Table of Contents

The College of Information Science and Technology

The College of Information Science and Technology

Founded in 1892, the College offers programs leading to a Master of Science (Library and Information Science), a Master of Science in Information Systems (MSIS), and a PhD.

Both master's degree programs are offered online or on campus. The College also administers the information science and technology track of the University's multidisciplinary Master of Science in Software Engineering (MSSE) degree. The College also offers advanced certificate opportunities for librarians and information specialists in related fields to update their education or develop new specialties.

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.

For more information about the College, visit the College of Information Science and Technology web site.

About the Goals of the College

Education

- To provide the student with a foundation for understanding, developing, and operating information systems, services, and products — including information creation, organization, communication, processing, and storage, as well as the technical, social, and human context in which information professionals operate
- To relate fundamental concepts to practical applications, and to provide the student with the necessary skills to function as a responsive professional in a variety of specialized roles
- To ground the student in state-of-the-art information technologies

Research

- To encourage a spirit of inquiry and criticism, and to advance the theory and practice of the information professions through research and publication

Service

- To contribute to the growth and development of the information professions

The general learning objectives of the College are to prepare graduates of the degree programs to:

- Take positions of professional leadership
- Balance and integrate human and technical aspects of information systems, services, and products
- Exhibit a strong client orientation in delivering information systems, services, and products, including an understanding of the implications of a culturally diverse society
- Use a variety of information technologies and readily adopt appropriate new technologies
- Analyze people's information requirements and match them with available technologies
- Analyze the flow, structure, and use of information among people and within organizations
- Develop and defend positions on relevant social, political, and ethical issues
- Communicate effectively with others
- Develop critical thinking skills

Admission Requirements

Deadlines for applications to the College of Information Science and Technology differ from those of the university. Applicants to degree programs must take the Graduate Record Examination and have the scores sent to Drexel University. See the College of Information Science and Technology's web pages for specific deadlines.

Although enrollment in the full-time programs is recommended whenever possible, part-time study is common. Courses are typically offered in the evening, online, and occasionally on Saturdays.

Scores for the GRE General Test are required for all master's and PhD applicants. Master's applicants will be automatically reviewed for a GRE waiver at the College's discretion based on a previous degree GPA. Generally the GPA threshold needed to receive a waiver is an overall 3.2 cum GPA or a half cum of a 3.2 on a 4.0 scale. Exceptions may apply.

Doctoral students must enroll as full-time students for at least three consecutive terms. Students may be admitted to the program for part-time study. All applicants to the PhD program are required to take the General (Aptitude) Test of the GRE. PhD applicants are not eligible for a waiver of the GRE requirement. For full information on Admissions Requirements please visit the College of Information Science and Technology's web site.

The standard requirement for the MS or MSIS degree is 45 credits. Students should allow approximately five to eight terms to complete the program.
In addition to the above-mentioned requirements, prospective MS and MSIS students must also complete the Credit for Work Experience Form. This form can be found in the Admissions Requirements section of each program on the College Web site. (This form must be completed and returned for an application to be considered complete regardless of whether or not the student is requesting Credit for Work Experience.)

All entering MS students must have a demonstrated competency in the use of basic desktop software.

MSIS and MSSE applicants should have a strong technical background either through education or work experience.

Although the time limit set by the University for completion of any degree is seven years, the College of Information Science and Technology strongly recommends that part-time students complete the master’s degree in no more than four years, for a meaningful and cohesive educational experience. On average, most part-time students complete the program in two to three years.

Placement of Graduates
The College maintains a Career Services Office with job listings from international, national and local sources on their web site.

Facilities

W. W. Hagerty Library
The Hagerty Library supports research supports research in the College of Information Science and Technology through provision of books, periodical literature, and related materials in all fields of inquiry in library and information science, computer science, systems engineering, information systems, and technology. With over 450 online literature databases, more than 21,500 full-text electronic journal titles and more than 110,000 electronic books, the majority of the Library's resources are now available online via its homepage (http://www.library.drexel.edu/). On-site amenities include close to one hundred laptop and desktop PCs for walk-in use by students and hundreds of seating options for quiet work or group projects, including over a dozen group study rooms and the 24/7 cafe area. The staff of ten reference librarians includes an IST subject specialist who is available for individual research consultations.

iCommons
Located in Room 106 of the Rush Building, the College's iCommons features a wireless/laptop area, more collaborative space for its students and a furnished common area. There is a fully equipped conference room for student use with Plasma display and videoconferencing capabilities. The iCommons provides technical support to students, faculty, and administrative staff. In addition, the staff provides audio-visual support for all presentation classrooms within the Rush Building. Use of the iCommons is reserved for all students taking *iSchool* courses.

