Software Engineering ..... 25

# Drexel University

## Catalog 2010-11

### **The College of Information Science and Technology**

The College of Information Science and Technology is also known as "The *iSchool* at Drexel." This identity highlights the College's participation in The i-Schools Caucus, and its status as a founding member of the organization. The i-Schools Caucus is a national alliance of library, information science and information system schools, the purpose of which is to raise awareness and understanding of the information sciences as a cutting-edge and progressive field of study.

The College of Information Science and Technology educates interdisciplinary professionals to provide information services and systems to meet a wide range of needs. The College complements its educational programs with research that increases the benefits of information science and technology for all sectors of society.

The College offers the following bachelor degree programs:

Bachelor of Science in Information Systems

Bachelor of Science in Information Technology

Bachelor of Science in Software Engineering

In addition, the College offers several accelerated and online degree completion options.

#### **General Information**

The College offers the majors in Information Systems and Information Technology both as four and five-year programs, and offers the Software Engineering major as a five-year program. The degree programs are open to freshmen and transfers from other departments at Drexel and other universities. Students have access to the College of Information Science and Technology's Computing Resource Center and the computing facilities available to all Drexel students.

Transfer admission occurs in the fall and winter terms only due to the sequence of required courses. Internal transfer students can be admitted any term. Please contact a College advisor for more information.

The College of Information Science and Technology offers graduate work leading to the degrees of Master of Science in Library and Information Science; Master of Science in Information Systems; Master of Science in Software Engineering; and Doctor of Philosophy.

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

Co-operative education at Drexel's *iSchool* emphasizes career management through experiential learning as an integral part of the education process. The *iSchool* co-op is based on employment in practical, major-related positions consistent with the interests, abilities, and aptitudes of the students.

For more general information on Drexel University's co-op opportunities, visit the Drexel Steinbright Career Development Center.

### Information Systems

The College of Information Science and Technology is also known as "The *iSchool* at Drexel." This identity highlights the College's participation in the iSchool Consortium, and its status as a founding member of the organization. The iSchool Caucus is a national alliance of library, information science and information system schools, the purpose of which is to raise awareness and understanding of the information sciences as a cutting-edge and progressive field of study.

Drexel's College of Information Science and Technology offers a Bachelor of Science Degree in Information Systems (BSIS) to meet the growing demand for individuals skilled in the development and management of information systems. This forward-looking program for undergraduates offers a solid background in liberal arts and sciences as well as the skills and knowledge needed to design, create, manage, and effectively use modern information systems.

The Information Systems curriculum has no single application focus. It is directed to the art and science of managing information in all application environments. Students learn how to determine information needs, design appropriate information systems, manage those systems, and measure the systems' performance. The emphasis is on the users of computers, and on building professional-level information systems skills. To further emphasize the business aspect of the degree, the BSIS curriculum includes a built in business minor.

The BSIS is accredited by the Computing Accreditation Commission (CAC) of the Accreditation Board for Engineering and Technology (ABET).

#### BSIS Program Outcomes

The program enables students to achieve, by the time of graduation:

- (a) An ability to apply knowledge of computing and mathematics appropriate to the discipline
- (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- (c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- (d) An ability to function effectively on teams to accomplish a common goal
- (e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- (f) An ability to communicate effectively with a range of audiences
- (g) An ability to analyze the local and global impact of computing on individuals, organizations, and society
- (h) Recognition of the need for and an ability to engage in

continuing professional development

- (i)** An ability to use current techniques, skills, and tools necessary for computing practice.
- (j)** An understanding of processes that support the delivery and management of information systems within a specific application environment.

# Drexel University

## Catalog 2010-11

### Information Systems

*Bachelor of Science Degree: 188.0 credits*

Degree requirements (incoming students, 2010/2011)

University and college requirements		4.0 Credits
COOP 101	Career Management/Professional Development	0.0
UNIV 101	The Drexel Experience	4.0
or		
INFO 120	Seminar for Transfer Students	4.0

Information systems requirements		77.0 Credits
INFO 101	Introduction to Information Technology	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 105	Information Evaluation, Organization, and Use	3.0
INFO 108	Foundations of Software	3.0
INFO 110	Human-Computer Interaction I	3.0
INFO 151	Web Systems and Services I	3.0
INFO 152	Web Systems and Services II	3.0
INFO 153	Applied Data Management	3.0
INFO 154	Software System Construction	3.0
INFO 200	Systems Analysis I	3.0
INFO 210	Database Management Systems	3.0
INFO 215	Social Aspects of Information Systems	3.0
INFO 324	Team Process and Product	3.0
INFO 330	Computer Networking Technology I	4.0
INFO 333	Introduction to Information Security	3.0
INFO 355	Systems Analysis II	3.0
INFO 420 WI	Software Project Management	3.0
INFO 424	Team Project Practicum	3.0
INFO 425 WI	Design Problem I	3.0
INFO 426 WI	Design Problem II	3.0
Information Systems electives*		16.0

\*Any non-required INFO course.

