# Drexel University

## Catalog 2005 / 2006

## Table of Contents

*The College of Information Science and Technology Undergraduate Programs*

# 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 iSchool Consortium, and its status as a founding member of the organization. The iSchool Consortium 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

**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 term 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, Library and Information Science; Master of Science in Information Systems; Master of Science in Software Engineering; and Doctor of Philosophy. Full details of all graduate curricula are located in the graduate section of the catalog.

Co-operative education, academic eligibility requirements, acceptance of transfer students, and placement services are described in detail in other sections of this catalog.

## 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 Consortium 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.

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

# Information Systems

*Bachelor of Science Degree: 188.0 credits*

## Degree Requirements

| Information systems requirements | | 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 | 4.0 |
| INFO 110 | Human-Computer Interaction I | 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 330 | Computer Networking Technology I | 4.0 |
| INFO 355 | Systems Analysis II | 3.0 |
| INFO 420 WI | Software Project Management | 3.0 |
| INFO 425 WI | Design Problem I | 3.0 |
| INFO 426 WI | Design Problem II | 3.0 |
| | Concentration courses | 6.0 |
| | Electives | 18.0 |

| Behavioral science requirements | | Credits |
|---|---|---|
| PSY 101 | General Psychology | 3.0 |
| PSY 330 | Cognitive Psychology | 3.0 |
| SOC 101 | Introduction to Sociology | 3.0 |
| or | | |
| ANTH 101 | Cultural Diversity | |
| SOC 250 | Research Methods I | 3.0 |
| SOC 350 | Research Methods II | 3.0 |
| | Electives | 9.0 |

| Computer science requirements | | Credits |
|---|---|---|
| CS 131 | Computer Programming A | 3.0 |
| CS 132 | Computer Programming B | 3.0 |
| CS 133 | Computer Programming C | 3.0 |
| or | | |
| CS 171 | Computer Programming I | 3.0 |
| CS 172 | Computer Programming II | 3.0 |
| CS 260 | Data Structures | 3.0 |

| Mathematics/natural science requirements | | Credits |
|---|---|---|
| MATH 101 | Introduction to Analysis I | 4.0 |
| MATH 102 | Introduction to Analysis II | 4.0 |
| or | | |
| MATH 121 | Calculus I | 4.0 |
| MATH 122 | Calculus II | 4.0 |
| MATH 180 | Discrete Computational Structures | 4.0 |
| | Natural science sequence | 8.0-9.0 |
| | Elective | 3.0-4.0 |

| Arts/humanities requirements | | |
|---|---|---|
| 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 111 | Beginning Logic | 3.0 |
| COM 230 | Techniques of Speaking | 3.0 |
| COM 310 WI | Technical Communication | 3.0 |
| | Electives | 3.0 |

| University and college requirements | | Credits |
|---|---|---|
| UNIV 101 | The Drexel Experience (for freshmen) | 2.0 |
| INFO 120 | IST Seminar for Transfer Students | 2.0 |

| Other courses | | Credits |
|---|---|---|
| | Free electives | 13.0 |

### *Minor in Business*

IST students who take all their courses at Drexel will qualify for the minor in business. Transfer students may or may not qualify for the minor depending on individual circumstances, but all BSIS students will have the credit equivalent of a minor.

| Business minor requirements | | Credits |
|---|---|---|
| ACCT 111 | Financial Accounting | 3.0 |
| ECON 211 | Principles of Economics I (Micro) | 3.0 |
| ECON 212 | Principles of Economics II (Macro) | 3.0 |
| ORGB 300 | Organizational Behavior | 4.0 |
| STAT 201 | Statistics I | 4.0 |
| STAT 202 | Statistics II | 4.0 |

| At least two of the following | | |
|---|---|---|
| BLAW 201 | Business Law I | 4.0 |
| FIN 311 | Financial Management | 3.0 |
| or | | |
| FIN 301 | Introduction to Finance | |

| | | |
|---|---|---|
| MKTG 301 WI | **Introduction to Marketing Management** | 5.0 |
| POM 300 WI | **Operations Management** | 4.0 |
| **or** | | |
| POM 311 WI | **Management of Operatons** | |