The computers for general use are Microsoft Windows machines with appropriate applications which include the Microsoft Office suite, various database management systems, modeling tools, and statistical analysis software. Library related resources may be accessed at the iCommons and through the Hagerty Library. The *iSchool* is a member of the Rational SEED Program which provides cutting-edge CASE and project management software for usage in the iCommons and *iSchool* classrooms.

iSchool students can access Drexel's mail server from within the iCommons. The iCommons, student labs, and classrooms have access to networked databases, print and file resources within the College, and the Internet via the University's network. Email accounts, Internet and BannerWeb access are available through the Office of Information Resources and Technology.

Other Facilities
The College maintains 7 classrooms equipped for audio-visual presentation. These rooms typically contain a networked PC, VCR, ceiling mounted projectors, and other equipment for presentations and demonstrations. Two of these classrooms are fully equipped to function as computing labs for networking, programming and database-related projects.

Information Technology Lab
In 2005, the *iSchool* designed and built a laboratory in support of the new degree program in Information Technology. This lab consists of enterprise class information technology hardware that students would encounter in industry positions. The hardware includes more than a dozen servers that are available to students and CISCO networking hardware.

Master of Science (Library and Information Science)

Learning Objectives of the MS Degree
Graduates of the MS program (Library and Information Science) are prepared to assume leadership positions designing, executing, and evaluating information services and products, and managing organizations that facilitate access to recorded knowledge. Their preparation encompasses the knowledge and abilities required to:

- Describe in standard terms the major attributes of information resources
- Demonstrate knowledge of the structure and bibliographic control of literatures
- Augment access to information resources through processes such as thesaurus creation, classification, indexing, abstracting, systematic listing, and reviewing
- Select information resources appropriate for given audiences and develop appropriate information-seeking strategies
- Retrieve textual, numeric, bibliographic, image, and other information from all appropriate information sources
- Analyze or synthesize data and information for the client, in the form of digests, reviews of the literature, or technical reports
- Teach people to use information resources effectively
- Manage information organizations and the production of information services and products through planning, controlling, staffing, organizing, and leading

Accreditation
The College of Information Science and Technology is a member of the Association for Library and Information Science Education, and its MS program (Library and Information Science) is accredited by the American Library Association.

Professional Affiliation for MS Students
Student groups include student chapters of the American Library Association, the American Society for Information Science and Technology, and the Special Libraries Association.

Master of Science (Library and Information Science)

Total credits: 45.0

Curriculum

The library and information science program assures students of a solid introduction to the field, a logical progression of coursework, and a wide variety of electives. All students are required to complete the six core courses, totaling 18 credits. Completion of the The MS(LIS) program requires a total of 45 credits. Students may take any available electives to complete their required number of credits in the program.

Students may declare a concentration in one of six areas: *archival studies, competitive intelligence and knowledge management, digital libraries, library and information services*, *school library media* and *youth services*. These concentrations will appear on the student's transcript. Except for the school library media concentration, three courses are typically required and two are chosen from a limited list of courses relevant to the topic area. The remaining 12 credits are free electives.

In exceptional cases, a student with previous coursework in an ALA-accredited program or information science may petition for exemption from one to three required courses. This petition should be made at the time of application to the College and should include both a detailed statement of the reasons for seeking exemption and a copy of the transcript, including course descriptions.

Core courses		**18.0 Credits**
INFO 515	**Research in Information Organizations**	3.0
INFO 520	**Social Context of Information Professions**	3.0
INFO 521	**Information Users and Services**	3.0
INFO 522	**Information Access and Resources**	3.0
INFO 530	**Foundations of Information Systems**	3.0
INFO 640	**Managing Information Organizations**	3.0

Electives		
	Free electives	12.0

Concentrations	**15.0 credits**

Archival Studies

The concentration in archival studies focuses on the practice and theory of managing collections of records and papers in a variety of archival settings, including governmental agencies, libraries, historical societies, corporations, not-for-profit organizations, museums, and religious institutions.

The course content within this concentration provides the educational component required for post-graduate certification by the Academy of Certified Archivists. This concentration may also be of interest to students planning careers in academic and special libraries.

Students take the following courses required for the concentration:

INFO 560	**Introduction to Archives I**	3.0
INFO 561	**Introduction to Archives II**	3.0
INFO 750	**Archival Access Systems**	3.0

Students select two courses from the following list:

INFO 751	**Archival Appraisal**	3.0
INFO 755	**Electronic Records Management**	3.0
INFO 756	**Digital Preservation**	3.0

Library and Information Services

This is a generalist concentration that includes key professional skills and an orientation to both a work setting and a relevant elective.