Natural Science Sequence		8.0 -9.0 Credits
Students select one sequence from the following:		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
or		
CHEM 111	General Chemistry I	4.0
CHEM 112	General Chemistry II	4.0

<b>or</b>		
PHYS 103	<b>General Physics I</b>	4.0
PHYS 104	<b>General Physics II</b>	4.0
<b>or</b>		
PHYS 101	<b>Fundamentals of Physics I</b>	4.0
PHYS 102	<b>Fundamentals of Physics II</b>	4.0
<b>or</b>		
BIO 107	<b>Cells, Genetics and Physiology</b>	3.0
BIO 108	<b>Cells, Genetics and Physiology Lab</b>	1.0
BIO 109	<b>Biological Diversity, Ecology and Evolution</b>	3.0
BIO 110	<b>Biological Diversity, Ecology and Evolution Lab</b>	1.0
<b>or</b>		
PHEV 145	<b>Weather I: Climate and Global Change</b>	4.0
PHEV 146	<b>Weather II: Analysis and Forecasting</b>	4.0
<b>or</b>		
BIO 100*		3.0
	<b>Applied Cells, Genetics &amp; Physiology</b>	
CHEM 151	<b>Applied Chemistry</b>	3.0
PHYS 151	<b>Applied Physics</b>	3.0

\*BIO 101 Applied Biological Diversity, Ecology & Evolution can be substituted for this course in this sequence.

**Mathematics/ requirements** **12.0 Credits**

MATH 101	<b>Introduction to Analysis I</b>	4.0
MATH 102	<b>Introduction to Analysis II</b>	4.0
MATH 180	<b>Discrete Computational Structures</b>	4.0
<b>or</b>		
MATH 121	<b>Calculus I</b>	4.0
MATH 122	<b>Calculus II</b>	4.0
MATH 180	<b>Discrete Computational Structures</b>	4.0

**Arts/humanities requirements** **24.0 Credits**

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
PHIL 105	<b>Critical Reasoning</b>	3.0
PHIL 111	<b>Propositional (Zero-Order) Logic</b>	3.0
COM 230	<b>Techniques of Speaking</b>	3.0
COM 310 WI	<b>Technical Communication</b>	3.0
	<b>Arts/Humanities elective*</b>	3.0

\* Any non-required course in COM, HIST, ENGL, GREC, PHIL, PSCI, ARTH, FMVD, VSST, and WRIT or any foreign language course.

**Behavioral science requirements** **21.0 Credits**

PSY 101	<b>General Psychology</b>	3.0
PSY 330	<b>Cognitive Psychology</b>	3.0
SOC 101	<b>Introduction to Sociology</b>	3.0
<b>or</b>		
ANTH 101	<b>Cultural Diversity</b>	
SOC 250	<b>Research Methods I</b>	3.0
SOC 350	<b>Research Methods II</b>	3.0
	<b>Behavioral Science electives*</b>	6.0

\* Any non-required course offered by the AFAS, ANTH, PSY, SOC or WMST departments.

<b>Business Minor Requirements</b>	<b>24.0 - 32.0 Credits</b>
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Students select one of the following business minors and complete all the required courses:

- Accounting
- Business
- Entrepreneurship
- Finance
- Legal Studies
- Marketing
- Operations Management

Note: Students taking a minor other than Business will also need to take STAT 201 Statistics I and STAT 202 Statistics II.

STAT 201	<b>Statistics I</b>	4.0
STAT 202	<b>Statistics II</b>	4.0

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<b>Free Electives</b>	<b>9.0-20.0 Credits</b>
<b>Free electives</b>	9.0- 20.0

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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.