*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 Information Systems

*Bachelor of Science Degree*

4-yr co-op 5-yr co-op

| Term 1 | | Credits |
|---|---|---|
| ENGL 101 | **Expository Writing and Reading** | 3.0 |
| INFO 101 | **Introduction to Information Technology** | 3.0 |
| INFO 108 | **Foundations of Software** | 4.0 |
| UNIV 101 | **The Drexel Experience** | 1.0 |
| MATH 101 | **Introduction to Math Analysis I** | 4.0 |
| **or** | | |
| MATH 121 | **Calculus I** | 4.0 |
| | *Term credits* | *15.0* |
| **Term 2** | | **Credits** |
| ENGL 102 | **Persuasive Writing and Reading** | 3.0 |
| INFO 102 | **Introduction to Information Systems** | 3.0 |
| UNIV 101 | **The Drexel Experience** | 1.0 |
| CS 131 | **Computer Programming A** [1] | 3.0 |
| **or** | | |
| CS 171 | **Computer Programming I** | 3.0 |
| MATH 122 | **Calculus II** | 4.0 |
| **or** | | |
| MATH 102 | **Introduction to Math Analysis II** | 4.0 |
| | *Term credits* | *14.0* |

1 Students interested in a Computing Science minor should take CS 171, CS 172, and CS 260 in place of CS 131, CS 132, and CS 133.

| Term 3 | | Credits |
|---|---|---|
| ENGL 103 | **Analytical Writing and Reading** | 3.0 |
| MATH 180 | **Discrete Computational Structures** | 4.0 |
| INFO 105 | **Information Evaluation, Organization, and Use** | 3.0 |
| INFO 110 | **Human-Computer Interaction** | 3.0 |
| CS 132 | **Computer Programming B** | 3.0 |
| **or** | | |
| CS 172 | **Computer Programming II** | 3.0 |
| | *Term credits* | *16.0* |
| **Term 4** | | **Credits** |
| PHIL 105 | **Critical Reasoning** | 3.0 |
| INFO 200 | **Systems Analysis I** | 3.0 |
| INFO 330 | **Computer Networking Technology I** | 4.0 |
| SOC 250 | **Research Methods I** | 3.0 |
| CS 133 | **Computer Programming C** | 3.0 |
| **or** | | |
| CS 260 | **Data Structures** | 3.0 |
| ANTH 101 | **Cultural Diversity: Introduction to Cultural Anthropology** | 3.0 |
| **or** | | |
| SOC 101 | **Introduction to Sociology** | 3.0 |
| | *Term credits* | *19.0* |
| **Term 5** | | **Credits** |
| SOC 350 | **Research Methods II** | 3.0 |
| INFO 210 | **Database Management Systems** | 3.0 |
| PSY 101 | **General Psychology I** | 3.0 |