Students take the following courses required for the concentration:

INFO 552	**Introduction to Web Design for Information Organizations**	3.0
INFO 660	**Cataloging and Classification**	3.0
INFO 665	**Collection Management**	3.0

Students select one Work Setting course and one Public or Technical Services course from the following list:

Work Settings

INFO 650	**Public Library Service**	3.0
INFO 651	**Academic Library Service**	3.0

Public Services

INFO 649	**Library Programming**	3.0
INFO 672-681	**(specialized reference courses INFO 672, 673, 674, 675, 677, 680, and 681)**	3.0

Technical Services

INFO 663	**Library Technical Services**	3.0
INFO 664	**Library Automation**	3.0
INFO 662	**Metadata and Resource Description**	3.0

Digital Libraries

This concentration covers a range of topics in digital resources, collections and services. It can serve as a bridging concentration accessible to MSIS students; several courses are part of the MSIS curriculum.

Students take the following courses required for the concentration:

INFO 552	**Introduction to Web Design for Information Organizations**	3.0
INFO 653	**Digital Libraries**	3.0
INFO 657	**Digital Library Technologies**	3.0

Students select two courses from the following list (courses are grouped based on general orientation):

Resource-focused courses

INFO 622	**Content Representation**	3.0

INFO 662	**Metadata and Resource Description**	3.0
INFO 740	**Digital Reference Services**	3.0

Systems-focused courses

INFO 605	**Introduction to Database Management**	3.0
INFO 608	**Human-Computer Interaction**	3.0
INFO 624	**Information Retrieval Systems**	3.0
INFO 658	**Information Architecture**	3.0

Competitive Intelligence and Knowledge Management

This concentration focuses on information needs and knowledge management in special library, corporate, and other organizational settings.

Students take the following courses required for the concentration:

INFO 643	**Information Services in Organizations**	3.0
INFO 644	**Knowledge Assets Management in Organizations**	3.0
INFO 678	**Competitive Intelligence**	3.0

Students select one course from the following list:

Information Retrieval

INFO 624	**Information Retrieval Systems**	3.0
INFO 674	**Resources in Science and Technology**	3.0
INFO 675	**Resources in the Health Sciences**	3.0
INFO 677	**Resources in Business**	3.0
INFO 680	**US Government Publications**	3.0
INFO 681	**Legal Research**	3.0

Students select one additional course from the following list:

Resource Structure, Content & Context

INFO 612	**Knowledge Base Systems**	3.0
INFO 622	**Content Representation**	3.0
INFO 650	**Public Library Service**	3.0
INFO 651	**Academic Library Service**	3.0
INFO 653	**Digital Libraries**	3.0
INFO 658	**Information Architecture**	3.0
INFO 662	**Metadata and Resource Description**	3.0
INFO 679	**Information Ethics**	3.0
INFO	**Special Libraries and Resource Centers**	3.0

Youth Services

This concentration meets the interests of students planning public library careers with a focus on youth populations.

Students take the following courses required for the concentration:

INFO 650	**Public Library Service**	3.0
INFO 683	**Resources for Children**	3.0
INFO 684	**Resources for Young Adults**	3.0

Students select two courses from the following list:

INFO 649	**Library Programming**	3.0
INFO 552	**Introduction to Web Design for Information Organizations**	3.0
INFO 665	**Collection Management**	3.0
INFO 688	**Instructional Role of the Information Specialist**	3.0

School Library Media

The School Library Media concentration is designed for students who wish to work in K-12 school library programs in both public and private schools. Designed to prepare graduates to be eligible for certification as school librarians by the Pennsylvania Department of Education (PDE), the program meets the requirements of the State of Pennsylvania and provides a strong basis for seeking certification in other states as well. In most instances, students will be required to complete a supervised field study to be eligible for certification.

Three course sequences are available within the concentration: one for students who have *no prior teaching certification* from PDE; one for students who have had *prior teaching certification from PDE* and who wish to add school librarian certification to their credentials; and one for students *with ALA-accredited master's degrees* who wish to seek school librarian certification from PDE.

Currently, all courses in the School Library Media concentration except the Field Study (INFO 891 or INFO 892) are offered online. Field Study, which is required for certification in the State of Pennsylvania, must be completed within a 50-mile radius of Drexel University's main campus. Students seeking certification elsewhere should check on requirements in their own jurisdictions.

For full course sequences, visit http://www.ischool.drexel.edu/CS/GraduatePrograms/MS/slim.

Master of Science in Information Systems

Learning Objectives of the MSIS Degree
Graduates of the MSIS program are prepared to assume leadership and management positions designing, developing, and delivering innovative technological solutions to information problems in a variety of contexts. Their preparation encompasses the knowledge and abilities required to:

- Apply a systems approach to developing and delivering information systems and services:
    - Identifying clients' information requirements
    - Analyzing the flow and structure of information in user tasks and organizational processes with the appropriate formal tools and methods
    - Matching requirements to technological opportunities and performing benefit/cost tradeoff analyses among design options
    - Designing, implementing, and integrating specified system solutions
    - Evaluating development products, including interim deliverables and
    - Developing and implementing plans for maintenance and support of operational systems
- Lead and manage teams of information professionals in the development of quality systems and services:
    - Understanding the business aspects of information systems development and application in organizations
    - Planning, controlling, staffing, and organizing to manage the processes for system development, services delivery, or system support and
    - Preparing general managers with technical information systems competencies.