**BS Information Systems**  
5 YR UG Co-op Concentration

**Recommended Plan Of Study**

		Credits
<b>Term 1</b>		
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">INFO 101</a>	Introduction to Information Technology	3.0
<a href="#">INFO 108</a>	Foundations of Software	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	2.0
<a href="#">MATH 121</a>	Calculus I	4.0
or		
<a href="#">MATH 101</a>	Introduction to Math Analysis	4.0
		<b>Term Credits</b>
		<b>15.0</b>
<b>Term 2</b>		
<b>Credits</b>		
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">INFO 102</a>	Introduction to Information Systems	3.0
<a href="#">INFO 151</a>	Web Systems and Services I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	2.0
<a href="#">MATH 122</a>	Calculus II	4.0
or		
<a href="#">MATH 102</a>	Introduction to Math Analysis	4.0
		<b>Term Credits</b>
		<b>15.0</b>
<b>Term 3</b>		
<b>Credits</b>		
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">INFO 105</a>	Information Organization, Evaluation and Use	3.0
<a href="#">INFO 110</a>	Human-Computer Interaction I	3.0
<a href="#">INFO 152</a>	Web Systems and Services II	3.0
<a href="#">MATH 180</a>	Discrete Computational Structures	4.0
		<b>Term Credits</b>
		<b>16.0</b>
<b>Term 4</b>		
<b>Credits</b>		
<a href="#">INFO 153</a>	Applied Data Management	3.0
<a href="#">INFO 200</a>	Systems Analysis I	3.0
<a href="#">INFO 333</a>	Intro Information Security	3.0
<a href="#">PHIL 105</a>	Critical Reasoning	3.0
<a href="#">SOC 250</a>	Research Methods I	3.0
<a href="#">SOC 101</a>	Introduction to Sociology	3.0
or		
<a href="#">ANTH 101</a>	Introduction to Cultural Diversity	3.0
		<b>Term Credits</b>
		<b>18.0</b>
<b>Term 5</b>		
<b>Credits</b>		
<a href="#">INFO 154</a>	Software System Construction	3.0
<a href="#">INFO 210</a>	Database Management Systems	3.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">SOC 350</a>	Research Methods II	3.0
		Information Systems (INFO) elective
		3.0
		<b>Term Credits</b>
		<b>15.0</b>
<b>Term 6</b>		
<b>Credits</b>		
<a href="#">COM 230</a>	Techniques of Speaking	3.0
<a href="#">INFO 324</a>	Team Process and Product	3.0
<a href="#">INFO 355</a>	Systems Analysis II	3.0
<a href="#">PHIL 111</a>	Propositional (zero-order) Logic	3.0
		Business elective
		4.0
		<b>Term Credits</b>
		<b>16.0</b>



<b>Term 7</b>		<b>Credits</b>
<a href="#">INFO 215</a>	Social Aspects Of Information Systems	3.0
<a href="#">INFO 330</a>	Computer Networking Tech I	4.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
	Business elective	4.0
	Information Systems (INFO) elective	3.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">COM 310</a>	Technical Communication	3.0
<a href="#">STAT 201</a>	Introduction to Business Statistics	4.0
	Free elective	3.0
	Information Systems (INFO) elective	3.0
	Science sequence course 1 (See degree requirements list)	4.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">STAT 202</a>	Business Statistics II	4.0
	Business elective	4.0
	Information Systems (INFO) elective	3.0
	Sciences sequence course 2 (See degree requirements list)	4.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">INFO 420</a>	Software Project Management	3.0
<a href="#">INFO 424</a>	Team Project Practicum	3.0
	Behavioral science elective	3.0
	Business elective	4.0
	Information Systems (INFO) elective	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">INFO 425</a>	Design Problem I	3.0
	Behavioral science elective	3.0
	Business elective	4.0
	Free elective	4.0
	<i>Term Credits</i>	<b>14.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">INFO 426</a>	Design Problem II	3.0
	Arts and Humanities elective	3.0
	Business elective	4.0
	Free elective	4.0
	<i>Term Credits</i>	<b>14.0</b>
	<b>Total Credits (minimum)</b>	<b>188.0</b>

### Information Technology

The College of Information Science and Technology is also known as The *iSchool* at Drexel. This identity highlights the College's participation in the iSchools Caucus, and its status as a founding member of the organization. The iSchools Caucus is a national alliance of library, information science and information system schools, the purpose of which is to raise awareness and understanding of the information sciences as a cutting-edge and progressive field of study.

The Bachelor of Science Degree in Information Technology (BSIT) is offered by Drexel's College of Information Science and Technology as both a five-year and a four-year co-op program. In addition to the core coursework in information systems, the major includes 12 credits towards a minor in business. Only 12 additional credits would be required to complete a minor in business.

Students graduating with a Bachelor of Science Degree in Information Technology will:

- Understand and be able to apply core information technologies.
- Approach the application of information technology from a user-centered perspective aimed at meeting the needs of users and organizations in a societal and global context.
- Apply sound methods and approaches to identify and analyze IT problems and design, implement, and evaluate effective and usable IT solutions.
- Display personal and interpersonal IT career skills, including the ability to work on a team, to communicate with technical and nontechnical people, and to pursue lifelong learning.

### BSIT Program Outcomes

The program enables students to achieve, by the time of graduation:

- (a)** An ability to apply knowledge of computing and mathematics appropriate to the discipline
- (b)** An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- (c)** An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- (d)** An ability to function effectively on teams to accomplish a common goal
- (e)** An understanding of professional, ethical, legal, security and social issues and responsibilities
- (f)** An ability to communicate effectively with a range of audiences
- (g)** An ability to analyze the local and global impact of computing on individuals, organizations, and society
- (h)** Recognition of the need for and an ability to engage in

continuing professional development

**(i)** An ability to use current techniques, skills, and tools necessary for computing practice.

**(j)** An ability to use and apply current technical concepts and practices in the core information technologies.

**(k)** An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems

**(l)** An ability to effectively integrate IT-based solutions into the user environment.

**(m)** An understanding of best practices and standards and their application.

**(n)** An ability to assist in the creation of an effective project plan.

**(o)** An ability to identify and manage information assurance and security risks, and integrate appropriate mitigation strategies in the administration and management of computing, communication, and organizational systems.