| | | |
|---|---|---|
| | **Elective** | 3.0-4.0 |
| | **Information Systems elective** | 3.0 |
| | *Term credits* | *15.0-16.0* |
| **Term 6** | | **Credits** |
| COM 230 | **Techniques of Speaking** | 3.0 |
| ECON 211 | **Principles of Economics I (Micro)** | 3.0 |
| PHIL 111 | **Beginning Logic** | 3.0 |
| INFO 355 | **Systems Analysis II** | 3.0 |
| | **Information Systems concentration course** | 3.0 |
| | *Term credits* | *15.0* |
| **Term 7** | | **Credits** |
| ECON 212 | **Principles of Economics II (Macro)** | 3.0 |
| PSY 330 | **Cognitive Psychology** | 3.0 |
| INFO 215 | **Social Aspects of Information Systems** | 3.0 |
| | **Information Systems concentration course** | 3.0 |
| | **Information Systems elective** | 3.0 |
| | *Term credits* | *15.0* |
| **Term 8** | | **Credits** |
| COM 310 WI | **Technical Communication** | 3.0 |
| STAT 201 | **Statistics I** | 4.0 |
| ACCT 111 | **Financial Accounting** | 3.0 |
| | **Information Systems elective** | 3.0 |
| | **Science sequence I** [1] | 4.0-4.5 |
| | *Term credits* | *17.0-17.5* |
| 1 | Students select one of the following course sequences: BIO 102/ BIO 104; ENVR 260-261/ENVR 262-263; CHEM 101/CHEM 102; CHEM 111/CHEM 112; PHYS 103/PHYS 104; PHYS 111/ PHYS 112; PHEV 141/142 and 143/144;or BIO 151/CHEM 151 and PHYS 151. | |
| **Term 9** | | **Credits** |
| ORGB 300 | **Organizational Behavior** | 4.0 |
| STAT 202 | **Statistics II** | 4.0 |
| | **Information Systems elective** | 3.0 |
| | **Science sequence II** | 4.0 |
| | *Term credits* | *15.0* |
| **Term 10** | | **Credits** |
| INFO 420 WI | **Software Project Management** | 3.0 |
| | **Elective** | 3.0 |
| | **Information Systems elective** | 3.0 |
| | **Behavioral Science elective** | 3.0 |
| | **Business minor course** | 3.0 |
| | *Term credits* | *15.0* |
| **Term 11** | | **Credits** |
| INFO 425 WI | **Design Problems I** | 3.0 |
| | **Elective** | 3.0 |
| | **Information Systems elective** | 3.0 |
| | **Behavioral Science elective** | 3.0 |
| | **Math/Natural Science elective** | 4.0 |
| | *Term credits* | *16.0* |
| **Term 12** | | **Credits** |
| INFO 426 WI | **Design Problem II** | 3.0 |
| | **Elective** | 3.0 |
| | **Arts and Humanities elective** | 3.0 |
| | **Behavioral Science elective** | 3.0 |
| | **Business minor course** | 3.0 |
| | *Term credits* | *15.0* |
| | **Total credits (minimum)** | **187.0** |

# 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 iSchool Consortium, and its status as a founding member of the organization. The iSchool Consortium 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 (B.S.I.T.) 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 15 credits towards a minor in business. Only 9 additional credits would be required to complete a minor in business.

Students graduating with a Bachelor of Science Degree in Information Technology (B.S.I.T.) 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.

**Integration with B.S.I.S.**
The B.S.I.T. integrates closely with Drexel's bachelor of science in information systems (B.S.I.S.), 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 B.S.I.T. 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.

# Information Technology

*Bachelor of Science Degree: 188.0 credits*

## Degree Requirements

| Technology requirements | | 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** | 4.0 |
| INFO 110 | **Human-Computer Interaction I** | 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 320 | **Server Technology I** | 4.0 |
| INFO 330 | **Computer Networking Technology I** | 4.0 |
| INFO 410 | **Information Technology Infrastructure** | 3.0 |
| INFO 415 | **Information Technology Services** | 3.0 |
| INFO 420 WI | **Software Project Management** | 3.0 |
| INFO 425 WI | **Design Problem I** | 3.0 |
| INFO 426 WI | **Design Problem II** | 3.0 |

**Advanced Topics** **9.0- 12.0**

Students select one of the following sequences:

| Database Management Systems | | |
|---|---|---|
| INFO 300 | **Information Retrieval Systems** | 3.0 |
| INFO 365 | **Database Administration I** | 3.0 |
| INFO 366 | **Database Administration II** | 3.0 |
| **or** | | |
| **Server and Network Technology** | | |
| INFO 321 | **Server Technology II** | 4.0 |
| INFO 322 | **Server Technology III** | 4.0 |
| INFO 331 | **Computer Networking Technology II** | 4.0 |

| Behavioral science requirements | | |
|---|---|---|
| PSY 101 | **General Psychology I** | 3.0 |
| PSY 330 | **Cognitive Psychology** | 3.0 |

| | | |
|---|---|---|
| | **Electives** | 9.0 |

**Required computer science sequence**

| | | |
|---|---|---|
| CS 131 | **Computer Programming A** | 3.0 |
| CS 132 | **Computer Programming B** | 3.0 |
| CS 133 | **Computer Programming C** | 3.0 |
| **or** | | |
| CS 171 | **Computer Programming I** | 3.0 |
| CS 172 | **Computer Programming II** | 3.0 |
| CS 260 | **Data Structures** | 3.0 |