Master of Science in Information Systems

Curriculum
The MSIS program requires 45.0 credits.

The distribution of credits for the MSIS degree is as follows:

Required courses		**27.0 Credits**
INFO 530	**Foundations of Information Systems**	3.0
INFO 532	**Software Development**	3.0
INFO 605	**Introduction to Database Management**	3.0
INFO 608	**Human-Computer Interaction**	3.0
INFO 614	**Distributed Computing and Networking**	3.0
INFO 620	**IS Analysis and Design**	3.0
INFO 630	**Information Systems Evaluation**	3.0
INFO 638	**Software Project Management**	3.0
INFO 646	**Information Systems Management**	3.0

Distribution requirements **12.0 Credits**

Completion of at least four of the following distribution courses is required for the degree. Additional courses from this list may also be taken as electives.

INFO 540	**Perspectives in Information Systems**	3.0
INFO 606	**Advanced Database Management**	3.0
INFO 607	**Applied Database Technologies**	3.0
INFO 610	**Analysis of Interactive Systems**	3.0
INFO 611	**Design of Interactive Systems**	3.0
INFO 612	**Knowledge Base Systems**	3.0
INFO 613	**Extensible Markup Language (XML) and Databases**	3.0
INFO 616	**Computer-Supported Cooperative Work**	3.0
INFO 617	**Introduction to System Dynamics**	3.0
INFO 622	**Content Representation**	3.0
INFO 624	**Information Retrieval Systems**	3.0
INFO 625	**Cognition and Information Retrieval**	3.0
INFO 626	**Language Processing**	3.0
INFO 627	**Requirements Engineering and Management**	3.0
INFO 628	**Information Systems Implementation**	3.0
INFO 629	**Concepts in Artificial Intelligence**	3.0
INFO 631	**Information Technology Integration**	3.0
INFO 633	**Information Visualization**	3.0

INFO 634	**Data Mining**	3.0
INFO 636	**Software Engineering Process I**	3.0
INFO 637	**Software Engineering Process II**	3.0
INFO 648	**Healthcare Informatics**	3.0
INFO 655	**Introduction to Web Programming**	3.0
INFO 658	**Information Architecture**	3.0
INFO 710	**Information Forensics**	3.0
INFO 712	**Information Assurance**	3.0
INFO 714	**Information Systems Auditing**	3.0
INFO 782	**Issues in Informatics**	3.0

Electives		**6.0 Credits**
	Free electives*	6.0

*Students may take any master's-level *iSchoo*l (INFO) course with the exception of INFO 521, 522, 552, 692, 694, 695, 701, 702 as well as the College of Business course, BUSN 501. If selecting a course outside Drexel University students should seek approval of Advisor.

Master of Science in Software Engineering

Drexel University's Master of Science in Software Engineering (MSSE) degree program was created in response to the growing importance of software to the national infrastructure and the rapid rise in demand for professional software engineers.

All students in the MSSE program take a core curriculum that spans the scope of disciplinary areas relevant to the degree, thereby providing a common foundation for all students in the program. Students also elect an area of concentration, or track — a cohesive, more specialized set of courses that builds on the core to support each student's particular career interest. Three tracks are available: information science and technology, computer science, and engineering. Students in all tracks are encouraged to participate in Drexel's Graduate Co-op Program if they do not have prior or current work experience. The average time to complete this master's degree is three years of part-time study.

Master of Science in Software Engineering

Admissions Requirements
In addition to satisfying the general admission requirements of the University, all applicants to the program must satisfy the following entrance requirements:

- Applicants must have a bachelor's degree from an accredited institution of higher education with an appropriate undergraduate major. Appropriate undergraduate majors include, but are not limited to, computer science, engineering, information systems, management science, and mathematics. Applicants may also have master's degrees in similar fields.
- The GRE General (Aptitude) Test is required for all applicants pursuing full-time study on the engineering and computer science tracks. MSSE applicants for the information science and technology track with a cumulative GPA of 3.2 or higher (on a 4.0 grade scale) in any completed degree, bachelor's or above and applicants with a "half cum" of 3.2 or higher (on a 4.0 grade scale) in any completed degree, bachelor's or above may be eligible for admission to the master's program without taking the GRE.
- After consultation with an academic advisor, students found to be deficient in one or more of the areas below will be required to take foundation courses (these will not count toward the degree) to prepare them for admission to the MSSE program. These foundation courses, to be determined by the advisor, will provide students with the requisite knowledge and skill necessary to begin the master's program. Foundation courses must be taken at Drexel or another approved university.
- Applicants should possess the following knowledge and/or experience:
    - Advanced capability to program in a block-structured programming language such as Pascal, C, or Ada, or an object-oriented language such as C++ or Smalltalk.
    - A grade of B or better in an undergraduate course in systems analysis and design or software engineering.
    - A grade of B or better in an undergraduate course in data structures and algorithms.
    - A grade of B or better in an undergraduate course in discrete mathematics.
    - Applicants must demonstrate evidence of an understanding of the development of industrial-strength software applications. This requirement may be met by at least two years of experience working directly with software system development, or (with permission of an advisor) by extensive software-intensive coursework. Students may also be required to have or develop proficiency in particular technologies, operating systems, or programming languages.