**(p)** An ability to identify and evaluate current and emerging technologies and assess their applicability to address the user's needs.

**Integration with BSIS.** The BSIT integrates closely with Drexel's bachelor of science in information systems (BSIS), and each enriches the other. The two degrees share a common freshman year and the same set of major courses, but they have different requirements. The difference is in the nature of specialization in upper-level courses. The BSIT is aimed at students who want a degree focused on applied information technology but with an emphasis on IT infrastructure rather than applications in business.

The structure of the freshman year allows students to embark on IT or IS without having to choose between them until later.

# Drexel University

## Catalog 2010-11

### Information Technology

*Bachelor of Science Degree: 188.0 credits*

Degree requirements (incoming students, 2010/2011)

<b>University and college requirements</b>	<b>4.0</b>
	<b>Credits</b>

COOP 101	<b>Career Management/Professional Development</b>	0.0
UNIV 101	<b>The Drexel Experience</b>	4.0
<b>or</b>		
INFO 120	<b>Seminar for Transfer Students</b>	4.0

<b>Technology requirements</b>	<b>86.0</b>
	<b>Credits</b>

INFO 101	<b>Introduction to Information Technology</b>	3.0
INFO 102	<b>Introduction to Information Systems</b>	3.0
INFO 105	<b>Information Evaluation, Organization, and Use</b>	3.0
INFO 108	<b>Foundations of Software</b>	4.0
INFO 110	<b>Human-Computer Interaction I</b>	3.0
INFO 151	<b>Web Systems and Services I</b>	3.0
INFO 152	<b>Web Systems and Services II</b>	3.0
INFO 153	<b>Applied Data Management</b>	3.0
INFO 200	<b>Systems Analysis I</b>	3.0
INFO 210	<b>Database Management Systems</b>	3.0
INFO 215	<b>Social Aspects of Information Systems</b>	3.0
INFO 320	<b>Server Technology I</b>	4.0
INFO 324	<b>Team Process and Product</b>	3.0
INFO 330	<b>Computer Networking Technology I</b>	4.0
INFO 333	<b>Introduction to Information Security</b>	3.0
INFO 410	<b>Information Technology Infrastructure</b>	3.0
INFO 415	<b>Information Technology Services</b>	3.0
INFO 420 WI	<b>Software Project Management</b>	3.0
INFO 424	<b>Team Project Practicum</b>	3.0
INFO 425 WI	<b>Design Problem I</b>	3.0
INFO 426 WI	<b>Design Problem II</b>	3.0
	<b>INFO electives (Technology electives)</b>	9.0 - 12.0

<b>Concentration requirements</b>	<b>9.0 -</b>
	<b>12.0</b>
	<b>Credits</b>

Students select one of the following sequences:

<b>Database Management</b>	<b>9.0</b>
	<b>credits</b>

INFO 300	Information Retrieval Systems	3.0
INFO 365	Database Administration I	3.0
INFO 366	Database Administration II	3.0
<b>or</b>		

<b>Server and Network Technology</b>		<b>12.0 Credits</b>
INFO 321	Server Technology II	4.0
INFO 322	Server Technology III	4.0
INFO 331	Computer Networking Technology II	4.0

**Natural Science Sequence** **8.0 -9.0 Credits**

Students select one sequence from the following:

CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5

**or**

CHEM 111	General Chemistry I	4.0
CHEM 112	General Chemistry II	4.0

**or**

PHYS 103	General Physics I	4.0
PHYS 104	General Physics II	4.0

**or**

PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0

**or**

BIO 107	Cells, Genetics and Physiology	3.0
BIO 108	Cells, Genetics and Physiology Lab	1.0
BIO 109	Biological Diversity, Ecology and Evolution	3.0
BIO 110	Biological Diversity, Ecology and Evolution Lab	1.0

**or**

PHEV 145	Weather I: Climate and Global Change	4.0
PHEV 146	Weather II: Analysis and Forecasting	4.0

**or**

BIO 100*		3.0
	Applied Cells, Genetics & Physiology	
CHEM 151	Applied Chemistry	3.0
PHYS 151	Applied Physics	3.0

\*BIO 101 Applied Biological Diversity, Ecology & Evolution can be substituted for this course in this sequence.