**Mathematics/natural science requirements**

| | | |
|---|---|---|
| MATH 101 | **Introduction to Analysis I** | 4.0 |
| **or** | | |
| MATH 121 | **Calculus I** | 4.0 |
| MATH 102 | **Introduction to Analysis II** | 4.0 |
| **or** | | |
| MATH 122 | **Calculus II** | 4.0 |
| MATH 180 | **Discrete Computational Structures** | 4.0 |
| | **Natural science sequence*** | 8.0-9.0 |

* Students select one of the following course sequences:
CHEM 101 and CHEM 102
CHEM 111 and CHEM 112
ENVR 260/261 and ENVR 262/263
PHYS 103 and PHYS 104
PHEV 141/142 and PHEV 143/144
BIO 102 and BIO 104
BIO 151, CHEM 151, and PHYS 151
or PHYS 111 and PHYS 112.

**Arts/humanities requirements**

| | | |
|---|---|---|
| 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 111 | **Beginning Logic** | 3.0 |
| COM 230 | **Techniques of Speaking** | 3.0 |
| COM 310 WI | **Technical Communication** | 3.0 |
| | **Technology electives** | 15.0-18.0 |
| | **Electives** | 3.0 |

**Business requirements**

| | | |
|---|---|---|
| ACCT 111 | **Financial Accounting** | 3.0 |
| **or** | | |
| ACCT 115 | **Financial Accounting Foundations** | 5.0 |
| ORGB 300 | **Organizational Behavior** | 4.0 |
| STAT 201 | **Statistics I** | 4.0 |
| STAT 202 | **Statistics II** | 4.0 |

**University and college requirements**

| | | |
|---|---|---|
| UNIV 101 | **The Drexel Experience (for freshmen)** | 2.0 |

| | | |
|---|---|---|
| INFO 120 | **IST Seminar for Transfer Students** | 2.0 |

**Other courses**

| | |
|---|---|
| **Free electives** | 27.0 - 28.0 |

*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 Information Technology

*Bachelor of Science Degree*

4-yr co-op 5-yr co-op

| Term 1 | | Credits |
|---|---|---|
| ENGL 101 | **Expository Writing and Reading** | 3.0 |
| INFO 101 | **Introduction to Information Technology** | 3.0 |
| INFO 108 | **Foundations of Software** | 4.0 |
| UNIV 101 | **The Drexel Experience** | 1.0 |
| MATH 101 | **Introduction to Math Analysis I** | 4.0 |
| **or** | | |
| MATH 121 | **Calculus I** | 4.0 |
| | *Term credits* | *15.0* |
| **Term 2** | | **Credits** |
| ENGL 102 | **Persuasive Writing and Reading** | 3.0 |
| INFO 102 | **Introduction to Information Systems** | 3.0 |
| UNIV 101 | **The Drexel Experience** | 1.0 |
| MATH 122 | **Calculus II** | 4.0 |
| **or** | | |
| MATH 102 | **Introduction to Math Analysis II** | 4.0 |
| CS 131 | **Computer Programming A** [1] | 3.0 |
| **or** | | |
| CS 171 | **Computer Programming I** | 3.0 |
| | *Term credits* | *14.0* |
| 1 | Students interested in a Computing Science minor should take CS 171, CS 172, and CS 260 in place of CS 131, CS 132, and CS 133. | |
| **Term 3** | | **Credits** |
| ENGL 103 | **Analytical Writing and Reading** | 3.0 |
| MATH 180 | **Discrete Computational Structures** | 4.0 |
| INFO 105 | **Information Evaluation, Organization, and Use** | 3.0 |
| INFO 110 | **Human-Computer Interaction** | 3.0 |
| CS 132 | **Computer Programming B** | 3.0 |
| **or** | | |
| CS 172 | **Computer Programming II** | 3.0 |
| | *Term credits* | *16.0* |
| **Term 4** | | **Credits** |
| COM 230 | **Techniques of Speaking** | 3.0 |
| INFO 200 | **Systems Analysis I** | 3.0 |
| INFO 320 | **Server Technology I** | 4.0 |
| PSY 101 | **General Psychology I** | 3.0 |
| CS 133 | **Computer Programming C** | 3.0 |
| **or** | | |
| CS 260 | **Data Structures** | 3.0 |
| | *Term credits* | *16.0* |
| **Term 5** | | **Credits** |
| PHIL 105 | **Critical Reasoning** | 3.0 |
| PSY 330 | **Cognitive Psychology** | 3.0 |
| INFO 210 | **Database Management Systems** | 3.0 |
| INFO 330 | **Computer Networking Technology I** | 4.0 |
| | **Elective** | 3.0 |
| | *Term credits* | *16.0* |