Master of Science in Software Engineering

Degree Requirements
Degree requirements vary by track. All students take the required six core courses (18.0 credits).

Core Courses
Core courses cover topics that are essential for the practicing software engineer.

Core Courses		18.0 Credits
Computer science courses		
CS 575	**Software Design**	3.0
CS 576	**Dependable Software Systems**	3.0
Electrical and computer engineering courses		
ECEC 500	**Fundamentals of Computer Hardware**	3.0
ECEC 600	**Fundamentals of Computer Networks**	3.0
Information science and technology courses		
INFO 627	**Requirements Engineering and Management**	3.0
INFO 638	**Software Project Management**	3.0

Tracks
Students in each track follow the policies determined by the respective College.

Information Science and Technology Track
Track Coordinator:
Dr. Eileen Abels, 215-895-6274, eabels@drexel.edu

This track supports students interested in applying software engineering to information systems problems in commercial organizations and other settings. The principal focus is the process by which user and system requirements are converted into cost-effective, maintainable software systems. This is complemented by a concern for defining, creating, understanding, and evaluating the full range of software life-cycle products. The track places particular emphasis on information systems methodologies such as human-computer interaction, requirements analysis, modeling, and validation, along with the use of off-the-shelf tools and components to assist in software processes.

Students in the information science and technology track take a total of nine track courses: four required track courses, three courses selected from the track distribution courses, and two courses selected from the distribution courses or other approved electives. This track requires a total of 45 credits, 18 of which are from the required core. The Graduate Co-op program (GCP) is available for up to six credits which do not count toward graduation. Hence, the GCP option requires students to take six credits more than the non-GCP option.

Required courses		12.0 Credits
INFO 608	**Human-Computer Interaction**	3.0
INFO 630	**Evaluation of Information Systems**	3.0
INFO 636	**Software Engineering Process I**	3.0
INFO 637	**Software Engineering Process II**	3.0

Distribution courses		9.0 Credits
INFO 606	**Advanced Database Management**	3.0
INFO 607	**Applied Database Technologies**	3.0
INFO 610	**Analysis of Interactive Systems**	3.0
INFO 611	**Design of Interactive Systems**	3.0
INFO 620	**Information Systems Analysis and Design**	3.0
INFO 631	**Information Technology Integration**	3.0
INFO 646	**Information Systems Management**	3.0

Two Elective courses		6.0 Credits
INFO 612	**Knowledge Base Systems**	3.0
INFO 613	**XML and Databases**	3.0
INFO 616	**Computer-Supported Cooperative Work**	3.0
INFO 617	**Introduction to System Dynamics**	3.0
INFO 634	**Data Mining**	3.0
INFO 780	**Special Topics**	3.0

Computer Science Track

Track Coordinator: Dr. Spiros Mancoridis, 215-895-6824, spiros@drexel.edu

The computer science track welcomes students who are interested in a variety of technical topics pertaining to the development of software systems such as databases, networks, operating systems, graphics and animation systems, compilers, expert systems, and systems for scientific computing. Students will use languages and apply techniques to specify, design, implement, test, and maintain software systems.

Students in the computer science track take 9 courses in addition to the 6 core courses. Of the 9 courses, 4 courses must be from one of the six concentrations. The other 5 courses are electives that may be fulfilled by any course offered for the MSSE degree.

Students in their final 3 quarters of study who have a 3.5 GPA or better may take a 9-credit project instead of 3 elective courses. To register for a project, the student must select a project advisor (a member of the CS faculty who is willing to supervise). The project is a large-scale software development effort in which students specify, design, implement, and test a significant software system.

The Graduate Co-op program (GCP) is also available for up to 6 credits. Hence, the GCP option requires students to take 6 credits more than the non-GCP option.