**Mathematics/ requirements** **12.0 Credits**

MATH 101	Introduction to Analysis I	4.0
MATH 102	Introduction to Analysis II	4.0
MATH 180	Discrete Computational Structures	4.0

**or**

MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 180	Discrete Computational Structures	4.0

**Arts/humanities requirements** **24.0 Credits**

ENGL 101	Expository Writing and Reading	3.0
ENGL 102	Persuasive Writing and Reading	3.0
ENGL 103	Analytical Writing and Reading	3.0

PHIL 105	<b>Critical Reasoning</b>	3.0
PHIL 111	<b>Propositional (Zero-Order) Logic</b>	3.0
COM 230	<b>Techniques of Speaking</b>	3.0
COM 310 WI	<b>Technical Communication</b>	3.0
	<b>Arts/Humanities elective*</b>	3.0

\* Any non-required course in COM, HIST, ENGL, GREC, PHIL, PSCI, ARTH, FMVD, VSST, and WRIT or any foreign language course.

<b>Behavioral science requirements</b>		<b>12.0 Credits</b>
PSY 101	<b>General Psychology</b>	3.0
PSY 330	<b>Cognitive Psychology</b>	3.0
	<b>Behavioral Science electives*</b>	6.0

\* Any non-required course offered by the AFAS, ANTH, PSY, SOC or WMST departments.

<b>Business requirements</b>		<b>12.0 Credits</b>
STAT 201	<b>Statistics I</b>	4.0
STAT 202	<b>Statistics II</b>	4.0
<b>Students select one of the following:</b>		
ACCT 115	<b>Financial Accounting Foundations</b>	4.0
ECON 201	<b>Principles of Microeconomics</b>	4.0
ORGB 300 WI	<b>Organizational Behavior</b>	4.0

<b>Free Electives</b>	<b>29.0-32.0 Credits</b>
<b>Free electives</b>	29.0-32.0

#### *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.

**BS Information Technology**  
5 YR UG Co-op Concentration

**Recommended Plan Of Study**

<b>Term 1</b>		<b>Credits</b>
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">INFO 101</a>	Introduction to Information Technology	3.0
<a href="#">INFO 108</a>	Foundations of Software	3.0
<a href="#">MATH 121</a>	Calculus I	4.0
<a href="#">UNIV 101</a>	The Drexel Experience	2.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 2</b>		<b>Credits</b>
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">INFO 102</a>	Introduction to Information Systems	3.0
<a href="#">INFO 151</a>	Web Systems and Services I	3.0
<a href="#">MATH 122</a>	Calculus II	4.0
<a href="#">UNIV 101</a>	The Drexel Experience	2.0
	Free elective	3.0
	<i>Term Credits</i>	<b>18.0</b>
<b>Term 3</b>		<b>Credits</b>
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">INFO 105</a>	Information Organization, Evaluation and Use	3.0
<a href="#">INFO 110</a>	Human-Computer Interaction I	3.0
<a href="#">INFO 153</a>	Applied Data Management	3.0
<a href="#">MATH 123</a>	Calculus III	4.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 4</b>		<b>Credits</b>
<a href="#">COM 230</a>	Techniques of Speaking	3.0
<a href="#">INFO 153</a>	Applied Data Management	3.0
<a href="#">INFO 200</a>	Systems Analysis I	3.0
<a href="#">INFO 320</a>	Server Technology I	4.0
<a href="#">PSY 101</a>	General Psychology I	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 5</b>		<b>Credits</b>
<a href="#">INFO 210</a>	Database Management Systems	3.0
<a href="#">PHIL 105</a>	Critical Reasoning	3.0
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
	Free elective	3.0
	IT elective	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 6</b>		<b>Credits</b>
<a href="#">INFO 333</a>	Intro Information Security	3.0
<a href="#">PHIL 111</a>	Propositional (zero-order) Logic	3.0
	Free elective	3.0
	IT advanced topic course (see degree requirements for sequences)	3.0
	Natural science sequence course (See degree requirements for list)	4.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 7</b>		<b>Credits</b>
<a href="#">INFO 215</a>	Social Aspects Of Information Systems	3.0
<a href="#">INFO 324</a>	Team Process and Product	3.0
<a href="#">INFO 330</a>	Computer Networking Tech I	4.0