| Term 6 | | Credits |
|---|---|---|
| PHIL 111 | **Beginning Logic** | 3.0 |
| | **Elective** | 3.0 |
| | **Information Technology advanced topic** | 3.0 |
| | **Information Technology elective** | 3.0 |
| | **Science sequence I** [1] | 4.0-4.5 |
| | *Term credits* | *16.0-16.5* |

1 Students select one of the following course sequences: CHEM 101 and CHEM 102; CHEM 111 and CHEM 112; ENVR 260/261 and ENVR 262/263; PHYS 103 and PHYS 104; PHEV 141/142 and 143/144; BIO 102 and BIO 104; BIO 151, CHEM 151 and PHYS 151; or PHYS 111 and PHYS 112.

| Term 7 | | Credits |
|---|---|---|
| INFO 215 | **Social Aspects of Information Systems** | 3.0 |
| | **Elective** | 3.0 |
| | **Information Technology advanced topic** | 3.0 |
| | **Information Technology elective** | 3.0 |
| | **Science sequence II** | 4.0 |
| | *Term credits* | *16.0* |

| Term 8 | | Credits |
|---|---|---|
| COM 310 WI | **Technical Communication** | 3.0 |
| STAT 201 | **Statistics I** | 4.0 |
| INFO 410 | **Information Technology Infrastructure** | 3.0 |
| | **Elective** | 3.0 |
| | **Information Technology elective** | 3.0 |
| | *Term credits* | *16.0* |

| Term 9 | | Credits |
|---|---|---|
| STAT 202 | **Statistics II** | 4.0 |
| INFO 415 | **Information Technology Services** | 3.0 |
| | **Elective** | 3.0 |
| | **Information Technology advanced topic** | 3.0 |
| | **Information Technology elective** | 3.0 |
| | *Term credits* | *16.0* |

| Term 10 | | Credits |
|---|---|---|
| ACCT 111 | **Financial Accounting** | 3.0 |
| INFO 420 WI | **Software Project Management** | 3.0 |
| | **Elective** | 4.0 |
| | **Information Technology elective** | 3.0 |
| | **Behavioral Science elective** | 3.0 |
| | *Term credits* | *16.0* |

| Term 11 | | Credits |
|---|---|---|
| ORGB 300 | **Organizational Behavior** | 4.0 |
| INFO 425 WI | **Design Problems I** | 3.0 |
| | **Elective** | 3.0 |
| | **Information Technology elective** | 3.0 |
| | **Behavioral Science elective** | 3.0 |
| | *Term credits* | *16.0* |

| Term 12 | | Credits |
|---|---|---|
| INFO 426 WI | **Design Problem II** | 3.0 |
| | **Two electives** | 6.0 |
| | **Arts and Humanities elective** | 3.0 |
| | **Behavioral Science elective** | 3.0 |
| | *Term credits* | *15.0* |

| | | |
|---|---|---|
| | **Total credits (minimum)** | **188.0** |

## 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 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.

# Software Engineering

*Bachelor of Science in Software Engineering (BSSE): 192.0 credits*

## Degree Requirements

| Software engineering requirements | | Credits |
|---|---|---|
| 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 | **Sofware Verification and Validation** | 3.0 |
| SE 410 | **Software Evolution** | 3.0 |
| SE 491 | **Design Project I** | 2.0 |
| SE 492 | **Design Project II** | 2.0 |
| SE 493 | **Design Project III** | 4.0 |

| Computer science requirements | | Credits |
|---|---|---|
| CS 260 | **Data Structures** | 3.0 |
| CS 361 | **Concurrent Programming** | 3.0 |
| CS 338 | **Graphical User Interfaces** | 3.0 |
| CS 472 | **Computer Networks** | 3.0 |

| Information systems requirements | | Credits |
|---|---|---|
| INFO 210 | **Database Management Systems** | 3.0 |
| INFO 310 | **Human Computer Interaction II** | 3.0 |
| INFO 420 WI | **Software Project Management** | 3.0 |