Concentration courses

Computing Systems concentration		
CS 500	**Database Theory**	3.0
CS 540	**High Performance Computing**	3.0

CS 543	**Operating Systems**	3.0
CS 544	**Computer Networks**	3.0
CS 643	**Advanced Operating Systems**	3.0
CS 645	**Network Security**	3.0
CS 647	**Distributed Systems Software**	3.0
CS 675	**Reverse Software Engineering**	3.0
CS 676	**Parallel Programming**	3.0
CS 741	**Computer Networks II**	3.0

Programming Languages concentration

CS 525	**Theory of Computation**	3.0
CS 550	**Programming Languages**	3.0
CS 551	**Compiler Construction I**	3.0
CS 552	**Compiler Construction II**	3.0
CS 650	**Program Generation and Optimization**	3.0
CS 675	**Reverse Software Engineering**	3.0
CS 676	**Parallel Programming**	3.0

User Interface Software concentration

CS 530	**Developing User Interfaces**	3.0
CS 536	**Computer Graphics**	3.0
CS 630	**Cognitive Systems**	3.0
CS 636	**Advanced Computer Graphics**	3.0
CS 680	**Special Topics in Computer Science: Game Design and Implementation**	3.0
PSY 612	**Psychology of Human-Computer Interaction Design**	3.0

Artificial Intelligence concentration

CS 510	**Artificial Intelligence**	3.0
CS 511	**Robot Building Laboratory**	3.0
CS 610	**Advanced Artificial Intelligence**	3.0
CS 612	**Knowledge-Based Agents**	3.0

Scientific Computation concentration

CS 540	**High Performance Computing**	3.0
CS 567	**Applied Symbolic Computing**	3.0
CS 668	**Computer Algebra I**	3.0
CS 669	**Computer Algebra II**	3.0
CS 676	**Parallel Programming**	3.0
CS 680	**Special Topics in Computer Science: Methods I**	3.0
CS 680	**Special Topics in Computer Science: Methods II**	3.0

For additional information on the Computer Science Track, as well as an FAQ, visit the Department of Computer Science's Master of Science in Software Engineering web page.

Engineering Track

T*rack Coordinator: Dr. Kapil Dandekar, 215-571-3579, dandekar@ece.drexel.edu*

Students in this track pursue techniques to model engineering problems and offer software solutions. The courses in this track emphasize problems facing engineering industries including electrical, mechanical, environmental, chemical, and others. Systems modeling and simulation techniques will be used to solve these problems.

Students in this track take 27 or more credits of track courses in addition to the 18 credits of required core courses. Three computer engineering courses are required; the other courses are from one of five concentrations. A total of 45 approved graduate credits are required for the MSSE, including the 18 credits of core courses. Students opting for the Graduate Co-op Program (GCP) option are required to complete 51 approved credits, including 6 GCP credits.

For more information on curriculum requirements, visit the Department of Electrical and Computer Engineering's Graduate Student Guide.

Sample Track Courses

Chemical engineering concentration		
CHE 554	**Process Systems Engineering**	3.0
CHE 658	**Advanced Process Design**	3.0

Civil and architectural engineering concentration		
CIVE 501	**Model Analysis of Structures**	3.0
CIVE 605	**Advanced Mechanics of Materials**	3.0
CIVE 701	**Structural Analysis I**	3.0
CIVE 702	**Structural Analysis II**	3.0
CIVE 703	**Structural Analysis III**	3.0
CIVE 704	**Behavior and Stability of Structural Members I**	3.0

Electrical and computer engineering concentration		
ECEC 511	**Issues in Combinational Circuit Design**	3.0
ECEC 512	**Issues in Sequential Circuit Design**	3.0
ECEC 513	**Design for Testability**	3.0
ECEC 621	**High Performance Computer Architecture**	3.0
ECEC 622	**Parallel Computer Architecture**	3.0
ECEC 623	**Advanced Parallel Computer Architecture**	3.0

NOTE: Any other ECE 500-level or above course may be eligible for credit for the Electrical and Computer Engineering concentration.

Materials engineering concentration		
MATE 605	**Computer Simulation of Materials and Processes I**	3.0
MATE 606	**Computer Simulation of Materials and Processes II**	3.0
MATE 670	**Materials Processing I**	3.0
MATE 671	**Materials Processing II**	3.0

Mechanical engineering and mechanics concentration		
MEM 534	**Discrete Time Control and Estimation I**	3.0
MEM 535	**Discrete Time Control and Estimation II**	3.0
MEM 536	**Microcomputer-Based Control of Dynamic Systems I**	3.0
MEM 537	**Microcomputer-Based Control of Dynamic Systems II**	3.0
MEM 574	**Introduction to CAM**	3.0
MEM 534	**Reliability of Mechanical Systems I**	3.0
MEM 677	**Reliability of Mechanical Systems II**	3.0
MEM 678	**Reliability of Mechanical Systems III**	3.0
MEM 681	**Finite Element Methods I**	3.0
MEM 682	**Finite Element Methods II**	3.0
MEM 683	**Finite Element Methods III**	3.0

Dual Degree Option

MS in Software Engineering (Computer Science Track) Dual Master's Degrees

Graduate students already enrolled in a master's degree program at Drexel have the opportunity, through the dual master's program, to work simultaneously on two master's degrees and to receive both upon graduation. To be eligible, graduate students must be currently working on their first degree when requesting admission to the second. They must obtain approval from the graduate advisors of both programs and work out a plan of study encompassing coursework and/or research (thesis) credits for both degrees.