	IT advanced topic course (see degree requirements for sequences)	3.0
	Natural science sequence course (See degree requirements for list)	4.0
	<i>Term Credits</i>	<b>17.0</b>
<b>Term 8</b>		<b>Credits</b>
<a href="#">COM 310</a>	Technical Communication	3.0
<a href="#">INFO 410</a>	Information Technology Infrastructure	3.0
<a href="#">STAT 201</a>	Introduction to Business Statistics	4.0
	Free elective	3.0
	IT elective	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 9</b>		<b>Credits</b>
<a href="#">INFO 415</a>	IT Services	3.0
<a href="#">STAT 202</a>	Business Statistics II	4.0
	Free elective	3.0
	IT advanced topic course (see degree requirements for sequences)	3.0
	IT elective	3.0
	<i>Term Credits</i>	<b>16.0</b>
<b>Term 10</b>		<b>Credits</b>
<a href="#">INFO 420</a>	Software Project Management	3.0
<a href="#">INFO 424</a>	Team Project Practicum	3.0
<a href="#">ACCT 115</a>	Financial Accounting Foundations	4.0
or		
<a href="#">ORGB 300</a>	Organizational Behavior	4.0
or		
<a href="#">ECON 201</a>	Principles of Microeconomics	4.0
	Free elective	2.0
	IT elective	3.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 11</b>		<b>Credits</b>
<a href="#">INFO 425</a>	Design Problem I	3.0
	Arts and Humanities elective	3.0
	Behavioral science elective	3.0
	Free electives	6.0
	<i>Term Credits</i>	<b>15.0</b>
<b>Term 12</b>		<b>Credits</b>
<a href="#">INFO 426</a>	Design Problem II	3.0
	Behavioral science elective	3.0
	Free electives	7.0
	<i>Term Credits</i>	<b>13.0</b>
	<b>Total Credits (minimum)</b>	<b>188.0</b>



### Software Engineering

Advances in information technology have captured the public imagination and had tremendous economic and social impact over the last 50 years. These advances offer great benefit, but have also created a great need for highly dependable systems developed at predictable cost. Unfortunately, it has become increasingly clear that our ability to produce the software for these systems in a way that meets cost and quality requirements is quite limited.

For example:

- Studies conclude that cost and schedule overruns on commercial software projects commonly average at least 100%. Some studies report averages as high as 300 - 400%.
- Studies of large projects indicate that about 25% of them are abandoned and never completed.
- There is a growing list of incidents in which software failures have caused injury and death.

Software engineering is an attempt to solve this problem. The notion can be traced to a conference sponsored by NATO in 1967. The conference was organized to discuss the problems in creating software systems reliably. In the years since, there has been some progress, but the problems that motivated the original conference are still very much in evidence. There is good reason to believe that the creation of software will never be easy. But there is tremendous incentive to make the process as efficient and reliable as possible.

In summary, software engineering can be defined as the application of processes, methods, and tools to the problem of building and maintaining computer software with a defined level of quality, at a predictable cost, on a predictable schedule.

# Drexel University

## Catalog 2010-11

### Software Engineering

*Bachelor of Science in Software Engineering (BSSE): 188.0 credits*

Required courses (incoming students, 2010/2011)

University and college requirements		<b>2.0 Credits</b>
COOP 101	Career Management/Professional Development	0.0
UNIV 101	The Drexel Experience	2.0
or		
INFO 120	Seminar for Transfer Students	2.0

Software engineering requirements		<b>36.0 Credits</b>
SE 101	Foundations of Software Engineering I	3.0
SE 102	Foundations of Software Engineering II	3.0
SE 103	Foundations of Software Engineering III	3.0
SE 210	Software Specification and Design I	3.0
SE 211	Software Specification and Design II	3.0
SE 310	Software Architecture I	3.0
SE 311	Software Architecture II	3.0
SE 320	Software Verification and Validation	3.0
SE 410	Software Evolution	3.0
SE 491	Design Project I	3.0
SE 492	Design Project II	3.0
SE 493	Design Project III	3.0

Computer science requirements		<b>13.0 Credits</b>
CS 260	Data Structures	3.0
CS 265	Advanced Programming Techniques	3.0
CS 281	Systems Architecture I	4.0
CS 283	Systems Programming	3.0

Networking elective		<b>3.0 - 4.0 Credits</b>
CS 472	Computer Networks	3.0
or		
INFO 330	Computer Networking Technology I	4.0

Information systems requirements		<b>9.0 Credits</b>
INFO 210	Database Management Systems	3.0

INFO 310	Human Computer Interaction II	3.0
INFO 420 WI	Software Project Management	3.0

<b>Computing electives</b>		<b>18.0 Credits</b>
	Any non-required INFO, CS or SE course at the 300+ level	18.0

<b>Mathematics/statistics requirements</b>		<b>26.0 Credits</b>
CS 270	Mathematical Foundations of Computer Science	3.0
MATH 121	Calculus I	4.0
MATH 122	Calculus II	4.0
MATH 123	Calculus III	4.0
MATH 221	Discrete Mathematics	3.0
STAT 201	Statistics I	4.0
STAT 202	Statistics II	4.0

<b>Science sequence requirements</b>		<b>21.0 Credits</b>
Students select one science sequence from the following:		
CHEM 101	General Chemistry I	3.5
CHEM 102	General Chemistry II	4.5
CHEM 103	General Chemistry III	5.0
<b>or</b>		
PHYS 101	Fundamentals of Physics I	4.0
PHYS 102	Fundamentals of Physics II	4.0
PHYS 201	Fundamentals of Physics III	4.0
<b>or</b>		
BIO 122	Cells and Genetics	4.5
BIO 124	Evolution and Organismal Diversity	4.5
BIO 126	Physiology and Ecology	4.5

<b>Science Electives</b>		
	Students select 8.0 - 9.0 additional credits from any natural science courses	7.5 - 9.0

<b>Liberal Studies requirements</b>		<b>33.0 Credits</b>
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 105	Critical Reasoning	3.0
PHIL 311	Computer Ethics	3.0
COM 230	Techniques of Speaking	3.0
COM 310 WI	Technical Communication	3.0
PSY 101	General Psychology	3.0
PSY 330	Cognitive Psychology	3.0
	Liberal studies electives*	6.0

\* Any non-required course in ENGL, PHIL, COM, PSY, SOC, ANTH, WMST, AFAM, PSCI.