| Computer engineering requirements | | Credits |
|---|---|---|
| ECE 200 | **Fundamentals of Intelligent Systems** | 3.0 |

| Computing electives | | Credits |
|---|---|---|
| | **Additional IS courses (CS courses see advisor)** | 18.0 |

| Mathematics/statistics requirements | | Credits |
|---|---|---|
| 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 205 | Statistical Inference I | 4.0 |
| STAT 206 | Statistical Inference II | 4.0 |

| Basic Science requirements (Choose one of the following sequences) | | Credits |
|---|---|---|
| BIO 102 | Biology I: Cells and Tissues | 4.0 |
| BIO 104 | Biology I: Growth and Heredity | 4.0 |
| BIO 106 | Organismal Biology | 4.0 |
| or | | |
| CHEM 101 | General Chemistry I | 4.0 |
| CHEM 102 | General Chemistry II | 4.0 |
| CHEM 103 | General Chemistry III | 5.0 |
| or | | |
| PHYS 111 | Physics I | 4.5 |
| PHYS 112 | Physics II | 4.5 |
| PHYS 211 | Physics III | 4.5 |
| | Additional science electives | 4.5 - 8.5 |

| Liberal studies requirements | | Credits |
|---|---|---|
| ENGL 101 | Expository Writing and Reading | 3.0 |
| ENGL 102 | Persuasive Writing and Reading | 3.0 |
| ENGL 103 | Analytical Writing and Reading | 3.0 |
| 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 |
| | Additional liberal studies electives | 6.0 |

| Business requirements | | Credits |
|---|---|---|
| ECON 211 | Principles of Economics I (Micro) | 3.0 |
| ECON 212 | Principles of Economics II (Macro) | 3.0 |
| ACCT 111 | Financial Accounting | 3.0 |

| University requirements | | Credits |
|---|---|---|
| UNIV 101 | The Drexel Experience | 2.0 |

| Other courses | Credits |
|---|---|
| **Free electives** | 24.0 |

*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 Software Engineering

*Bachelor of Science Degree* — 5-yr co-op

| Term 1 | | Credits |
|---|---|---|
| ENGL 101 | **Expository Writing and Reading** | 3.0 |
| MATH 121 | **Calculus I** | 4.0 |
| SE 101 | **Foundations of Software Engineering I** | 3.0 |
| UNIV 101 | **The Drexel Experience** | 1.0 |
| BIO 102 | **Biology I: Cells and Tissues** | 4.0 |
| **or** | | |
| CHEM 101 | **General Chemistry I** | 4.0 |
| **or** | | |
| PHYS 111 | **Physics I** [1] | 4.5 |
| | *Term credits* | *15.0* |

1 Students may only take Physics 111 in the first term of the Freshman year if they have taken AP Calculus. If not, students can schedule Physics I in the second term.

| Term 2 | | Credits |
|---|---|---|
| ENGL 102 | **Persuasive Writing and Reading** | 3.0 |
| MATH 122 | **Calculus II** | 4.0 |
| SE 102 | **Foundations of Software Engineering II** | 3.0 |
| UNIV 101 | **The Drexel Experience** | 1.0 |
| BIO 104 | **Biology II: Growth and Heredity** | 4.0 |
| **or** | | |
| CHEM 102 | **General Chemistry II** | 4.0 |
| **or** | | |
| PHYS 112 | **Physics II** | 4.5 |
| | *Term credits* | *15.0* |

| Term 3 | | Credits |
|---|---|---|
| ENGL 103 | **Analytical Writing and Reading** | 3.0 |
| MATH 123 | **Calculus III** | 4.0 |
| SE 103 | **Foundations of Software Engineering III** | 3.0 |
| | **Liberal Studies elective** | 3.0 |
| BIO 106 | **Biology III: Organismal Biology** | 4.0 |
| **or** | | |
| CHEM 103 | **General Chemistry III** | 5.0 |
| **or** | | |
| PHYS 211 | **Physics III** | 4.5 |
| | *Term credits* | *17.0* |