To satisfy dual degree requirements for MSSE-CS the plan of study must include the following: the core and 4 concentration courses for a total of 30.0 credits. To obtain a dual degree you must have a minimum of 60 credits, thesis (MSSE-CS has a 9-credit project in place of thesis) and research credits will be in excess of the 30.0 credits required by MSSE-CS. Dual degree for MSSE-CS is only available to on-campus students.

The dual master's student must complete the Graduate Dual Degree Form and obtain approvals from both graduate advisors. Final approval is granted by the Office of Graduate Studies. The student is then registered in both majors simultaneously. Upon graduation, the student must file two Application for Degree forms.

Doctor of Philosophy (PhD) in Information Studies

Purpose and Scope
The PhD degree is not based on the accumulation of credits but represents a high level of scholarly achievement in both supervised and independent study and research. There are few fixed program requirements, and the master's degree is not a prerequisite for the PhD. The doctoral program has two major goals: to allow students to acquire in-depth knowledge of a specialized area within the field of information science and technology and to prepare students for a career in which research is a basic element: whether that career is in administration, research, or teaching.

Opportunities
Most graduates move into academic programs, research and development (R&D) positions, or become high-level managers of information organizations in the private or public sectors.

For additional information about the program visit the College of Information Science and Technology's PhD Program web pages.

Doctor of Philosophy (PhD) in Information Studies

Coursework
The degree requires a minimum of 90 credits beyond the bachelor's degree for the PhD degree or 45 credits beyond an applicable MS degree. At least three consecutive terms of full-time resident doctoral study are required. Students may be admitted to the program for part-time study, but they must be formally accepted as doctoral students and must meet the residency requirement.
Courses are taken, under an approved plan of study, to ensure the development of competence in:

- Information science and technology broadly construed
- One or more domains of study
- Research methodology
- Other courses as required by the plan of study
- Additional credits as needed

Advancement to Candidacy
To measure proficiencies in research and to assess students' mastery of their chosen area of study, students maintain a portfolio that is reviewed on a regular basis. Candidacy is awarded based on satisfactory reviews and the presentation of a scholarly document reviewing the literature and developing research questions in the student's dissertation area.

Dissertation
The dissertation must be an original scholarly contribution to the field of information science and technology that will demonstrate the student's capacity to conduct research. The final defense of the dissertation completes the program.

For a sample plan of study, visit the College of Information Science and Technology's PhD Program web pages.

Dual MS/MSIS Degree Option

The College of Information Science and Technology offers a dual master's degree program, leading to the Master of Science in Library and Information Science (MS) and the Master of Science in Information Systems (MSIS). The dual degree combines the focus of the MS program a concern with selecting, organizing, managing and accessing information resources to meet user's information needs with the MSIS graduates skills in creating and managing the databases, interfaces, and information systems that connect users with the information they are seeking. Students who pursue this path greatly increase their ability to compete in today's cutting-edge information marketplace, where the importance of digitized information resources and the needs of organizations and companies to provide networked access to these resources via intranet gateways and knowledge management systems is steadily increasing.

Graduate students already enrolled in a master's degree program at Drexel have the opportunity, through the dual master's program, to work simultaneously on two masters degrees and to receive both upon graduation. To be eligible, graduate students must be currently working on their first degree when requesting admission to the second.

For more information, see the MS/MSIS degree web page on the College's web site.

Information Science and Technology Professional Development Programs

The College of Information Science and Technology offers opportunities for librarians and information specialists in related fields to update their education or develop new specialties.

Advanced Certificate in Information Studies and Technology (ACIST)
This non-degree program provides specialized training beyond the master's degree so that practitioners can update and extend their skills and knowledge by adding position-relevant coursework in order to meet their current employment requirements. It is not intended to provide coursework that can be applied to the *iSchool* master's or doctoral degrees. The program leads to an Advanced Certificate in Information Studies and Technology awarded through the College of Information Science and Technology.

Admission Requirements
Applicants must have completed a master's degree in areas such as library science, computer or information science, information systems, instructional technology, software engineering, or other appropriate degrees from a suitable accredited program that has prepared them for advanced study in the area chosen for specialization. Applicants must meet all the general requirements for admission to graduate studies and the College of Information Science and Technology. Admissions requirements include: completed graduate application form, photocopies of transcripts from all colleges and/or universities attended, essay, resume and Graduate Record Examination (or equivalent), if required.