<b>Students select two of the following business courses:</b>		<b>8.0 Credits</b>
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ACCT 115	<b>Financial Accounting Foundations</b>	4.0
ECON 201	<b>Principles of Microeconomics</b>	4.0
ECON 202	<b>Principles of Macroeconomics</b>	4.0
<b>Free electives</b>		<b>18.0 - 19.0 Credits</b>
<b>Free electives</b>		16.0- 19.0

*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.

**BS Software Engineering**  
5 YR UG Co-op Concentration

**Recommended Plan Of Study**

		Credits
<b>Term 1</b>		
<a href="#">COOP 101</a>	Career Management/Professional Development	0.0
<a href="#">ENGL 101</a>	Expository Writing and Reading	3.0
<a href="#">MATH 121</a>	Calculus I	4.0
<a href="#">SE 101</a>	Foundations of Software Engineering I	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	1.0
	First course in a 3-part laboratory science sequence	4.0-4.5
	<i>Term Credits</i>	<i>15.0-15.5</i>
<b>Term 2</b>		
<a href="#">ENGL 102</a>	Persuasive Writing and Reading	3.0
<a href="#">MATH 122</a>	Calculus II	4.0
<a href="#">SE 102</a>	Foundations of Software Engineering II	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	0.5
	Second course in a 3-part laboratory science sequence	4.0-4.5
	<i>Term Credits</i>	<i>14.5-15.0</i>
<b>Term 3</b>		
<a href="#">ENGL 103</a>	Analytical Writing and Reading	3.0
<a href="#">MATH 123</a>	Calculus III	4.0
<a href="#">SE 103</a>	Foundations of Software Engineering III	3.0
<a href="#">UNIV 101</a>	The Drexel Experience	0.5
	Liberal studies elective	3.0
	Third course in a 3-part laboratory science sequence	4.0-4.5
	<i>Term Credits</i>	<i>17.5-18.0</i>
<b>Term 4</b>		
<a href="#">COM 230</a>	Techniques of Speaking	3.0
<a href="#">SE 210</a>	Software Specification and Design I	3.0
<a href="#">CS 265</a>	Advanced Programming Tools and Techniques	3.0
<a href="#">CS 270</a>	Mathematical Foundations of Computer Science	3.0
	Natural science elective	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 5</b>		
<a href="#">CS 260</a>	Data Structures	3.0
<a href="#">INFO 210</a>	Database Management Systems	3.0
<a href="#">MATH 221</a>	Discrete Mathematics	3.0
<a href="#">SE 211</a>	Software Specification and Design II	3.0
	Natural science elective	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 6</b>		
<a href="#">COM 310</a>	Technical Communication	3.0
<a href="#">CS 281</a>	Systems Architecture I	4.0
<a href="#">PSY 101</a>	General Psychology I	3.0
<a href="#">SE 310</a>	Software Architecture I	3.0
<a href="#">STAT 201</a>	Business Statistics I	4.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 7</b>		
<a href="#">SE 311</a>	Software Architecture II	3.0
<a href="#">STAT 202</a>	Business Statistics II	4.0
	Free elective	3.0
	Computing elective (300-level or higher INFO, SE, CS)	3.0