| Term 4 | | Credits |
|---|---|---|
| COM 230 | **Techniques of Speaking** | 3.0 |
| CS 260 | **Data Structures** | 3.0 |
| INFO 210 | **Database Management Systems** | 3.0 |
| SE 210 | **Software Specification and Design I** | 3.0 |
| | **Natural science elective** | 3.0 |
| | *Term credits* | *15.0* |

| Term 5 | | Credits |
|---|---|---|
| COM 310 WI | **Technical Communication** | 3.0 |
| CS 270 | **Mathematical Foundations of Computer Science** | 3.0 |
| MATH 221 | **Discrete Mathematics** | 3.0 |
| SE 211 | **Software Specification and Design II** | 3.0 |

| | | |
|---|---|---|
| | **Science elective** | 3.0 |
| | *Term credits* | *15.0* |
| **Term 6** | | **Credits** |
| ECE 200 | **Fundamentals of Intelligent Systems** | 3.0 |
| SE 320 | **Software Verification and Validation** | 3.0 |
| STAT 205 | **Statistical Inference I** | 4.0 |
| | **Elective** | 3.0 |
| | **Science elective** | 3.0 |
| | *Term credits* | *16.0* |
| **Term 7** | | **Credits** |
| SE 410 | **Software Evolution** | 3.0 |
| STAT 206 | **Statistical Inference II** | 4.0 |
| | **Elective** | 3.0 |
| | **Liberal Studies elective** | 3.0 |
| | **Computing elective** [1] | 3.0 |
| | *Term credits* | *16.0* |
| 1 | Any non-required ISYS/INFO course. See advisor for Computer Science (CS) course options. | |
| **Term 8** | | **Credits** |
| CS 361 | **Concurrent Programming** | 3.0 |
| PHIL 105 | **Critical Reasoning** | 3.0 |
| SE 310 | **Software Architecture I** | 3.0 |
| | **Elective** | 3.0 |
| | **Two Computing electives** | 6.0 |
| | *Term credits* | *18.0* |
| **Term 9** | | **Credits** |
| INFO 310 | **Human Computer Interaction II** | 3.0 |
| SE 311 | **Software Architecture II** | 3.0 |
| | **Two electives** | 6.0 |
| | **Computing elective** | 3.0 |
| | *Term credits* | *15.0* |
| **Term 10** | | **Credits** |
| CS 472 | **Computer Networks** | 3.0 |
| ECON 211 | **Principles of Economics I (Micro)** | 3.0 |
| INFO 420 WI | **Software Project Management** | 3.0 |
| PSY 101 | **General Psychology I** | 3.0 |
| SE 491 | **Design Project I** | 2.0 |
| | **Elective** | 3.0 |
| | *Term credits* | *17.0* |
| **Term 11** | | **Credits** |
| ECON 212 | **Principles of Economics II (Macro)** | 3.0 |
| PSY 330 | **Cognitive Psychology** | 3.0 |
| SE 492 | **Design Project II** | 2.0 |
| | **Elective** | 3.0 |
| | **Two Computing electives** | 6.0 |
| | *Term credits* | *17.0* |
| **Term 12** | | **Credits** |
| CS 338 | **Graphical User Interfaces** | 3.0 |
| PHIL 311 | **Computer Ethics** | 3.0 |
| ACCT 111 | **Financial Accounting** | 3.0 |
| SE 493 | **Design Project III** | 4.0 |
| | **Elective** | 3.0 |
| | *Term credits* | *16.0* |
| | **Total credits (minimum)** | **192.0** |

### Minor in Information Systems

The information systems minor is available to all University students in good standing, with the exception of information systems majors. A minimum of 25 credits is needed to complete the academic minor in information systems.

| Required courses | | Credits |
|---|---|---|
| INFO 102 | **Introduction to Information Systems** | 3.0 |
| INFO 110 | **Human-Computer Interaction I** | 3.0 |
| INFO 200 | **Systems Analysis I** | 3.0 |
| INFO 210 | **Database Management Systems** | 3.0 |
| INFO 330 | **Computer Networking Technology I** | 4.0 |
| INFO 355 | **Systems Analysis II** | 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.

| Requirements | | Credits |
|---|---|---|
| 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 | **Sofware Verification and Validation** | 3.0 |
| SE 410 | **Software Evolution** | 3.0 |
| | **Two Software Engineering electives** | 6.0 |