Program Requirements
The Advanced Certificate in Information Studies and Technology consists of a minimum of eight courses that must be completed within three calendar years. Students must take four INFO courses as well as complete the final independent study within the College. The three remaining courses may be taken from offerings within the College or from other programs in the University, based on consultation with the student's advisor and agreement of the faculty mentor. [More courses, including a practicum in place of the independent study, may be required for students holding a master's in library science who are seeking certification as School Library/Media specialists in Pennsylvania.]

Students design a program of study in consultation with a faculty mentor, and must complete the required courses within three calendar years. Such individualized plans often require coursework found in other Drexel departments or other universities, but at least 4 courses must be chosen from Information Science and Technology courses. Students also complete an independent study project, which integrates studies, field experiences, individual reading, and work experience. Successful completion of the certification program requires a cumulative grade point average of 3.0.

Post-Master's Study for iSchool Alumni
Applicants who hold a master's degree from the College of Information Science and Technology may request readmission by contacting the College.

Special Associate Study

Students who are currently enrolled in a Library Science or Information Systems graduate program at another university may take a graduate class from the College by applying for Special Associate status. Applications for Special Associate students are accepted every quarter. Admissions requirements include: completed graduate application form and a letter from your graduate advisor or department head indicating which classes you have permission to take and that you are in good academic standing.

For additional information, view the College of Information Science and Technology's Professional Development page.

Specialist Certificate Programs
Continuing education opportunities to update or enhance initial skills and knowledge are an important part of many professions. The iSchool's five-course Specialist Certificate Programs allow students to expand their skills and specializations beyond the master's degrees. Like the Advanced Certificate in Information Studies and Technology (ACIST), these certificate programs require a master's degree, must be completed within three years, and will be recorded on a student's transcript. Applicants must have a master's degree from an ALA-accredited program or a graduate degree closely to the chosen specialization (e.g. history for the Archives Specialist program) as well as pre-requisites for individual courses. Students with unrelated master's degrees or those who lack the pre-requisites are eligible to apply to the Advanced Certificate in Information Studies and Technology program.

These certificate programs are available in the following subject areas:

Archival Studies

Digital Libraries

Youth Services

Competitive Intelligence and Knowledge Management

Additional information can be found on the School's Special Programs and Professional Development page.

Archives Specialist Certificate

Total credits: 15.0

The Archives Specialist Certificate is designed for professionals already holding a master's degree from an ALA-accredited program or a graduate degree closely related to this specialization.

This specialization in archival studies focuses on the practice and theory of managing collections of records and papers in a variety of archival settings, including governmental agencies, libraries, historical societies, corporations, not-for-profit organizations, museums, and religious institutions.

The course content within this specialization provides the educational component required for post-graduate certification by the Academy of Certified Archivists. This certification may also be of interest to students planning careers in academic and special libraries.

The program must be completed within three years.

Required courses

INFO 560	**Introduction to Archives I**	3.0
INFO 561	**Introduction to Archives II**	3.0
INFO 750	**Archival Access Systems**	3.0

Students select two courses from the following list:

INFO 751	**Archival Appraisal**	3.0
INFO 755	**Electronic Records Management**	3.0
INFO 756	**Digital Preservation**	3.0

Digital Libraries Specialist Certificate

Total credits: 15.0

This Digital Libraries Specialist Certificate is designed for professionals already holding a master's degree from an ALA-accredited program or a graduate degree closely related to this specialization. This specialization covers a range of topics in digital resources, collections and services. It can serve as a bridging concentration accessible to MSIS students; several courses are part of the MSIS curriculum.

The program must be completed within three years.

Required courses		
INFO 552	**Introduction to Web Design for Information Organizations**	3.0
INFO 653	**Digital Libraries**	3.0
INFO 657	**Digital Library Technologies**	3.0
Students select two courses from the following list (courses are grouped based on general orientation):		
Resource-focused courses		
INFO 622	**Content Representation**	3.0
INFO 662	**Metadata and Resource Description**	3.0
INFO 740	**Digital Reference Services**	3.0
Systems-focused courses		
INFO 605	**Introduction to Database Management**	3.0
INFO 608	**Human-Computer Interaction**	3.0
INFO 624	**Information Retrieval Systems**	3.0
INFO 658	**Information Architecture**	3.0

Youth Services Specialist Certificate

Total credits: 15.0

This Youth Services Specialist Certificate is designed for professionals already holding a master's degree from an ALA-accredited program or a graduate degree closely related to this specialization. This program meets the interests of students planning public library careers with a focus on youth populations

The program must be completed within three years.

Required courses		
INFO 650	**Public Library Service**	3.0
INFO 683	**Resources for Children**	3.0
INFO 684	**Resources for Young Adults**	3.0

Students select two courses from the following list:		
INFO 649	**Library Programming**	3.0
INFO 552	**Introduction to Web Design for Information Organizations**	3.0
INFO 665	**Collection Management**	3.0
INFO 688	**Instructional Role of the Information Specialist**	3.0