	Natural science elective	3.0
	<i>Term Credits</i>	<i>16.0</i>
<b>Term 8</b>		<b>Credits</b>
<a href="#">CS 283</a>	Systems Programming	3.0
<a href="#">INFO 420</a>	Software Project Management	3.0
<a href="#">PHIL 105</a>	Critical Reasoning	3.0
<a href="#">SE 320</a>	Software Verification and Validation	3.0
	Free elective	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 9</b>		<b>Credits</b>
<a href="#">INFO 310</a>	Human-Computer Interaction II	3.0
<a href="#">PHIL 311</a>	Computer Ethics	3.0
<a href="#">SE 410</a>	Software Evolution	3.0
	Computing electives (300-level or higher INFO, SE, CS)	3.0
	Free elective	3.0
	<i>Term Credits</i>	<i>15.0</i>
<b>Term 10</b>		<b>Credits</b>
<a href="#">SE 491</a>	Design Project I	3.0
<a href="#">INFO 330</a>	Computer Networking Technologies I	4.0
or		
<a href="#">CS 472</a>	Computer Networks	3.0
<a href="#">ECON 201</a>	Principles of Microeconomics	4.0
or		
<a href="#">ECON 202</a>	Principles of Macroeconomics	4.0
or		
<a href="#">ACCT 115</a>	Financial Accounting Foundations	4.0
	Computing elective (300-level or higher INFO, SE, CS)	3.0
	Free elective	3.0
	<i>Term Credits</i>	<i>17.0</i>
<b>Term 11</b>		<b>Credits</b>
<a href="#">PSY 330</a>	Cognitive Psychology	3.0
<a href="#">SE 492</a>	Design Project II	3.0
<a href="#">ACCT 115</a>	Financial Accounting Foundations	4.0
or		
<a href="#">ECON 202</a>	Principles of Macroeconomics	4.0
or		
<a href="#">ECON 201</a>	Principles of Microeconomics	4.0
	Computing electives (300-level or higher INFO, SE, CS)	6.0
	<i>Term Credits</i>	<i>16.0</i>
<b>Term 12</b>		<b>Credits</b>
<a href="#">SE 493</a>	Design Project III	3.0
	Computing elective (300-level or higher INFO, SE, CS)	3.0
	Free electives	6.0
	Liberal studies elective	3.0
	<i>Term Credits</i>	<i>15.0</i>
	<b>Total Credits (minimum)</b>	<b>188.0-189.5</b>

### Minor in Informatics

Informatics is the science of information, the practice of information processing, and the engineering of information systems. The *iSchool's* minor in informatics combines basic courses in information systems and technology with courses that address the cognitive issues and social contexts in which information systems and technologies are embedded.

Any student in any major can benefit from a minor in informatics. Graduates with such background knowledge are prepared to actively participate in the application of information technology within their major area of study.

The minor is available to all University students in good standing, with the exception of students majoring in Information Systems, Information Technology or Software Engineering. A minimum of 24.0 credits is required to complete this minor.

Requirements		24.0 Credits
INFO 101	Introduction to Information Technology	3.0
INFO 102	Introduction to Information Systems	3.0
INFO 105	Information Organization, Evaluation and Use	3.0
INFO 108	Foundations of Software	3.0
INFO 110	Human-Computer Interaction I	3.0
INFO 210	Database Management Systems	3.0

Students select one of the following elective pairs:

#### Informatics on the Internet

INFO 151	Web Systems and Services I	3.0
INFO 152	Web Systems and Services II	3.0

#### Informatics in Society

INFO 205 WI	Strategic Uses of Information Systems	3.0
INFO 215	Social Aspects of Information Systems	3.0

#### Informatics in the Organization

INFO 205 WI	Strategic Uses of Information Systems	3.0
INFO 435	Information Services	3.0

#### Planning and Delivery of IT Services

INFO 410	Information Technology Infrastructure	3.0
INFO 415	IT Services	3.0

# Drexel University

## Catalog 2010-11

### Minor in Information Systems

The information systems minor is available to all University students in good standing, with the exception of students already majoring in Information Systems. A minimum of 25 credits is required to complete the academic minor in information systems.

#### Required courses

INFO 102	<b>Introduction to Information Systems</b>	3.0
INFO 110	<b>Human-Computer Interaction I</b>	3.0
INFO 200	<b>Systems Analysis I</b>	3.0
INFO 210	<b>Database Management Systems</b>	3.0
INFO 330	<b>Computer Networking Technology I</b>	4.0
INFO 355	<b>Systems Analysis II</b>	3.0

An additional 6 credits or more are to be chosen from other course offerings in information systems pertinent to the student's overall program of study. Guidance in selecting these electives will be provided by staff and faculty of the College of Information Science and Technology.



### Minor in Software Engineering

The software engineering minor is available to all University students in good standing, with the exception of software engineering majors. A total of 24 credits is needed to complete the academic minor in software engineering.

#### Prerequisites

Computer programming competence may be established by completing one of the following course sequences:

- CS 171-2 (Computer Programming I-II)
- CS 131-2-3 (Computer Programming A-B-C)
- SE 101-2-3 (Fundamentals of Software Engineering I-II-III)
- CS/ECE203-ECE480 (Programming for Engineers, Advanced Programming for Engineers)
- INFO 151-2-3-4 (IS Software I-II-III-IV)

Additional computer programming competence may be established by completing both CS 265 (Advanced Programming Techniques) and CS 260 (Data Structures).

#### Minor Requirements

SE 210	<b>Software Specification and Design I</b>	3.0
SE 211	<b>Software Specification and Design II</b>	3.0
SE 310	<b>Software Architecture I</b>	3.0
SE 311	<b>Software Architecture II</b>	3.0
SE 320	<b>Software Verification and Validation</b>	3.0
SE 410	<b>Software Evolution</b>	3.0
	<b>Two Computing/Software Engineering electives</b>	6.0